EUROPEAN CONFERENCE
ON GENERAL THORACIC SURGERY

ESTS

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SUNDAY 19 JUNE 2022
VIDEO I
14:00 - 15:00

V-001

SUCCESSFUL MANAGEMENT OF PULMONARY ARTERIAL BLEEDING WITHOUT CONVERSION DURING ROBOTIC SLEEVE RESECTION

Darren S Bryan, John P Kuckelman, Paul L Feingold, Emily Polhemus, John S Young, M. Blair Marshall
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OBJECTIVES
Pulmonary artery (PA) injury during anatomic lung resection represents one of the most feared intraoperative complications which can result in significant morbidity or rapid demise of the patient. The anxiety surrounding pulmonary artery injury is heightened when this occurs during a minimally invasive approach. The default decision is conversion to an open operation for control and repair. However, there is little available in terms of direction as to when and how to persist without conversion. The robotic approach adds the complexity of management of the bedside robotic system while maintaining control. We aim to provide a video case displaying successful strategies for management of PA injury robotically without the need for conversion.

VIDEO DESCRIPTION
We present the case of a 75-year-old woman with a locally advanced right upper lobe squamous cell carcinoma involving the right main stem with negative mediastinal staging who primarily underwent a robotic right upper lobe sleeve lobectomy with en bloc right lower lobe wedge. Large volume PA bleeding occurs following opening of a previously divided recurrent branch onto the main PA. Multiple techniques are utilized and shown in the management of the injury. Principles to be emphasized include the use of direct pressure and extended periods of time. This can be done with a stationary robotic arm while continuing to progress with other components of the operation. Hemostatic agents and direct suture arterioplasty may also be utilized. Robotic reconstruction of the bronchus intermedius was completed following hemostasis. Patient post-operative course was uncomplicated with extubation in the OR, admission to the thoracic surgical ward with discharge on post-operative day four.

CONCLUSIONS
Often, the first reflex maneuver to manage intraoperative PA injury during a minimally invasive resection is thoracotomy. This may be avoided using the techniques shown here which embrace the advantages of robotic platform.

Disclosure: No significant relationships.
Keywords: Robotic, Sleeve Resection, Bleeding, Technique, Minimally Invasive.

V-002

STAGED HYBRID MINIMALLY INVASIVE AND OPEN REVERSAL OF ESOPHAGEAL DIVERSION

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[2]*VA Boston Healthcare System, West Roxbury, United States*

OBJECTIVES
We present a technique utilizing laparotomy, laparoscopy, and right thoracoscopy to recanalize the esophageal hiatus and reverse esophageal diversion in an elderly patient who had previously undergone esophageal exclusion for perforated gastric volvulus.

VIDEO DESCRIPTION
We include video footage of the laparotomy and laparoscopy to take down adhesions, close the gastrostomy feeding tube site, and recanalize the esophageal hiatus. The supra-hiatal dissection was difficult and the planes were difficult to visualize, so right thoracoscopy was performed to complete the lower esophageal mobilization. A circular stapler was used to reconstruct the gastroesophageal junction. The left neck esophagostomy was closed in interrupted fashion. An upper GI study after each procedure confirmed no leak.

CONCLUSIONS
A hybrid approach can be effectively utilized to facilitate maximal exposure of the esophageal hiatus in a redo operative setting when esophageal diversion is being reversed.

Disclosure: No significant relationships.
Keywords: Esophageal Exclusion, Esophageal Diversion, Esophagostomy, Spit Fistula, Esophageal Perforation.

V-003

UNIPORTAL VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) RIGHT MAIN PULMONARY ENDARTERECTOMY IN NON-THROMBOTIC PULMONARY ARTERY EMBOLISM

Anna Minasyan[1], Mercedes De La Torre Bravos[1], Ricardo Fernández Prado[1], Marina Paradela De La Morena[1], Alejando García Pérez[1], Ignacio Sánchez Valenzuela[1], Diego González Rivas[2]
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[2]*Shanghai Pulmonary Hospital, Shanghai, China*

OBJECTIVES

Non-thrombotic pulmonary embolism (NTPE) is commonly described as the partial or complete occlusion of the pulmonary circulation caused by numerous non-thrombotic embolic agents. We present a surgical removal of glueball located in the right main pulmonary artery. To the best of our knowledge, this is the first documented case in the literature of migrated glue to the pulmonary artery and the first time that pulmonary endarterectomy is performed by minimally invasive surgery to treat NTPE.

VIDEO DESCRIPTION

A 49 year old female presenting severe dyspnea was admitted to our department and diagnosed with right PA embolism due to pelvic varicose vein embolization. Previously, she was offered on-pump open heart surgery, sternotomy, and potential pneumonectomy in two hospitals. After a detailed analysis, we proposed a minimally invasive Uniportal VATS approach. Under general anesthesia and double-lumen intubation, a 3 cm incision was made in the fourth intercostal space between mid and anterior axillary lines. A wide opening of the pericardium was done anterior to the phrenic nerve. Superior vena cava (SVC) was retracted and, intrapericardial dissection of the right main pulmonary artery was performed between the SVC and aorta. The right main pulmonary artery, superior, middle, and inferior pulmonary veins were encircled with tourniquets. A longitudinal incision over the main pulmonary artery was made to remove the embolization material. Next, we performed partial endarterectomy of adherent thrombotic areas and used Fogarty balloon catheters to extract the distal vascular tree remains. The hypertrophied intimate layer of the artery was first reconstructed and then the artery was closed using a 5/0 Prolene running suture. A six-month follow-up showed an excellent recovery with no sign of dyspnea or impaired lung function.

CONCLUSIONS

Uniportal VATS technique was a successful and safe procedure for this patient, achieving symptom resolution without the need for a more invasive approach.

Disclosure: No significant relationships.

V-004

COMPUTED (CT)-GUIDED MICROCOIL POSITION FOR GROUND GLASS OPACITIES IN UNIPORTAL VATS LUNG RESECTIONS

Andrea La Rosa, Stylianos Korasidis, Gianmarco Elia, Tommaso Ferrarello, Vittorio Aprile, Maria Giovanna Mastromarino, Marcello Carlo Ambrogi
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OBJECTIVES

In order to find and therefore be able to guarantee surgical radicality in patients with pulmonary nodules of reduced dimensions, in a central-parenchymal position and difficult to explore by instrumental and manual palpation, it is possible to implement various technique including the positioning of CT-guided metal coil. In this video we describe our experience with this method, highlighting its advantages and limitations

VIDEO DESCRIPTION

51 years old male with aortic bicuspid defect and a previous poorly differentiated tubular adenocarcinoma G3 of the cardia treated surgically with subtotal esophagectomy. Preoperative CT staging highlighted a GGO area at LUL and two micronodules at LIL, in the absence of mediastinal lymphadenopathy. After primary surgery, oncological follow-up revealed volumetric and metabolic increase in the LIL's lesions and stability of the LUL's one. Due to subcentrimetric dimension, low density and centroparenchyma position of the LUL lesion, positioning of metal coil was indicated. Double wedge resection of LUL and of LIL in U-VATS technique was performed. The definitive histological report of the LUL nodule suggests pT1b pulmonary adenocarcinoma

CONCLUSIONS

The placement of metal coil has limitations, including the availability and ability of the interventional radiologist, the risk of post-procedural PNX, the need to perform surgery on the same day to limit the discomfort linked to the positioning and maintenance of a transient immobility of the patient to avoid the mobilization of the landmark, and the non-accessibility of all parenchymal lesions, such as those subscapularis. The main advantage of this method, on the other hand, is linked to the execution of a pre-operative CT scan, which can further help the surgeon before the surgery, in the exact location of the lesion, without, signal decay or dispersion. of a radiopharmaceutical used with another method, guaranteeing its surgical radicality, using minimally invasive techniques or with open access.

Disclosure: No significant relationships.
Keywords: Uniportal VATS, GGO, Microcoil.

V-005

SURGICAL MANAGEMENT FOR A DRAMATIC PRESENTATION OF THORACIC ENDOMETRIOSIS

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OBJECTIVES
Thoracic endometriosis syndrome (TES) is an exceptionally rare disorder. There are four clinical presentations: catamenial hemothorax, catamenial hemoptysis, catamenial pneumothorax, and/or lung nodules. We report a case of catamenial hemothorax and lung nodules in 37-year-old female. The patient had a history of endometriosis and recurring hemothoraces requiring monthly thoracenteses at an outside institution. She presented to our ER reporting increased shortness of breath. CT revealed a large right sided effusion and pulmonary nodules. We recommended drainage of the effusion, resection of the nodules, and mechanical pleurodesis.

VIDEO DESCRIPTION
The patient underwent general anesthesia and a right VATS approach. Approximately 600mL of fluid was drained. Cystic masses on the diaphragm, pericardium, and right lower lobe were resected. Holes in the diaphragm were closed with serial firings of endo-staplers and endo-stiches to prevent further migration of endometrial tissue. The chest was carefully inspected to ensure there were no remaining endometrial implants. Mechanical pleurodesis of the parietal pleura was carried out to prevent future bloody effusions.

CONCLUSIONS
The patient was discharged uneventfully. At her one-month follow-up, imaging revealed a moderate right basilar effusion. Shortly after, gynecology performed a laparoscopic total hysterectomy, bilateral salpingectomy, unilateral oophorectomy, appendectomy, and excision of her abdominal and pelvic endometriosis. At the conclusion of that procedure, we performed a right-sided thoracentesis to drain the residual effusion. Recently seen for her two-month post-operative appointment, she reported no symptoms and chest x-ray was unremarkable. We will follow up in six months for a surveillance CT.
These interventions appear to be successful thus far. However, even when the abdomen and pelvis are treated aggressively, there is a high risk of recurrence of at least one of the clinical presentations. We report this case of TES to emphasize that treatment must include precise thoracic surgery to prevent recurrence and diligent follow-up is necessary to identify recurrence.

Disclosure: No significant relationships.
Keywords: VATS, Technique, Diaphragm, Pulmonary Non-Neoplastic, Pleura.

V-006

ROBOTIC ANTERIOR SEGMENTECTOMY IN A PATIENT WITH PARTIAL SITUS INVERSUS: ANATOMIC VARIATIONS AND CHALLENGES

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OBJECTIVES
We present the case of a 61-year-old man with a right upper lobe 1.4 cm anterior segment (S3) nodule. The nodule grew in a 3-month interval CT scan and, after multidisciplinary discussion, it was considered not accessible neither by transthoracic nor bronchoscopic biopsy. In addition, the patient presented a partial situs inversus, with a right aortic arch and a right pulmonary anatomy resembling the left lung.

VIDEO DESCRIPTION
After standard preoperative work-up, including PET-CT, pulmonary function tests and cardiological evaluation, an S3 robotic anatomical resection was planned.

Given the anatomical variations presented by the patient, we transected first the A3 branch of the pulmonary artery, afterwards de B3 segment of the bronchus and finally and more caudally, the V3 venous branch.

Parenchymal transection was performed after insufflation of the lung and delimitation of the section regions.

Frozen section of N1 lymph nodes and the lesion showed no malignancy so no further lymph node resection was performed.

Patient was extubated in the operating room and after 4 hours in the recovery room, he was discharged to the thoracic surgery ward. Oral pain medication was started on postoperative day one. Chest tube was removed on the same postoperative day. After satisfactory pain control and adequate chest radiograph, the patient was discharged home on postoperative day 2.

Final pathology showed an indeterminate vascular growth without malignant features.

CONCLUSIONS
In this video, we show a diagnostic and therapeutic S3 resection for a benign lesion in a patient with a partial situs inversus.

Disclosure: Teaching fees and grants from Abex/Intuitive
Keywords: Robotic, Segmentectomy, Situs Inversus, Lung Cancer.

MONDAY 20 JUNE 2022
INNOVATIVE/EXPERIMENTAL I SESSION II
08:00 - 09:00

O-007

COMPARISON OF TWO BIOABSORBABLE SURGICAL PATCHES IN THE TREATMENT OF AIR LEAK: A SINGLE-CENTRE, SINGLE-BLIND, RANDOMIZED, PROSPECTIVE TRIAL

Sandrine Dackam[1], Aljaz Hojski[1], Makhmudbek Mallaev[1], Zeljko Djakovic[1], Mark Wiese[1], Deborah Vogt[2], Helga Bachmann[1], Didier Lardinois[1]
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OBJECTIVES
Prolonged air leak (PAL) is often associated with pain and immobilization and is a major limiting factor for discharge from the hospital. The efficacy of 2 surgical patches (TachoSil®, Takeda, UK and Neoveil™, Gunze, Japan) was investigated in the treatment of air leak following open surgery.

METHODS
45 patients with a mean age of 65.1 y were randomized in a 1:1 ratio to either treatment with Neoveil™ (n=22) or TachoSil® (n=23). Air leak was recorded at 2, 4, 12, 24 hours after surgery and then daily at 8 am and 6 pm (Thopaz digital system drainage). The primary outcome was the time from end of surgery to the first time when air loss was less than 30ml for (at least) 2 consecutive measurements on the digital recording. Secondary outcomes were intensity of air leak, incidence of air leak, incidence of PAL (>7 days), and the incidence of pneumonia.

RESULTS
On average, air loss within the first 24h after surgery was lower and declined faster in patients treated with Neoveil™ vs TachoSil®. Accordingly, time to pulmonary air leak closure was somewhat shorter under Neoveil™ (median [IQR] 10 [2, 52] hours) as compared to TachoSil®, (19 [2, 120] hours). However, air leak closure occurred faster and the difference between the two treatments was small (p = 0.364, Wilcoxon rank sum test). Air leak 2h after surgery was observed in 11/22 (50%) vs 14/23 (61%) patients treated with Neoveil™, respectively TachoSil®; PAL occurred in 3/22 (14%) vs 6/23 (26%) patients, and pneumonia occurred in 2/22 (9%) vs 4/23 (17%) patients treated with Neoveil™, respectively TachoSil®.

CONCLUSIONS
Our results suggest that Neoveil™ might be superior to TachoSil® in reducing the incidence of air leak within the first 24h after surgery and the incidence of PAL but these results were not statistically significant.

Disclosure: No significant relationships.
Keywords: Prolonged Air Leak, Neoveil™, TachoSil®, Open Lung Surgery.

O-008

CYTOKINE ADSORPTION AFTER IN-VIVO REPERFUSION DOES NOT ATTENUATE ALLOGRAFT ISCHEMIA-REPERFUSION INJURY IN A PORCINE LEFT LUNG TRANSPLANTATION MODEL

Anna Elisabeth Frick[1], Michaela Orlitová[1], Arno Vanstapel[2], Sandra Claes[3], Dominique Schols[3], Caroline Mathyssen[2], Robin Vos[2], Geert Verleden[2], Bart Vanaudenaerde[2], Stijn Verleden[4], Laurens Ceulemans[5], Dirk E. Van Raemdonck[5], Arne P. Neyrinck[1]

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[5]Department of Thoracic Surgery, University Hospitals Leuven and Experimental Thoracic Surgery, KU Leuven, Leuven, Belgium

OBJECTIVES
Primary graft dysfunction resulting from ischemia-reperfusion injury (IRI) remains a major obstacle after lung transplantation (LTx). Continuous release of inflammatory cytokines, due to the process of ischemia and reperfusion, triggers a complex cascade of apoptosis and necrosis resulting in graft dysfunction. Previous studies demonstrated successful graft improvement by cytokine filtration during ex-vivo lung perfusion (EVLP). We hypothesize that plasma cytokine filtration (CytoSorb©) during in-vivo graft perfusion immediately after implantation may attenuate IRI after left LTx in a porcine model.

METHODS
Left porcine lung transplantation was performed with allografts preserved for 24 hours at 4°. In the treatment group [T(n=7)], a veno-venous shunt was created to insert the cytokine filter (CytoSorbents, Berlin, Germany). In the control group [C (n=4)] the shunt was created without the filter. Hemodynamic parameters, lung mechanics, blood gases and plasma cytokines were assessed during 6-hours in-vivo reperfusion.

RESULTS
During 6-hours of reperfusion no significant differences in proinflammatory cytokines (IL- 1β, IL-12p40, IL-4, IL-6, IL-8, IFN-α, IFN-γ and TNF-α) and anti-inflammatory cytokines (IL-10) concentrations in the plasma were observed between [T] vs. [C]. (Figure 1) Furthermore, no significant differences, nor meaningful differences in hemodynamics and blood gases were seen. Also, histological biopsies and wet-to-dry ratios at the end of the experiment did not show any significant, nor meaningful differences between [T] vs. [C].

CONCLUSIONS
In our model, cytokine adsorption had no impact on development of IRI and did not alter cytokine concentrations in a porcine left lung transplantation model. This is in contrast to
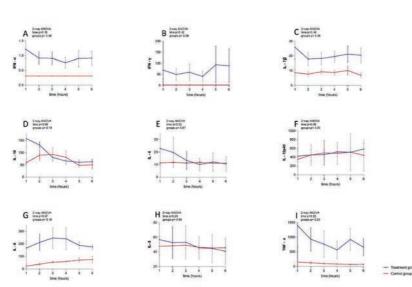
previous studies with CytoSorb© use during EVLP as a surrogate LTx model. The explanation for this unexpected difference is unclear, however, it may highlight the fact that the theoretical benefit of inserting an additional cytokine adsorber to improve graft function in clinical practice should be critically evaluated with further studies.

Disclosure: No significant relationships.
Keywords: Lung Transplantation Model, Ischemia-Reperfusion Injury, Cytokine Adsorption.

O-009

THE LEFT UPPER LOBE CHALLENGE IN VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) – BETTER ASSESSMENT OF SIMULATED LOBECTOMY USING A COMPOSITE SCORE

Tamim Ahmad Haidari[1,2], Flemming Bjerrum[3,2], Søren Grimstrup[4], Henrik Jessen Hansen[1], Lars Konge[4,2], Rene Horsleben Petersen[1,2]

[1]Department of Cardiothoracic Surgery, University Hospital of Copenhagen, Rigshospitalet, Copenhagen, Denmark

[2]Department of Clinical Medicine, Faculty of Health and Medical Sciences, University of Copenhagen, Copenhagen, Denmark

[3]Department of Surgery, Herlev-Gentofte Hospital, Herlev, Denmark

[4]Copenhagen Academy for Medical Education and Simulation, Center for Human Resources and Education, Copenhagen, Denmark

OBJECTIVES

Evaluating competency in VATS is challenging. The aim of this study was to develop a reliable composite score based on combining the simulator metrics and examine the combination with rater assessments to explore the reliability of these combined measures.

METHODS

Standardized simulator metrics (time, bleeding, economy of movement) and expert rater assessments from two previous studies were combined. A linear mixed model including experience level, lobe, and number of previous simulated procedures was applied for the repeated measurements. Reliabilities for each of the four assessments were calculated using Cronbach's alpha. The Nelder-Mead numerical optimization algorithm was used for optimal weighing of scores. A pass-fail standard for the composite score was determined using the contrasting groups' method.

RESULTS

Forty-one participants with different experience level, performed a total of 123 virtual reality VATS lobectomies allocated by randomization were assessed by simulator metrics and VATS experts. The standardized reliability of VATS raters was very high, Cronbach's alpha = 0.90, whereas standardized simulator metrics reliabilities were 0.77, 0.70, 0.70 for time, economy of movement, and bleeding respectively. Across the four different assessments (time, bleeding, economy of movement and expert raters) effects of surgical experience, lobe, and simulator experience were significant ($p < 0.01$), except for simulator experience on bleeding ($p = 0.98$). Left upper lobe was significantly more difficult compared to other lobes, albeit barely when measured using raters ($p = 0.02$). A maximum reliability of 0.92 could be achieved by combining the standardized simulator metrics with standardized expert raters scores. The pass/fail level for the composite score including one expert rater was 0.33.

CONCLUSIONS

Combining simulator metrics with one or two raters increases reliability and can be used to assess trainees in a reliable way. The composite score can be used to implement a standardized and feasible simulation-based mastery training program in VATS lobectomy.

Disclosure: No significant relationships.
Keywords: VATS Lobectomy, Virtual Reality Simulation, Composite Score, Assessment, Simulation Training And Competency In VATS.

Table 1: Standardized composite score reliabilities. The percent shows the weighted value of each of the four measurements.

All simulator scores standardized to z-scores
dependent on lobe.

VATSAT* standardized according to total ratings	No rater	1 rater	2 raters	3 raters
Expert rater(s) using VATSAT	0%	28%	56%	61%
Time in seconds	50%	32%	17%	15%
Economy of movement in meters	38%	24%	13%	11%
Bleeding in ml	12%	16%	14%	13%
Composite score reliability	0.85	0.88	0.91	0.92

*VATSAT (video-Assisted Thoracoscopic Surgery Assessment Tool).
Weighing on each parameter is shown in percent.

O-010

GENDER DIFFERENCES IN MEDICARE PAYMENTS TO GENERAL THORACIC SURGEONS IN 2019

SangMin Kim[1], Sun Kim[2], Sue X. Wang[1], Darren S. Bryan[1], Ruhi Kanwar[1], Raphael Bueno[1], M. Blair Marshall[1]
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[2]*Department of Global Health and Population, Harvard T H Chan School of Public Health, Boston, United States*

OBJECTIVES
Little data exists on the pay gap between women and men thoracic surgeons. As earnings often parallel collections, we reviewed the US Medicare database on physician payments in thoracic surgery to gain more knowledge.

METHODS
A cross-sectional analysis of the 2019 Center for Medicare & Medicaid Services (CMS) payment database was performed analyzing payments, provider's gender, years since graduation, services provided, number of unique billing codes, the complexity of patients, and regional population density. National Downloadable File was merged with Medicare Physician & Other Practitioners - by Provider to obtain provider's years since graduation. To minimize outliers, exclusion criteria were set to exclude those with the highest and lowest 2.5% income and those with less than ten services provided.

RESULTS
In 2019, 2,311 thoracic surgeons (195 women, 8.4%) received payments from CMS. Women thoracic surgeons received less mean payment (- \$35,126), provided fewer mean services (-93.6), and filed fewer mean total unique billing codes (-2.8). (Fig. 1) In a multivariable-adjusted linear regression, women thoracic surgeons received fewer payments after adjusting for services provided, the number of unique billing codes, years since graduation, regional population density, and complexity of patients (β = -\$23,894.6; 95% CI = -\$32,288.8 to -\$15,500). In addition, women thoracic surgeons provided fewer services (β = -68.5; 95% CI = -130.4 to -6.5) after adjusting for the complexity of patients, years since graduation, and regional populational density. The difference in the number of unique billing codes was not statistically different between the women and men thoracic surgeons after adjusting for the complexity of patients, years since graduation, and regional populational density.

CONCLUSIONS
From the analysis of the 2019 CMS data, women thoracic surgeons received less payment than men. The etiology behind these differences merit further research.

Disclosure: No significant relationships.
Keywords: Gender Differences, Thoracic Surgery, Payments.

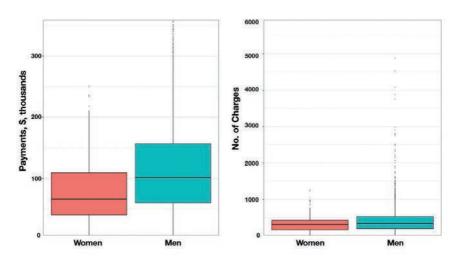**Figure 1: CMS Payments (US Dollars) and Number of Charges (#) for Women and Men Thoracic Surgeons in 2019**

Fig. 1A

Fig. 1B

O-011

ALASKA POLLOCK GELATIN SEALANT SHOWS GOOD BIOCOMPATIBILITY IN PULMONARY AIR LEAK MODELS USING RATS

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[1]*Department of General Thoracic Surgery, University of Tsukuba, Tsukuba, Japan*
[2]*Biomaterial Field, Research Center for Functional Materials, National Institute for Materials Science, Tsukuba, Japan*

OBJECTIVES
We developed a novel sealant based on a hydrophobically modified Alaska pollock gelatin sealant (ApGltn sealant: AS), which has been demonstrated to have high adhesive strength and conformability in ex vivo and in vivo experiments using swine. The aims of this study were to investigate the long-term influence and biocompatibility of AS in a rat pulmonary air leakage models as a preclinical stage.

METHODS
The experiment was conducted in comparison with fibrin glue (FG). The total of 40 rats were assigned in each group (AS: post operated day 1, 7, 14, 28, 56, 84, FG: post operated day 1, 7, 14. 28) (n= each 4). Rats with a 5 mm pleural defect were created in a clean field under general anesthesia. After applying each sealant using the spray, the chest was closed. The rats were observed in certain periods as mentioned above, followed by sacrifice, and lung samples were collected. The transitions of tissue findings and inflammatory cells infiltration into the lung were evaluated.

RESULTS
No evidences of air leakage or infection were confirmed during the courses. FG was absorbed about 14 days after application. AS was gradually absorbed and replaced by neogenetic tissue, which took about 56 days. Inflammatory cells infiltration in the lung side was not significantly different between the two groups. However, inflammatory cells infiltration in the sealant side in FG group was significantly higher than AS group on the post operated day 1, 7, 14.

CONCLUSIONS
Uneventful course and modest inflammation were observed after application of AS for prevention of pulmonary air leakage in rats, which suggests that AS has long term adhesive capacity and good biocompatibility. AS is considered to be an effective and safe material for preventing pulmonary air leakage.

O-012

PROSPECTIVE FEASIBILITY STUDY EVALUATING A NOVEL WIRELESS LOCALIZATION TECHNIQUE FOR DEEPLY LOCATED SMALL PULMONARY LESION UNDER THORACOSOCOPY: RADIOFREQUENCY IDENTIFICATION MARKING SYSTEM

Yojiro Yutaka, Hidenao Kayawake, Satona Tanaka, Yoshito Yamada, Akihiro Ohsumi, Daisuke Nakajima, Masatsugu Hamaji, Toshi Menju, Hiroshi Date
Department of Thoracic Surgery, Kyoto University, Kyoto, Japan

OBJECTIVES
We have clinically introduced a novel wireless localization technique using a radiofrequency identification (RFID) microchip since September 2019. The purpose of this study was to prospectively investigate the safety and efficacy of this technique.

METHODS
A total of 50 consecutive patients were included. RFID-microchip was fixed with nickel-titanium anchors as close as possible to the lesion using electromagnetic navigation bronchoscopy; in a hybrid operation theater with CBCT under general anesthesia or a conventional endoscopic examination room with fluoroscopy under intravenous anesthesia. Within 3 days after marking procedure, surgeons determined deep resection line under thoracoscopy without lung palpation according to the strength of wireless signals (Fig. A). Safety was evaluated by post-marking CT findings (Fig. B). Efficacy was evaluated by the tumor recovery rate and deep surgical margin (Fig. C, D).

RESULTS
Totally 53 markers (29: CBCT, and 24: fluoroscopy) were placed for 53 lesions (size: 8.2 ± 3.9 mm, consolidation/tumor ratio: 0.39, depth from the pleura: 18.3 ± 10.4 mm). CBCT (an average of 2.8 times inspections) enabled marker placement significantly closer to the lesion than fluoroscopy: 8.1 ± 6.1 mm in CBCT, and 12.9 ± 8.0 mm in fluoroscopy, respectively (p = 0.0133). CT taken after RFID placement showed no pneumothorax and silent minimum intrapulmonary hemorrhage in 10 lesions (18.9%). The operations were comprised of 40 VATS wedge resections, 8 VATS segmentectomies, and 5 RATS segmentectomies. Tumor recovery rate with negative surgical margin was 96.2% (51/53). For 2 lesions in one obese patient (BMI: 37.5), atelectasis of the lower lobe precluded planned marker placement. The mean deep surgical margin was 9.5 ± 2.1 mm (range: 5.0 – 18.4 mm).
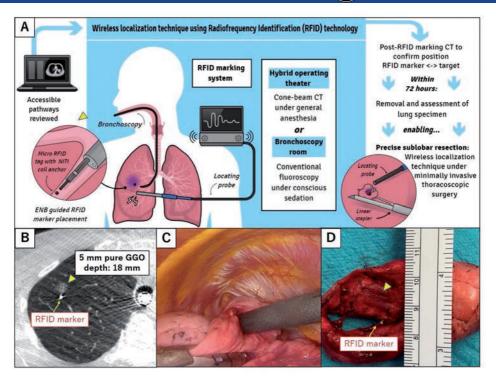
CONCLUSIONS
RFID marking was safe and provided sufficient deep surgical margin in sublobar resection for deeply located small pulmonary lesions.

Disclosure: No significant relationships.
Keywords: Small Pulmonary Lesion, Localization, Thoracoscopy, Marking, Depth.

MONDAY 20 JUNE 2022
MIXED THORACIC I
08:00 - 09:00

O-013

EFFECTS OF VIRTUAL POSTOPERATIVE POST-DISCHARGE CARE IN PATIENTS UNDERGOING LUNG RESECTION DURING THE CORONAVIRUS-19 (COVID-19) PANDEMIC

Gileh-Gol Akhtar-Danesh[1], Allison Chhor[1], Housne Begum[1], Jocelyne Efua Ewusie[2], John Agzarian[1], Christian Finley[1], Wael Hanna[1], Lawrence Mbuagbaw[1], Yaron Shargall[1]
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[2]St. Joseph's Healthcare Hamilton, Hamilton, Canada

OBJECTIVES
The COVID-19 pandemic has impacted the landscape of healthcare delivery, including a significant uptake in the use of virtual medicine. In our institution, this includes virtual visits for routine postoperative follow-up in patients undergoing major lung resections. The aim of this study was to evaluate the effects of COVID-19 on postoperative outcomes, and whether virtual follow-ups are associated with worse postoperative outcomes compared to in-person visits.

METHODS
A retrospective, single-centre propensity-matched cohort analysis was conducted. Patients undergoing anatomic lung resections were included. Outcomes of interest included 60-day readmission, ER visits, mortality, and complication rates. Initial analysis compared pre-COVID (January-December 2019) patients to those receiving either in-person or virtual follow-up during COVID (March 2020 – February 2021). Secondary analysis compared COVID-era patients receiving mixed in-person/virtual follow-up (hybrid) to those receiving completely virtual care (no in-person visits).

RESULTS
In total, 1,282 patients were assessed for eligibility. After propensity matching, 128 patients were included in the COVID-era, and 212 patients in the pre-COVID group. Baseline characteristics were similar in both groups (Table 1). Initial analysis showed no statistically significant differences between COVID-era and pre-COVID patients in terms of 60-day readmission (5.5% vs. 7.5% respectively, $p = 0.57$), ER visits (4.7% vs. 6.6%, $p = 0.77$), mortality (0.8% vs. 0.0%, $p = 0.99$), or complications. After subdividing patients with hybrid vs. completely virtual follow-up, there was no significant difference in all outcomes of interest ($p > 0.05$ for all).

CONCLUSIONS
In our experience, early postoperative outcomes during the COVID-19 era were not inferior to those prior to COVID-19. Furthermore, evaluation of the impact of complete virtual follow-up for patients undergoing anatomic lung resection showed no significant differences in clinical outcomes compared to routine in-person follow up, suggesting that postoperative, post-

discharge care might not be compromised by eliminating routine in-person assessments after major lung surgery.

Disclosure: No significant relationships.

Table 1. Baseline characteristics after propensity matching

Variable	Pre Covid Cohort, n(%) 212 (62.4)	Covid Era Cohort, n(%) 128 (37.6)	Total n(%) 340 (100)	Standardized Mean Difference
Age, years; mean(SD)	68.8 (8.81)	68.6 (9.33)	68.7 (8.99)	-0.0097
Sex; n(%) Male Female	88 (41.5) 124 (58.5)	52 (40.6) 76 (59.4)	140 (41.2) 200 (58.8)	-0.0053
BMI; mean(SD)	28.5 (5.94)	28.1 (6.41)	28.3 (6.11)	-0.0125
Smoking Status; n(%) Never Former Current	27 (12.7) 121 (57.1) 64 (30.2)	21 (16.4) 70 (54.7) 37 (28.9)	48 (14.1) 191 (56.2) 101 (29.7)	-0.0518
COPD, yes; n(%)	79 (37.3)	49 (38.3)	128 (37.7)	0.0000
Asthma, yes; n(%)	19 (9.0)	14 (10.9)	33 (9.7)	0.0883
Emphysema, yes; n(%)	5 (2.4)	3 (2.3)	8 (2.4)	0.0242
ILD, yes; n(%)	1 (0.5)	1 (0.8)	2 (0.6)	0.0000
Diabetes Melitus, yes; n(%)	45 (21.2)	24 (18.8)	69 (20.3)	-0.0070
Cardiac Disease, yes; n(%)	73 (34.4)	36 (28.1)	109 (32.1)	-0.0496
Renal Disease, yes; n(%)	17 (8.0)	11 (8.6)	28 (8.2)	0.0592
Hypertension, yes; n(%)	121 (57.1)	66 (51.6)	187 (55.0)	0.0078
CVD, yes; n(%)	20 (9.4)	19 (14.8)	39 (11.5)	0.0359
Previous Cancer, yes; n(%)	48 (22.6)	31 (24.2)	79 (23.2)	-0.0573
Previous Thoracic Surgery, yes; n(%)	8 (3.8)	8 (6.3)	16 (4.7)	0.0150
EtOH, yes; n(%)	136 (64.2)	77 (60.2)	213 (62.7)	-0.0026
FEV1(%); mean(SD)	84.0 (18.32)	84.1 (22.90)	84.0 (20.13)	0.0022
DLCO(%); mean(SD)	76.7 (21.28)	78.4 (21.68)	77.3 (21.42)	0.0046
ECOG; median(Min, Max)	1 (0,4)	0 (0,3)	1 (0,4)	-0.0603
ASA score; mean(SD)	3.5 (0.51)	3.5 (0.56)	3.5 (0.53)	0.0336
Charlson co-morbidity score; mean(SD)	5.6 (1.83)	5.7 (1.93)	5.7 (1.87)	0.0213

Variable	Pre Covid Cohort, n(%) 212 (62.4)	Covid Era Cohort, n(%) 128 (37.6)	Total n(%) 340 (100)	Standardized Mean Difference
Diagnosis; n(%)				
Malignant lung	202 (95.3)	123 (96.1)	325 (95.6)	
Mediastinum	0 (0.0)	1 (0.8)	1 (0.3)	
Metastatic disease	9 (4.2)	3 (2.3)	12 (3.5)	-0.0573
Other	0 (0.0)	1 (0.8)	1 (0.3)	
Not Lung	1 (0.5)	0 (0.0)	1 (0.3)	
Histology; n(%)				
Adenocarcinoma	140 (66.0)	84 (65.6)	224 (65.9)	
Squamous Cell CA	41 (19.3)	23 (18.0)	64 (18.8)	
Typical carcinoid	11 (5.2)	7 (5.5)	18 (5.3)	
Atypical carcinoid	2 (0.9)	1 (0.8)	3 (0.9)	
Large cell carcinoma	1 (0.5)	1 (0.8)	2 (0.6)	0.0096
Neuroendocrine	1 (0.5)	3 (2.3)	4 (1.2)	
Small cell carcinoma	3 (1.4)	1 (0.8)	4 (1.2)	
Other	13 (6.1)	7 (5.5)	20 (5.9)	
No cancer	0 (0.0)	1 (0.8)	1 (0.3)	
Pathologic Stage; n(%)				
0	2 (0.9)	2 (1.6)	4 (1.2)	
1	133 (62.7)	77 (60.2)	210 (61.8)	
2	32 (15.1)	27 (21.1)	59 (17.3)	0.0054
3	31 (14.6)	13 (10.1)	44 (12.9)	
4	14 (6.6)	9 (7.0)	23 (6.8)	
Type of Surgery; n(%)**				
Wedge resection	23 (10.8)	2 (1.6)	25 (7.4)	
Segementectomy	27 (12.7)	29 (22.7)	56 (16.5)	0.000
Lobectomy	160 (75.5)	97 (75.8)	257 (75.6)	
Decortication	2 (0.9)	0 (0.0)	2 (0.6)	
Surgical approach; n(%)				
Open	71 (33.5)	30 (23.4)	101 (29.7)	
VATS/Lap	76 (35.8)	62 (48.4)	138 (40.6)	0.0303
Robotic	65 (30.7)	36 (28.1)	101 (29.7)	

*based on Monemar test and Wilcoxon signed rank rest
** only lobectomy and segmentectomy included

O-014

THE CLINICAL SPECTRUM OF "UNNECESSARY" SURGERY IN THE SETTING OF SUSPICIOUS SOLITARY LUNG NODULES AND OPACITIES WITHOUT PREOPERATIVE TISSUE DIAGNOSIS

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OBJECTIVES
To determine the epidemiology, postoperative outcomes, and clinical determinants for benign conditions in a contemporary surgical program for suspicious solitary lung nodules & opacities.

METHODS
We performed a retrospective single center study using a prospectively implemented database between 2010 and 2020. We selected patients operated on for suspicious clinical stage I or II lung cancers without preoperative tissue diagnosis. We assessed the frequency of benign conditions at final pathology examination and compared the perioperative 90-day outcomes of these patients with those of patients with a malignant diagnosis and identified the clinical determinants for malignancy using multivariable logistic regression.

RESULTS
Among 1419 patients operated for suspicious stage I or II lung cancers, 1392 complied with the recommendations of the Fleischner Society for surgical exploration. Among these 1392 patients, 213 (15.3%) were diagnosed with benignancy; these patients underwent mostly wedge resections (50.7%) and lobectomies (35.7%) by minimally invasive approach (72.3%). Benignity encompassed infections (39.9%), hamartoma (19.7%), inflammatory (11.7%) or fibrous (8.9%) nodules, and miscellaneous (19.7%). Compared with patients with malignancy, patients with benignancy were respectively younger (48 vs. 64 years), less smokers (25 vs. 34 pack-years) with less cardiovascular co-morbidities (35% vs. 56%); all $P<0.05$. 90-day mortality was nil (0% vs. 2 %), hospital stay duration was shorter (5.9 vs. 7.8 days, $P<0.01$) but 90-day re-admission rates were similar (6.1% vs. 6.3%, P=NS). Older age, history of another controlled cancer (>5 years), and concomitant cardiovascular disease were independent predictors for malignancy (respective Odd Ratio and [95% confidence intervals] 1.02 [1.00; 1.04], 2.32 [1.47; 3.73]), 3.11 [1.48; 7.80].

CONCLUSIONS
Benign nodules represented 15.3% of patients operated for clinically suspected localized lung cancer without preoperative diagnosis in a large academic center over 10 years. While the safety profile was acceptable; older age, history of controlled cancer and cardiovascular events predicted malignant nodules.

Disclosure: No significant relationships.
Keywords: Pulmonary Nodule, Benign Nodule, Lung Cancer, Thoracic Surgery, Morbidity.

O-015

TRENDS IN AGE- AND SEX-SPECIFIC LUNG CANCER MORTALITY IN EUROPE AND NORTHERN AMERICA: ANALYSIS OF VITAL REGISTRATION DATA FROM THE WORLD HEALTH ORGANISATION (WHO) MORTALITY DATABASE BETWEEN 2000 AND 2017

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OBJECTIVES
Current comprehensive lung cancer mortality in Europe and Northern America in relation to the new molecular therapy and screening advances is unknown.

METHODS
We analysed vital registration data from the WHO Mortality Database (2000-17) covering Northern America and Eastern/Northern/Southern/Western Europe. To assess temporal trends in lung cancer mortality we performed a population-averaged Poisson autoregressive analysis. The average annual percent change (AAPC) calculated with a segmented regression was used as a summary measure of overall and country-specific trends in lung cancer mortality.

RESULTS
In the total population of 872·5 million people between 2015 and 2017, the average annual age-standardised mortality was 54·6 deaths per 100 000 with substantial differences across countries. Lung cancer was reported as the primary cause of death in 5·4 cases per 100 deaths. Age-standardised lung cancer mortality rate decreased constantly (AAPC –1·5%) from 2000 to 2017. Whilst male mortality dropped annually by an average of –2·3%, female mortality only decreased by an average of –0·3%, and this slight decline was driven exclusively by the United States. Conversely, 21 out of 31 countries registered a significant increase in female lung cancer mortality between 2000 and 2017, with Spain (AAPC 4·1%) and France (AAPC 3·6%) leading the list.

CONCLUSIONS
Despite the overall decreasing lung cancer mortality trends in Europe and Northern America, in all countries except the US female mortality remained either unchanged or increased. National mortality outcomes are very heterogenous and probably limited from variabilities in tobacco control, screening, and access of effective treatment.
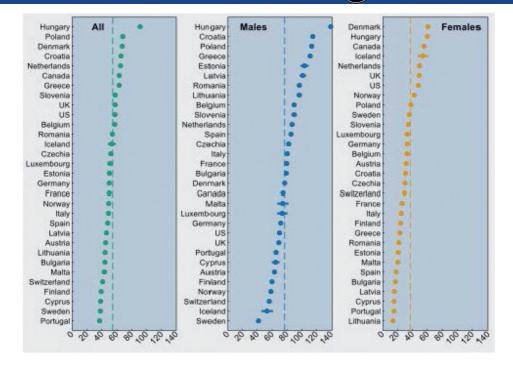
Disclosure: No significant relationships.
Keywords: Lung Cancer, Epidemiology, Death, Incidence.

Monday P.M.
Abstract 013-018

O-016

THE MODIFIED SURGICAL APGAR SCORE PREDICTS POSTOPERATIVE COMPLICATION AND SURVIVAL AMONG LUNG CANCER PATIENTS UNDERGOING SURGERY

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OBJECTIVES
The surgical Apgar score (SAS) is associated with mortality in cancer surgery, and is calculated using three intraoperative parameters—blood loss, lowest mean arterial pressure, and lowest heart rate. The modified SAS, which reflects pulmonary parenchymal damage, incorporates oxygen saturation measured by pulse oximeter along with the original parameters. The aim of this study was to analyze the newly innovated modified SAS.

METHODS
We retrospectively analyzed the data of 691 patients who underwent surgery for primary lung cancer between 2015 and 2019 in a single institute. We analyzed how the modified SAS impacted postoperative outcomes after lung cancer surgery using a logistic regression model and Kaplan–Meier method.

RESULTS
In a total of 691 patients, the number of postoperative complications defined by the Clavien–Dindo classification as grade III or over, and mortality were 51 (7.4%) and seven patients (1.0%), respectively. We analyzed the capability of the modified SAS to predict postoperative complications compared with the original SAS using a receiver operating characteristics curve; the calculated c-index (0.622) was superior to that of original SAS (c-index, 0.604; P = 0.398). We divided the patients into three groups stratified by modified SAS: 0–6 points (n = 59), 7–9 points (n = 420), and 10–12 points (n = 212). On univariate and multivariate analyses for postoperative complications, lower modified SAS was identified as an independent negative risk factor (odds ratio 3.53, P = 0.02). Furthermore, survival analysis demonstrated that patients with lower modified SAS had a poor 5-year overall survival rate (58.9%, P < 0.0001) and worse cancer-specific survival rate (69.4%, P = 0.0006), respectively (Figure A and B).

CONCLUSIONS
The modified SAS could precisely predict postoperative complications and survivals among lung cancer patients undergoing surgery. We should cautiously manage and prepare postoperative care and consider close follow-ups at outpatient clinics, especially for patients with lower scores.

Disclosure: No significant relationships.
Keywords: Lung Cancer Surgery, Prognostic Score, Modified Surgical Apgar Score.

O-017

PULMONARY RESECTION FOR LUNG CANCER PATIENTS WITH HEART FAILURE WITH REDUCED EJECTION FRACTION: CLINICAL OUTCOMES AND LONG-TERM SURVIVAL RESULTS

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OBJECTIVES
The aim of our study was to evaluate clinical outcomes of lung cancer patients diagnosed with heart failure with reduced ejection fraction after pulmonary resection.

METHODS
Among 9814 lung cancer patients who underwent pulmonary resection from 2010 to 2018, 9722 patients (99.0%) who received preoperative echocardiography were enrolled for this study. Fifty-six patients (0.57%) had heart failure with ejection fraction (LVEF) of 45% or less, and propensity-score matched (1:3) to compare postoperative clinical outcomes and survival with those with normal ejection fraction.

RESULTS
Fifty-six patients with LVEF of 45% or less (Low EF group) and 168 patients with LEVF of 45% or more (Normal EF group) were matched and compared. The 5-year overall survival (OS) was 60.1% for the Low EF group and 66.0% for the Normal EF group. The 5-year OS for clinical stage I was practically equivalent (76.4% vs. 76.8%) but there was significant difference for clinical stages II + III (39.8% vs 53.8%). Complications (32.7% vs. 33.9%, p=0.8627) and cardiac-related complications (9.8% vs. 12.5%, p=0.5409) were similar in two groups. There was one case of 30-day mortality and four cases of 90-day mortality for the Low EF group. The cause of death was following: brain hemorrhage, aggravation of idiopathic pulmonary fibrosis, acute lung injury, and unknown cause. There was no 30-day nor 90-day mortality for the normal EF group (p<0.001). Three cases of 30-day re-admission were reported for the normal EF group and six cases for the normal EF group (p=0.5959).

CONCLUSIONS
Lung cancer surgery for heart failure patients with reduced ejection fraction provides favorable long-term outcomes despite relatively high postoperative 90-day mortality. A comprehensive preoperative assessment of the patients' comorbidities could help to select the best therapeutic option for the early lung cancer patients with heart failure.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Pulmonary Resection, Heart Failure, Reduced Ejection Fraction.

LVEF < 45%	LVEF > 45% (n = 56)	(n = 168)	P - value
Gender, n (%)			0.5299
Female	8 (14.3)	22 (13.1)	
Male	48 (85.7)	146 (86.9)	
Age (years old), median	66.5 (61-71)	68 (61-73)	0.5870
Tumor histology, n (%)			0.2302
Adenocarcinoma	28 (50.0)	91 (54.2)	
Squamous cell carcinoma	24 (42.9)	70 (41.7)	
Other	4 (7.1)	7 (4.1)	
Clinical stagea, n (%)			0.3283
I	32 (57.1)	89 (53.0)	
II	15 (26.8)	56 (33.3)	
III	9 (16.1)	23 (13.7)	
Co-morbidity, n(%)			
HTN	25 (44.6)	86 (51.2)	0.3248
Tuberculosis (Tbc)	11 (19.6)	31 (18.5)	0.8602
COPD	6 (10.7)	24 (14.3)	0.3889
Asthma	1 (1.8)	6 (3.6)	0.4179
DM	24 (42.9)	41 (24.4)	0.0036
Neoadjuvant therapy, n (%)	4 (7.1)	17 (10.2)	0.2640
Adjuvant therapy, n (%)	13 (23.2)	64 (38.3)	0.0177
Extent of resection, n (%)			0.9245
Pneumonectomy	2 (1.2)	2 (3.6)	
Bilobectomy	3 (1.8)	1 (1.8)	
Sleeve lobectomy	3 (1.8)	1 (1.8)	
Lobectomy	126 (75.0)	40 (71.4)	
Segmentectomy	5 (3.0)	2 (3.6)	
Wedge resection	29 (17.3)	10 (17.9)	
Complications, n (%)	55 (32.7)	19 (33.9)	0.8627
Cardiac complications, n(%)	15 (9.8)	7 (12.5)	0.5409
MACE, n(%)	1 (0.6)	1 (1.8)	0.4795
30-day mortality, n (%)	1 (1.8)	0 (0)	< 0.001
90-day mortality, n (%)	4 (7.1)	0 (0)	< 0.001
30-day readmission	3 (5.4)	6 (3.6)	0.5959
Transfusion, n (%)	6 (10.7)	29 (17.3)	0.1973
Hospital stay			0.0435
Days, average	9.82 + 6.83	8.05 + 5.24	
Days, Median (Q1,Q3)	8 (6,10)	7 (5,9)	
ICU stay			< 0.0001
Days, average	3.38 + 6.91	1.37 +1.67	
Days, Median (Q1,Q3)	1 (1,2)	1 (1,1)	

[a] American Joint Committee on Cancer(AJCC) TNM 7th Stage

O-018

NATIONAL LUNG CANCER SCREENING PROGRAM FEASIBILITY STUDY

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OBJECTIVES
Lung cancer screening, using low-dose CT (LDCT), has been proved to reduce mortality and its implementation is currently recommended by international medical societies and guidelines. However, there is no consensus, exactly whom and how to enrol.
Aim of the current study was to evaluate the feasibility of systematic patient enrolment, using in parallel two potential inclusion criteria (smoking status and lung cancer risk score).

METHODS
In three family physician practices, smoking status of all 55–74-year-old patients was detected and all smokers invited to a "lung cancer screening visit" to detail their smoking history and determine the lung cancer risk score (PLCOm2012noRace).
Patients with elevated lung cancer risk either according to smoking status (>20 pack-years; quit <15 years ago) or PLCOm2012noRace risk score (>1.5) were assigned LDCT, which was evaluated according to LungRADS version 1.1 independently by two radiologists.

RESULTS
In three family physician practices, out of total 7035 patients, 495 (7.0%) were 55–74 years old current or previous smokers. Study inclusion was planned for 8 months, but was completed considerably faster. Altogether 395 patients (5.6% of total patients; 32.9% of those aged 55–74) were invited to the "lung cancer screening visit".
198 patients had an elevated lung cancer risk according to smoking history, 125 according to risk score and 206 according to either one or both the criteria. Out of the 206 patients referred to LDCT, 201 actually ended up taking it (97.6% of patients referred to LDCT; 16.6% of patients aged 55–74; 2.9% of total patients).
One lung cancer was detected; 27 (13.4%) patients needed a repeat CT after 3 or 6 months; 186 (92.5%) had other incidental findings.

CONCLUSIONS
Systematic enrolment of patients for lung cancer screening by family physician ensures high uptake among eligible patients. Data from the feasibility study provide excellent input for a regional or national lung cancer screening program.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Screening, Enrolment, Feasibility.

MONDAY 20 JUNE 2022
BROMPTON
09:15 - 10:45

B-019

RISK FACTORS FOR CONVERSION DURING VIDEO-ASSISTED THORACIC SURGERY – THE EPITHOR CONVERSION SCORE

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OBJECTIVES
Intraoperative conversion from video-assisted thoracic surgery (VATS) to thoracotomy is not infrequent during anatomic lung resection. The objectives of the present study were to identify risk factors for intraoperative conversion and to develop a predictive score.

METHODS
We performed a multicentre retrospective analysis of French thoracic surgery departments having contributed data on anatomic lung resections to the Epithor database over a 10-year period (from January-2010 to December-2019). Using univariate and multivariate logistic regression analyses, we determined risk factors for intraoperative conversion and elaborated a new conversion score - the Epithor conversion score (ECS). The ECS was then validated in a cohort of patients operated on between January- and June-2020.

RESULTS
A total of 210,037 procedures (including 55,030 anatomic lung resections) had been registered in the Epithor database between 2010 and 2019. We excluded patients having undergone upfront thoracotomy or robotic-assisted thoracoscopic surgery (n=40,293), and those with missing data (6,794). Hence, 7943 patients with intent-to-treat VATS were assessed: 7100 with a full-VATS procedure, and 843 patients with intraoperative conversion to thoracotomy (conversion rate: 10.6%). Thirteen preoperative variables were identified as potential risk factors and weighted accordingly to give the ECS. The score showed acceptable discriminant power (area under the curve: 0.62 in the development cohort and 0.64 in the validation cohort) and good calibration (p=0.23 in development cohort and 0.30 in the validation cohort).
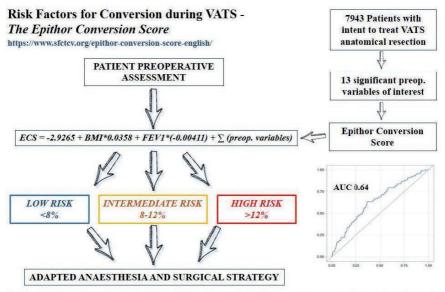
CONCLUSIONS

Thirteen potential preoperative risk factors were identified, enabling us to develop and validate the ECS – an easy-to-use, reproducible tool for estimating the risk of intraoperative conversion during VATS

Disclosure: No significant relationships.
Keywords: Lung Cancer Surgery; Thoracoscopy; Intraoperative Conversion; Thoracotomy.

Risk Factors for Conversion during VATS - The Epithor Conversion Score
https://www.sfctcv.org/epithor-conversion-score-english/

7943 Patients with intent to treat VATS anatomical resection

13 significant preop. variables of interest

Epithor Conversion Score

PATIENT PREOPERATIVE ASSESSMENT

$ECS = -2.9265 + BMI*0.0358 + FEV1*(-0.00411) + \sum (preop.\ variables)$

LOW RISK <8%

INTERMEDIATE RISK 8-12%

HIGH RISK >12%

AUC 0.64

ADAPTED ANAESTHESIA AND SURGICAL STRATEGY

Take home message: The ECS estimates the risk of intraoperative conversion for planned VATS anatomical lung resection, and enables adapted anaesthesia and surgical strategy.

BMI: Body Mass Index; ECS: Epithor Conversion Score; FEV1: Forced Expiratory Volume in 1s; VATS: Video-Assisted Thoracoscopic Surgery.

B-020

COMPARISON OF BIPOLAR VESSEL SEALER TO CONVENTIONAL ELECTROCOAGULATION IN VIDEO-ASSISTED THORACOSCOPIC SURGERY LOBECTOMY

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OBJECTIVES
Dissection of tissues with monopolar electrocautery during lobectomy and lymphadenectomy may result in complications related to suboptimal closure of blood and lymphatic vessels (increased postoperative drainage volume, chylothorax) or thermal injury (esophageal perforation). The application of high-energy devices may hypothetically lead to diminished chest drainage volume and complications rate. The aim of the study was to compare the results of thoracoscopic (VATS) lobectomy and lymphadenectomy performed with LigaSure™ high-energy device and monopolar electrocoagulation.

METHODS
This prospective randomized controlled trial was registered at ClinicalTrials.gov (NCT03125798). We included patients who underwent VATS lobectomy with mediastinal lymph node dissection due to lung cancer from May 3, 2018 to November 4, 2021. Exclusion criteria were: neoadjuvant chemo- or radiotherapy, mediastinoscopy or other prior surgical procedures of mediastinum or chest on the side to be operated. Primary outcome measure was postoperative chest drainage volume. Secondary outcome measures were C-reactive protein levels at 72h after surgery and esophageal temperature during subcarinal lymph nodes removal.

RESULTS
Two hundred fourteen patients were enrolled. Conversion rate was 6,5%. After exclusion of patients after conversion, LigaSure (n=100) and Monopolar (n=100) groups were compared. There was no difference between LigaSure and Monopolar groups in terms of postoperative chest drainage volume (550ml v. 580ml, p=0.381), changes in the esophageal temperature during lymphadenectomy (-0.1oC v. -0.1oC, p=0.547) and C-reactive protein levels (68.5 v 69.2, p=0.732). There was no difference between the groups in terms of duration of surgery, chest drainage and hospital stay, and complication rate. In the LigaSure group, higher number of lymph nodes was removed during lymph node dissection (13 v. 11, p=0.001).

CONCLUSIONS
The application of LigaSure™ was not related to improved short-term outcomes of VATS lobectomy and lymphadenectomy. Increased number of lymph nodes removed during lymphadenectomy may indicate improved lymphadenectomy with LigaSure™ and requires evaluation in subsequent studies.

B-021

TIME-TO-SURGERY IN EARLY-STAGE NON SMALL CELL LUNG CANCER (NSCLC) PATIENTS AND THE DELAY CAUSED BY THE CORONAVIRUS-19 (COVID-19) PANDEMIC

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OBJECTIVES
Timely discovery is crucial in non-small cell lung cancer (NSCLC) since curative-intent surgery and long-term survival is only possible in early stages. Although the time from radiological discovery to surgery can vary from multiple factors, common sense dictates that the elapsed time itself is of the essence. The purpose of this study is to analyze the effects of extended time-to-surgery on survival and to evaluate the impact of COVID-19 pandemic in a large single-center retrospective patient cohort.

METHODS
The data of 2536 patients who underwent curative lung resection for NSCLC in the National Institute of Oncology was analyzed. The mean and median time-to-surgery (defined from first radiological diagnosis) was 91.06 and 77 days, respectively. 1 month, 2 months, 77 days and 91.06 days between CT diagnosis and surgery were evaluated as possible cut-off values for worse outcome after lung resection. Comorbidities and clinicopathological variables were analyzed. Multivariable Cox-regression analysis was used to determine whether delay to surgery was an independent prognostic factor. Time from CT to PET-CT, the effects of examining centers and the impact of the COVID-19 pandemic were also explored.

RESULTS
Delay of surgical treatment had a negative effect on overall survival (OS). The most significant difference in outcome was seen when a 2 months cut-off was used ($p=0.002$). In Cox regression analysis time-to-surgery ($p=0.011$), vascular invasion ($p=0.0001$), age ($p=0.02$) and stage ($p=0.0001$) all had a significant effect on OS. Importantly, during the COVID-19 pandemic, the time-to-surgery increased with a median of 12 ($p=0.000001$).
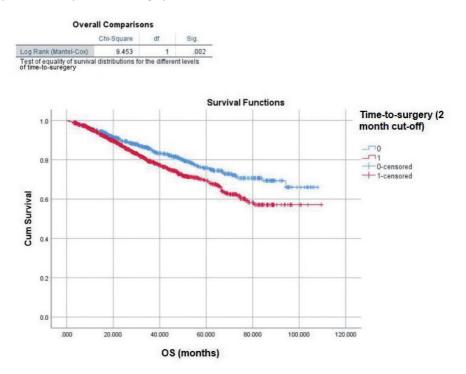
CONCLUSIONS
Survival outcomes were significantly worse in NSCLC patients where the time-to-surgery was longer than 2 months. Mean and median time-to-surgery was significantly shorter before the COVID-19 pandemic but the specific COVID-19 waves had no effects on elapsed time until the surgery which shows the general strain it put on the Hungarian healthcare system.

Disclosure: No significant relationships.
Keywords: Delay, Time To Surgery, COVID, Survival, NSCLC.

B-022

OPERATING TIME: AN INDEPENDENT AND MODIFIABLE RISK FACTOR FOR SHORT-TERM COMPLICATIONS AFTER VIDEOTHORACOSCOPIC PULMONARY LOBECTOMY

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OBJECTIVES
Prolonged operating time (OT) is directly correlated to procedural complexity and may also be associated with surgical skills. However, the relationship between OT and postoperative morbidity has not been fully characterized in thoracic surgery. We aimed to determine the risk factors and impact of prolonged OT on postoperative complications after video-thoracoscopic (VATS) lobectomy.

METHODS
Patients undergoing thoracoscopic lobectomy for lung cancer from December 2016 to March 2018, within the prospective registry of the Spanish Video-Assisted Thoracic Surgery Group were identified. Database included case and surgeon related variables. Operative times were stratified by quartiles and complication rates analysed using $\chi2$ test. Primary outcomes included 30-day overall, pulmonary, and cardiovascular complications and wound infection. Multivariable logistic regression analyses were then performed to determine the independent association between OT and postoperative complications and to identify risk factors for prolonged OT (>75th percentile).

RESULTS
Data of 1518 thoracoscopic bi/lobectomy cases were examined. The median OT was 174 min (interquartile range: 130-210 min). OT ≥210 min was associated with increased overall complications compared to OT <130 min (34.4% vs 20.5%, p<0.001) and respiratory complications (26.4% vs 14.6%, p<0.001), but not with cardiovascular complications (6.2% vs 2.7%, p=0.085) neither wound infection (1% vs 0.8%, p=0.479). These associations remained statistically significant after multivariable regression analysis: prolonged OT increases odds of overall complications (OR, 2.05; 95% CI, 1.46-2.88; p<0.001) and that of pulmonary complications (OR, 2.08; 95% CI, 1.43-3.03; p<0.001). Male sex (OR, 1.73; p=0.045), pleural adhesions (OR, 4.61; p<0.001), undefined fissures (OR, 4.4; p<0.001), surgeon seniority (OR, 3.81; p=0.001) and little individual experience in VATS (OR, 14.46; p=0.064) were identified as risk factors for long OT.

CONCLUSIONS
Prolonged OT is associated with increased odds of postoperative complications. Modifiable factors contributing to prolonged OT such as VATS training may serve as a target for future quality improvement.

Disclosure: No significant relationships.
Keywords: Lung Resection, VATS, Operating Time, Risk Assessment, Postoperative Morbidity.

B-023

FLUORESCENCE QUANTITATIVE ASSESSMENT OF BLOOD PERFUSION IN THE GASTRIC CONDUIT TO REDUCE THE ANASTOMOTIC LEAKAGE AFTER ESOPHAGECTOMY: A PROSPECTIVE RANDOMIZED CONTROLLED TRIAL

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OBJECTIVES
Avoiding postoperative anastomotic leakage is the key to the success of esophagectomy. However, the key factor affecting the anastomotic leakage is the blood perfusion of the gastric conduit. The purpose of our study is to use indocyanine green(ICG) fluorescence quantitative assessment of blood perfusion in the anastomotic site to reduce postoperative anastomotic leakage.

METHODS
We first performed an angiography of the gastric conduit using ICG fluorescence to determine the fluorescence threshold of anastomotic leakage without any other intervention. After that, we enrolled eligible patients who underwent McKeown esophagectomy in Sichuan Cancer Hospital from August 1, 2019 to July 31, 2021 and divided them into two groups according to a random number table. In the intervention group, ICG fluorescence was used to quantitatively assess the blood perfusion fluorescence value of the anastomotic site in gastric conduit, and anastomosis could only be performed at the site where the fluorescence value was at least higher than the threshold value. In the control group, the anastomosis was performed at the site of the anastomosis evaluated visually by the surgeon's experience. Postoperative follow-up was 30 days for anastomotic leakage and 90 days for anastomotic stenosis.

RESULTS
The fluorescence threshold of at least 43 was determined from the previous observational trial of 10 cases. Subsequently, 92 eligible patients were divided into the two groups, anastomotic leakage within 30 days were 6.7%(3/45) in the intervention group and 21.3%(10/47) in the control group(p=0.044), respectively. In addition, no differences were found in the anastomotic stenosis within 90 days and on the effect of the neoadjuvant therapy on anastomotic leakage.

CONCLUSIONS
Intraoperative blood perfusion of the anastomotic site in gastric conduit directly affects postoperative anastomotic leakage. Fluorescence quantitative assessment of blood perfusion at the anastomotic site in gastric conduit can significantly reduce the anastomotic leakage after esophagectomy.

Disclosure: No significant relationships.
Keywords: Fluorescence Quantitative;Blood Perfusion;Gastric Conduit;Anastomotic Leakage;Esophagectomy.

Table1 Patients' demographics
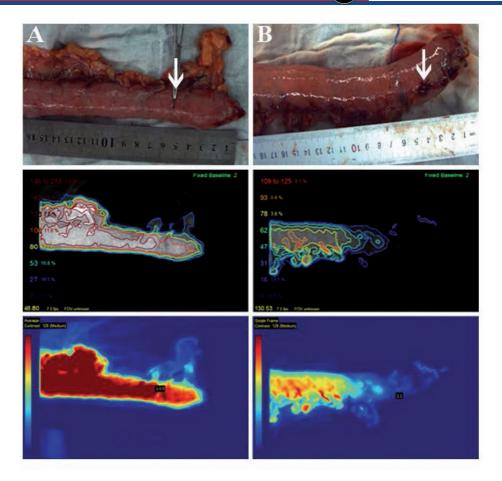
	Intervention group(n=45)	Control group(n=47)	P value
Age(years)	60.24±7.73	62.77±6.56	0.134
Gender			0.918
male	36(80.0%)	38(80.9%)	
female	9(20.0%)	9(19.1%)	
BMI(kg/m²)	22.97±2.75	22.96±2.48	0.209
Complication (hypertension/diabetes)			0.538
yes	11(24.4%)	9(19.1%)	
no	34(75.6%)	38(80.9%)	
Neoadjuvant therapy			0.855
yes	20(44.4%)	20(42.6%)	
no	25(55.6%)	27(57.4%)	
Tumor location			0.112
Upper	6(13.3%)	2(4.2%)	
Middle	21(46.7%)	31(66.0%)	
Lower	18(40.0%)	14(29.8%)	
Pathological stage			0.443
I(p/yp)	14(31.1%)	15(31.9%)	
II(p/yp)	12(26.7%)	14(29.8%)	
III(p/yp)	17(37.8%)	16(34.0%)	
IV(p/yp)	2(4.4%)	2(4.3%)	
Lymph node dissection			0.092
Two field	40(88.9%)	46(97.9%)	
Three field	5(11.1%)	1(2.1%)	
Gastric conduit length (cm)	30.92±2.83	30.60±2.23	0.141
Gastric conduit width (cm)	3.04±0.24	3.05±0.22	0.84
Distances between anastomosis and final vascular arch	6.51±2.66	7.39±2.05	0.187
Anastomotic leak (within 30 days)			**0.044**
Yes	3(6.7%)	10(21.3%)	
No	42(93.3%)	37(78.7%)	
Anastomotic stenosis (within 90 days)			0.924
Yes	8(17.8%)	8(17.0%)	
No	37(82.2%)	39(83.0%)	

B-024

CAN RHOMBOID INTERCOSTAL BLOCK BE AN ALTERNATIVE TO PARAVERTEBRAL BLOCK IN VIDEO-ASSISTED THORACOSCOPIC SURGERIES?: A RANDOMIZED PROSPECTIVE NON-INFERIORITY STUDY

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[2]Cleveland Clinic, Ohio, United States

OBJECTIVES
Rhomboid intercostal block (RIB) is an interfascial plane block, that is in use since 2016. RIB is a simple and safer technique, in comparison to thoracic paravertebral block (PVB). PVB is an advanced regional technique, requires experienced hands, and serious complications are possible due to its close proximity to central neuraxial structures. In this study, we aim to compare the analgesic efficacy of RIB to PVB in oncologic video-assisted thoracoscopic surgeries (VATS).

METHODS
This is a randomized prospective non-inferiority study with 90 patients aged 18-75 and ASA I-III, undergoing elective VATS. The study was approved by ethical committee and registered under clinicaltrials.org. After obtaining informed consent, patients were randomized to receive ultrasound-guided RIB or PVB at T5-level with 20 ml %0.25 bupivacaine in the operating room preoperatively. All surgeries were performed under general anesthesia. Postoperatively, patient-controlled IV analgesia with fentanyl was prescribed, delivering 10 µg boluses with 10 minutes of lock-out period and no background infusion. All patients received Paracetamol 1g IV, three times a day, until discharge. Tramadol 50mg IV was the rescue analgesic for breakthrough pain. Postoperative Numeric Rating Scale (NRS) for pain scores, total opioid consumptions, and rescue analgesic requirements were recorded at postoperative 1st, 3rd, 6th, 12th, and 24th hours.

RESULTS
Of the 89 patients analyzed, there were no significant differences in NRS pain scores, total opioid consumption, and rescue analgesic requirements between the RIB and PVB groups. 24 hours median Fentanyl consumption was 240(60-450)µg for RIB and 240(80-430)µg for PVB groups.

CONCLUSIONS
To the best of our knowledge, this is the first randomized prospective clinical trial comparing RIB to PVB block in VATS. We think that RIB is non-inferior to PVB in analgesic efficacy for VATS and can be considered as an alternative analgesic modality when there is a contraindication or technical difficulty to perform PVB.

Disclosure: No significant relationships.
Keywords: Regional Anesthesia, Thoracoscopy, Oncologic Surgery, Rhomboid Intercostal Block.

Comparison of NRS Pain Scores and Fentanyl Consumption in micrograms (μg) between groups.

	RIB (n=45)	PVB (n=44)	Test Statistic	P
NRS Pain Scores				
1st hour	3(0-8)/47.73[a]	2(0-8)/42.2[a]	1,021	0.307[a]
3rd hour	3(0-9)/47.34[a]	2,5(0-6)/42.6[a]	0,876	0.381[a]
6th hour	3(0-6)/47.32[a]	2(0-8)/42.63[a]	0,873	0.383[a]
12th hour	2(0-5)/44.79[a]	2(0-5)/45.22[a]	-0,081	0.936[a]
24th hour	1(0-5)/41.83[a]	1(0-5)/48.24[a]	-1,237	0.216[a]
Fentanyl Consumption (μg)				
1st hour	10(0-60)/45,02[a]	10(0-60)/43,98[a]	0,945	0.844[a]
3rd hour	89.77±54.45[b]	83.40±56.27[b]	0,539	0.539[b]
6th hour	125.45±56.34[b]	112.72±56.29[b]	1,060	0.292[b]
12th hour	180(60-400)/46.64[a]	150(50-350)/40.21[a]	1,198	0.231[a]
24th hour	240(60-450)/41.59[a]	240(80-430)/38.10[a]	0,676	0.499[a]

Data are expressed as a Mann Whitney U. median (min-max) / median rank b T-test. mean ± standard deviation

MONDAY 20 JUNE 2022
PULMONARY NEOPLASTIC I - (EARLY STAGE LUNG CANCER)
13:30 - 14:30

O-025

LOCAL CONTROL AND SHORT-TERM OUTCOMES AFTER VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) SEGMENTECTOMY VERSUS LOBECTOMY FOR PT1C PN0 R0 NON SMALL CELL LUNG CANCER (NSCLC)

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OBJECTIVES
Pulmonary segmentectomy has shown comparable oncological results to lobectomy for non-small cell lung cancers (NSCLC) of less than 2 cm. However, controversy remains for tumors of larger size. The aim of this study was to compare short-term outcomes and local control in pT1c pN0 NSCLC that were intentionally treated by VATS segmentectomy or lobectomy.

METHODS
Multicenter retrospective study from January 2014 to October 2021 of 162 consecutive patients undergoing complete (R0) anatomical resections for pT1c pN0 NSCLC. Two groups, VATS lobectomy (VL) or VATS segmentectomy (VS) were defined according to the extension of the resection. Patients' characteristics, postoperative outcomes and survival were compared.

RESULTS
In total, 162 patients underwent VL (n=81) or VS (n=81). Except for age (median of 68 vs 71 years, p=0.034) and past medical history of cancer (32% vs 48%, p=0.038), there was no difference between VL and VS in terms of demographics and comorbidities (table1). Segmentectomies were performed in upper lobes in 68% and single segments represented 46% of all cases. Conversion thoracotomy rate was 5% in both groups. Morbidity were similar in both groups (34% vs 30%, p=0.5). The median time for chest tube removal (3 vs 2 days, p=0.002) and median LOS (6 vs 5 days, p=0.039) were in favor of the VS group. Significantly larger tumor (25mm vs 23.5 mm p=0.001) and an increased number of lymph nodes removal (median 14 vs 10, p<0.001) were found in the VL group. During the follow-up (median: 31 months), no statistical difference was found for local and distant recurrence in VL groups (12.3%) and VS group (6.2%) (p=0.414). Overall survival was comparable in-between both groups (p=0.166).

CONCLUSIONS

Despite a short follow-up, our preliminary data shows that local control is comparable for VATS lobectomy and VATS segmentectomy. Further prospective randomized trials are needed to corroborate these results.

Disclosure: No significant relationships.
Keywords: VATS Segmentectomy, Lung Cancer.

Table 1

	Total (n=162)	Lobe (n=81)	Segments (n=81)	P-value
Sex (female)	79 (48.7%)	39 (48.1%)	40 (49.3%)	0.875
Age, years (median)	69 (63-74)	68 (60-73)	71 (65-76)	**0.037**
BMI,mean +/- SD	25.3 +/- 4.3	25.2 +/- 4.3	25.9 +/- 4.3	0.814
FEV1 (mean)	86.03 +/- 21.6	88.9 +/- 21.1	86.1 +/- 21.6	0.085
DLCO (mean)	73.4 +/- 22.4	75.8 +/- 22.6	71.1 +/- 22.3	0.194
Cardiopathy	46 (28.4%)	20 (24.7%)	26 (32%)	0.297
HTA	86 (53%)	43 (53%)	43 (53%)	1
Atrial Fibrillation	18 (11%)	9 (11%)	9 (11%)	1
Tobacco	132 (81.4%)	63 (77.7%)	69 (85%)	0.228
Diabetes	23 (14.1%)	9 (11%)	14 (17.2%)	0.264
Kidney Failure	16 (9.8%)	7 (8.6%)	9 (11%)	0.599
Previous cancer	65 (40.1%)	26 (32%)	39 (48.1%)	**0.038**
ASA Score (mean)	2.52	2.48	2.57	0.329
Adenocarcinoma	125 (77.1%)	60 (74%)	65 (80%)	
Squamous cellcarcinoma	35 (21.6%)	19 (23.4%)	16 (19.8%)	0.351
Large cells tumour	2 (1%)	2 (2%)	0	
Size (mean)	24.3	25.1	23.6	**0.001**
21-25mm	114 (70.3%)	48 (29.7%)	46 (56.7%)	<0.001
25-30mm	35 (43.3%)	68 (83.9%)	13 (16%)	
Dissected lymph nodes (median)	12 (7-19)	14 (9-23)	10 (6-15)	**<0.001**
Adjuvant chemotherapy	15 (9.2%)	10 (12%)	5 (6.1%)	0.183
90-days mortality	2 (1.2%)	1 (1,2%)	1 (1.2%)	1
Overall Morbidity	52 (32%)	28 (34.5%)	24 (29.6%)	0.501
Pulmonary complications	42 (25.9%)	23 (28.4%)	19 (23.4%)	0.474
Cardiac complications	12 (7.4%)	5 (6.1%)	7 (8.6%)	0.550
Re-operation	3 (1.9%)	1	2	0.568
Re-admission	3 (1.9%)	1	2	0.568
Length of drainage (days)	2 (1-4)	3 (1-5)	2 (1-3)	**0.002**
Post-operative length of stay (days)	5 (3-8)	6 (4-9)	5 (3-7)	**0.039**

	Total (n=162)	Lobe (n=81)	Segments (n=81)	P-value
Follow-up in months	31	37	29	**0.009**
Recurrence	15 (9.2%)	10 (12.3%)	5 (6.1%)	0.183
Local recurrence only - Mediastinal Lymph node - Lung	6 (3.8%) 6 0	4 (4.9%) 4 0	2 (2.4%) 2 0	0.414
Local and distant	1	1	0	1
Distant	7 (4.3%)	4 (4.9%)	3 (3.7%)	0.700

Data were reported as mean ± standard deviation or as median and range. Categorical variables were compared by X^2 analysis and continuous variables by Student's t-test. Survival was calculated using the Kaplan-Meier method and survival comparison was performed by log-rank test. P-value < 0.05 was considered significant.

Monday P.M.
Abstract O25-O30

O-026

PROGNOSTIC COMPARISON OF SEGMENTECTOMY AND LOBECTOMY FOLLOWING THE INCREASE OF EXAMINED LYMPH NODES IN NODE-NEGATIVE NON-SMALL CELL LUNG PATIENTS

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OBJECTIVES
For non-small cell lung cancer (NSCLC) patients with pathologically reported negative lymph nodes, prognostic significance of examined lymph nodes (ELNs) has not been explored. Therefore, we evaluated the prognosis of segmentectomy with different number of ELNs using lobectomy with equal ELNs as comparison.

METHODS
Node-negative patients undergoing segmentectomy or lobectomy were extracted from Surveillance, Epidemiology, and End Results database. Propensity score matching method was performed to minimize differences of confounding variables between surgical groups. Interactive effect of surgical procedure and the number of ELNs was validated in multivariate Cox model. Thin plate regression splines were utilized to realize continuous analysis of the prognostic comparison between segmentectomy and lobectomy.

RESULTS
In total, 18032 patients were screened out. After propensity score matching, 5838 patients underwent segmentectomy (n =1185) or lobectomy (n =4653) were enrolled for survival analysis. In multivariate Cox model analysis, lobectomy was independent protective factor compared with segmentectomy on the whole (Overall survival [OS], p <0.001; Lung cancer-specific survival [LCSS], p <0.001), and surgical procedure showed significant interactive effect with the number of ELNs (OS, p =0.009; LCSS, p =0.011). Furthermore, thin plate regression splines demonstrated that 4 was the cut-off point distinguishing the postoperative survival of segmentectomy and lobectomy (Figure 1). And the following Kaplan-Meier method analysis comparing the prognosis between the surgical procedures confirmed our findings. Specifically, segmentectomy demonstrated significantly worse OS (p <0.001) and LCSS (p <0.001) compared with lobectomy in patients with less than 4 ELNs. Nevertheless, similar prognoses were achieved between segmentectomy and lobectomy in patients with 4 or more 4 ELNs (OS, p =0.654; LCSS, p =0.935).

CONCLUSIONS
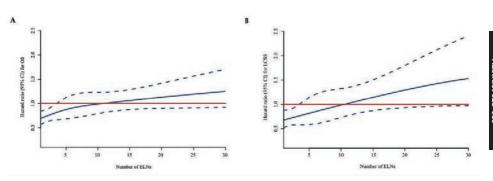Lobectomy could achieve better postoperative survival than segmentectomy for node-negative NSCLC patients overall. However, the number of ELNs could mediate the prognosis of different procedures, and 4 or more ELNs are recommended in segmentectomy to improve prognosis.

Disclosure: No significant relationships.

Keywords: Non-Small Cell Lung Cancer; Segmentectomy; Lobectomy; Examined Lymph Nodes.

O-027

PERIPHERAL LOCATION OF LUNG CANCER IS ASSOCIATED WITH HIGHER LOCAL DISEASE RECURRENCE

Alex Fourdrain, Vassili Anastay, Vanessa Pauly, Xavier-Benoit D'Journo, David Boulate, Pascal-Alexandre Thomas
Marseille University Hospital, Marseille, France

OBJECTIVES
To evaluate the association between the distance of the tumor to the visceral pleura, and the rate of local recurrence in patient surgically treated for stage p I lung cancer.

METHODS
A single centre retrospective review of 578 subsequent patients with a clinical stage I lung cancer who underwent lobectomy or segmentectomy from January 2010 to December 2019. Were excluded those 107 patients with either positive margins, previous lung cancer, neoadjuvant treatment, pathological stage II or higher status, or patients in whom preoperative CT-scan was not available at the time of the study. Distance between the tumor and the closest visceral pleura area (fissure/mediastinum/lateral) was assessed by two independent investigators, using the preoperative CT-scan and multiplanar 3D reconstructions. An AUC curve was performed to determine the best threshold for tumor/pleura distance, and then multivariable survival analyses (Cox regression) to assess the relationship between local recurrence and this distance.

RESULTS
A cut-off value of 5mm between the tumor and the pleura was statistically determined. Local recurrence occurred in 27/471 patients (5.8%). In multivariate analysis, local recurrence rate was significantly higher in patients with tumor-to-pleura ≤5mm, compared to patients with tumor-to-pleura >5mm (8.5% vs. 2.7%, HR 2.967, 95%CI 1.185-7.313, p=0.02). Sub-group analyses regarding patients with pIA and tumor size <2cm found local recurrence in 4/78 patients treated with segmentectomy (5.1%), with a significant higher occurrence in tumor-to-pleura ≤5mm (11.4% vs 0%, p=0.02), and in 16/292 patients treated with lobectomy (5.5%) without significant higher occurrence in tumor-to-pleura ≤5mm (7.7% vs 3.4%, p=0.13).

CONCLUSIONS
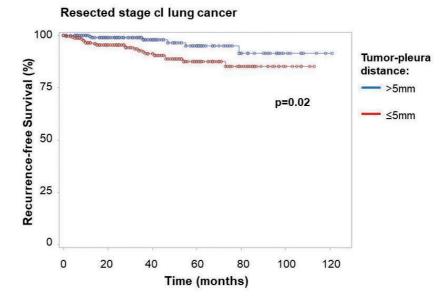Peripheral location of lung tumor is associated with a higher rate of local recurrence and should be taken into account during preoperative planning when considering segmental versus lobar resection.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Recurrence, Visceral Pleura, Segmentectomy, Lobectomy.

Resected stage cI lung cancer

p=0.02

Tumor-pleura distance:
— >5mm
— ≤5mm

O-028

PROGNOSTIC VALUE OF ADDING BLOOD AND LYMPHATIC VESSEL INVASION TO THE 8TH CLASSIFICATION OF TNM IN LUNG CANCER IN STAGES I AND II

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OBJECTIVES
Expanding the tumor, lymph node, metastasis (TNM) staging system with the addition of new prognostic factors for cancer could enhance patient stratification and survival prediction. The goal of this study is to assess if TNM prognosis could be improved by incorporating pathological characteristics of surgical specimen.

METHODS
We retrospectively reviewed the resections of lung cancer, stages I-II, performed in our department from the 1st January 2010 to the 1st May 2019. In addition to clinical variables, we collected pathological characteristics: vascular, lymphovascular and perineural invasion, STATS, necrosis and stromal inflammatory infiltrate. Mortality and recurrence-free survival were assessed. We performed univariate and multivariate Cox analysis. Finally, we explored how these factors modified the TNM Harrel's index (a tool to quantify the prognostic value of each factor), when added to the TNM.

RESULTS
A total of 629 tumors were analyzed. Median overall survival was 53.9 months. Median recurrence-free survival was 47.6 months. Specific survival at 3, 5 and 10 years was 90, 83 and 74%. Recurrence-free survival at 3, 5 and 10 years was 76, 70 and 65%. The multivariate analysis showed that specific survival was significantly related to TNM classification (p 0.000), vascular infiltration (HR 2.23 P 0.000) and lymphovascular invasion (HR 1.85 p<0.021). Harrell's index for TNM was 0.66, but after adding vascular and lymphovascular invasion, it increased to 0.71. Recurrence-free survival was related to TNM, vascular infiltration (HR 1.48, p<0.023) and lymphovascular invasion (HR 2.40, p 0.000). Harrell's index for TNM was 0.62, but after adding vascular and lymphovascular invasion it increased to 0.67.

CONCLUSIONS
Staging system classification should consider including vascular and lymphatic vessels invasion to better stratify and identify patients at risk of recurrence and tumor-related death. Moreover, these patients could benefit from adjuvant treatments to reduce the mortality and risk of recurrence.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Prognostic Factors, Blood Vessel Invasion, Lymphovascular Invasion.

O-029

PROGNOSTIC IMPACT OF TUMOR VOLUME DOUBLING TIME IN CLINICAL T1 NON-SMALL CELL LUNG CANCER WITH PURE-SOLID RADIOLOGICAL FINDINGS

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OBJECTIVES
To investigate whether tumor volume doubling time (VDT) could be a prognostic factor in clinical T1 non-small cell lung cancer (NSCLC) with pure-solid radiological findings.

METHODS
The objectives of this study were 403 patients who underwent anatomical resection for clinical T1 NSCLC with pure-solid radiological findings from January 2006 to April 2020. Exclusion criteria were as follows: less than 1 month between computed tomography (CT) detection of lung nodules and CT before surgery, and presence of shrunken nodules. After exclusion, a total of 286 patients were analyzed. VDT (days) = $(T2 - T1) \times \log 2/(\log V2 - \log V1)$. T2: the date the patient underwent CT before lung resection. T1: the date on which CT detected the lung nodule for the first time. V2: tumor volume at the time of T2. V1: tumor volume at the time of T1. V (tumor volume, cm3) = $1/6 \times \pi \times X \times Y2$ (X: the diameter in the long-axis direction [cm], Y: the diameter in the short-axis direction [cm] on axial CT).

RESULTS
Univariable analysis identified SUVmax (>6.0; HR =3.62, $p < 0.01$), tumor diameter on CT (>2.0 cm; HR = 2.08, $p < 0.01$), and VDT (<300 days; HR = 3.40, $p < 0.01$) as significant prognostic factors for recurrence-free survival. Multivariable analysis identified SUVmax (>6.0; HR =2.14, $p < 0.01$), and VDT (<300 days; HR =3.46, $p < 0.01$) as significantly independent prognostic factors for recurrence-free survival. In the curve of recurrence-free survival by the combinations of high or low SUVmax and long or short VDT, a group with low SUVmax and long VDT has a significantly better prognosis than other groups.

CONCLUSIONS
The combination of VDT and SUVmax could be a useful prognostic predictor in clinical T1 NSCLC with pure-solid radiological findings.

Disclosure: No significant relationships.
Keywords: Non-Small Cell Lung Cancer, Prognostic Factor, Tumor Volume Doubling Time, Computed Tomography, Pure-Solid Radiological Findings.
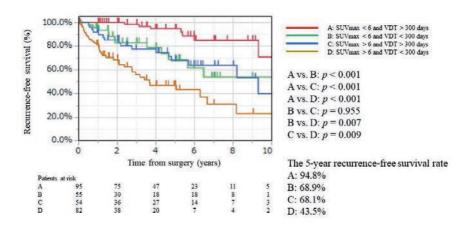
Figure

A: SUVmax < 6 and VDT > 300 days
B: SUVmax < 6 and VDT < 300 days
C: SUVmax > 6 and VDT > 300 days
D: SUVmax > 6 and VDT < 300 days

A vs. B: $p < 0.001$
A vs. C: $p < 0.001$
A vs. D: $p < 0.001$
B vs. C: $p = 0.955$
B vs. D: $p = 0.007$
C vs. D: $p = 0.009$

The 5-year recurrence-free survival rate
A: 94.8%
B: 68.9%
C: 68.1%
D: 43.5%

Patients at risk

A	95	75	47	23	11	5
B	55	30	18	18	8	1
C	54	36	27	14	7	3
D	82	38	20	7	4	2

O-030

SEGMENTECTOMY VERSUS LOBECTOMY FOR THE TREATMENT OF INNER LOCATED SMALL-SIZED EARLY NON-SMALL-CELL LUNG CANCER.

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[2]Osaka Saiseikai Nakatsu Hospital, Osaka, Japan

OBJECTIVES
Although segmentectomy is an acceptable alternative to lobectomy for peripheral small-sized non-small-cell lung cancer, the effectiveness of segmentectomy for inner lesions remains unknown. The aim of this study was to examine the feasibility of segmentectomy in comparison with lobectomy for inner lesions.

METHODS
We retrospectively analyzed 570 patients with small (≤2 cm) cN0 non-small-cell lung cancer who underwent segmentectomy or lobectomy between January 2007 and March 2021. We focused on patients with lesions located in the inner two-thirds, which was determined using three-dimensional computed tomography (n = 227), and after propensity-score matching analysis based on sex, age, pulmonary function, serum carcinoembryonic antigen level, radiographic tumor findings, and tumor location, we compared the surgical and oncological outcomes in patients who underwent segmentectomy (n = 66) and lobectomy (n = 66).

RESULTS
Postoperative mortality or morbidity did not differ significantly between the two groups. The 5-year recurrence-free and overall survival rates in the segmentectomy and lobectomy groups were 93.6% vs. 84.1% and 95.8% vs. 87.9%, respectively, and the differences between the groups were not significant ($p = 0.62$ and $p = 0.23$, respectively). The two groups also showed no differences in locoregional recurrence. Multivariable Cox regression analysis revealed that segmentectomy had a comparable impact on recurrence-free survival (hazard ratio, 0.61; 95% confidence interval, 0.17-2.03; $p = 0.43$).

CONCLUSIONS
Segmentectomy for inner-located small-sized non-small-cell lung tumors could be an acceptable treatment in comparison with lobectomy.

Disclosure: No significant relationships.
Keywords: Non-Small-Cell Lung Cancer, Inner Location, Prognosis, Segmentectomy.
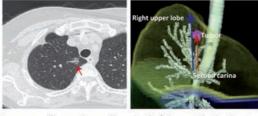
	Segmentectomy (n=66)	Lobectomy (n=66)	P value
Surgical Approach Thoracoscopy / Thoracotomy	39/27	38/28	0.86
Resected site			0.98
RUL	11	11	
S1	2		
S2	8		
S2b+S3a	1		
RLL	21	19	
S6	15		
S8	3		
S10	2		
Basal	1		
LUL	18	18	
S1+2	2		
S1+2+3	10		
S4+5	6		
LLL	17	17	
S6	13		
S8	3		
Basal	1		
Operation time (min)	182±55	176±47	0.50
Blood loss volume (ml)	81±96	105±161	0.30
Postoperative complication (overall) (%)11 (15.1)	7 (10.6)	0.31	
Prolonged air leak (%)	6 (9.1)	4 (6.0)	0.51
Histology (Ad / non-Ad)	59/7	61/5	0.54
Lymph node metastasis (Yes/ No)	2/64	10/56	0.015
Vascular invasion (Yes/No)	10/56	18/48	0.086
Lymphatic invasion (Yes/No)	6/60	15/51	0.032
Pathological stage			0.052
I	64	56	
II	1	4	
III	1	6	
Adjuvant chemotherapy (%)	10 (15.1)	15 (22.7)	0.27
Recurrence			0.39
Regional	2 (3.0)	1 (1.5)	
Distance	3 (4.5)	3 (4.5)	
Regional + Distance	1 (1.5)	4 (6.0)	

A. Representative image of the inner located lesion (Tumor centrality ratio below 2/3).
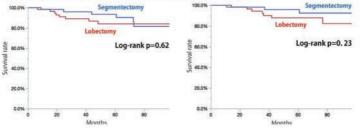
Tumor centrality ratio was defined as the distance from the secondary carina to the center of the tumor (red arrow) divided by the distance from the secondary carina to the visceral surface (blue arrow).

B. Recurrence free and overall survival of the matched cohort.

MONDAY 20 JUNE 2022
YOUNG INVESTIGATORS AWARD
14:30 - 16:00

O-031

THE UTILITY OF VALIDATED PROGNOSTIC SCORES TO PREDICT OUTCOMES IN PATIENTS BRIDGED TO LUNG TRANSPLANTATION WITH EXTRACORPOREAL LIFE SUPPORT

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OBJECTIVES
Selection of patients who may benefit from extracorporeal life support (ECLS) as a bridge to lung transplant(LTx) is crucial:highly urgent patients would mostly benefit from ECLS but at the same time they could be considered too marginal for this support. The aim of this study is to assess if validated prognostic scores could help in selecting patients who may benefit from ECLS bridging predicting their post-operative outcome.

METHODS
All clinical data of patients successfully ECLS-bridged to LTx from 2009 to 2021 were retrospectively collected from two European centers. Patients ECLS-bridged to re- or multi-organ transplantation, placed on ECLS bridge at other institutions or with missing data were excluded. For each patient, Sequential Organ Failure Assessment(SOFA), Simplified Acute Physiology Score III(SAPS III), Acute Physiology and Chronic Health Evaluation II(APACHE II) were calculated at intensive care unit(ICU) admission, before placing ECLS support, and then correlated with outcome.

RESULTS
47 patients (62% females, median age at LTx 39 years, 60% cystic fibrotic) were enrolled. Median duration of ECLS-bridge was 14 days (IQR 3-23). 9 patients (19%) were awake during ECLS support. Median values of SOFA, SAPS III and APACHE II were respectively 5 (IQR 3-9), 57 (IQR 47.5-65), 21 (IQR 15-26). Post-LTx in-hospital, 30-days and 90-days mortality were respectively 19%, 13% and 23%. SOFA, SAPS III and APACHE II were analyzed as predictors of in-hospital, 30- and 90-days mortality respectively (SOFA AUC: 0.726, 0.770, 0.692; SAPS III AUC: 0.577, 0.456, 0.555; APACHE II AUC: 0.564, 0.461, 0.555). For SOFA, the best predictor of outcomes in this population, a cut-off=9 was identified for predicting mortality with high probability.

CONCLUSIONS
Among validated prognostic scores, only SOFA may be considered an adequate predictor of outcome in patients ECLS-bridged to LTx, helping clinical decision-making and improving post-LTx outcomes. More specific and simplified scores for this peculiar population are necessary.

Disclosure: No significant relationships.
Keywords: Lung Transplantation, Extracorporeal Life Support, Bridge To Transplantation, Prognostic Scores.

Monday P.M.
Abstract 031-036

O-032

UPGRADED FROM CT1A-C TO PT2A LUNG CANCER, RELATED TO VISCERAL PLEURAL INVASION, AFTER SEGMENTECTOMY: IS IT AN INDICATION TO COMPLETE RESECTION TO LOBECTOMY?

Joseph Lula Lukadi[1], Alessio Vincenzo Mariolo[1], Dominique Gossot[1], Jean-Marc Baste[2,3], Bertrand De Latour[4], Agathe Seguin-Givelet[1,5]
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[2]Rouen University Hospital, Rouen, France
[3]Normandie University UNIROUEN, Rouen, France
[4]Rennes University Hospital, Rennes, France
[5]Paris 13 University, Bobiny, France

OBJECTIVES
Segmentectomy is mainly indicated for T1a-cN0 non-small cell lung cancer (NSCLC). However, several patients are upgraded pT2a at final pathological examination due to visceral pleural invasion (VPI). As resection is not usually completed to lobectomy, this may raise issue of potential worse prognosis.

METHODS
3 centers data of cT1a-cN0 patients who underwent either lobectomy (n= 191) or segmentectomy (n= 62) and who finally had a VPI, were analyzed. Patients were operated on from April 2007 to December 2019. Median follow-up was 41 months (range: 2-168). Factors affecting survival and recurrence were assessed by Kaplan Meier method and cox regression analysis.

RESULTS
Both groups were similar but, in segmentectomy arm, there were more (p=0.0001) patients with history of prior operated lung cancer , more (p=0.0023) cT1aN0 patients and less (p= 0.0016) cT1cN0 patients. Ninety-days complications were comparable in both groups, but length of stay was shorter (p=0.013) in segmentectomy group. Sixty (23.7 %) patients had a recurrence. No difference (p=0.739) in recurrence free survival (RFS) between lobectomy (78%) and segmentectomy (71%) was observed. There was no difference in local recurrence (p= 0.7708), nor in ipsilateral pleural recurrence (p= 0.9229). There were more distant recurrence (p= 0.0279) in segmentectomy group. Metachronic lung cancer rate was not significatively different (p= 0.4068) between two arms. In multivariable analyses, performance status (HR= 2.413) and age (HR= 1.034) were significantly influencing RFS. Adjuvant chemotherapy was not a significant variable for RFS, even at univariate analysis. Overall survival was similar (p=0.930) for both lobectomy (77.5%) and segmentectomy (79.0%). In multivariable analysis, male gender (HR= 2.014), performance status (HR= 2.588), length of stay (HR=1.042), and recurrence (HR= 2.927) were impacting survival.

CONCLUSIONS
Detection of visceral pleural invasion (pT2a upgrade) on patient who just underwent segmentectomy for cT1a-c NSCLC is not an indication to extend resection to lobectomy.

Disclosure: No significant relationships.
Keywords: Segmentectomy, Visceral Pleural Invasion, Prognosis, Early-Stage Lung Cancer.

O-033

ADJUVANT TRANSTHORACIC NEGATIVE PRESSURE VENTILATION IN NON-INTUBATED THORACOSCOPIC SURGERY

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[2]Department of Anesthesia and Intensive Care, Policlinico Tor Vergata University, Rome, Italy
[3]Department of Biostatistics, Tor Vergata University of Rome, Rome, Italy

OBJECTIVES
To minimize risks of barotrauma during nonintubated thoracoscopic surgery under spontaneous ventilation we investigated an adjuvant transthoracic negative pressure ventilation (TNPV) method in patients operated on due to severe emphysema or interstitial lung disease.

METHODS
In this pilot study , TNPV was employed in case of temporary low oxygen saturation and to achieve end-operative lung re-expansion during nonintubated thoracoscopic lung volume reduction surgery for severe emphysema (group 1N, 30 patients) and in wedge resection of undetermined interstitial lung disease (group 2N, 30 patients). Results were compared following 1:1 propensity score matching with equivalent control groups (groups 1P and 2P, 30 patients each) undergoing the same procedures with conventional positive pressure ventilation through the laryngeal mask. Primary outcomes were changes (preoperative – postoperative value) in the ratio of arterial oxygen tension to fraction of inspired oxygen ($\Delta PO2/FO2$;) and completeness of lung expansion on chest radiograph (CXR, scored as 2:full or 1:incomplete) assessed at 24h.

RESULTS
Intergroup comparisons (1N vs 1P and 2N vs 2P) showed no difference in age, sex and baseline pulmonary function. In the study groups, TNPV could be accomplished in all instances. There was no conversion to open surgery or general anesthesia with intubation. Main baseline data and results are depicted in Table 1 showing that amongst emphysema patients, $\Delta PO2/FO2$ was better in group 1N with no difference in CXR score whereas amongst patients with interstitial lung disease, both $\Delta PO2/FO2$ and CXR score were better in group 2N. There was no operative mortality and no intergroup difference in morbidity and hospital stay (Table 1).

CONCLUSIONS
This pilot study has shown that as compared with positive pressure ventilation, nonintubated thoracoscopic surgery with adjuvant TNPV resulted in better 24h-oxygenation measures in patients with emphysema or interstitial lung disease and in better lung expansion at CXR in patients with interstitial lung disease.

Disclosure: No significant relationships.
Keywords: Non-Intubated Thoracic Surgery; VATS; Spontaneous Ventilation; Emphysema; Interstitial Lung Disease.

Table 1. Results in the study groups.

	Emphysema			Interstitial lung disease		
	Group N1 (N=30)	Group P1 (N=30)	P value	Group N2 (n=30)	Group P2 (N=30)	P value
PO$_2$/FO$_2$ *	263±65	233±54	0.08	342±45	321±68	0.26
ΔPO$_2$/FO$_2$	3.04±22	9.93±29	0.027	9.2±17	25±31	0.035
PCO$_2$*(mmHg)	43±5.0	42±4.7	0.15	38±3.2	39±3.4	0.24
ΔPCO$_2$ (mmhg)	2.26±3.1	0.03±2.5	0.008	0.10±3.3	0.30±2.8	0.98
CXR (score)	1.80±0.4	1.65±0.5	0.34	1.9±0.3	1.57±0.5	0.026
Operative Time (min)	40±11	37±11	0.17	25±6.3	27±7.5	0.19
Global OR Time (min)	145±42	150±43	0.93	86±14	119±31	<0.001
Morbidity (N)	4	5	0.73	2	2	1.0
Hospital stay (days)	6.8±3.9	6.8±5.7	0.77	1.17±0.5	1.26±0.7	0.95

*preoperative value; PO$_2$/FO$_2$:ratio of arterial oxygen tension to fraction of inspired oxygen; ΔPO$_2$/FO$_2$:difference betwee preoperative and postoperative PO$_2$/FO$_2$; PCO$_2$: arterial carbon dioxide tension; ΔPCO$_2$difference between preoperative and postoperative PCO$_2$; CXR: chest x-ray; OR: operatin room time.

O-034

MULTIMODALITY THERAPY FOR LUNG CANCER WITH CHEST WALL INVASION: AN EPITHOR DATABASE STUDY.

Jérémy Tricard[1], Pascal Alexandre Thomas[2]
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[2]*EPITHOR Group, Marseille, France*

OBJECTIVES
Induction therapy for lung cancer invading chest wall is still under debate. Surgery with adjuvant chemotherapy is the standard therapy for T3N0-N1 cancers. We present an EPITHOR database study (French Society of Thoracic and Cardiovascular Surgery thoracic surgery database) of survival of patients operated without neoadjuvant therapy (0_Neo), with neoadjuvant chemotherapy (Neo_CT) and with neoadjuvant chemoradiation therapy (Neo_CRT).

METHODS
EPITHOR database queries were: "primary lung cancer, chest wall resection, January 2004 to December 2019, complete files". We excluded Pancoast tumor (first rib invasion). We included 688 patients: 522 operated without neoadjuvant therapy (0_Neo), 101 with Neo_CT, and 65 with Neo_CRT. Survey status on 1 August 2021 was validated by French National Institute for Statistics and Economic Research.

RESULTS
Postoperative <90-day mortality was 10.7% in 0_Neo group, 5.0% in Neo_CT group, 7.7% in Neo_CRT group (p=0.17). Incomplete resection rate was 14.0% in 0_Neo group, 6.9% in Neo_CT group, 6.2% in Neo_CRT group (p=0.04). In 0_Neo group, 69.9% of patients were treated with adjuvant therapy, 52% in Neo_CT group, 36% in Neo_CRT group. Overall survival (OS) analysis showed better outcomes in Neo_CRT group (5-year 0S probability: 58% versus 40% for 0_Neo and Neo_CT groups; p=0.035). In the multivariate analysis, Neo_CRT (HR=0.548, CI 0.342-0.876; p=0.012), age (>60 years-old, HR=1,507, CI 1.174-1.934; p=0.001), gender (female, HR=0,573, CI 0,438-0,749; P<0.001), pneumonectomy (HR=1.374, CI 1.018-1.855, p=0.038), pN2 status (HR=2.012, CI 1.544-2.622; p<0.001), number of resected ribs (≥3, HR=1.473, CI 1.182-1.835; p=0.001), resection completeness (R1-R2, HR=2.445, CI 1.796-3.328; p<0.001) and adjuvant therapy (HR=0.539, CI 0.425-0.683; p<0.001) were associated with OS. Neo_CT was not associated with survival (HR=0.799, CI 0.586;1.091; p=0.158).

CONCLUSIONS
Neoadjuvant chemoradiation therapy improves survival of patients with lung cancer invading chest wall probably with a better control of parietal lymphatic and vascular involvement, a better selection of surgical patients and a better observance of non-surgical treatments.

Disclosure: No significant relationships.
Keywords: Lung Cancer; Chest Wall; Induction Therapy.

O-035

EFFECT OF LATERALITY ON THE POSTOPERATIVE SURVIVAL OF NON-SMALL CELL LUNG CANCER PATIENTS UNDERGOING PNEUMONECTOMY

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<div style="float:right">**Monday P.M.**
Abstract 031-036</div>

OBJECTIVES
This research evaluated the effect of laterality on short and long-term survival in patients undergoing pneumonectomy for non-small cell lung cancer.

METHODS
We reviewed the Surveillance, Epidemiology, and End Results database for patients who underwent pneumonectomy for stage I-III non-small cell lung cancer (NSCLC) from 2004 through 2015. Propensity score matching (PSM) was used to reduce the selection bias. Postoperative mortality in both-sided patients was assessed. Logistic regression was used to analyze the correlation between laterality together with other potential variables to mortality at 3, 6, and 9 months. Kaplan-Meier curve was used to further assess the effect of laterality on the overall survival (OS).

RESULTS
A total of 4763 patients met the enrollment criteria (right-sided, 1988 [41.7%]; left-sided, 2775 [58.3%]). After PSM, 1911 patients on each side were included in the further study. The first 6 months after pneumonectomy was the main period of death, with 32.0% (428/1336) and 19.9% (250/1258) of right- and left-sided deaths occurring during this period (Fig. 1A). Patients were associated with a higher mortality rate in the first 6 months, and thereafter patients on each side tended to be relatively consistent (Fig. 1B). Logistic regression analysis showed that right-sided pneumonectomy was an independent risk factor for 3- (P <0.001) and 6- (P <0.001, Tab. 1) month postoperative death. There was no significant difference for laterality in postoperative death at 7-9 months (P =0.829). In the total cohort, right-sided patients had worse OS (P <0.001, Fig. 1C), but subgroup survival analysis of patients with follow-up >6 months found that laterality had no statistical significance on OS (P =0.752, Fig. 1D).

CONCLUSIONS
Right-sided pneumonectomy was associated with higher perioperative mortality risk which lasted about 6 months. After the period, laterality was not observed with the significant prognostic difference in the OS of patients undergoing pneumonectomy.
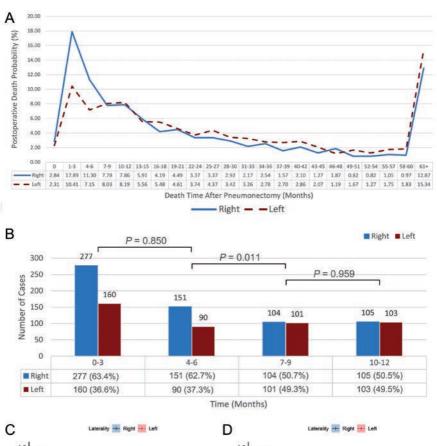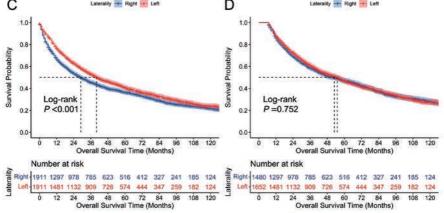
Variables	Univariable logistic regression		Multivariable logistic regression	
	OR (95% CI)	*P* value	OR (95% CI)	*P* value
Gender				
Male vs. Female	1.310 (0.976-1.758)	0.072*	1.330 (0.973-1.818)	0.073
Age				
>60 vs. ≤60	1.492 (1.129-1.971)	0.005*	1.441 (1.074-1.934)	0.015
Race				
Other vs. White	1.024 (0.704-1.490)	0.901		
Marriage				
Other vs. Married	0.968 (0.737-1.270)	0.813		
Laterality				
Right vs. Left	1.318 (1.152-1.507)	<0.001*	1.292 (1.122-1.488)	<0.001
Grade		0.107		
II vs. I	1.236 (0.585-2.609)	0.579		
III/IV vs. I	1.631 (0.786-3.386)	0.189		
Histology		0.015*		0.078
SCC vs. ADC	0.825 (0.616-1.106)	0.198	0.848 (0.620-1.158)	0.299
NEC vs. ADC	0.717 (0.257-2.003)	0.526	0.778 (0.274-2.209)	0.637
Other vs. ADC	1.491 (1.025-2.169)	0.037	1.396 (0.941-2.071)	0.098
Tumor size (cm)		0.067*		0.522
3< T≤5 vs. T≤3	1.030 (0.721-1.471)	0.870	1.029 (0.714-1.481)	0.879
5< T≤7 vs. T≤3	1.061 (0.704-1.599)	0.778	0.979 (0.642-1.492)	0.921
T>7 vs. T≤3	1.578 (1.069-2.329)	0.022	1.290 (0.858-1.939)	0.222
N stage		0.009*		0.010
N1 vs. N0	0.899 (0.653-1.238)	0.516	1.038 (0.746-1.444)	0.826
N2 vs. N0	1.506 (1.097-2.067)	0.011	1.698 (1.192-2.418)	0.003
N3 vs. N0	2.086 (0.721-6.034)	0.175	2.290 (0.756-6.932)	0.143
Surgery type		0.079*		0.109
Radical PNEU vs. PNEU	0.885 (0.667-1.176)	0.400	0.934 (0.694-1.257)	0.652
Extended PNEU vs. PNEU	1.664 (0.930-2.979)	0.086	1.734 (0.948-3.172)	0.074
Chemotherapy				
No vs. Yes	1.336 (1.027-1.740)	0.031*	1.766 (1.273-2.449)	0.001
Radiotherapy				
No vs. Yes	0.711 (0.530-0.954)	0.023*	0.599 (0.417-0.862)	0.006

O-036

VALIDATION OF THE MODIFIED EUROLUNG RISK PREDICTION MODELS IN THE NETHERLANDS, USING DATA FROM THE DUTCH LUNG CANCER AUDIT

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OBJECTIVES
Risk prediction models are useful tools to support clinical decision making and facilitate comparison of results between hospitals and countries. The objective of this study was to validate the modified Eurolung risk models for cardiopulmonary morbidity and mortality and assess its value as a prediction tool for Dutch surgical lung cancer patients.

METHODS
This is a retrospective analysis based upon data from the Dutch Lung Cancer Audit - Surgery (DLCA-S) from 2012 until 2020. In total, 18,307 anatomic lung resections were included from all centers performing lung cancer surgery in the Netherlands. 30-day mortality and cardiopulmonary morbidity were calculated and compared with the predicted rates of the modified Eurolung models, using hazard ratios (HR) and 95% confidence intervals (CI). Missing values were imputed.

RESULTS
The overall mortality rate was 2.05% and marginally, but significantly higher than the predicted value (1.85%, HR 1.11, 95% CI 1.00-1.23). Sensitivity and subgroup analyses revealed similar results for men (HR 1.00, 95% CI 0.89-1.13), but a higher ratio for women (HR 1.54, 95% 1.26-2.86). The mortality after bilobectomy (5.13%) was substantially higher than the Eurolung estimate (2.17%, HR 2.36, 95% CI 1.78-3.07). Mortality after right pneumonectomy was higher than after left pneumonectomy, (11.52% vs 5.28%, p<0.001). Cardiopulmonary morbidity was slightly, but significantly higher than the Eurolung 1 prediction, namely 19.75% vs 17.03% (HR 1.16, 95% CI 1.13-1.19).

CONCLUSIONS
The modified Eurolung models are applicable as a clinical prediction tool for Dutch surgical lung cancer patients. However, both mortality and cardiopulmonary morbidity rates were slightly, but significantly higher in the Netherlands than predicted. This could possibly be explained by the compulsory nature of the DLCA-S, securing inclusion of all operated patients, as opposed to the voluntary ESTS database. For women, recalibration of the model may be necessary. Further research will focus on complications after bilobectomy and right pneumonectomy.

Disclosure: No significant relationships.
Keywords: Lung Resections; Lung Cancer; Eurolung Risk Scores; Mortality; Morbidity.

MONDAY 20 JUNE 2022
MITIG VATS RESECTION
16:30 - 18:00

O-037

UNI-PORTAL VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) ANATOMICAL SEGMENTECTOMIES: A COMPARISON OF LONG-TERM OUTCOMES WITH MATCHED LOBECTOMY PATIENTS

Priyad Ariyaratnam, John Edwards, Jagan Rao, Sara Tenconi, Mohamed Komber, Sanjay Agrawal, Laura Socci
Sheffield Teaching Hospitals, Sheffield, United Kingdom

OBJECTIVES
Anatomical segmentectomies are becoming a popular method to resect small lung cancers although the learning curve for this operation via a uni-portal VATS approach is steep and little data exists for the long-term outcomes. We present our long-term oncological outcomes using this technique compared with VATS lobectomies.

METHODS
This was a retrospective analysis of 205 uni-portal VATS anatomical segmentectomies performed between April 2014 and November 2021 for patients with early stage lung tumours. We performed a 1:1 propensity-matched analysis comparison with 205 VATS lobectomy patients using SPSS 27.

RESULTS
The mean age at surgery for segmentectomies was 69.7 years. The mean FEV1 was 91.36% predicted and the mean DLCO was 73.3% predicted. Left sided tumours formed the majority of resections (78%). Upper tri-segments (38.7%) formed the majority of resections followed by Segment 6 resections (26.0%) The mean tumour size was 23.8mm. Adenocarcinomas formed the majority of resections (46.8%). Of those that were primary tumours (N=137), 54.% were T1 and 41.1% were T2. The mean length of hospital stay was 5.2 days (+/- 4.1). There was 1 conversion to a thoracotomy and 1 30-day mortality.

The number of segmentectomies increased yearly from 2014 to 2021 ($p<0.05$) whilst the total number of anatomical resections remained relatively constant. Residents performed 26% of the segmentectomies and took longer to perform the operations (155.3 mins vs 129.8 mins, $p<0.001$) compared to consultants although without adversely affect outcomes.
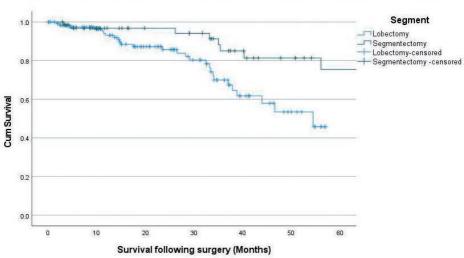
5-year survival for T1 tumours in the segmentectomy group was 74% whilst the lobectomy group was 45% (log rank, $p=0.02$). There were 2 R1 margins at final histology and 2 instances of recurrence in the segmentectomy group.

CONCLUSIONS

Uni-portal-VATS Segmentectomies for lung tumours can safely be performed and taught in a controlled setting without compromising long-term outcomes and this may be beneficial as we push the boundaries in minimally invasive surgery

Disclosure: No significant relationships.
Keywords: Segmentectomies; Survival.

Survival following lung cancer surgery comparing segmentectomy and lobectomy for T1 Cancers

O-038

IS NODAL UPSTAGING DURING VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) RELATED TO SURGEON EXPERIENCE? RESULTS FROM A LARGE PROSPECTIVE NATIONAL DATABASE

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OBJECTIVES

Despite recent improvement in preoperative staging, nodal and mediastinal upstaging occur in about 5-15% of cN0 patients. Different clinical and tumour characteristics are associated to upstaging, while the role of surgeon's experience is not well evaluated.
Aim of this study is to investigate if operator experience may influence nodal upstaging during VATS anatomical lung resection.

METHODS

Clinical and pathological data from the prospective VATS Italian nationwide registry were reviewed and analysed. Patients with incomplete data regarding tumour and surgical characteristics, GGO tumours, cN2-3 and with distant metastases were excluded. Patients clinical data, tumour characteristics, and surgeon experience were correlated to nodal and mediastinal(N2) upstaging using Pearson's Chi-Squared or Fisher's exact test for categorical,Mann-Whitney U and t-tests for quantitative variables. A multivariable model was built using logistic regression analysis. Surgeon experience was categorized considering the number of VATS major anatomical resection and years after residency.

RESULTS

The final analysis was conducted on 3319 cN0 patients for nodal upstaging and 3471cN0N1 patients for N2upstaging(table). Adenocarcinoma was the predominant histology(2811 patients,80.1%), cTNM stage was I in 2846(81.9%),II in 533(15.3%) and III(cT3N1) in 92(2.8%)patients. The median number of resected nodes and number of N2 resected nodes were 11(1-51) and 5(1-41). Nodal upstaging occurred in 489(13.1%) patients while N2-upstaging occurred in 229(6.1%) patients.
Table 1 reports univariable analysis. In particular, surgeon's years after residency(p=0.60 for nodal, p=0.13 for N2-upstaging) and number of VATS procedures(p=0.49 for nodal, p=0.72 for nodal upstaging)did not correlate with nodal and N2 upstaging.

Multivariable analysis confirmed as factors independently correlated to nodal upstaging cT-dimension(p=0.001), solid nodules(p<0.001),cTNM(p<0.001) and SUVmax(p<0,001), while factors independently correlated to N2-upstaging resulted cT-dimension (p=0.005),cTNM(p<0.001) and SUVmax(p=0.028).

CONCLUSIONS
Our study showed surgeon's experience did not influence nodal and mediastinal upstaging during VATS anatomical resection while cT-dimension, cTNM and SUVmax resulted independently correlated to nodal and mediastinal upstaging.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Surgery, VATS, Lymphadenectomy.

Variable		Nodal Upstaging		p	Mediastinal Upstaging		p
		No	Yes		No	Yes	
cT dimension							
<2cm		89.7%	10.3%		95.8%	4.2%	
	(num)	1016	117		1111	49	
2-3 cm		84.6%	15.4%	<0.0001	92.5%	7.5%	<0.0001
	(num)	763	139		871	71	
4-5 cm		84%	16%		92.5%	7.5%	
	(num)	837	160		975	79	
>5 cm		73.6%	26.4%		90.1%	9.9%	
	(num)	203	73		274	30	
T lung							
Left		84%	16%		93.1%	6.9%	
	(num)	1154	219	0.10	1316	98	0.51
Right		86.1%	13.9%		93.6%	6.4%	
	(num)	1676	270		1926	131	
cN							
cN0		-	-		93.8%	6.2%	
	(num)	-	-		3133	206	<0.0001
cN1		-	-		84.9%	15.1%	
	(num)	-	-		129	23	
Nodule density							
Solid		83.5%	16.5%		92.9%	7.1%	
	(num)	2200	435	<0.0001	2576	196	0.03
Part Solid		92.1%	7.9%		95.3%	4.7%	
	(num)	630	54		666	33	
C TNM							
cIa		88.4%	11.6%		95.2%	4.8%	
	(num)	2044	269		2201	112	
cIb		79.4%	20.6%	<0.0001	89.9%	10.1%	<0.0001
	(num)	423	110		479	54	
cII		77.8%	22.2%		91.9%	8.1%	
	(num)	318	91		376	33	
cIII (T3N1)		7 0.3%	29.7%		89.1%	10.9%	
	(num)	45	19		82	10	
Preoperative diagnosis							
No		89%	11%		94.6%	5.4%	
	(num)	1194	147	<0.0001	1307	74	0.02
Yes		82.7%	17.3%		92.6%	7.4%	
	(num)	1636	342		1935	155	

Variable	Nodal Upstaging No	Yes	p	Mediastinal Upstaging No	Yes	p
Operator Seniority (years after residency)						
<5	83.3%	16.7%		90.8%	9.2%	
(num)	245	49		285	29	
5-10	85.9%	14.1%	0.60	94.1%	5.9%	0.13
(num)	341	56		385	24	
>10	85.4%	14.6%		93.6%	6.4%	
(num)	2244	384		2572	176	
First operator VATS lobectomy number						
0-20	86.4%	13.6%		92.8%	7.2%	
(num)	533	84		604	47	
21-50	86%	92%	0.49	93.9%	6.1%	0.72
(num)	565	14		644	42	
>50	84.7%	15.3%		93.4%	6.6%	
(num)	1732	313		1994	140	
(num)	475	67		529	38	
	25	6		33		
Resection						
Segmentectomy	93.2%	6.8%		97.2%	2.8%	
(num)	234	17		247	7	
Lobectomy	84.7%	15.3%	<0.0001	93.2%	6.8%	0.0006
(num)	2537	457		2922	212	
Bilobectomy	79.7%	20.3%		88%	12%	
(num)	59	15		73	10	
Tumour location						
Upper/middle lobes	85.8%	14.2%		93.8%	6.2%	
(num)	1848	306	0.24	2114	139	0.17
Lower lobes	84.3%	15.7%		92.6%	7.4%	
(num)	982	183		1128	90	
Continuous Variables						
Age at surgery			.003			.167
cT SUV			.000			.000
Operative Time			.001			.053

O-039

ENERGY DEVICES - VERSUS ELECTROCOAGULATION IN VIDEO-ASSISTED THORACOSCOPIC LOBECTOMY: A PROPENSITY-MATCH COHORT STUDY

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OBJECTIVES
The aim of the study was to compare the effect on perioperative outcome of intraoperative use of different devices for tissue dissection (electrocoagulation or energy devices) in patients who underwent video-assisted thoracoscopic (VAT) lobectomy for lung cancer.

METHODS
We retrospectively reviewed 191 consecutive patients who underwent VAT lobectomy, divided into two cohorts: energy device (ED) (117 patients), and electrocoagulation (EC) (74 patients); after propensity score matching, 148 patients were extracted, 74 for each cohort. The primary endpoints considered were complication rate, and 30-day mortality rate. The secondary endpoints considered were length of stay (LOS), and the number of lymph nodes harvested.

RESULTS
The complication rate did not differ between the two cohorts (16.22% EC group, 19.66% ED group, p=0.549), before and after propensity match (16.22% for both EC and ED group, p=1.000). The 30-day mortality rate was 0 in the overall population. Median LOS was 5 days for both groups, before and after propensity match, with the same interquartile range, (IQR: 4-8). ED group had a significantly higher median number of lymph nodes harvested (ED mean: 18, IQR: 12–24; EC mean: 10, IQR: 5-19; p=0.0002). The difference was confirmed after the propensity score matching (ED mean: 17, IQR: 13–23; EC mean: 10, IQR: 5-19; p=0.0008).

CONCLUSIONS
Energy device tissue dissection during VAT lobectomy did not lead to different complication rates, mortality rates, and LOS compared to electrocoagulation tissue dissection. Energy device use led to a significantly higher number of intraoperative lymph nodes harvested compared to electrocoagulation use.

Disclosure: No significant relationships.
Keywords: VATS, Lobectomy, Energy Device.

O-040

SLEEVE LOBECTOMY IN NON-SMALL CELL LUNG CANCER PATIENTS: A REPORT FROM THE EUROPEAN SOCIETY OF THORACIC SURGERY DATABASE 2021

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OBJECTIVES
For centrally located tumours, sleeve lobectomy is now accepted as the preferred approach over pneumectomy. We report an overview of surgical practices and peri-operative outcomes in patients undergoing sleeve resections based on data from the European Society of Thoracic Surgeons (ESTS) database.

METHODS
We retrieved data of patients undergoing sleeve lobectomy or bilobectomy registered in the ESTS database from January 2007 to January 2021. We evaluated baseline characteristics, surgical approach, neo-adjuvant treatments and morbidity. Open and video-assisted thoracic surgery (VATS) procedures were compared in terms of post-operative outcomes.

RESULTS
A total of 1652 patients (median age: 63 years, f/m ratio 446/1206) underwent sleeve lobectomy (n=1536) or bilobectomy (n=116) by open thoracotomy (n=1491; 90.2%) or video-assisted thoracoscopic surgery (VATS) (n=161; 9.8%) with thoracotomy conversion rate of 21.1% (n=34). Neo-adjuvant treatment was administrated in 24.1% of patients (n=398). Overall morbidity and 30-day mortality were 40.6% and 2.2% respectively. Bronchial anastomotic complications occurred in 29 patients (1.8%) with conservative treatment in 5 cases (17%) and operative management in 24 (83%). On multivariable analysis, factors of elevated risk of cardiopulmonary complications were BMI < 20 (OR:2.3; P<0.001) and bilobectomy (OR:2.28, p<0.001), while age <60 (OR. 0.71, p=0.013), female sex (OR: 0.54, p<0.001) and VATS (0.64, p<0.001) were associated with decreased risks. Neo-adjuvant treatment was not associated with increased risks of cardio-pulmonary complications (OR: 1.05;p=0.664). When comparing VATS and open thoracotomy, VATS was associated with significant decreased overall morbidity (30.4% vs. 40.1%, p=0.06) and length of stay (median: 5 days vs. 8 days;

p<0.001).

CONCLUSIONS

Sleeve lobectomies can be safely performed after neo-adjuvant treatment. Taking into account inherent limitations, the patients undergoing VATS approach had a shorter length of stay and decreased morbidity.

Disclosure: No significant relationships.

Keywords: Sleeve Lobectomy, VATS, Lung Cancer.

Baseline Characteristics	Total (n=1652)	Percentage (%)
Sex (females /males)	446/1206	27/73
Age, median (IQR)	63(56-70)	
Age < 60 y	646	39.2
BMI, mean (SD)	26.2(± 4.9)	
BMI < 20	137	8.3
BMI > 30	308	18.7
ASA Score (mean)	2.15 (±0.74)	
1	297	18
2	700	42.4
3	474	28.7
4	21	1.3
Unknown	160	9.7
No Comorbidities	674	40.8
Overall comorbidities	976	59.2
Cardiac comorbidities	746	50
Coronary artery disease	187	12.5
Arterial Hypertension	598	40.1
Atrial Fibrillation	82	5.5
Insulin-dependant diabetes	67	4.8
CVD	43	3.1
CKD	66	4.8
Ppofev1, mean (DS)	68.3 (±17.1)	
Ppofev1 < 70 %	820	55.7
Neoadjuvant treatment	398	24.1
None	1254	75.9
Chemotherapy	305	18.5
Radiotherapy	2	0.1
Chemo-radiotherapy	91	5.5
Open	1491	90.2
VATS	161	9.8
Conversion	34	21.1

Baseline Characteristics	Total (n=1652)	Percentage (%)
Lobectomy	1536	93
RUL	792	48
RML	36	2.2
RLL	76	4.6
LUL	454	27.5
LLL	178	10.8
Bilobectomy	116	7
Upper	63	3.8
Lower	53	3.2
Resection margin		
R0	1393	92.9
R1-2	107	7.1
Pathological stage		
T0	106	6.4
T1	403	24.4
T2	737	44.6
T3	327	19.8
T4	79	4.8
N0	877	53.1
N1	501	30.3
N2	269	16.3
N3	6	0.4
M0	1624	98.3
M1	28	1.7
Overall morbidity	671	40.6
30-day mortality	65	2.2
Cardio-pulmonary complications	358	33.7
Pneumonia	164	9.9
Atelectasis	141	8.5
Bronchial complications	29	1.8
Prolonged air leak (> 5 days)	181	11
Atrial fibrillation	127	7.7
Length of stay (median) (IQR)	8 (7-12)	

O-041

COMPUTED TOMOGRAPHY (CT)-BASED SARCOPENIA AND OUTCOMES IN PATIENTS UNDERGOING VIDEO-ASSISTED THORACOSCOPIC SURGERY (VATS) ANATOMICAL RESECTION FOR NON SMALL CELL LUNG CANCER (NSCLC)

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OBJECTIVES

Sarcopenia is defined by a progressive loss of skeletal muscle mass and strength, combined with muscle fatty infiltration. Lung cancer patients frequently suffer from sarcopenia which may be associated with poorer post-operative outcomes. The aim of this study is to evaluate whether preoperative CT-based sarcopenia was associated with postoperative outcomes and survival after VATS resections in patients with early-stage non-small cell lung cancer (NSCLC).

METHODS

We retrospectively reviewed all consecutive patients that underwent anatomical resection for NSCLC between 2012 and 2019. The skeletal muscle index (SMI) and muscle quality (SMRA and IMAT) were measured at the L3 vertebral level on preoperative CT or PET/CT scans. We used the following SMI cut-off values for sarcopenia: 52.4 cm2/m2 for men and 38.5 cm^2/m^2 for women.

RESULTS

In total, 401 patients (sex ratio F/M: 173/228, mean age: 67 +/- 9.3 years) underwent VATS lobectomies (n=304) and segmentectomies (n=97) for NSCLC. Overall morbidity and mortality were 42.4% and 0.2%, respectively. The median length of stay was 7 days (IQR: 4-10). Sarcopenia was identified in 92 patients (23%). Patients with sarcopenia were predominantly males (75% vs 25%, p<0.001) and had lower BMI (21.4 vs 26.5, p<0.001). Patients with sarcopenia presented significantly increased morbidity (53.2% vs 39.2%, p=0.017) and had longer lengths of stay (6 vs 8 days, p=0.032). However, only lower BMI and ASA score >2 remained associated with increased morbidity on multivariate analysis. The median overall survival was comparable between patients with sarcopenia and those without sarcopenia (41 vs. 46 months, p=0.240).

CONCLUSIONS

Based on CT assessment alone, preoperative sarcopenia appeared to have little impact on postoperative clinical outcomes or overall survival in patients undergoing VATS pulmonary resection. Further studies should also consider muscle strength and physical performance, in addition to CT imaging, for preoperative risk assessment.

Disclosure: No significant relationships.
Keywords: NSCLC, Sarcopenia, VATS.

Table 1: Patients characteristics and postoperative outcomes with or without sarcopenia

	Overall (n=401)	Sarcopenia (n=92)	Non sarcopenia (n=309)	P-value
Age, mean (SD)	67,1 (9,3)	67,7 (8,6)	66,9 (9,5)	0.631
BMI, mean (SD)	25,3 (5)	21,4 (3,4)	26,5 (4,9)	<0.001
Sex, M/F, n (%)	228/173 (43,1/56,9)	69/23 (75/25)	159/150 (51,5/48,5)	<0.001
Charlson comorbidity index, median (IQR)	2 (1-3)	2 (1-3)	2 (1-3)	0.177
ASA score, median (IQR)	2 (2-3)	3 (2-3)	2 (2-3)	0.038
FEV1, mean (SD)	87,5 (21,6)	80,7 (19,3)	89,5 (21,9)	<0.001
DLCO, mean (SD)	72,5 (20,1)	63,6 (18,7)	75,3 (19,7)	<0.001
Segmentectomy, n (%)	102 (25,4)	29 (31,5)	73 (23,6)	0.128
Lobectomy, n (%)	304 (75,8)	64 (69,6)	240 (77,7)	
Length of drainage, median (IQR)	3 (2-6)	4 (2-7)	3 (2-5)	0.005
Length of stay, median (IQR)	7 (4-10)	8 (5-12)	6 (4-10)	0.032
Overall complications, n (%)	170 (42,4)	49 (53.2)	121 (39.2)	0.017
Cardiac complications, n (%)	30 (7,5)	7 (7,6)	23 (7,4)	0.767
Pulmonary complications, n (%)	149 (37,2)	45 (48,9)	104 (33,7)	0.008
Hospital mortality, n (%)	1 (0,2)	0 (0)	1 (0,3)	1
Re-operation, n (%)	11 (2,7)	3 (3,3)	8 (2,6)	0.730

O-042

EARLY AND LATE READMISSION AFTER ENHANCED RECOVERY THORACOSCOPIC LOBECTOMY

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OBJECTIVES
Application of enhanced recovery programs after video-assisted thoracoscopic surgery (VATS) has significantly lowered length of stay (LOS). However, there are limited procedure-specific evidence of reasons for early (0-30 day) and late (31-90 day) readmission after VATS lobectomy following enhanced recovery after surgery (ERAS) programs.

METHODS
A retrospective analysis of prospective collected data from an institutional database was performed. Data from consecutive VATS lobectomies from January 2019 until December 2020 was analyzed. All reasons for readmission with complete follow-up were individually evaluated. Univariate and multivariate logistic regression analyses were used to assess predictors.

RESULTS
In total, 505 VATS lobectomies were included. Median LOS was 3 days in the index hospitalization. There were 77 (15.2%) and 54 (10.7%) patients who experienced early and late readmission, respectively. Multiple readmissions ($\geq$ 2) were 13% and 20% on postoperative 0-30 and 31-90 day. The median time to early and late readmission was 11 and 52 days from the index operation. In both readmission periods, median LOS was 5 days. Pneumonia (19.8%) and pneumothorax (18.3%) were the dominant reasons for early readmission. For late readmission, side effects to adjuvant therapy (22.0%) was the most dominant reason (Figure 1). On multivariate analyses, current smoking was a significant predictor for early readmission (OR 0.31, 95% CI 0.13 to 0.73, P= .007), while gastrointestinal complications (OR 2.99, 95% CI 1.21 to 7.34, P= .017) and adjuvant therapy (OR 2.77, 95% CI 1.02 to 7.49, P= .045) were significant predictors for late readmission. Remarkably, early discharge (< 3 days) was not a predictor for readmission.
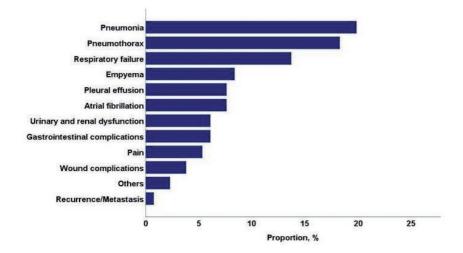
CONCLUSIONS
Pneumonia and pneumothorax are the most predominant reasons for early readmission (0-30 day) after ERAS VATS lobectomy. Side effects to adjuvant chemotherapy is the most common reason for late readmission (31-90 day). Early discharge was not a predictor for readmission.
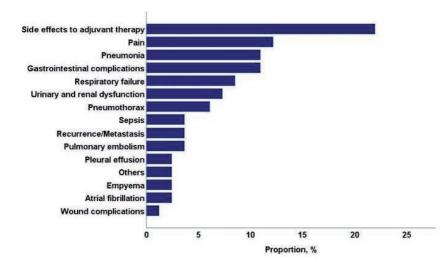
Disclosure: No significant relationships.
Keywords: Readmission, Enhanced Recovery After Surgery, Video-Assisted Thoracoscopic Surgery, Early Discharge.

Early readmission (0-30 day)

Late readmission (31-90 day)

O-043

ROBOTIC ASSISTED LOBECTOMY VERSUS TRIPORTAL VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) LOBECTOMY: A MONOCENTRIC PROSPECTIVE RANDOMIZED TRIAL

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OBJECTIVES
In recent years mini-invasive lobectomy became the treatment of choice for early stage NSCLC. At the same time robotic assisted surgery is emerging as the natural evolution of mini-invasive surgery. The study aim is to compare video assisted (VATS) and Robotic assisted (RATS) lobectomy in the effort to identify advantages and limits of robotic procedures considering the high costs and specific surgeon training.

METHODS
This is a monocentric prospective randomized trial in which patients suitable for mini-invasive lobectomy were randomized 1:2 in two groups: Group A, RATS, and Group B, VATS. 25 patients were enrolled in group A and 50 in group B. The two groups were compared in terms of perioperative and postoperative results with a mean follow up of 37.9 (10.9) months.

RESULTS
No differences were observed between the two groups in perioperative outcomes. We observed a significant reduction of pleural effusion on day 1 (140 ml vs 214, p=0.003) and day 2 (186 vs 321, p=0.001) for group A. Also the Visual Analogue Scale (VAS) showed significantly lower pain in the 1st p.o. day in group A (0,92 vs 1,17, p=0,005). Surgery time in Group B was significantly lower (190 min vs 210, p=0.036), but had a higher onset of atrial fibrillation and other cardiac arrhythmias (0/25 vs 9/50, p=0.038). The overall survival and disease free survival were similar between two groups (95.5% vs 93.1%, and 95.5% vs 89.7%, respectively). Furthermore, no statistical difference in the evaluation of quality of life (using EQ-5D score) during follow-up was found.

CONCLUSIONS
Our results seem to confirm that Robotic approach might be more accurate in tissue management, however VATS lobectomy is associated with lower operative times.
These differences have a very low clinical relevance, and traditional indicators of outcome are not able to identify the biological impact of the two techniques.

Disclosure: No significant relationships.
Keywords: RATS, VATS, Lobectomy.

O-044

UNIPORTAL (SINGLE-PORT) VERSUS 3-PORT VATS FOR ANATOMICAL LUNG RESECTIONS. THE SIN-3-PORT TRIAL

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OBJECTIVES
Video-thoracoscopically assisted anatomical lung resections are established procedures for treatment of lung cancer. These are usually carried out using 3-port technology. The reduction of access to one port (uniportal VATS) has enjoyed a high level of acceptance in thoracic surgery society to this day. The advantage of the uniportal technique compared to the 3-port VATS with regard to postoperative chronic pain has not yet been scientifically proven. The aim of our prospective randomized clinical study (SIN-3-PORT-trial, German Register for Clinical Studies:DRKS00014987) was to compare the postoperative pain intensity and the neuropathic pain 120 days after anatomical thoracoscopic lung resection using 3-port or single-port (uniportal) VATS.

METHODS
In a period of about 3 years n: 134 patients could be prospectively randomized. Inclusion criteria were as follows: anatomical thoracoscopic lung resection with radical lymph node dissection. Main exclusion criteria were as follows: pre-existing pain or analgesic therapy, re-operation, decortication or chest wall resection, no definitive histological malignancy. The intensity of the pain was measured on the 120th p.o. day documented using Numeric Rating Scale (NRS). Neuropathic pain was identified and documented using the LANSS questionnaire.

RESULTS
The intensity of pain 120 days after surgery was not statistically significantly different between the two groups (p:0.726). However, the incidence of neuropathic pain was significantly higher in the 3-PORT-VATS group (56% for the 3-PORT and 22% for the single-PORT group p: 0.01). Likewise, the incidence of analgetics use 120 days postoperatively was higher in the 3-PORT group (22% for the 3-PORT and 6.4% for the single-PORT group, p:0.02).

CONCLUSIONS
The uniportal approach showed no statistically significant influence on the intensity of chronic pain 120 days after surgery. However, both groups had an extremely low intensity of pain. The uniportal approach has a statistically significant impact on the development of neuropathic pain compared to 3-PORT VATS.

O-045

COMPARISON OF SHORT-TERM OUTCOMES BETWEEN ROBOTIC-ASSISTED AND VIDEO-ASSISTED SEGMENTECTOMY: A PROPENSITY SCORE MATCHING STUDY

Hao-Xian Yang, Mu-Zi Yang, Zi-Hui Tan, Ji-Bin Li, Hao Long, Jian-Hua Fu, Lan-Jun Zhang, Peng Lin
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OBJECTIVES
We aim to compare the short-term outcomes between robotic-assisted segmentectomy (RAS) and video-assisted segmentectomy (VAS).

METHODS
A total of 299 segmentectomies for lung neoplasms between June 2018 and December 2021 were included. These patients were grouped into two groups (RAS group and VAS group). Propensity score matching (PSM) analysis was conducted to minimize bias. The logistic regression model was performed to identify the independent risk factors associated with complications.

RESULTS
Before PSM, there were 132 RASs and 167 VASs and there was no peri-operative death. Patients with VAS were older ($P < 0.01$), had large tumour size ($P < 0.01$), and had lower forced expiratory volume for 1 second expressed as a percentage of the forced vital capacity ($P < 0.01$). As Table 1 showed, patients with RAS had shorter total operative time ($P = 0.01$), less blood loss ($P < 0.01$), fewer length of stay in hospital after surgery ($P < 0.01$), and more cost ($P < 0.01$). There were two cases with conversion to open surgery in the VAS group and there was no case with conversion in the RAS group. After PSM, 53 pairs were matched and all of the baseline characters were well balanced. As Table 1 showed, patients with RAS had less blood loss ($P < 0.01$), fewer length of stay in hospital after surgery ($P < 0.01$), and more cost ($P < 0.01$). The multivariate logistic regression model showed that only blood loss was the independent risk factor associated with the complications.

CONCLUSIONS
RAS had a better short-term outcome than VAS, and RAS might be a more efficient and safer technique compared with VAS.

Disclosure: No significant relationships.
Keywords: Segmentectomy, Robotic-Assisted Thoracic Surgery, Video-Assisted Thoracic Surgery, Short-Term Outcomes.

Table 1. Comparison of Peri- and Post-operative Factors of Two Groups before and after PSM.

Characteristics	Before PSM (N = 299)		P	After PSM (N = 106)		P
	RATS	VATS		RATS	VATS	
	(N = 132)	(N = 167)		(N = 53)	(N = 53)	
Total operative time (min)	111.4 ± 41.9	133.6 ± 67.0	0.01	108.4 ± 38.2	135.7 ± 63.3	0.05
Blood loss (ml)	39.9 ± 30.5	64.6 ± 93.9	<0.01	38.3 ± 31.5	73.4 ± 118.5	<0.01
Intraoperative complication, %	4.5 (6/132)	3.0 (5/167)	0.69	3.8 (2/53)	3.8 (2/53)	1.00a
Postoperative complication, %	13.6 (18/132)	13.3 (22/167)	0.92	13.2 (7/53)	11.3 (6/53)	0.77
Arrhythmia	1.5 (2/132)	5.4 (9/167)		0	7.5 (4/53)	
Air leak > 5 days	3.0 (4/132)	1.8 (3/167)		1.9 (1/53)	0	
Atelectasis	3.0 (4/132)	0		1.9 (1/53)	0	
Electrolyte disturbances	1.5 (2/132)	1.8 (3/167)		1.9 (1/53)	3.8 (2/53)	
Other	4.5 (6/132)	4.2 (7/167)		4	0	
Conversion, %	0	1.2 (2/167)	0.51a	0	3.8 (2/53)	0.50a
Chest tube duration (day)	3.3 ± 1.4	3.6 ± 2.4	0.13	3.1 ± 1.3	3.1 ± 1.1	0.44
Length of stay in hospital after surgery (day)	4.3 ± 1.5	5.3 ± 2.5	<0.01	3.9 ± 1.3	4.9 ± 1.6	<0.01
Cost (¥)	106468.6 ± 15688.6	71859.8 ± 19448.6	<0.01	105754.6 ± 18264.4	69808.2 ± 11648.1	<0.01

[a] Fisher exact test.

RATS, robotic-assisted thoracic surgery; VATS, video-assisted thoracic surgery; PSM, propensity score matching.

TUESDAY 21 JUNE 2022
PULMONARY NEOPLASTIC II (ADVANCED STAGE LUNG CANCER)
08:00 - 09:30

O-046

LOG-ODDS RATIO OF RESECTED AND POSITIVE LYMPH NODES DEFINES PROGNOSIS INDEPENDENTLY OF N- DESCRIPTORS IN RESECTABLE NON SMALL CELL LUNG CANCER (NSCLC)

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OBJECTIVES
The ratio of resected and positive lymph nodes (LN ratio) has been shown to be prognostic in operable NSCLC. Contrary to LN ratio, calculating LN log odds ratio (LN-LOR) additionally considers the total number of resected lymph nodes. We aim to refine pathological lymph node staging (pN) by using LN-LOR between resected and positive lymph nodes.

METHODS
A total of 944 patients with NSCLC who underwent curative intent lobectomy with systematic lymph node dissection treated at two high-volume centers were retrospectively studied. LN-LOR was dichotomized according to impact on OS and further combined with N descriptors and correlated with clinical variables and survival. Multivariate logistic regression was used to identify independent prognostic factors.

RESULTS
Cut-off analysis revealed that a LN-LOR of 0.45 significantly discriminated patients according to OS ($p<0.001$, chi-square test 41.26). When combined with N descriptor, N1-LN-LOR_low patients had similar survival to N2-LN-LOR_low patients (median OS 87 and 83 months). Similarly, median OS of patients with N1-LN-LOR_high was similar to those with N2-LN-LOR_high (median OS 50 and 59 months). The number of resected lymph nodes showed a significantly positive correlation with the number of positive lymph nodes (Pearson r 0.11, $p<0.001$). Strikingly, in node positive patients, LN-LOR was significantly higher in presence of positive station 7 lymph nodes ($p=0.048$). Using multivariate cox regression analysis revealed that age (HR 1.016, 95% CI 1.001-1.032), sex (female, HR 0.59; (95%CI 0.45-0.78), pathological stage (HR 1.23, 95% CI 1.01-1.45) and LN-LOR (low, HR 0.49 95%CI 0.34-0.74) were independent prognostic factors for OS.

CONCLUSIONS
This retrospective two-center analysis shows that LN-LOR is significantly associated with OS and better reflects the biological behavior of the disease, regardless of anatomical lymph node location. This finding strongly supports the value of extensive LN dissection.

Disclosure: No significant relationships.
Keywords: Log-Odds Ratio, Lymph Nodes, Prognosis, Resectable NSCLC.

O-047

IS THE BURDEN OF THE METASTATIC LYMPH NODE STATIONS A PROGNOSTIC FACTOR IN RESECTED LUNG CANCER PATIENTS? A MULTICENTER STUDY WITH VALIDATION IN T STAGE

Necati Citak[1], Volkan Erdogu[2], Yunus Aksoy[2], Aysegül Ciftci[2], Nisa Yildiz[2], Özgür Isgörücü[2], Servet Özdemir[3], Selcuk Köse[3], Kenan Can Ceylan[1], Muzaffer Metin[2]

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OBJECTIVES
The burden of metastatic lymph node (LN) stations might reflect a distinct N-subcategory with more aggressive biology and behavior when compared to the traditional N-classification. It was investigated whether the number of metastatic LN stations is a prognostic factor in resected lung cancer and whether this could be validated across each pT-stage.

METHODS
Between 2008 and 2018, 1236 patients who had pN1/2 lung cancer were analyzed. When survival was analyzed by per LN station metastases, the number of metastatic LN stations that give additional prognostic information was considered an optimal threshold. The N prognostic subgrouping was performed according to thresholds of the number of metastatic LN stations with a maximum chi-square log-rank value. It was validated at each pT-stage.

RESULTS
The 5-year survival rates for IASLC proposed N-subclassifications N1a, N1b, N2a1, N2a2, and N2b were 61.6%, 45.2%, 42.1%, 30.7%, and 17.4%, respectively ($p<0.001$). In multivariate analysis, age ($p<0.001$), tumor histology ($p<0.001$), IASLC proposed N-subclassification ($p<0.001$), the number of metastatic LN stations ($p=0.009$) were independent risk factors. Survival showed a statistical stepwise deterioration with the increase of the number of the metastatic LN stations (Table 1a). According to survival analyses results (Table 1b), threshold values for the number of the metastatic LN stations were determined and N prognostic subgrouping was created as sN-αlfa; one LN station metastases (n=632), sN-βeta; two-three LN stations metastases (n=505), and sN-Ɣamma; ≥4 LN stations metastasis (n=99). The 5-year survival rate was 57.7% for sN-αlfa, 39.2% for sN-βeta, 12.7% for sN-Ɣamma (chi-square log rank=97.906, $p<0.001$). We observed a clear tendency of deterioration of survival from sN-αlfa to sN-Ɣamma in the same pT stage, except pT4 stage (Figure 1).

CONCLUSIONS
The burden of the metastatic lymph node stations is an independent prognostic factor for survival in lung cancer patients and could add different prognostic information to the N classification.
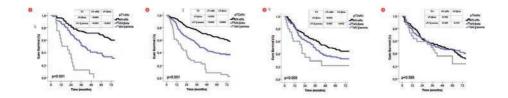
Disclosure: No significant relationships.
Keywords: Non-Small Cell Lung Cancer, Nodal Classification, Station Metastasis, Prognosis.

1a. Survival analyses for LN station(s) metastases				
Number of metastatic LN station(s)	No. of patients	5-year survival rate	p	HR (%95 CI)
1 versus ≥2 LN stations metastases	632 vs 604	57.7% vs %34.9	**<0.001**	1.721 (1.482–1.999)
≤2 versus ≥3 LN stations metastases	990 vs 246	51.5% vs 26.9%	**<0.001**	1.919 (1.566–2.351)
≤3 versus ≥4 stations metastases	1137 vs 99	49.6% vs %12.7	**<0.001**	2.545 (1.816 – 3.565)
≤4 versus ≥5 LN stations metastases	1213 vs 23	47.2% vs %6.2	**<0.001**	2.822 (1.355 – 5.877)
1b. Survival analyses for per LN station metastases				
Number of metastatic LN station(s)	No. of patients	5-year survival rate	p	HR (%95CI)
1 versus 2 LN stations metastases	632 vs 358	57.7% vs 40.6%	**<0.001[a]**	1.455 (1.210 – 1.750)
2 versus 3 LN stations metastases	358 vs 147	40.6% vs 36.7%	0.09	1.229 (0.960 – 1.574)
3 versus 4 LN stations metastases	147 vs 76	36.7% vs 13.4%	**0.001[a]**	1.668 (1.185 – 2.348)
4 versus 5 LN stations metastases	76 vs 16	13.4% vs 12.5%#	0.547	1.164 (0.689 – 1.964)
5 versus 6+7 LN stations metastases*	16 vs 7	12.5%# vs 0.0%#	0.898	1.098 (0.882-1.345)

[a] It was accepted as cutpoints (thresholds) for LN station(s) metastases, * There were only two patients who had seven different LN stations metastases. # Four-year survival rate, HR; hazard ratio, CI: confidence interval

O-048

SURVIVAL EFFECTS OF NX VERSUS N0 NODAL STAGE IN EARLY STAGE NON-SMALL-CELL LUNG CANCER: A POPULATION-BASED STUDY

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McMaster University, Hamilton, Canada

OBJECTIVES
Lymph node staging is a determining factor for the survival of patients with early-stage non-small cell lung cancer (NSCLC). This population-based study examines the risk factors and survival of pathological Nx patients, an indeterminate stage with uncertain outcomes and treatment guidelines, compared to node-negative pN0 patients.

METHODS
This large population-based retrospective study included patients from 2010 to 2016 with stage I and II NSCLC with pN0 or pNx in Ontario, Canada. We used a logistic regression to identify predictors of pNx and a flexible parametric survival model to compare survival differences between pNx and pN0 patients.

RESULTS
Of the 5101 patients included, 52 (1.0%) were identified with pNx staging. The proportion of pNx patients was greater among patients with stage II compared to stage I NSCLC (1.7% vs 0.9%, p=0.019). Stage II NSCLC was the only predictor of pNx staging (OR = 2.01, 95%CI: $1.11 - 3.63$, p = 0.021). Receiving adjuvant treatment was associated with pNx staging, but type of surgery including VATS was not. The hazard ratio for pNx vs pN0 was HR=1.24 (95%CI: $0.77 - 2.00$, p=0.382), showing no overall survival difference between the two groups, adjusted for cofounders. However, for patients with stage I NSCLC, pN0 had a survival advantage over pNx staging. Open surgery showed a 5.7% N0-Nx 5-year survival difference, compared to 4.1% and 5.1% for VATS lobectomy and sublobar resection.
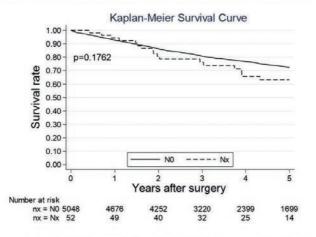
CONCLUSIONS
The rate of pNx patients in Ontario is extremely low, but proportionally higher in Stage II patients. There is no overall survival difference between pNx and pN0 patients, except for stage I NSCLC. VATS does not increase the rate of pNx staging. Overall, patients with pNx are at higher risk and should not be treated as pN0 patients. All attempts should be made to complete systematic lymph node sampling at the time of operation.

Disclosure: No significant relationships.
Keywords: NSCLC, Nx, N0, Nodal Stage, Survival.

Figure 1: Adjusted survival rates for patients with stage I/II NSCLC for N0 vs. Nx nodal status.

Survival rate adjusted for age group, sex, tumour histology, stage of disease, frailty, adjuvant treatment and type of surgery.

O-049

POSITIVE PARENCHYMAL MARGIN AFTER NON-SMALL CELL LUNG CANCER RESECTION: IS THERE AN IMPACT ON OVERALL SURVIVAL?

Francois Khazoom, Caitlin Anstee, Urmila Bhattacharyya, Sebastien Gilbert, Donna Elizabeth Maziak, Andrew J. Seely, Sudhir Sundaresan, Patrick James Villeneuve
The Ottawa Hospital, Ottawa, Canada

OBJECTIVES

A positive parenchymal margin (PPM) following pulmonary resection for lung cancer is an uncommon and challenging occurrence, with no clear evidence-based consensus currently available to guide best adjuvant treatments. There are very few dedicated reports that evaluate the implications of positive margins following surgery. Therefore, we sought to examine the impact of positive parenchymal margins on disease free and overall survival.

METHODS

Ethics board approval was obtained for this single centre retrospective analysis of prospectively collected data of all lung resections at a single academic center between 2008 and 2014. Patients undergoing non-pneumonectomy lung resections for stage I to III non-small cell lung cancer (NSCLC) were included. Resections with positive bronchial margins or those performed for metastatic disease were excluded. Patients with PPM were matched 1:3 to negative margin controls using a propensity score analysis. Overall survival (OS) and disease-free survival (DFS) were compared using a Kaplan Meier analysis. A margin was defined as positive by the presence of tumor cells after staple line removal.

RESULTS

Over the study period, 1428 patients underwent non-pneumonectomy lung resection for NSCLC. Of those, 22 (3.6%) had a PPM and were matched 1:3 to 588 (96.4%) controls. Margin positivity was significantly associated with undergoing a wedge resection (59% vs 12% in controls; $p<0.05$) and lower pre-operative DLCO (57% vs 74% in controls; $p<0.05$). DFS was significantly lower in patients with a PPM (25 months vs 60 months in controls; $p = 0.04$). There was no significant difference in overall survival ($p=0.88$). Patterns of adjuvant treatments were similar between the two groups.

CONCLUSIONS

The rate of positive margins in our study was low (3.6%) compared to reported rates of 5-15%. Although patients with positive margins had lower disease free survival, there was no significant difference in overall survival. Careful selection of adjuvant treatments may explain these findings.
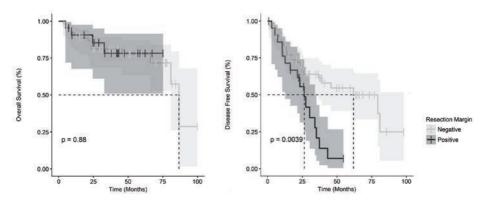
Disclosure: No significant relationships.

O-050

THE IMPACT OF CYTOKERATIN 7 (CK7) ON LONG TERM SURVIVAL IN LUNG CANCER PATIENTS

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[2]University of Cologne, Faculty of Medicine, Cologne, Germany

OBJECTIVES
The immunohistochemical marker CK7 plays a central role in characterization of pulmonary large cell neuroendocrine carcinoma (LCNEC) and adenocarcinoma. While pulmonary adenocarcinoma is the most frequent histological subtype in lung cancer, pulmonary LCNEC represents a rare malignant entity with a poor prognosis. We retrospectively analyzed the survival outcome of LCNEC in comparison to patients with pulmonary adenocarcinoma.

METHODS
We included all consecutive patients that underwent anatomical resection for lung cancer at our institution from 01/2012 to 12/2020. After excluding patients, that did not show LCNEC or adenocarcinoma as the underlying malignancy, we conducted survival analysis for both entities and compared them using Kaplan Meier method and log rank testing. All patients were treated according to the current guidelines.

RESULTS
A total of 467 patients were integrated for further analysis. In the overall cohort, the mean age was 65.3±9.6 years. There was no significant difference between both groups regarding age, gender, or comorbidities. In terms of UICC stage, the groups were equally distributed. Mean survival in the LCNEC group was 28.9±7.3 months while in the adenocarcinoma group it was 62.1±2.3 months. The difference was highly significant (p value = 0.003). We seperately analyzed the LCNEC group regarding survival between CK7 positive and negative patients. We found that the mean survival rates in the CK7 expression group was 27.5±5.6 months and in the group without expression 64.6±4.2 months even if the difference was not statistically significant. Consequently, we found CK7 being an independent risk factor for death using Cox regression analysis with a Hazard ratio of 1.3.

CONCLUSIONS
Our study suggests, that the pulmonary LCNEC has a significantly worse prognosis than adenocarcinoma of the lung. CK7 expression seems to have a negative impact on long term survival in the highly malignant entity of LCNECs.

Disclosure: No significant relationships.
Keywords: Immunohistochemistry, LCNEC, Adenocarcinoma, Pulmonary Malignancy.

O-051

DOES PLEURAL INVASION CORRELATE WITH NODAL UPSTAGING AND N2 SKIP METASTASIS?

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OBJECTIVES
Visceral pleura involvement stands as an independent prognostic factor for lung cancer. Tumors up to 3cm with pleural invasion are staged as IB since their survival is similar to 3-4cm tumors. The pleural invasion may alter the lymphatic drainage from the pulmonary lymphatics to the mediastinum having a theoretical increase in N2 skip metastasis.
This study aims to assess node upstaging and N2 skip metastasis and risk factors for pleural invasion, comparing patients with tumors up to 3cm with and without pleural involvement.

METHODS
This is a retrospective study with data collection from an institutional database with only patients who underwent surgery for lung cancer. We selected patients with tumor sizes up to 3cm and grouped them according to pathological report analysis: group 1 with negative pleural involvement and group 2 positive.

RESULTS
We collected data from 258 patients. The mean age was 64,2 years old, and most of them were women (59%). 43 (16,6%) patients had pleural involvement. The group 1 had more subsolid nodules (16,9% vs 7,3%; p= 0,11), with smaller mean size (1,77cm vs 2,11cm; p= 0,002). The most common type of cancer was adenocarcinoma in both groups, but group 2 had more solid (16,6% vs 8,7%) and micropapillary (6,7% vs 2,2%) subtypes (p=0,003). All patients had clinical N0 disease, and group 2 had more pathological node disease (25,6% vs 10,2%; p= 0,023); with 9,3% N1, and 16,3% N2. Skip N2 node metastasis ocurred most frequently in the group 2 (9,3% vs 1,8%; OR=7,04; p = 0,011), as well as recurrence in 32,6% (vs 17,2%, OR = 2.23 p = 0,04).

CONCLUSIONS
The pleural invasion was associated with increased nodal upstaging and N2 skip metastasis. In addition, this group of patients had a higher incidence of aggressive adenocarcinoma subtypes, suggesting this feature may be related to a more aggressive tumor.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Pleural Invasion, Nodal Upstaging, Mediastinal Staging.

O-052

EPIDERMAL GROWTH FACTOR RECEPTOR (EGFR) TYROSINE KINASE INHIBITOR AS FIRST-LINE TREATMENT FOR POSTOPERATIVE RECURRENCE OF EGFR-MUTATED LUNG ADENOCARCINOMA: A MULTICENTER RETROSPECTIVE STUDY

Ryo Miyata[1], Masatsugu Hamaji[1], Yumeta Shimazu[2], Masashi Ishikawa[2], Hidenao Kayawake[1], Toshi Menju[1], Masashi Kobayashi[3], Norihito Okumura[3], Yasuto Sakaguchi[4], Makoto Sonobe[4], Akira Matsumoto[5], Hiromichi Katakura[5], Ryota Sumitomo[6], Cheng-Long Huang[6], Mamoru Takahashi[7], Akihiro Aoyama[7], Tomoya Kono[8], Ryo Miyahara[8], Naoki Date[9], Takuji Fujinaga[9], Ei Miyamoto[10], Tatsuo Nakagawa[10], Takehisa Fukada[11], Hiroaki Sakai[11], Hiroshi Date[1]

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OBJECTIVES

The epidermal growth factor receptor (EGFR) tyrosine kinase inhibitors (TKIs) are recommended for metastatic lung adenocarcinoma with EGFR gene mutation, whereas there is a dearth of data upon outcomes in patients receiving EGFR-TKIs for postoperative recurrence. The objective of this study was to clarify survival outcomes and prognostic factors of patients receiving EGFR-TKIs as first-line treatment for postoperative recurrence.

METHODS

Retrospective chart review was performed on the basis of our multi-institutional database to identify patients receiving EGFR-TKIs as first-line treatment for postoperative recurrence of lung adenocarcinoma harboring EGFR gene mutation between 2014 and 2016. Survival outcomes were analyzed with the Kaplan-Meier method, and relevant factors were analyzed using the Cox proportional hazard model in univariable and multivariable analyses.

RESULTS

We identified 47 males (35.1%) and 87 females (64.9%), with a median age of 69 years (range, 42-88). The median follow-up period was 30.5 months (range, 0.6-76.4) after administration of receiving EGFR-TKIs. The median progression free survival was 32.5 months (5-year progression free survival: 17.4%), and the median overall survival was 58.9 months (5-year overall survival: 46.1%). Exon 21 L858R mutation (hazard ratio: 1.88, 95% confidence interval 1.11-3.19, $P = 0.02$) was a significant factor in association with worse progression free

survival in multivariate analysis. Also, smoking history (hazard ratio: 2.70, 95% confidence interval 1.35-5.40, P <0.01) and Exon 21 L858R mutation (hazard ratio: 2.38, 95% confidence interval 1.17-4.86, P = 0.02) were significant factors in association with worse overall survival in multivariable analysis.

CONCLUSIONS

Treatment with EGFR-TKIs as first-line treatment was associated with favorable survival outcome in patients with postoperative recurrence of EGFR-mutated lung adenocarcinoma. Exon 21 L858R mutation may be an important prognostic factor in progression free survival and overall survival.

Disclosure: No significant relationships.
Keywords: EGFR Tyrosine Kinase Inhibitor, Postoperative Recurrebce.

O-053

ONCOLOGICAL OUTCOMES OF UPFRONT SURGERY IN PATIENTS WITH "OCCULT" PATHOLOGICAL N2 NON-SMALL CELL LUNG CANCER: AN INTERNATIONAL MULTICENTRE STUDY

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OBJECTIVES
The role of surgery in the multimodality treatment stage IIIa/N2 NSCLC remains controversial. To assess the oncological outcomes of upfront lung resection and potential prognostic factors, we examined a subset of patients diagnosed with 'occult' pN2 NSCLC.

METHODS
Multicentre retrospective analysis of the clinical records of patients who underwent upfront major lung anatomical resection and ipsilateral hilar-mediastinal lymphadenectomy for 'occult' pN2 NSCLC at three European centres.
'Occult' pN2 disease was defined as neoplastic involvement of mediastinal lymph nodes that was not disclosed by routine preoperative imaging (cN0-N1 tumours).
Single station pN2 NSCLC was defined as the neoplastic involvement of one mediastinal station.
Skip-N1 NSCLC was defined as pN2 disease without neoplastic involvement of hilar lymph nodes.
Clinical and pathological staging were performed according to the 8th edition TNM classification.
Exclusion criteria were: sublobar or non-anatomical resections, pneumonectomies, neoadjuvant treatments for NSCLC, R1/R2 surgery, cTNM/pTNM stages higher than IIIA.

RESULTS
We included 138 patients with 'occult' pN2 NSCLC. The mean age was 64.0±8.9 years; male/female ratio was 1.1. The most common histology was adenocarcinoma (92.0%), the most frequent cTNM stage was IA (48.6%). Minimum follow-up time was 30 months. There were no statistically significant differences in baseline preoperative characteristics among the three centres (Table).
Median OS and recurrence-free survival (RFS) were 71 months (95%CI: 46-90 months) and 26 months (95%CI: 21-58 months), respectively (Graphic).

OS and RFS were not significantly affected by single-station pN2 disease (p=0.21 and p=0.67), skip-N1 disease (p=0.58 and p=0.92) and adjuvant chemotherapy (p=0.43 and p=0.20), respectively.

In patients who underwent adjuvant radiotherapy, RFS was significantly longer (p<0.0001), while OS was not significantly influenced (p=0.13).
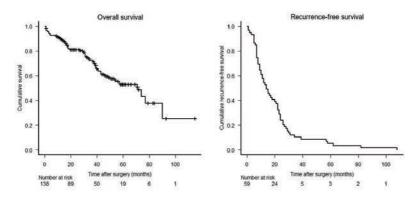
CONCLUSIONS

Our analyses suggest a protective effect of adjuvant mediastinal radiotherapy on recurrence; the number (single vs. multiple station) and location (hilar/mediastinal) of involved lymph nodes do not affect survival.

Disclosure: No significant relationships.
Keywords: NSCLC, N2, Stage IIIa, Lung Cancer, Upfront Surgery.

Variables	Centre A (n=48)	Centre B (n=45)	Centre C (n=45)	p-value
Age (mean ± SD), years	65.1 ± 8.7	61.9 ± 8.5	64.9 ± 9.5	0.17
Male gender, n (%)	27 (56.3)	18 (40.0)	28 (62.2)	0.43
Histology, n (%) - Adenocarcinoma - Squamocellular - Large cell - Adenosquamous - Sarcomatoid	47 (97.9) 1 (2.1) 0 0 0	41 (91.1) 4 (8.9) 0 0 0	39 (86.7) 3 (6.7) 1 (2.2) 1 (2.2) 1 (2.2)	0.88
cTNM stage, n (%) - IA - IB - IIA - IIB - IIIA	25 (52.1) 9 (18.8) 1 (2.1) 13 (27.1) 0	15 (33.3) 7 (15.6) 5 (11.1) 16 (35.6) 2 (4.4)	27 (60.0) 9 (20.0) 3 (6.7) 6 (13.3) 0	0.73

SD: standard deviation, cTNM: clinical TNM classification, 8th edition

O-054

PATHOLOGICAL N1/N2 IN EARLY STAGE BRONCHOGENIC CARCINOMA. ANALYSIS FROM A PROSPECTIVE MULTICENTRE DATABASE

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OBJECTIVES

Surgery remains the only curative option for patients with resectable non-small cell lung cancer (NSCLC), although some authors advocate the option of local non-surgical treatments, such as stereotactic radiotherapy. The absence of material for histological study presumably means that patients with occult N1/N2 disease do not receive adjuvant treatment, and therefore their chances of survival are reduced.

The aim of the study is to determine the incidence of occult N1/N2 and associated factors in patients with early stage NSCLC in a prospective multicenter database.

METHODS

Patients with a NSCLC of 3 cm or less, cN0 by PET and CT scan, that received at least a lobectomy were selected from a national prospective multicenter database of 3085 patients undergoing anatomic lung resection between 2016 and 2018.

Clinical and pathological variables were compared between patients with pN0 and pN1/N2 to identify factors associated with the presence of lymph node metastases.

Chi2 and the Mann-Whitney U test were used for categorical and continuous variables, respectively. Statistically significant variables identified in the univariable analysis (p-value <0.05) were included in the multivariate analysis.

RESULTS

The study included 1205 (34%) patients from the cohort.

The incidence of occult pN1/N2 disease was 10.70% (95%CI, 9.01-12.58).

The differentiation degree, radiological density, location, size and maximal uptake in PET of the tumor, surgical approach, years of surgical experience (>10y) and number of resected lymph nodes showed significant association in univariable analysis.

Multivariable analysis revealed that the differentiation degree, size of the tumor and surgeon seniority were associated with occult N1/N2 metastases.

CONCLUSIONS

The non-negligible incidence of unsuspected lymph node involvement in this cohort supports the indication for surgical excision where possible. If alternative treatments are considered in these group of patients, invasive staging techniques should be performed to rule out occult nodal disease.

Disclosure: No significant relationships.
Keywords: Non-Small Cell Lung Cancer, Nodal Metastases.

TUESDAY 21 JUNE 2022
PULMONARY NON-NEOPLASTIC
08:00 - 09:30

O-055

NON-INTUBATED VERSUS INTUBATED LUNG VOLUME REDUCTION SURGERY IN PATIENTS WITH END-STAGE LUNG EMPHYSEMA AND SEVERE HYPERCAPNIA

Ali Akil[1], Stephan Ziegeler[2], Stephanie Rehers[2], Stefan Fischer[1]

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OBJECTIVES

Lung volume reduction surgery (LVRS) represents an important treatment option in carefully selected patients with end-stage lung emphysema. The aim of the study was to assess the efficacy and safety of non-intubated LVRS compared to intubated LVRS in patients with preoperative severe hypercapnia and end-stage lung emphysema.

METHODS

Between April 2019 and February 2021 all patients (n= 92) with end-stage lung emphysema and preoperative severe hypercapnia undergoing unilateral video-assisted thoracoscopic LVRS (VATS-LVRS) performed in non-intubated technique (group 1, n= 36 patients) or intubated, general anesthesia (group 2, n= 56 patients) were prospectively enrolled in this study. In all patients low-flow veno-venous extracorporeal lung support (VV ECLS) was applied as bridge through LVRS. Hospital mortality and 90-days mortality were considered as primary outcomes.

RESULTS

Mean length of postoperative VV ECLS support was 3 ± 1 day in group 1 compared to 4 ± 1 in group 2. 90-days mortality rate was 3 % (1 patient) in group 1 compared to 7 % (4 patients) in group 2 ($p<0.05$). In group 1 all chest tubes were removed at 5 ± 1 day (range 4-32 days) and 8 ± 1 day (range 4 - 44 days) in the control group ($p<0.02$). The mean ICU stay was 4 ± 1 days in group 1 compared to 8 ± 2 days in the control group ($p = 0.04$). Mean hospital stay was significantly shorter in the non-intubated group 1 (6 ± 2 vs. 10 ± 4, $p=0.01$). Conversion to general anesthesia was necessary in one patient due to severe pleural adhesions.

CONCLUSIONS

Non-intubated VATS-LVRS in patients with end-stage lung emphysema and severe hypercapnia is effective and well tolerated. Compared to general anesthesia a significant reduction in mortality, chest tube duration, ICU and hospital stay and lower rate of prolonged air leak was observed.

Disclosure: No significant relationships.
Keywords: Lung Emphysema, Lung Volume Reduction Surgery, Non-Intubated.

O-056

COLD COAGULATION IN THORACOSCOPIC TREATMENT OF PRIMARY PNEUMOTHORAX: A COMPARISON WITH APICOECTOMY

<u>Vittorio Aprile</u>, Elena Marrama, Stylianos Korasidis, Maria Giovanna Mastromarino, Marco Lucchi, Marcello Carlo Ambrogi
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OBJECTIVES
Primary spontaneous pneumothorax is a common disease with an incidence up to 15 cases per 100,000/years. In most cases surgery with a thoracoscopic approach may allow good results with a low recurrence rate, although different techniques were described. Herein, we report our results of 10-year experience of patients treated with Transcollation® Technology.

METHODS
We retrospectively collected data of all patients with recurrent or persistent spontaneous pneumothorax and Stages III and IV bullae according to Vanderschueren's classification, who underwent surgery by thoracoscopy. Two different surgical techniques were compared: stapler resection of the lung apex with pleurodesis and Transcollation® Technology of the eventual bleb/bullae followed by pleurodesis.

RESULTS
Out of 200 patients with primary spontaneous pneumothorax treated from 2010 to 2020, 177 patients (138 male and 39 female), with a median age of 24 years (Range: 13-43) were selected and included in this study. Seventy-seven patients (43.5%) underwent Transcollation®-pleurodesis (group A) and 100 (56.5%) Apicoectomy-pleurodesis (group B).
Clinical and demographics characteristics are presented in Tables 1. Mean operation time was statistically different between two groups (43.2 ± 19.5 and 49.3 ± 20.1, in group A and B respectively; p-value: 0.050). No conversion to thoracotomy was observed in two groups. The median postoperative hospital stay was 4 days for both groups [Range: 2-23 days]. Morbidity rate was 9.6% (n=17), 4 in the group A (2.5%) and 13 (8.1%) in the group B (p:0.071).
Over a median follow-up period of 107 months, 13 recurrences were reported (7.3%); 2/77 cases in the group A (1.1%), 11/100 cases in the group B(6.2%), with statistical difference (p:0.044).

CONCLUSIONS
Transcollation® Technology may be considered effective in the treatment of primary spontaneous pneumothorax whereas it guarantees a proper immediate air sealing with a low-rate of post-operative complications and long-term recurrences.

Disclosure: No significant relationships.
Keywords: Primary Spontaneous Pneumothorax, Transcollation Pleurodesis, Apicoectomy.

Clinical Characteristics	
Gender	138 (78%) M; 39 (22%) F
N^ of episode to surgery	1: 72 (40.7%) 2: 84 (47.5%) ≥3: 21 (11.8%)
Side of pneumothorax	Right: 83 (46.9%) Left: 94 (53.1%)
Age at surgery (Median; Range)	24 (13-43) years
Vanderschueren's stage	3: 123 (69.5%) 4: 54 (30.5%)
Operative Time (Median; Range)	40 (15-120) min
N^ of chest tube (Median; Range)	2 (1-2)
Complications	Missed data: 16 (9%) No: 160 (90.4%) Yes: 17 (9.6%) - Prolonged (> 3days) air leak: 10 (5.6%) - Hemothorax: 2 (1.2%) - Others: 5 (2.8%)
Hospital Stay (Median; Range)	4 (2-23) days
Follow-up (Median; Range)	107 (24-170) months
Recurrence	No: 164 (92.7%) Yes: 13 (7.3%) treated with iterative surgery.
Recurrence Time (Mean; ±SD)	1 (9.5) months

O-057

EXERCISE TRAINING AMELIORATES INFLAMMATORY RESPONSES INDUCED BY ONE-LUNG VENTILATION VIA THE SUPPRESSION OF NF-KB ACTIVATION

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OBJECTIVES
Re-expansion pulmonary edema and subsequent acute respiratory distress syndrome, is one of the most catastrophic complications that occurs after one-lung ventilation (OLV). The transcription factor NF-κB is a key regulator of genes involved in inflammation responses during OLV, but the mechanism is still unclear. Physical exercise can reduces the deleterious effects of cardiovascular and inflammatory disorders. Therefore, the purpose of this study was to evaluate the beneficial effects of physical training on the inflammatory responses following one-lung ventilation in rats.

METHODS
Male Sprague Dawley rats were divided into sham-operated animals and sedentary and trained animals submitted to one-lung ventilation. The run training programme consisted of 5 sessions·week−1, each lasting 60 min·day−1, at 66% of maximal oxygen consumption for 8 weeks. Interleukin-6 (IL-6), interleukin-1β (IL-1β) and tumor necrosis factor-α (TNF-α) level in serums were assayed using an ELISA kit. Using Western blot, the expression of NF-κB in lungs were assessed.

RESULTS
The lung injury scores of rats in trained group were much lower than that in sedentary group. The expression of interleukin-6 (IL-6), interleukin-1β (IL-1β) and tumor necrosis factor-α (TNF-α) after OLV was increased, which could activated the transcription factor NF-κB signaling pathway. Trained group displayed higher survival rate as well as decreased IL-6, IL-1β, TNF-α levels and lung edema in comparison to sedentary group.

CONCLUSIONS
Our findings suggest that exercise training had protective effects on acute lung injury and reduced inflammation induced by OLV, possibly via the suppression of NF-κB activation

Disclosure: No significant relationships.
Keywords: One Lung Ventilation, Inflammatory Responses, NF-κB.

O-058

DOES A NOVEL SCORING MODEL PREDICT PATIENTS WITH PNEUMOTHORAX REQUIRING SURGERY? AN INTERNAL VALIDATION STUDY

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OBJECTIVES
We aimed to develop a risk score model for primary spontaneous pneumothorax (PSP). It was then internally validated for the need for surgery (prolonged air leak-PAL or ipsilateral recurrence-IpsRec) risk estimation.

METHODS
Between 2014 and 2018, 453 PSP patients with at least 1-year follow-up were analyzed. Patients were randomly assigned in a 2:1 ratio to Study cohort (n=302) or Validation cohort (n=151). Logistic regression analysis was performed for patients in the Study cohort, and the PSP scoring model was developed using the sum of the odds ratios (ORs) calculated separately for demographic and radiologic risk factors. The 'optimal' cut-off point for the need for surgery in PSP patients was determined using the best sensitivity and specificity scores, which were calculated using the ROC analysis. It was then internally validated with the Validation cohort.

RESULTS
The median follow-up time was 875 days. Surgery was indicated in 217 patients (47.8%); because of PAL (n=130) or IpsRec (n=87). There was no demographic or radiological difference between the two cohorts. Logistic regression analysis showed that the presence of bullae/blebs and per 1% increase of pneumothorax volume were independent risk factors for the surgical indication (Table 1a). The PSP scoring model developed with the results of the Study cohort predicted patients who had surgical indications significantly (area under the curve: 0.754, p<0.001) (Figure 1). The optimal cut-off point for surgical indication was calculated as 11.47 (sensitivity=77.1%, specificity=67.9%, positive predictive value=70.1%, negative predictive value=75.4%). In the Validation cohort, the surgical indication rate was significantly higher among patients with the high PSP score (>11.47, n=76) than patients with low score (≤11.47, n=75) (61.8% vs. 28.0%, p<0.001) (Table 1b).

CONCLUSIONS
The internally validated PSP scoring model is a good predictor of the need for surgery in PSP patients. Prospective external validation studies with large patient cohorts are needed.

Disclosure: No significant relationships.
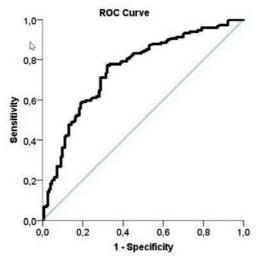**Keywords:** Primary Spontaneous Pneumothorax, Surgery, Predictor, Scoring Model, Validation.

1a) Development of the PSP scoring model

Variables	Odds ratio	95%CI	p value
Age (per year)	0.993	0.948-1.041	0.774
Gender (Male vs Female)	1.234	0.503-3.031	0.646
Smoking (No vs Yes)	1.077	0.546-2.126	0.830
Smoking (per pack/years)	1.019	0.965-1.075	0.503
Side (Left vs Right)	1.098	0.647-1.863	0.729
Kirscher PSP volume (per volume)	1.033	1.019-1.048	**<0.001**
Presence of bullae/blep	3.340	1.753-6.363	**<0.001**
Dystrophy severity score (per score)	1.079	0.961-1.210	0.110

1b) Application of the PSP scoring model to cohorts

Cohort name	Surgical indication, n (%)	Odds ratio	95%CI	p value
Study cohort (n=302)*				
Low score (n=136)	34 (25.0%)	1		
High score (n=166)	135 (69.3%)	6.765	4.065-11.257	**<0.001**
Validation cohort (n=151)*				
Low score (n=75)	21 (28.0%)	1		
High score (n=76)	47 (61.8%)	4.167	2.102-8.262	**<0.001**

*Comparing the patients categorised on the basis of low PSP score and high PSP score using the cut-points (11.47) calculated. CI, confidence interval;

ROC Curve

O-059

AGGREGATE 1-YEAR HOSPITAL STAY AFTER ACCELERATED SERIAL DEBRIDEMENT OR OPEN WINDOW THORACOSTOMY FOR PLEURAL EMPYEMA AFTER ANATOMICAL LUNG RESECTION

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OBJECTIVES
In patients with empyema after anatomical lung resection (ALR) being refractory to drainage and/or decortication, one can proceed to accelerated serial debridement (ASD) or open window thoracostomy (OWT). This retrospective single-center study aimed to investigate aggregate 1-year hospital stay (a1YHS) in both treatments in an intention-to-treat fashion.

METHODS
All patients treated from 2000 to 2020 for empyema after ALR were analyzed using a prospectively maintained dataset. Primary outcomes were a1YHS and chest closure.

RESULTS
In the same time frame as 4366 anatomical lung resections, 77 patients with empyema after ALR, of which 49% (n=38) after pneumonectomy, were treated with a non-window single procedure (n=30, including 5 thoracoplasties), ASD (n=35) or OWT (n=12). Interval between ALR and ASD or OWT, respectively, was 58d (IQR 23-322) and 169d (IQ R16-850). Pneumonectomy preceded in 60% (n=21) of ASD vs 75% (n=9) of OWT. Median hospital and ICU stay were similar at 26 and 9 days. ASD had a trend of lower median a1YHS (32days IQR20-48), better 5YS (37%) compared to OWT (42days IQR31-63, 25% respectively, NS). Median number of necessary interventions was comparable for both groups (n=5 IQR 4-7.5 vs n=4 IQR 4-6). Closed chest was achieved in 91% (n=32) vs 33% (n=4, p<0.001) at a median interval between first empyema procedure and closure of 11 days (IQR7-21) vs 767 days (IQR 470-1151, p<0.05). When including only 1-year survivors, a1YHS was 27 days (IQR 20-46) after ASD (n=23) vs. 33 days (IQR 32-52) after OWR (n=6) (NS).

CONCLUSIONS
Intention-to-treat analysis of the accelerated serial debridement group shows similar number of necessary interventions, hospital and ICU stay, but a trend of lower aggregate 1-year hospital stay, better survival at 1 and 5 years and significant faster and higher percentage of closed chests when compared to open window thoracostomy.

O-060

VARIABLES INFLUENCING HOSPITAL STAY AND 10-YEAR STAYING TRENDING AFTER ANATOMICAL LUNG RESECTION

M. Teresa Gomez-Hernandez[1,2,3], Clara Forcada[1], Marta G. Fuentes[1,2,3], Nuria M. Novoa[1,2,3], Jose Luis Aranda[1,2,3], Cristina Rivas[1], Gonzalo Varela[2], Marcelo F. Jimenez[1,2,3]
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[2]Salamanca Institute for Biomedical Research, Salamanca, Spain
[3]University of Salamanca, Salamanca, Spain

OBJECTIVES

Postoperative hospital length of stay (LOS) is one of the variables closely related to quality of care in surgical patients. The objective of this study was to assess trending of LOS after anatomical lung resection at a high-volume academic hospital in the last 10 years. A secondary goal was to identify factors associated with LOS.

METHODS

An institutional database was reviewed to identify patients who underwent anatomical lung resection for NSCLC from 2011 to 2021. The population was divided into three time periods: 2011-2014, 2015-2018, and 2019-2021. Patients´ clinical characteristics, postoperative morbidity, and LOS were compared by χ2 test, ANOVA or Kruskal-Wallis tests. Multiple linear regression analysis was used to estimate determinants of LOS and multivariable logistic regression analysis was conducted to examine the impact of surgical approach (thoracotomy, VATS or robotic) on short LOS (defined as ≤48 hours) during the last period.

RESULTS

The series consisted of 1544 cases. Thirteen patients who died before discharge were excluded. A total of 1531 cases were analysed: 391 cases (2011-2014), 650 cases (2015-2018) and 490 cases (2019-2021). Pneumonectomy rates remained stable along the study period (5.4%, 4.3% and 4.5%, respectively, p=0.719). Minimally invasive approaches significantly increased (5.9%, 60.8% and 76.9%, respectively, p<0.001). Overall postoperative complications decreased during the last period (34.5%, 35.2% and 29%, respectively, p=0.065). Median LOS significantly decreased from 6 days (IQR: 2 days) in the first period to 5 days (IQR: 2 days) in the second period and 3 days (IQR: 2 days) in the third one (p<0.001). LOS correlated significantly with age, sex, DLCOppo and surgical approach. In multivariable logistic regression analysis, robotic approach increased odds of short LOS (OR, 4.53; p<0.001) compared to VATS.

CONCLUSIONS

LOS after anatomical lung resection has progressively decreased over the last 10 years. Robotic approach is associated with 4-fold decrease of LOS.

Disclosure: No significant relationships.
Keywords: Lung Resection, Length Hospital Stay, Robotic, VATS, Time Trending.

O-061

WHICH SURGERY FOR STAGE II-III EMPYEMA PATIENTS? OBSERVATIONAL SINGLE CENTRE COHORT STUDY ON 719 CONSECUTIVE PATIENTS

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OBJECTIVES
Surgery is widely recommended in stage II-III empyema treatment. More recent guidelines support the use of thoracoscopic surgery(VATS), however, which is the best surgical approach is still debated. The aim of our study is to demonstrate safety and efficacy of VATS approach compared to open surgery in empyema treatment.

METHODS
Observational cohort study on prospectively collected cases of stage II-III empyema surgically treated in a single centre(2000-2020). All patients underwent Chest-CT to assess empyema stage. TBC and HIV+ patients were excluded. Patient's characteristics, surgical approach, postoperative outcomes, success rate and long-term results were analysed. Patients were divided into open group(OT, posterolateral muscle sparing thoracotomy) and VATS group(VT, 3 port±utility incision). All patients were followed up 1, 3 and 6 months after surgery in outpatient clinic with chest radiograph/CT

RESULTS
719 consecutive patients were surgically treated for stage II-III postpneumonic empyema. Preoperative patients' characteristics were showed in table 1. All patients had a clinical history of pneumonia no more than 6 months before surgery. 553(76.9%) had stage II empyema. Operative time was 92,7±6.8 min for OT and 112,2±7.4 for VT. The conversion rate was 8.4%(46/545) in stage II and 19,2%(19/99) in for stage III. Twelve 12 patients in VT(1,86%) and 4 patients in OT (5.3%) underwent redo-sugery for bleeding. Overall postoperative mortality was 1.25%(9/719): 5.3% (4/75) in OT and 0,77% (5/644) in VT. Postoperative stay was 10±6.5 days in OT and 8±2.4 in VT. Overall morbidity was 14,7%(106/719): 21.3%(16/75) in OT and 13,9%(90/644) in VT. In VT, 6 patients(0.93%) showed recurrent empyema: 5 were treated with chest drainage and 1 with redo open surgery.

CONCLUSIONS
Our finding suggest that VATS approach, with a 99% of success rate, shorter length of stay and lower postoperative morbidity, should be considered the treatment of choice for thoracic empyema either in stage II or III.

Disclosure: No significant relationships.
Keywords: Empyema, Surgery, Vats, Thoracotomy.

Table 1: Preoperative patients' characteristics

Characteristics	OPEN (n=75)	VATS(n=644)
Male/Female	43/32	471/173
Age (range)	58,4 (23-83)	55,5 (17-82)
Preoperative treatment:		
chest drainage	63 (84%)	543 (84.3%)
thoracentesis	12 (16%)	101 (15.7%)
Smoking history	25 (33.3%)	141 (21.9%)
Comorbidities		
DIABETES	51 (68%)	432 (67%)
Alcoholism	24 (32%)	81 (12.6%)
Cardiovascular	45 (60%)	376 (58.4)
Liver cirrhosis	18 (24%)	26 (4%)
Empyema stage II	8 (10.6%)	545 (84.6%)
Empyema stage III	67 (89.3%)	99 (15.4%)

O-062

A NEW METHOD USING POSTOPERATIVE X-RAY TO EVALUATE RESIDUAL PLEURAL SPACE AND PREDICT INFECTIOUS PLEUROPULMONARY COMPLICATIONS AFTER LUNG RESECTION FOR INFECTIOUS DISEASE

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OBJECTIVES
Postoperative residual pleural space (RPS), is critical in the evaluation of pulmonary resection by infectious diseases. This study correlates the presence of RPS, and Its dimensions, by an original measurement method, with the risk to develop infectious pleuropulmonary complications in these patients.

METHODS
We performed a retrospective cohort of patients undergoing non-pneumonectomy pulmonary resection, due to infectious lung disease. Two thoracic surgeons, blinded to the patient's postoperative evolution, individually analyzed the fourth-day and second-week postoperative chest X-rays using a DICOM-viewer software. They systematically defined the presence of a RPS, its area, and the ratio between the area of the total pleural space. These measures were correlated to the risk for infectious pleuropulmonary complications in the first 30 postoperative days.

RESULTS
A total of 135 patients were included. The most frequent etiology was tuberculosis (37.7%). RPS on the 4th postoperative chest x-ray was noted on 76 patients (58%), and 77.6% (59) of those, persisted at the end of the second week. The interobserver agreement index was 89.5% (Kappa: 0.77). In the univariate analysis, patients with RPS on the 4th postoperative day showed a relative risk for empyema of 3.68 (95% CI: 1.12 - 12.11; p = 0.017). In the subgroup with a RPS ratio ≥20%, the risk for empyema was 6.2 (95% CI: 2.7 - 14.4; p = 0.001) and for pneumonia was 2.24 (95% CI: 1.3 - 4.9; p = 0.043). A multivariate analysis also showed that a RPS ratio ≥20% is an independent risk factor for the development of empyema (HZ = 6.24 (95% CI: 1.95 - 19.93; p = 0.002)).
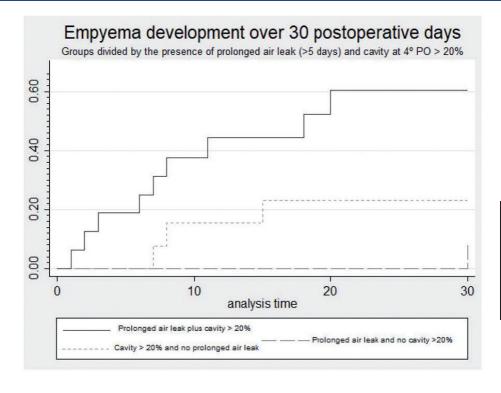
CONCLUSIONS
We demonstrate the applicability of an unpublished and accessible methodology, capable of objectively measuring the RPS. The results proved that RPS is related to a greater chance of developing infectious pleuropulmonary complications opening the discussion about postoperative preemptive strategies.

Disclosure: No significant relationships.
Keywords: Complications, Tuberculosis, Empyema, Lobectomy, Residual Pleural Cavity.

Empyema development over 30 postoperative days

Groups divided by the presence of prolonged air leak (>5 days) and cavity at 4º PO > 20%

O-063

IMPACT OF VISUALIZATION SYSTEM IN THORACOSCOPIC SURGERY: A PROSPECTIVE RANDOMIZED STUDY

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OBJECTIVES
Endoscopic lens fogging is a frequent and a major impediment to a clear visual field during endoscopic surgery. Data on etiology and methods to improve vision have only sporadically been considered in the literature.
Our aim was to evaluate the efficacy of two fogging-reducing methods: hot water thermos and a visualization system.The primary outcome was the number of fogging events during the operation, while secondary outcomes were operating time, cost differences and surgeons' satisfaction.

METHODS
This single center prospective randomized study included patients undergoing thoracoscopic pulmonary resection. The commercial visualization system (Clearify™) and the hot water thermos were compared.The characteristics of patients (age, sex, body mass index, Charlson comorbidity index), data of environment (Temperatures variances), data of procedures (type of surgery and duration) and the number of fogging events were recorded . A cost analysis was also performed. At least, we asked thoracic surgeons which of the two methods they preferred using an anonymous questionnaire.

RESULTS
There were 17 eligible patients recruited in the study. The operating time is similar between the two groups. Using hot water thermos mean interruptions times were 15, with a duration of 5.51 minutes (3.59% of the whole surgery); using the new visualization system the average number of interruptions was 10, with a duration of 4.17 minutes (3.21% of the whole surgery) (p<0.05). Cost analysis didn't show significant differences between two groups. Surgeons preferred the new visualization system.

CONCLUSIONS
The visualization system produced less fogging events, and consequently less duration of cleaning interruptions. It returns a more safety perception to our surgeons. Costs and operating times are similar in the two groups of study.

Disclosure: No significant relationships.
Keywords: VATS; Fogging; Surgery.

TUESDAY 21 JUNE 2022
ESTS VOGT-MOYKOPF LECTURE
09:30 - 10:00

O-064

VIDEO-ASSISTED THORACIC SURGERY (VATS) OR THORACOTOMY FOR LUNG CANCER SURGERY IN OBESE PATIENTS? AN ANALYSIS OF THE EUROPEAN SOCIETY OF THORACIC SURGEONS DATABASE

Francesco Guerrera[1,2], Alessandro Brunelli[3], Pierre-Emmanuel Falcoz[4], Pier Luigi Filosso[1], Zalan Szanto[5], Paolo Olivo Lausi[1], Giulio Luca Rosboch[2], Enrico Ruffini[1]
[1]*University of Torino, Torino, Italy*
[2]*AOU Città della Salute e della Scienza di Torino, Torino, Italy*
[3]*St. James's University Hospital, Leeds, United Kingdom*
[4]*Strasbourg University Hospital, Strasbourg, France*
[5]*University of Pecs, Pecs, Hungary*

OBJECTIVES
There is a lack of evidence whether perioperative outcomes differ in obese patients after video-assisted thoracic surgery (VATS) or open lobectomy. We queried the European Society of Thoracic Surgeons (ESTS) database with the aim to assess morbidity and postoperative length of hospital stay (LOS) in obese patients submitted to VATS and open pulmonary lobectomy for non-small cell lung cancer.

METHODS
We collected all consecutive patients from 2007 to 2021 submitted to lobectomy through VATS or thoracotomy and presenting a body mass index (BMI) greater than or equal to 30. An intention to treat analysis was carried out. Primary outcomes were morbidity rate, mortality rate, death, and postoperative length of stay (LOS). Secondary outcomes assessed were major cardiac complication rate, resection status. Propensity score (PS) matching was used to manage possible selection bias, including the following variables: age, gender, BMI, comorbidity, smoking history, PPO DLCO, PPO FEV1, clinical TNM stage. Between-group differences were evaluated by Wilcoxon–Mann–Whitney test, $\chi2$ test, or Fisher's exact test.

RESULTS
Out of a total of 78,018 patients submitted to lung lobectomy, 13,999 cases (17.9%) were considered in the analysis including 5,562 VATS lobectomies and 8,437 thoracotomy lobectomies. The VATS group showed a lower complication rate (26.5% vs. 33.5%, P<0.001) and LOS (5 days vs. 7 days, P<0.001). After PS-matching (1:1, N= 1,612), VATS approach confirmed a lower complication rate (31.9% vs. 22.5%, P<0.001) and LOS (4 days vs. 6 days, P<0.001). Moreover, these results were consistently observed when analyzed the severe obese subgroup (BMI:30-39.9) and morbid obese subgroup (BMI≥40).
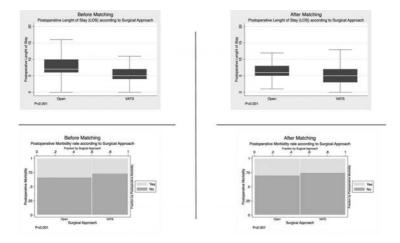
CONCLUSIONS

In obese patients with non-small cell lung cancer, VATS lobectomy was found to be associated with improved postoperative outcomes than open lobectomy. Consequently, it should be considered the approach of choice in the Obese population.

Disclosure: No significant relationships.
Keywords: VATS, Lobectomy, Lung Cancer, Obesity, Morbidity.

TUESDAY 21 JUNE 2022
ESOPHAGUS/MEDIASTINUM
11:00 – 12:00

O-065

THYMECTOMY IN SEVERE (MGFA CLASS IV-V) GENERALIZED MYASTHENIA GRAVIS: IS THE GAME REALLY WORTH THE CANDLE?

Debora Brascia[1], Marco Lucchi[2], Vittorio Aprile[2], Diana Bacchin[2], Stylianos Korasidis[2], Federico Rea[3], Giovanni Maria Comacchio[3], Eleonora Faccioli[3], Maria Carlotta Marino[3], Stefano Margaritora[4], Elisa Meacci[4], Maria Teresa Congedo[4], Dania Nachira[4], Giulia De Iaco[1], Angela De Palma[1], Giuseppe Marulli[1]

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OBJECTIVES
Total thymectomy in addition to medical treatment is an accepted standard treatment for myasthenia gravis (MG). Patients with severe generalized MG present life-threatening events, poor prognosis and higher risk of postoperative myasthenic crisis. To date, limited information is available concerning outcome after thymectomy in this subset of patients. Aim of our study is to investigate neurological and surgical results in patients with MGFA class IV and V MG following thymectomy.

METHODS
76 thymomatous and nonthymomatous MG patients with preoperative MGFA class IV and V who underwent thymectomy, were prospectively collected. Primary endpoint included short-term surgical outcomes. Secondary endpoint included the achievement of complete stable remission (CSR) and any improvement as defined by MGFA post-intervention status criteria. Before surgery, an accurate neurological assessment was done to achieve the best pharmacological control of disease and plan a pre-or postintervention therapy to prevent myasthenic crisis.

RESULTS
There were 25(32.9%) males and 51(67.1%) females; 53(69.7%) were classified as MGFA class IV and 23(30.3%) as class V. Before surgery, 3 patients received plasmapheresis and 9 Immunoglobulines; thymectomy was performed through sternotomy in 25(32.9%) patients, by VATS in 5(6.6%) and RATS in 46(60.5%). Median operative time was 120(65-305) minutes. In-hospital mortality was observed in 1(1.3%) patient, postoperative complications
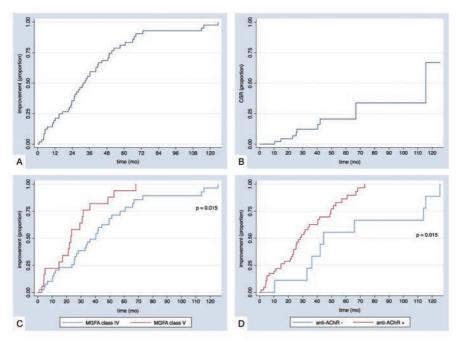
in 14(18.4%) comprising 7 myasthenic crisis and 1 respiratory insufficiency with prolonged ICU stay. Median hospital stay was 4 days (3-45 days). Pathological examination revealed 31(40.8%) thymic hyperplasia/other benign and 45(59.2%) thymomas. Cumulative CSR and improvement probabilities were 20.6% and 83.4% at 5-year, and 66.9% and 97.6% at 10-year, respectively. Patients with MGFA class V MG achieved a higher rate of improvement than those with class IV(p=0.015) as well as patients with anti-AChR+ MG vs anti-AChR–(p=0.015).

CONCLUSIONS
Thymectomy in patients with severe MG yields good perioperative outcomes, achieving satisfactory long-term neurological improvement, especially for patient with MGFA class V and anti-AChR+.

Disclosure: No significant relationships.
Keywords: Myasthenia Gravis, Thymectomy, Complete Stable Remission, VATS, RATS.

O-066

PERIOPERATIVE OUTCOMES COMPARISON BETWEEN ROBOT-ASSISTED AND VIDEO-ASSISTED THORACOSCOPIC THYMECTOMY: A SINGLE CENTER EXPERIENCE

Deping Zhao, Haoran E, Junqi Wu, Long Xu, Chang Chen
Tongji University Affiliated Shanghai Pulmonary Hospital, Shanghai, China

OBJECTIVES
The advent of robot-assisted surgery has completely revolutionized the modality of thymectomy, which could reportedly achieve equivalent efficacy compared with minimally invasive approach. This study was conducted to further compare the perioperative outcomes between these two modalities.

METHODS
A retrospective single-center study enrolling patients receiving robot-assisted or video-assisted thoracoscopic thymectomy between January and November 2021 was conducted. Clinical and pathological characteristics and perioperative outcomes were collected and compared between these two cohorts.

RESULTS
A total of 229 patients were enrolled in this study, with 73 (31.9%) and 156 (68.1%) of them undertaking robot-assisted and video-assisted surgery, respectively. Age and gender distribution, BMI status, smoking history and comorbidity indexes were evaluated of no difference between two cohorts. Robotic resections were more frequently conducted through subxiphoid approach than VATS procedure (54/73, 74.0% vs. 27/156, 17.3%, $p < 0.001$), while there was 1 VATS operation conducted through transcervical pathway. More thymic epithelial carcinomas were pathologically proven in the VATS cohort than its counterpart (85/156, 54.5 vs. 22/73, 30.1%, $p = 0.015$). Perioperative outcomes including intraoperative blood loss volume, conversion rate, length-of-stay, drainage duration and volume and postoperative complication rate showed no difference when comparing between 2 cohorts, while only the operation duration was longer in the robotic resection cohort than the VATS group (median, 120 vs. 84 min, $p < 0.05$).

CONCLUSIONS
The clinical efficacy of robot-assisted thoracoscopic thymectomy was preliminarily proven comparable to the standard VATS approach. Accumulation of robotic thymectomy procedures would contribute to acceptable clinical outcomes.

O-067

RISK OF CHYLOTHORAX FOLLOWING EN-BLOC VERSUS SELECTIVE THORACIC DUCT LIGATION DURING ESOPHAGECTOMY: A PROPENSITY-MATCHED ANALYSIS

Stephan Soder[1], Yasmine Labad[2], David Levi[1], Clare Pollock[1], Pasquale Ferraro[1], Edwin Lafontaine[1], Jocelyne Martin[1], Basil Nasir[1], Moishe Liberman[1]
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[2]University of Sherbrooke, Sherbrooke, Quebec, Canada

OBJECTIVES
To evaluate whether en-bloc versus selective thoracic duct ligation results in less postoperative chylothorax following esophagectomy in the context of esophageal cancer. Secondary objectives were to evaluate clinical perioperative outcomes.

METHODS
Retrospective study of a single-center prospective registry containing patients with primary esophageal or gastroesophageal junction cancer (Siewert I/II) who underwent esophagectomy between January 2014 and June 2021. Patients were classified according to the modality of thoracic duct ligation performed, either en-bloc ligation (EBL) or selective thoracic duct ligation (STDL). A propensity-score matching (PSM) analysis including 16 covariates was performed and perioperative outcomes were evaluated.

RESULTS
After exclusions, 383 patients were analyzed. In the EBL (n=251) and STDL (n=132) groups, 82.7% vs 84.8% (p=0.656) had adenocarcinoma histology and 87.7 vs 96.2% (p<0.001) received neoadjuvant chemotherapy +/- radiation, respectively. Crude chylothorax incidence was 8.4% in EBL and 2.3% in STDL groups (p=0.019). Median time from surgery to chylothorax diagnosis was 8 days.

Following PSM, 276 cases were analyzed (EBL, n=166 and STDL, n=110). ECOG score (p=0.006) represented the only significantly different covariate between both groups. Surgical blood loss (median: 350 vs 200 cc, p<0.001) and in-hospital length of stay (median: 13 vs 9 days, p<0.001) were significantly reduced in the STDL group. Ivor Lewis esophagectomy was performed in 72.3 vs 79.1% (p=0.142). Rates of chylothorax (7.8 vs 2.7%, p=0.113), need for reoperation (8.4 vs 2.8%, p=0.073), anastomotic leak (10.2 vs 11%, p=0.266), readmission (15.2 vs 7.7%, p=0.163) and 90-day mortality (2.4 vs 5.1%, p=0.299) were similar between matched EBL and STDL groups, respectively.

CONCLUSIONS
In patients undergoing selective versus en-bloc thoracic duct ligation during esophagectomy, PSM reveals a trend towards reduced postoperative chylothorax incidence (PSM: 2.7% versus 7.8%; crude: 2.3% vs 8.4%). Larger studies are required to confirm whether a true difference in postoperative chylothorax incidence between these two techniques exists.

Disclosure: No significant relationships.
Keywords: Esophagectomy; Chylothorax; Thoracic Duct Ligation.

Table 1. Baseline characteristics and chylothorax rate of the overall population, and operative and post-operative outcomes of en-bloc ligation (EBL) and selective thoracic duct ligation (STDL) groups, after propensity-score matching.

Characteristics of the overall (non-matched) population	EBL (n=251)	STDL (n=132)	P-value
Age (years), median (IQR)	66.2 (13.9)	66 (12.2)	0.541
Sex (female), n (%)	57 (22.7)	33 (25)	0.615
Chronic obstructive pulmonary disease, n (%)	65 (25.9)	25 (18.9)	0.127
Tumor location (distal and gastroesophageal junction), n (%)	229 (92.3)	118 (89.4)	0.546
Neoadjuvant therapy			<0.001
Chemoradiation, n (%)	151 (60.2)	62 (47.0)	
Chemotherapy alone, n (%)	69 (27.5)	65 (49.2)	
No neoadjuvant therapy, n (%)	31 (12.4)	5 (3.8)	
Ivor Lewis esophagectomy, n (%)	184 (73.9)	106 (80.3)	0.051
Minimally invasive Ivor Lewis esophagectomy, n (%)	40 (16.1)	89 (67.4)	<0.001
Post-operative chylothorax, n (%)	21 (8.4)	3 (2.3)	0.019
Outcomes in the matched population	EBL (n=166)	STDL (n=110)	
Ivor Lewis esophagectomy, n (%)	120 (72.3)	87 (79.1)	0.142
Intraoperative blood loss (cc), median (IQR)	350 (350)	200 (200)	<0.001
Operating time (minutes), median (IQR)	198 (90)	175.5 (57)	0.008
Total lymph nodes resected (number), median (IQR)	16.5 (14)	19 (13)	0.054
Post-operative chylothorax, n (%)	13 (7.8)	3 (2.7)	0.113
Reoperation, n (%)	14 (8.4)	3 (2.8)	0.073
Anastomotic leakage, n (%)	18 (10.2)	12 (11)	0.266
ICU LOS (days), median (IQR)	7.5 (12)	6 (5)	0.634
In-hospital LOS (days), median (IQR)	13 (7)	9 (6)	<0.001
Readmission in 30 days after discharge, n (%)	25 (15.2)	8 (7.7)	0.163
30-day mortality, n (%)	1 (0.6)	3 (2.7)	0.305
90-day mortality, n (%)	4 (2.4)	5 (5.1)	0.299
Complete resection (R0), n (%)	166 (100)	109 (99.1)	0.396

Abbreviations: ICU, Intensive Care Unit; IQR, Interquartile Range; LOS, Length of Stay.

Tuesday A.M.
Abstract 065-070

O-068

IMPROVED QUALITY OF LIFE OF PATIENTS WITH LOCALISED HYPERHIDROSIS AFTER THORACOSCOPIC SYMPATHETIC CLIPPING: LONG TERM RESULTS

Denis I. Trufa, Wojciech Dudek, Horia Sirbu
University of Erlangen-Nuremberg, Erlangen, Germany

OBJECTIVES

Hyperhidrosis (H) is a disorder characterized by sweating in excess with negative impact of patients' quality of life. Current epidemiological studies estimate the prevalence of hyperhidrosis at 1% to 3% . The aim of our study was to evaluate the long-term quality of life after thoracoscopic sympathetic clipping.

METHODS

From 2008 to 2021, 334 patients underwent bilateral thoracoscopic sympathetic clipping according to the localisation of hyperhidrosis (H-facialis on R3, H-palmaris on R3 / R4, H-axillaris on R4 / R5 level).
The quality of life and disease characteristics were assessed using detailed pre- and post-operative questionnaires (dermatological quality of life questionnaire, hyperhidrosis quality of life questionnaire-HidroQoL).

RESULTS

In our patients group were included 218 (65.3 %) women and 116 (34.7 %) men, mean age 27.2 ± 10.3 years. The patients had localised hyperhidrosis: 7.8 % palmaris, 15 % palmaris / axillaris, 41.9 % palmaris / plantaris, 18.3 % palmaris/ axillaris / plantaris, 6.3 % axillaris, 1.2 % facialis and 9.5 % other localisations of hyperhidrosis. The mean follow-up period of the patients was 89 months. A total of 112 out of 334 patients responded to the quality of life questionnaires. 96 out of 112 (85.7%) patients reported improved quality of life postoperatively. 103 out of 119 (86.6%) patients were satisfied or very satisfied with postoperative results. Compensatory sweating was observed in 100 out of 118 (84.7%) cases. After operation 107 out of 114 (93.9%) responders declared good, very good or excellent social contacts. 88 out of 106 (83 %) patients would have operation done again.

CONCLUSIONS

Our study shows a high rate of long term satisfaction after thoracoscopic sympathetic clipping. Compensatory sweating is the most common postoperative complication. Postoperative quality of life is little influenced by compensatory sweating.

Disclosure: No significant relationships.

O-069

THE RISE OF POWER: A REAL LIFE INTRODUCTION OF POWERED CIRCULAR STAPLER FOR ESOPHAGOGASTRIC ANASTOMOSIS – COHORT AND PROPENSITY MATCHED SCORE STUDY

Stijn Vanstraelen, Willy Coosemans, Lieven Depypere, Yannick Mandeville, Hans Van Veer, Philippe Nafteux
University Hospitals Leuven, Leuven, Belgium

OBJECTIVES

Esophagectomy remains the cornerstone of the curative treatment of patients with esophageal cancer. Anastomotic leakage is one of the most feared complications after resection, which results in increased morbidity, length of stay and even mortality. The aim of our study was to evaluate the impact of the introduction of a powered circular stapler on complications after esophagectomy with intrathoracic anastomosis for esophageal cancer.

METHODS

Between May 2019 and July 2021, after introduction of a new powered circular stapler device (Echelon CircularTM Powered Stapler, Johnson&Johnson), 126 consecutive esophagectomies for cancer with intrathoracic anastomosis in a high-volume center were included in this retrospective cohort study. Surgeons were free to choose either a non-powered (n=66) or powered circular stapler (n=62). A propensity score matched analysis was conducted, correcting for preoperative characteristics age, BMI, ECOG performance and tumor stage. This resulted in 2 groups of 49 patients.

RESULTS

No difference could be observed in patient characteristics, comorbidities, performance status, and tumor stage. Fewer anastomotic leakages were observed with the powered stapler with an odds ratio of 7.3 (3.2% (n=2) vs 19.7% (n=13); p=0.004) in the total cohort. After propensity score matching this remained statistically significant with respectively 20.4% (n=10) in the non-powered and 4.1% (n=2) in the powered group (p=0.013) Additionally, stapler diameter was significantly higher with the powered stapler compared to the non-powered with a median of 29mm (63.3%) and 25mm (57.1%) respectively (p<0.0001). There was no significant difference in Clavien-Dindo complications (p=0.711). Mean length of stay was 18.7 and 11.1 days in respectively the non-powered and powered group (p=0.022).

CONCLUSIONS

Postoperative anastomotic leakage after esophageal resection was significantly reduced after the introduction of the powered circular stapler, consequently resulting in a reduced length of stay. Further evaluation on long-term stenosis and quality of life are warranted to support these results.

Disclosure: No significant relationships.
Keywords: Esophageal Cancer, Anastomotic Leakage, Mechanic Anastomosis.

N= (%)	Whole cohort			Propensity score matched		
	Non-powered 66	Powered 62	P-value	Non-powered 49	Powered 49	P-value
Sex			0.264			0.610
Male	51 (77.3%)	53 (85.5%)		38 (77.6%)	41 (83.7%)	
Female	15 (22.7%)	9 (14.5%)		11 (22.4%)	8 (16.3%)	
Age (mean)	65.1	64.9	0.892	65.2	64.2	0.708
BMI						
Underweight	3 (4.5%)	3 (4.8%)		1 (2%)	3 (6.1%)	
Normal	26 (39.4%)	28 (45.2%)	0.696	23 (46.9%)	28 (57.1%)	1
Overweight	26 (39.4%)	25 (40.3%)		19 (38.8%)	25 (51.0%)	
Obese	11 (16.7%)	6 (9.7%)		6 (12.2%)	6 (12.2%)	
Performance status						
ECOG 0	31 (47.0%)	22 (35.5%)		21 (42.9%)	21 (42.9%)	
ECOG 1	28 (42.4%)	35 (56.5%)	0.453	25 (51.0%)	25 (51.0%)	1
ECOG 2	5 (7.6%)	4 (6.5%)		3 (6.1%)	3 (6.1%)	
ECOG 3	3 (4.5%)	1 (1.6%)		0 (0.0%)	0 (0.0%)	
Charlson Index						
0	21 (31.8%)	25 (40.3%)		16 (32.7%)	20 (40.8%)	
1	14 (21.2%)	13 (21.0%)		12 (24.5%)	12 (24.5%)	
2	16 (24.2%)	14 (22.6%)		11 (22.4%)	12 (24.5%)	
3	9 (13.6%)	5 (8.1%)	0.924	5 (10.2%)	4 (8.2%)	0.610
4	2 (3.0%)	2 (3.2%)		2 (4.1%)	0 (0.0%)	
5	1 (1.5%)	1 (1.6%)		0 (0.0%)	0 (0.0%)	
6	2 (3.0%)	2 (3.2%)		2 (4.1%)	1 (2.0%)	
7	1 (1.5%)	0 (0.0%)		1 (2.0%)	0 (0.0%)	
Setting						
Post-induction	55 (83.3%)	50 (80.6%)	0.819	43 (87.8%)	43 (87.8%)	1
Primary	11 (16.7%)	12 (19.4%)		6 (12.2%)	6 (12.2%)	
Stapler size (mm)						
21	2 (3.0%)	0 (0.0%)		2 (4.1%)	0 (0.0%)	
25	38 (57.6%)	19 (30.6%)		28 (57.1%)	17 (34.7%)	
28	26 (39.4%)	NA	**<0.0001**	19 (38.8%)	NA	**<0.001**
29	NA	42 (67.7%)		NA	31 (63.3%)	
31	NA	1 (1.6%)		NA	1 (2.0%)	

	Whole cohort			Propensity score matched		
Anastomotic leak	13 (19.7%)	2 (3.2%)	**0.004**	10 (20.4%)	2 (4.1%)	**0.013**

Clavien-Dindo
  Grade 0
  Grade 1
  Grade 2
  Grade 3A
  Grade 3B
  Grade 4A
  Grade 5
	14 (21.2%)
	1 (1.5%)
	26 (39.4%)
	4 (6.1%)
	5 (7.6%)
	15 (22.7%)
	1 (1.5%)
		19 (30.6%)
		4 (6.5%)
		20 (32.3%)
		5 (8.1%)
		4 (6.5%)
		10 (16.1%)
		0 (0.0%)
			0.488	12 (24.5%)
				0 (0.0%)
				21 (42.9%)
				2 (4.1%)
				4 (8.2%)
				9 (18.4%)
				1 (2.0%)
					13 (26.5%)
					1 (2.0%)
					17 (34.7%)
					5 (10.2%)
					4 (8.2%)
					9 (18.4%)
					0 (0.0%)
						0.711

Comprehensive Complication Index (mean)	33.8	23.0	**0.005**	33.0	25.9	0.146
Length of stay (mean)	18.3	11.9	**0.026**	18.7	11.1	**0.022**
90-day mortality	4 (6.1%)	1 (1.6%)	0.366	3 (6.1%)	1 (2.0%)	0.312

Tuesday A.M.
Abstract 065-070

O-070

THE CLINICAL CHARACTERISTICS AND TREATMENT OF POST-ESOPHAGECTOMY AIRWAY FISTULA: A MULTICENTER RETROSPECTIVE STUDY

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OBJECTIVES
Post-esophagectomy airway fistula (PEAF) is a serious complication after esophagectomy. At present, the management of PEAF patients remains inconclusive. We aimed to investigate the clinical characteristics and management of patients with PEAF through a multi-center retrospective study.

METHODS
We included consecutive patients who underwent esophagectomy for esophageal cancer in seven major Chinese esophageal cancer centers from January 2010 to December 2020. Based on the anatomic characteristics of PEAF patients, PEAFs were divided into Union type I (without digestive fistula) and Union type II [respiratory-digestive fistula (RDF)], and subtypes a and b (tracheal or bronchial fistulas), as well as L1 and L2 (same or different level of fistulas). The clinical characteristics, diagnoses, managements and effects of the various types were retrospectively analyzed.

RESULTS
PEAF occurred in 85 of 26,608 patients (0.32%), including eight females and 77 males. There were 16 patients with type I and 69 with type II. The numbers of healings, non-healings, and deaths at discharge were 45 (52.9%), 20 (23.5%), and 20 (23.5%), respectively. Type Ib was common in type I, and type II L1 was common in type II. The healing rates of surgical, stent, and conservative treatments were 50%, 60%, and 50%, respectively. All type I patients treated with stent implantation were healed at discharge. The healing rates, mortality, and 3-year survival of type II L1 and type II L2 patients were 55.4% and 30.8%, 17.9% and 30.8%, and 34.3% and 15.4%, respectively. The 5-year survival rates of all PEAFs were 21.1%.

CONCLUSIONS
PEAF is an infrequent and life-threatening complication after esophagectomy. Patients with different types of PEAF often have different inducements. In this study, we found that the healing rates of surgical and conservative treatments were similar, and stent implantation may have the potential to inprove efficacy. Type II L2 patients were the most difficult to cure.

Disclosure: No significant relationships.
Keywords: Esophageal Cancer, Post-Esophagectomy Airway Fistula (PEAF), Tracheobronchial Fistula (TBF), Aerodigestive Fistula.

TUESDAY 21 JUNE 2022
MIXED THORACIC II
13:00 – 14:00

O-071

AMBULATORY VIDEOTHORACOSCOPIC INDWELLING PLEURAL CATHETER VERSUS VIDEOTHORACOSCOPIC TALC PLEURODESIS APPROACH IN CASE OF INITIAL MANAGEMENT OF MALIGNANT PLEURAL EFFUSION: A PROPENSITY SCORE ANALYSIS

Charlotte Baltazard[1,2], Henri De Lesquen[2], Pierre-Julien Cungi[2], Jean-Philippe Avaro[2]
Percy Military Hospital, Paris, France
Saint Anne Military Hospital, Toulon, France

OBJECTIVES
Malignant pleural effusion (MPE) indicates advanced stages of cancer among patients with short mean life expectancy. Both talc pleurodesis (TP) and indwelling pleural catheter (IPC) are used. Our study was conducted to determine if vidéothoracoscopic pleural sampling followed by IPC is more effective than TP in reducing total effusion-relative hospitalisation days in the remaining lifespan of patients with MPE.

METHODS
This is a comparative retrospective analysis of patients with MPE who underwent one of this methods : videothoracoscopic talc pleurodesis or ambulatory videothoracoscopic indwelling pleural catheter. Primary endpoint was effusion-relative hospital stay at 3 months. Secondary endpoints were efficacy of pleurodesis and no recurrence, necessity of additional pleural procedure and adverse events at 3 months.

RESULTS
From 2019 to 2021, 176 patients underwent surgical procedure in case of MPE : 128 in the VATS-TALC group and 48 in the VATS-CPT group. After propensity score, both of the two groups were comparable. Total time of hospital stay was significatively lower in the VATS-CPT group after propensity score (1.80 +/-3.95 vs 6.85 +/- 6.15 days, p<0.001). First procedure time of hospital stay was also significatively lower (0.81 +/- 1.27 vs 6.02 +/- 4.83, p<0.001). Additional pleural procedure rate (11.1 vs 10.4%, p=1.000) and pleurodesis (66.7% for TALC vs 72.3% for CPT, p=0.706) were similar. Adverse events rate was higher in the VATS-TALC group but it was not significative (16.7% vs 8.7%, p=0.396). No difference of mortality at 3 months was found (18.8% vs 16.7%, p=1.000).

CONCLUSIONS
In our study IPC seems to be non-inferior to TP with equivalent pleurodesis rate and number of recurrences at 3 months for patients with shorter effusion-relative hospitalization stay. Ambulatory IPC has fewer all-grade complications. Despite IPC required long-term in situ-

draining at home, it was associated with a lower rate of rehospitalization among patients with short mean life expectancy.

Disclosure: No significant relationships.
Keywords: Malignant Pleural Effusion, Indwelling Pleural Catheter, Pleurodesis.

Table 1. Population, pleural effusion characteristics and postoperative outcomes

		VATS-TALC (%) (n=128)	VATS-CPT (%) (n=48)	p
Population				
Age		72 ± 12.2	72 ± 12.3	0.998
Men		70 (54.7%)	30 (62.5%)	
Women		58 (45.3%)	18 (37.5%)	0.447
PS ≤ 1		82 (64.1%)	44 (91.7%)	**0.001**
Median MRC		2.28 ± 1.35	2.50 ± 1.41	0.357
History of cancer		66 (51.6%)	20 (41.7%)	0.317
Frozen-section histopathologic examination				
Cancer				
	Lung	9 (7%)	24 (50%)	
	Mesothelioma	22 (17.2%)	7 (14.6%)	
	Breast	22 (17.2%)	6 (12.5%)	
	Other	21 (16.4%)	4 (8.3%)	
Benign		54 (42.2%)	7 (14.6%)	
Pleural-effusion				
Side	*Left*	64 (50.8%)	23 (50%)	0.903
	Right	59 (46.8%)	22 (49%)	
	Bilateral	3 (2.4%)	1 (1%)	
Degree	*Minor*	12 (9.38%)	4 (8.33%)	1.000
	Moderate	69 (53.9%)	33 (68.8%)	0.108
	Major	47 (36.7%)	11 (22.9%)	0.120
Postoperative care				
Time of hospital stay (days)	*First procedure*	5.58 ± 3.82	0.81 ± 1.27	**<0.001**
	Pleural effusion relative	1.39 ± 4.09	1.02 ± 3.78	0.580
	Total	6.97 ± 5.95	1.80 ± 3.95	**<0.001**
Additionnal pleural procedure		14 (10.9%)	5 (11.1%)	1.000
Adverse events		28 (21.9%)	4 (8.70%)	0.079
Pleurodesis		79 (61.7%)	34 (72.3%)	0.261
Mortality at 3 months		37 (28.9%)	8 (16.7%)	0.143

Table 2. Postoperative outcomes with propensity score

		VATS-TALC (%) (n=128)	VATS-CPT (%) (n=48)	*p*
Postoperative care				
Time of hospital stay	*First procedure*	6.02 ± 4.83	0.81 ± 1.27	**<0.001**
(days)	*Pleural effusion relative*	0.83 ± 3.78	1.02 ± 3.78	0.810
	Total	6.85 ± 6.15	1.80 ± 3.95	**<0.001**
Additionnal pleural procedure		5 (10.4%)	5 (11.1%)	1.000
Adverse events		8 (16.7 %)	4 (8.70%)	0.396
Pleurodesis		32 (66.7%)	34 (72.3%)	0.706
Mortality at 3 months		9 (18.8%)	8 (16.7%)	1.000

O-072

THE 'BEER' PRE-BIOTIC IMPROVES THE IMPACT OF ANTI-CTLA4 IMMUNE CHECKPOINT INHIBITOR IN A MURINE MODEL OF MALIGNANT PLEURAL MESOTHELIOMA

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[3]*University of Lausanne, Lausanne, Switzerland*
[4]*Embion Technologies, Etoy, Switzerland*

OBJECTIVES
Immune checkpoint inhibition (ICI) therapy has revolutionized the outcome of certain cancers such as malignant pleural mesothelioma (MPM). However, patient responsiveness to this treatment remains unpredictable. Recently, a role for the gut microbiota composition has emerged for patients to generate a robust immune response against their tumors, following immunotherapy. Here, we studied the impact of Prembion®, a pre-biotic and modulator of the gut microbiota, on tumor control and lymphocyte infiltration in a murine MPM model treated by ICI.

METHODS
Prembion® (diluted into drinking water) was administrated to BALBc mice for 14 days. These animals were then inoculated orthotopically with a syngeneic MPM cell line (AB12-luc cells injected in the pleura) and followed by bioluminescence imaging. We determined the tumor growth and mouse survival in different groups: untreated control, Prembion®, IgG control, anti-PDL-1, anti-CTLA4, Prembion®+anti-PDL-1 and Prembion®+anti-CTLA4. A correlation between tumor response/animal survival and MPM infiltration with CD8+ lymphocyteswas also performed by immunohistochemistry.

RESULTS
Prembion® was well tolerated and did not affect animal weight or activity. Interestingly, Prembion® was as effective as anti-PDL1 and anti-CTLA4 monotherapy on tumor control, prolonging survival by 4.0 ± 1.1 days compared to controls ($p<0.05$). Moreover Prembion® potentiated anti-CTLA4 efficacy with a significant improvement in mouse survival of the Prembion®+anti-CTLA4 compared to controls (3.6 ± 1.1 days, $p<0.05$). Additionally, this finding correlated with enhanced MPM infiltration by CD8+ lymphocytes compared to controls ($p<0.05$).

CONCLUSIONS
Prembion® positively regulated the adaptive immune response against MPM and helped to improve the impact of anti-CTLA4 ICI on MPM. Further work focusing on the gut microbiome changes induced by Prembion® are ongoing to better understand the mechanisms involved.

Disclosure: No significant relationships.
Keywords: Malignant Pleural Mesothelioma - Immunotherapy - Microbiota - Thoracic Surgery.

O-073

AN EVALUATION OF PERIOPERATIVE HOSPITAL CORONAVIRUS-19 (COVID-19) INFECTION RATES IN THORACIC SURGERY PATIENTS DURING THE ACUTE CORONAVIRUS DISEASE 2019 PANDEMIC

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OBJECTIVES
The perioperative Coronavirus disease 2019 (COVID-19) infection rates of asymptomatic patients presenting for semi-elective and urgent thoracic surgery during the acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic is unknown.

METHODS
Utilizing a prospective, IRB-approved, quality-assurance database, we performed a retrospective review of thoracic surgery patients who underwent semi-elective and urgent thoracic surgery during the pandemic at a large tertiary care hospital in Massachusetts. We included all patients for whom at least 2 weeks of follow-up data were available after discharge. We excluded any known COVID-19 positive patients.

RESULTS
From March 30, 2020, to September 30, 2020, 1091 patients underwent 1480 thoracic procedures. Of those, 1058 patients who underwent 1447 procedures met inclusion criteria. Procedures performed during the pandemic were in line with state guidelines. Three asymptomatic patients tested positive preoperatively. Two had surgery delayed until at least two subsequent negative tests were obtained, and one underwent surgery due to medical necessity. Postoperative testing was performed in 258 patients. Three patients developed positive tests within 14 days postoperatively: one false positive, one exposed to COVID-19 by a spouse, and one who was re-admitted before developing a positive test. Twenty-three patients had symptoms suspicious of COVID-19 but tested negative.

CONCLUSIONS
In asymptomatic patients presenting for semi-elective thoracic surgery during the acute pandemic, 0.2% tested COVID-19 positive perioperatively. The nosocomial transmission rate in preoperatively COVID-19 negative patients appeared extremely low. The safety measures adopted by our health system appear effective in protecting patients from infection during the acute pandemic and may have implications for future pandemics.

Disclosure: No significant relationships.
Keywords: COVID-19, Nosocomial Infection, Perioperative Complication, Infection Prevention Protocol.

Table 1 Thoracic surgical procedures performed and the number of each performed from March

30 through September 30, 2020.

	Pulmonary/Airway		Gastrointestinal		Chest Wall/Pleura
369	Bronchoscopy with Intervention	161	Esophagoscopy with Intervention	90	Pleural Catheter Insertion/Removal
148	Wedge Resection	52	Feeding Tube Insertion/Revision	30	Decortication
81	Lobectomy	50	Esophagectomy	24	MPM Pleurectomy
44	Tracheostomy	39	Paraesophageal Hernia Repair	19	Other Thoracotomy
24	Segmentectomy	13	Other Laparotomy/Laparoscopy	18	VATS Pleural Biopsy
23	Lung Transplant	9	Per Oral Endoscopic Myotomy	14	Chest Wall Resection
6	Pneumonectomy	5	Esophageal Reconstruction	6	Hemothorax Evacuation
5	Image-guided Biopsy/Ablation	3	Esophagostomy		
3	Bronchopleural Fistula Repair	2	Heller Myotomy		
1	Pancoast Resection	2	Repair of Esophageal Perforation		
1	Tracheal Resection				
	Cardiovascular		Mediastinum/Diaphragm		Other
8	ECMO Cannulation	26	Mediastinal Mass Resection	8	Supraclavicular Lymph Node Biopsy
7	Pericardial Window	25	Mediastinoscopy	7	Other VATS
3	Thromboendarterectomy	11	Robotic/VATS Lymph Node Biopsy	4	Neck Exploration
2	Aortoenteric Fistula Repair	4	Thoracic Duct Ligation	3	Soft Tissue Resection
		2	Diaphragm Repair/Plication		

ECMO, Extracorporeal Membrane Oxygenation; MPM, Malignant Pleural Mesothelioma;

VATS, Video-Assisted Thoracoscopic Surgery.

O-074

IS MESOTHELIAL HYPERPLASIA A BENIGN DISEASE?

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OBJECTIVES

When VATS is performed for recurrent pleural effusion, mesothelial hyperplasia (MH) is occasionally found. From a speculative point of view, MH could represent the first step of the evolution toward in situ mesothelioma (ISM) and conclamate malignant mesothelioma (MM). Considering their role in diagnosis and pathogenesis of MM, BAP-1 and MTAP expression was analyzed in MH cases to test the hypothesis that mutated patients are at higher risk to develop MM.

METHODS

Patients with a diagnosis of MH were identified from a series of 2585 consecutive VATS procedures performed from January 1990 to March 2020. Then biopsy specimens were re-assessed searching for loss of BAP-1 (an oncosoppressor gene that has been shown to be a highly specific marker for the diagnosis of MIS) and MTAP (a gene involved in tandem deletion associated with MM). The population was divided in two cohorts according to mutational status, mutated and wild-type patients. The number of MM diagnosed during follow-up was compared between groups.

RESULTS

In the considered period, 64 patients had a histological diagnosis of MH and 12 of them (18.7%) developed MM during follow-up. At the time of diagnosis, 8 patients (12.5%) presented mutation of BAP-1 or MTAP and 7 of them (87.5%) developed MM over time. Out of the 56 wild-type patients, 5 cases of MM were recorded during follow-up (8.9%). The difference in the number of MM between groups was significant (p 0.001).

CONCLUSIONS

When MH is diagnosed, the overall risk of developing MM is not negligible (>15%). This risk dramatically increases (>80%) when BAP-1 and MTAP mutations are present. A specific surgical strategy should be defined for mutated MH given the presence of limited pleural disease at this stage.

Disclosure: No significant relationships.
Keywords: Mesothelial Hyperplasia, Pleural Disease, In Situ Mesothelioma, Thoracoscopy, BAP-1 MTAP.

O-075

EARLY READMISSION AFTER MAJOR LUNG RESECTIONS: ANY MODIFIABLE RISK FACTORS?

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OBJECTIVES
Early readmission (ER) after lung surgery negatively affects 90 days survival and is more likely in patients who had experienced postoperative respiratory complications. The aim of the study was to search for potentially modifiable predictors of ER.

METHODS
The cohort of patients who underwent pulmonary resections for lung cancer from January 2008 to December 2017 was reviewed searching for predictors of ER, defined as an unplanned hospitalization within 30 days after discharge. Among preoperative variables, smoking habit, BMI, and lung function were considered as potentially modifiable. All clinical relevant factors were tested by hierarchical regression model and results presented as adjusted odds ratio (CI 95%). Ninety days survival was analysed by Kaplan Meier curves and comparisons made by the Log rank test.

RESULTS
During the considered period, 1052 patients underwent lung resection. Median FEV1 and Dlco were 93% and 79%, respectively. Lobectomy was performed in 821 cases (78%) and pneumonectomy in 100 cases (9.5%). During hospitalisation, 95 patients (27%) had respiratory complications. After discharge, 26 patients (2.5%) were readmitted during the first month, mainly due to pulmonary events (7), and bronco-pleural fistula (7). Multivariate analysis identified neoadjuvant chemotherapy (OR 3,3; I.C:1,3-8,6), preoperative DLCO <80% (OR 2,9; IC: 1,1-7,4) and postoperative complications (OR 5,1; IC: 2,1 - 12,1) as independent risk factors of ER. Ninety day survival in the ER group was significantly reduced (p <0,0001).
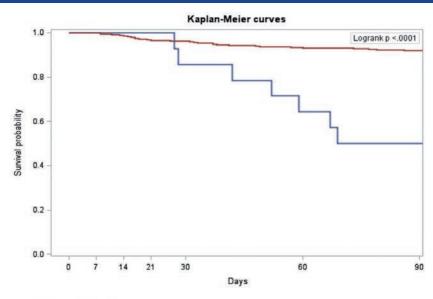
CONCLUSIONS
ER is a rare event but it doubles mortality during the first three months after surgery. Unfortunately, the presented study failed to identify modifiable risk factors of ER, a part from Dlco whose dominant effect could have hidden in the analysis the positive benefits of smoking cessation.

Disclosure: No significant relationships.
Keywords: Early Readmission, Lung Cancer, Modifiable Risk Factors,

Kaplan-Meier curves

Blu line: readmitted patients.
Red line: not-readmitted patients.

O-076

BILATERAL THORACOSCOPY IS ASSOCIATED WITH A REDUCED COMPLICATION RATE AND BETTER COSMESIS IN MINIMALLY-INVASIVE PECTUS EXCAVATUM REPAIR

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OBJECTIVES

Several modifications were put forward to improve Nuss' minimally-invasive pectus excavatum repair. Among them was bilateral thoracoscopy whose effect in reducing complication rates has not been investigated. We therefore analysed its effect on complication rate by comparing the results between two centres using uni- or bilateral thoracoscopy.

METHODS

All minimally-invasive pectus excavatum repairs at two centres conducted between 01.01.2009 and 31.12.2020 were retrospectively included. Bilateral thoracoscopy was utilised in 198 and unilateral right thoracoscopy in 133 patients. We assessed differences between the two groups and analysed possible predictors by logistic regression.

RESULTS

There were no sex differences (χ^2=2.0496, P=0.152) between the groups, but patients that had unilateral thoracoscopy were older by 2.3 years (95% confidence interval: 1.3–3.3, P<0.001). Complications occurred in 74 patients, 4 events were intraoperative, 47 early postoperative, and 35 late postoperative. The adjusted odds ratio for all complications was five times higher if only unilateral thoracoscopy was used (95% confidence interval: 2.72–9.17, P<0.001) and also increased by each year of age by 1.08 (95% confidence interval: 1.01–1.15, P=0.023), but was neither influenced by sex or the number of bars. For early postoperative complications, the result was similar: Unilateral thoracoscopy was associated with an increased adjusted odds ratio of 3.24 (95% confidence interval: 1.59–6.57, P<0.001), but not with other factors. Late postoperative complications were associated with unilateral thoracoscopy by an adjusted odds ratio of 13.63 (95% confidence interval: 4.51–41.22, P<0.001) and also male sex (adjusted odds ratio: 5.34, 95% confidence interval: 1.18–24.11, P=0.029). Likewise, a negative cosmetic outcome was also associated to unilateral thoracoscopy (adjusted odds ratio: 7.45, 95% confidence interval: 1.48–37.34, P=0.006).

CONCLUSIONS

Unilateral thoracoscopy in minimally-invasive pectus excavatum repair was associated with an increased chance of complications, particularly postoperative complications. Prospective research is necessary to corroborate this finding.

Disclosure: No significant relationships.
Keywords: Funnel Chest, Nuss Repair, Operative Technique, Complication Rate.

TUESDAY 21 JUNE 2022
INTERESTING CASES
14:30 - 15:30

O-077

CASE REPORT AND MANAGEMENT OF BILATERAL PNEUMOTHORACES FOLLOWING SINGLE CRYOPROBE TRANSBRONCHIAL LUNG BIOPSY IN LUNG TRANSPLANT RECIPIENT

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OBJECTIVES
Herein we describe the first reported case of bilateral pneumothoraces following unilateral surveillance Cryoprobe transbronchial lung biopsy (Cryo-TBB) in a patient treated with bilateral lung transplantation via bilateral thoracotomy.

CASE DESCRIPTION
A 52-year-old man received, in March 2020, a bilateral sequential lung transplantation through bilateral anterolateral thoracotomy for cystic fibrosis-related end-stage lung disease. After six months he underwent fibre-optic bronchoscopy and Cryo-TBB following the surveillance protocol of our Center. The patient had moderate sedation. Bronchoalveolar lavage was done from the middle lobe while a single Cryo-TBB (sample diameter 0,5 cm) was taken from the right lower lobe. The procedure was well tolerated. During post-procedural monitoring, a decrease in patient blood oxygen saturation was detected (from 99% to 92%). Severe bilateral pneumothoraces were detected at the one-hour post-procedural chest X-ray. A 24Ch right chest tube was placed emergently in fifth intercostal space on the anterior axillary line with immediate air leak. At the subsequent chest X-ray, we could see a complete resolution of pneumothorax on both sides. The chest tube was removed the day after and the patient was discharged in the second post-operative day.

CONCLUSIONS
In this case report we can notice that lung transplantation can produce pleuropleural communication ("buffalo chest") even without a direct mediastinum involvement. Moreover, a unilateral procedure such as Cryo-TBB, usually considered safe, can lead to late and life-threatening complications. Besides we demonstrate that bilateral pneumothoraces can be treated safely with a monolateral procedure (chest tube positioning) exploiting that pleuropleural communication. With the increase in number of lung transplantation procedures worldwide, we think that it is important to understand what complications can occur in such patients and how to manage them.

Disclosure: No significant relationships.
Keywords: Lung Transplantation; Cryoprobe Transbronchial Lung Biopsy; Bilateral Pneumothoraces.

O-078

EXTRAPLEURAL PNEUMONECTOMY (EPP) WITH VENO-ARTERIAL-VENOUS EXTRACORPOREAL MEMBRANE OXYGENATION (VAV-ECMO) SUPPORT FOR PRIMARY PULMONARY SYNOVIAL SARCOMA IN A YOUNG ADULT

Ahmed Hamdouna[1], Torsten Richter[2], Ana Beatriz Almeida[1], Christian Reeps[2], Michael Schweigert[1]
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[2]University Hospital Carl Gustav Carus, Dresden, Germany

OBJECTIVES
Primary pulmonary sarcomata are uncommon tumor entities in young adults. Only limited experience exists regarding the application of VAV-ECMO for extensive thoracic surgery in this age group. In this report, we present the case of a 33-year-old woman who underwent EPP for synovial sarcoma of the lung.

CASE DESCRIPTION
A 33-year-old healthy young woman started to complain about shortness of breath for several weeks. Ultrasound showed a mass and computed-tomography revealed a huge tumor occupying the whole right chest and displacing the mediastinum to the opposite side. Percutaneous biopsy showed a solitary fibrous tumor (SFT) and therefore surgery without induction therapy was advised by the multidisciplinary team meeting. Surgery in lateral position was made severely difficult by the size and weight of the tumor with subsequent compression of vital mediastinal structures. Therefore, we decided to apply VAV-ECMO for extracorporeal circulatory and respiratory support.

VAV-ECMO was established via open inguinal cannulation of the right femoral vein and artery and via percutaneous cannulation of the right jugular vein. The patient was then placed into lateral position and underwent thoracotomy. The tumor displaced but did not invade the large vessels and the heart. EPP with resection of parts of the right diaphragm was carried out. VAV-ECMO allowed stable conditions throughout the procedure despite the substantial weight of the mass and the considerable displacement of the airways and vessels. Following surgery decannulation took place in the OR.

Instead of SFT pathology showed synovial sarcoma of the lung (KI-67% proliferation index 20%). The postoperative course was largely uneventful. The MDT meeting recommended adjuvant chemotherapy.

CONCLUSIONS
VAV-ECMO is an excellent tool to establish functional operability in cases of huge tumors compressing vital mediastinal structures. Stable circulation and gas exchange allow technically demanding surgery under safe conditions. Our case illustrates that EPP under VAV-ECMO support is an option for selected patients.

Disclosure: No significant relationships.
Keywords: ECMO, ECLS, Pulmonary Sarcoma, Extrapleural Pneumonectomy.
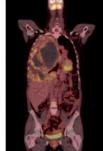
Fig. 1 A

Fig. 1 B

Fig. 1 C

Fig. 1 D

O-079

MINIMALLY INVASIVE INTRAPLEURAL VACUUM THERAPY WITH INSTILLATION AND SIMULTANEOUS ENDOBRONCHIAL VALVE PLACEMENT IN THE MANAGEMENT OF POSTOPERATIVE BRONCHOPLEURAL FISTULA AND RECURRENT EMPYEMA AFTER LOWER LOBE RESECTION FOR PULMONARY ABSCESS AND PLEURAL EMPYEMA

Sameer Hammoudeh[1], Sebastian Stange[1], Claus Steppert[2], Zsolt Sziklavari[1]
[1]Department of Thoracic Surgery, Coburg, Germany
[2]Department of Pulmonology, Coburg, Germany

Tuesday P.M.
Abstract 077–082

OBJECTIVES
A 60-year-old man was readmitted with a complex recurrent empyema and bronchopleural fistula (BPF) after an extended left lower lobe resection via double thoracotomy for pulmonary abscess and empyema. He suffered initially from no postoperative complications until 3 months. The computed tomography showed a dorso-basal-cavity (6 cm) intrapleural. To avoid major reoperation with the risk of losing the remaining lobe, the decision was made to proceed with a novel minimally invasive approach consisting of intrapleural vacuum therapy with antiseptic instillation (Mini-VAC-Instill) and intrabronchial valve implantation simultaneously.

CASE DESCRIPTION
A stump-insufficiency was ruled out. The VATS confirmed a BPF (B5) and local pleural empyema. We performed here a Mini-VAC-Instill (125 mm Hg) with periodically hypochlorous acid lavage. In addition, to close the BPF, a 7 mm spiral valve was endobronchial inserted. He was early discharged after 10 days of treatment, the sponge was changed once a week (outpatient) without general anesthesia. Nine weeks later, there was a visible clearing and significant volume reduction of the cavity, without antibiotics. After valve removal, no leakage was evident. The remaining small residual space was filled up with gentamicin-collagen-sponge and a secondary wound closure was performed on the 63. postoperative day. No recurrence was observed during the 6 months follow-up time.

CONCLUSIONS
This is the first case presentation of an outpatient and minimally invasive BPF and recurrent empyema treatment with Mini-VAC-Instill and endobronchial valve implantation after extended lobectomy.
In order to reduce the risk of major surgical trauma after double thoracotomy, we decided on an interdisciplinary basis to perform a simultaneously and outpatient minimally invasive intrapleural and endobronchial therapy.
In comparison to extended redo surgery, length of hospital stay was extremely short. Also, the patient had almost no pain and regained mobility much faster. The minimally invasive combination of intrabronchial and intrapleural treatment seems to be safe and effective.

Disclosure: No significant relationships.
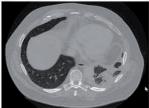**Keywords:** Empyema, VAC, BPF, Recurrent, Valve.

O-080

BILATERAL LUNG TRANSPLANTATION AND GIANT PULMONARY ARTERY ANEURISM RECONSTRUCTION WITH AORTA GRAFT IN A WOMAN WITH PULMONARY HYPERTENSION

<u>David Poveda Chavez</u>[1], Elie Fadel[2], William Lorenzi[2], Jean Baptiste Menager[2], Francesco Cassiano[2]
[1]Reina Sofia University Hospital, Cordoba, Spain
[2]Marie Lannelongue, Paris, France

OBJECTIVES

Aneurysm of pulmonary artery (PA) is a rare but severe complication in patients suffering from pulmonary arterial hypertension (PAH). For these patients, lung or heart-lung transplantation is the only definitive therapy available. This case aims to show a reconstruction strategy of the mismatch PA with donor aorta.

CASE DESCRIPTION

A 51-year-old woman with a history of hereditary pulmonary hypertension and a giant PA aneurysm extending to the left branch, underwent Bilateral-LTx. The operation required cardiopulmonary bypass (CPBP). After right pneumonectomy, the main PA was dissected and divided close to the valve. The right graft hilum attached the main PA trunk that passed behind the SVC and aorta and was anastomosed close to pulmonary valve.

Donor aorta segment was needed to create a left PA. Its proximal extreme was implanted to PA trunk and clamped to start the right graft reperfusion. Next, the distal aorta graft passed through a space created at the posterior pleura, behind phrenic nerve, and was anastomosed to the left PA. Left bronchus and vein was implanted as standard technique.

Total lung ischemic time was 275 min (right) and 325 min (left) respectively. CPBP: 219 min. Postoperative echography shows good left and right ventricles function, no dilated right chambers.

During her post-LTx ICU-stay, patient presented hypovolemic shock and vasoplegic state with blood content in the drains that improved after hemostasis was corrected. Vasoactive amines are withdrawn at 2 POD and the patient is extubated at 3 POD. The evolution was satisfactory.

CONCLUSIONS

Pulmonary aneurysm can be a complicating factor in PAH as in this case. Bilateral-LTx is the preferred option when right and left ventricle function is preserved.
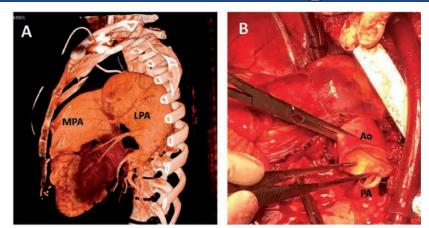The pulmonary trunk of the recipient can be reconstructed with the donor aorta.

Disclosure: No significant relationships.
Keywords: Pulmonary Artery Aneurysm, Lung Transplant, Pulmonary Hypertension.

O-081

NOVEL METHOD FOR COSTO-CLAVICULAR JOINT REPAIR AND RECONSTRUCTION

Nestor Ivan Quiroga, David Sanchez, Marc Boada, Pablo Paglialunga, Leandro Grando, Carlos Guerrero, Angela Guirao, Irene Bello, Laureano Molins
Thoracic Surgery - Hospital Clinic i Provincial Barcelona, Barcelona, Spain

OBJECTIVES
Localized primary sternal tumors and metastases can be treated with resection and reconstruction with good oncological results. New prothesis offer chest stability and mechanical breathing. However, the sternoclavicular joint reconstruction is a challenge, in order to prevent difficulties in upper extremities movements. Expensive prothesis have been proposed in this cases. We propose an effective and cheap alternative of reconstruction.

CASE DESCRIPTION
We show the case of a 73-years-old patient with history of resected breast carcinoma in 2003 and currently biopsy proven metastatic sternal lesion and a PET-Scan without additional lesions. The patient is proposed for sternal, manubrium, the clavicular heads and costal cartilages resection. A titanium sternal prosthesis with 3 rib bars in each side were placed. As a novel method, we performed a hole in both clavicles and Otholox-type tapes were passed through these, emulating the sterno-clavicular joint. Both pectoral muscles were approximated in the midline to cover the prothesis. No type of flap was used.
The patient was extubated intraoperatively, without manifesting paradoxical breathing or any restriction of the thoracic cage, maintaining mediastinal drainage until 3 postoperative days. The esthetical results un the sternoclavicular joint were excellent as well as the upper extremities movements. Patient didn't present postoperative complication, and was discharged the day 4 after surgery. One month after surgery the patient continued with good results.
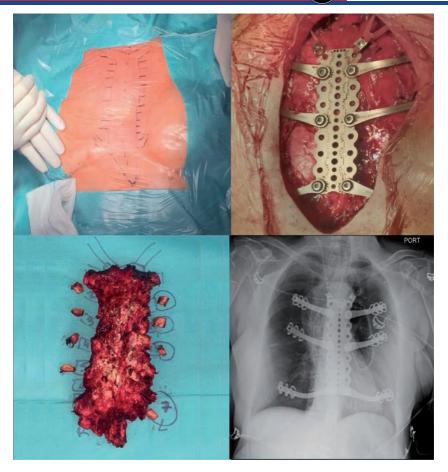
CONCLUSIONS
Chest wall resections alter respiratory mechanics, this being the main inconvenience in the postoperative period. When part of the shoulder girdle is resected, the problem of mobility of the upper extremities is added. In the presented case we show a cheap and effective option of sternoclavicular joint reconstruction that allowed a good shoulder girdle mobility in addition to a stable sternum, thus allowing mobility in the upper extremities similar to pre-operative ones, as well as adequate ventilatory mechanics, preventing mucosal stasis and infections.

Disclosure: No significant relationships.
Keywords: Sternectomy, Reconstruction, Prosthesis, Novel Technique, Breast Cancer.

Tuesday P.M.
Abstract 077–082

O-082

LUNG TRANSPLANT AFTER 6 MONTHS OF EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) SUPPORT FOR SARS-COV-2 INDUCED PULMONARY FIBROSIS

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OBJECTIVES

So far, few cases of lung transplantation have been reported in patients with SARS-CoV-2 induced acute respiratory distress syndrome (ARDS), after the first transplant performed in China in 2020. Even fewer cases of patients undergoing bilateral lung transplantation after months of ExtraCorporeal Membrane Oxygenation (ECMO) support, have been reported. We present the case of a patient who underwent bilateral lung transplantation after more than 6 months of support with ECMO for SARS-CoV-2 ARDS with fibrotic progression of the disease.

CASE DESCRIPTION

Here we present the case of a 57 years old man with no history of previous lung diseases. He contracted SARS-CoV-2 infection in May 2021 with respiratory failure requiring immediate hospitalization in intensive care unit with subsequent tracheostomy and need for support through VV-ECMO. He turned SARS-CoV-2 negative, but later progressed into a pulmonary interstitial disease. During the hospitalization, he resulted positive to numerous multidrug-resistant bacterial agents for which maximal antibiotic therapy was prescribed. Bilateral lung transplantation was performed in November 2021. One month after the transplant, the respiratory conditions worsened with isolation of A. Baumanni and Pseudomonas through bronchoscopic evaluation. Pleural effusion was found and then drained. A2-DSA and DQ2-DSA were discovered. Transbronchial lung biopsies were also performed which documented acute rejection. High dose corticosteroids therapy and NIMV ventilation were set, with progressive improvement of symptoms. After two months of hospitalization he was discharged without necessity of oxygen therapy and autonomous in carrying out daily activities.

CONCLUSIONS

In selected patients with development of ARDS and pulmonary fibrosis from SARS-CoV-2 infection, lung transplantation can be considered as the last therapy, when other supportive ones have failed. However, the criteria for patient selection and timing of lung transplantation have yet to be discussed on larger patient cohorts and with a longer follow up.

Disclosure: No significant relationships.
Keywords: Lung Transplantation, SARS-CoV-2, Pulmonary Fibrosis, ECMO.

TUESDAY 21 JUNE 2022
TRANSPLANT AND AIRWAY
15:30 - 15:37

O-083

COMPARISON OF LIVING-DONOR LOBAR LUNG TRANSPLANTATION AND CADAVERIC LUNG TRANSPLANTATION FOR PULMONARY HYPERTENSION

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OBJECTIVES
Living-donor lobar lung transplantation (LDLLT) is a life-saving procedure for critically ill patients with various lung diseases including pulmonary hypertension (PH). However, because only one or two lobes are implanted, there are obvious concerns regarding whether heart failure with pulmonary edema may develop after LDLLT. The purpose of this study was to compare the preoperative condition and outcome of LDLLT with those of conventional cadaveric lung transplantation (CLT) for patients with PH.

METHODS
Between December 2010 and December 2021, we performed 34 lung transplants including 12 LDLLTs (5 single and 7 bilateral) and 22 CLTs (all bilateral) for PH. Preoperative variables and early and late outcomes were retrospectively compared between the two procedures.

RESULTS
The average age was significantly younger in the LDLLT group than the CLT group (16.5 y vs 30.7 y, p = 0.007). Based on preoperative variables of less ambulatory ability (50 vs 100%, p < 0.001) and higher proportion of WHO class 4 (83.3 vs 18.2%, p < 0.001), LDLLT patients were more debilitated than CLT patients. LDLLT patients tended to require postoperative ECMO support more frequently than CLT patients (41.7 vs 18.2%, P = 0.282), however, hospital death was similar between the two groups (8.3 vs 9.1%, p > 0.99). One and 5-year survival rates were also similar between the two groups (90.0 and 90.0% vs 90.9 and 75.5%, P = 0.49, Figure). All living donors returned to their previous lifestyles without restriction.
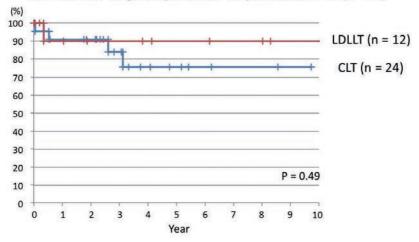
CONCLUSIONS
Although LDLLT patients with PH were sicker preoperatively and tended to require more frequent ECMO support postoperatively than CLT patients with PH, LDLLT patients demonstrated survival rates similar to CLT patients. LDLLT is a viable option for patients with PH.

Disclosure: No significant relationships.
Keywords: Lung Transplantation, Pulmonary Hypertension, Living-Donor Lobar Lung Transplantation, Cadaveric Lung Transplantation.

Survival after lung transplantation for patients with PH (n = 34)

O-084

THE OUTCOME OF ENDOSCOPIC DILATATION OF BENIGN AIRWAY STENOSIS IN RELATION TO CORONAVIRUS-19 (COVID-19) INFECTION: RESULTS OF A MULTICENTER STUDY

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OBJECTIVES
Benign subglottic/tracheal stenosis is a life-threatening condition commonly caused by prolonged endotracheal intubation or tracheostomy. Most of patients affected by COVID-19 infection need prolonged tracheal intubation and/or tracheostomy. Due to the spread of the COVID-19 pandemic, the number of patients with airway stenosis is likely to increase in the future. This patient cohort often is unfit for surgery and endoscopic treatment remains the first choice for symptoms relief. Herein, we evaluated whether COVID-19 infection affected the outcome of patients undergoing endoscopic dilatation of airway stenosis.

METHODS
It was a retrospective observational multicenter study including consecutive patients with benign subglottic/tracheal stenosis undergoing endoscopic dilatation with at least 3 months follow-up. The outcome of patients with airway stenosis after COVID-19 infection was compared with that of patients without COVID-19 infection in relation to length, location, and grade of stenosis and procedure type. Then, a multivariate analysis identified the risk factors for recurrence.

RESULTS
Seventy nine patients were included in the study; 23 (29%) of these developed airway stenosis after COVID-19 infection. COVID patients compared to control group presented a higher rate of stenosis due to prolonged intubation (82% vs. 43%;p=0.0014) while no other differences were found regarding demographic data, characteristics of stenosis and procedure type (Table 1). Nineteen (25%) patients had recurrence after first dilatation (23% for No-COVID vs. 26% for COVID group; p=0.78), and in 11 (14%) of these the stenosis recurred also after repeated dilatation procedures (12% for No-COVID vs. 17% for COVID group; p=0.57). Grade I-II (p=0.001), tracheal location (p=0.004) and no laser use (p=0.01) were predictive factors of favorable final results.

CONCLUSIONS
COVID-19 infection did not affect the final outcome of endoscopic treatment of airway stenosis, thus the treatment of these patients should not differ from that of general population.

Disclosure: No significant relationships.
Keywords: Airway Stenosis, Endoscopic Dilatation. COVID-19 Infection.

Variables	All patients (n=79)	No-COVID group (n=56)	COVID group (n=23)	p-Value
Gender (male)	51 (64%)	33 (56,5%)	18 (78%)	0.07
Age	53±18	51±10	56±21	0.15
Etiology of stenosis • Prolonged Intubation • Previous tracheostomy	43 (54%) 36 (46%)	24 (43%) 32 (57%)	19 (82%) 4 (18%)	0.0014
Location of stenosis • Subglottic • Trachea	23 (29%) 56 (71%)	16 (28%) 40 (72%)	7 (30%) 16 (70%)	0.86
Grade of stenosis (Cotton classification) • I grade (<50%) • II grade (51%-70%) • III grade (>71%)	18 (23%) 41 (52%) 20 (25%)	12 (21%) 31 (55%) 13 (23%)	6 (26%) 10 (43%) 7 (30%)	0.65 0.34 0.50
Vertical lenght of stenosis (mm)	18±8.5	18±4.8	17±9.1	0.29
Type of procedure • Dilatation alone • Laser + dilatation	60 (76%) 19 (24%)	40 (71%) 16 (29%)	20 (87%) 3 (13%)	0.14
Number of endoscopic interventions	1.3±0.8	1.3±0.4	1.4±7.1	0.59
Recurrence	19 (25%)	13 (23%)	6 (26%)	0.78
Failure and other treatments • Stent insertion • Tracheostomy • Surgery	11 (14%) 9 (11%) 1 (1%) 1 (1%)	7 (12%) 6 (11%) 0 1 (2%)	4 (17%) 3 (13%) 1 (4%) –	0.57

Tuesday P.M.
Abstract 063-088

O-085

INFLUENCE OF DE NOVO MALIGNANCIES ON LONG-TERM SURVIVAL AFTER LUNG TRANSPLANTATION

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OBJECTIVES
To analyze the incidence of the novo malignancies in patients after lung transplantation and their influence on long-term outcomes and survival in a large cohort of lung transplants.

METHODS
Retrospective review of 731 consecutive lung transplants from 1994 to 2021 in a single center. Donor and recipient demographic and clinical data, transplant indication and type, and number and location of malignancies were recorded. Patients with and without malignancies were compared by univariable and multivariable analyses. Survival was compared with Kaplan-Meier and Cox regression analysis.

RESULTS
There were 731 patients (509M/222F; 47±16 years old) transplanted for COPD (38%), pulmonary fibrosis (23%), cystic fibrosis (20%), and other indications (19%). 367 (51%) single lung transplants, 359 (49%) double lung transplants, and 5 combined liver-lung transplants. Malignancies developed in 91 patients (12,4%) with a related mortality of 47% (43 cases). Native lung cancer, digestive and hematological malignancies were associated with higher lethality (table). Malignancies were more frequent in males (81%; p=0.005), transplanted for COPD (55%; p=0.003), with cyclosporine-based immunosuppression (58%; p<0.001), and undergoing single lung transplants (65%; p=0.011). Survival was worse in patients with malignancies (overall) and with native lung cancer. Survival at 3, 5, 7, 10 years (without vs. with malignancies): 85%, 76%, 70%, 64% vs. 83%, 70%, 60%, 51%, p<0.001. Survival at 3, 5, 7, 10 years (without vs. with lung cancer): 85%, 76%, 70%, 63% vs. 76%, 43%, 31%, 11%, p<0.001. Independent risk factors for mortality were cyclosporine-based immunosuppression (OR 1.8; 95%CI: 1.3-2.4; p<0.001) and de novo lung cancer (OR 2.6; 95%CI: 1.5-4.4; p<0.001).

CONCLUSIONS
De novo malignancies are an important source of morbidity and mortality following lung transplantation that should not be neglected. Especially, those single lung transplants for COPD are at risk of mortality due to lung cancer in the native lung.

Disclosure: No significant relationships.
Keywords: Lung Transplantation, Malignancies, Outcomes, Survival.

Tumor site	n (%)	Lethality n (%)	Post-transplant time to diagnosis (months)	95%CI (months)
Lung	22 (24)	17 (77)*	52 ± 42	33 - 71
Digestive	9 (10)	8 (89)*	79 ± 70	24 - 133
Hematological	14 (15)	10 (71)*	72 ± 34	52 - 91
Skin	27 (30)	3 (11)	66 ± 51	46 - 86
Urological	8 (10)	1 (12)	74 ± 67	17 - 130
ORL	3 (3)	1 (33)	89 ± 43	16 - 196
Neurological	2 (2)	1 (50)	54 ± 36	
Breast	2 (2)	1 (50)	13 ± 10	
Gynecological	3 (3)	0	33 ± 11	
Sarcoma	1 (1)	1 (100)		

O-086

EXTUBATION BY SUPRAGLOTTIC AIRWAY AFTER LOBECTOMY PREVENT PROLONG COUGHING AND AIR LEAKAGE

Hironori Ishibashi[1], Ryo Wakeshima[2], Yuri Sumi[1], Ryosuke Kumagai[2], Katsutoshi Seto[1], Shunichi Baba[2], Yasuyuki Kurihara[1], Kenichi Okubo[2]
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[2]*Tokyo Medical and Dental University, Tokyo, Japan*

OBJECTIVES

Double-lumen endobronchial tubes (DLTs) is necessary for differential lung ventilation but is likely causes coughing at extubation of DLT and prolonged cough associated with an increased risk for parenchymal air leak due to lung injury because they were long, rigid and irritable. We reported the efficacy of supraglottic airways (SGAs) to prevent coughing at extubation after lobectomy (ESTS 2013 and ESTS 2018).

The aim of this study is to evaluate the efficiency of SGA at extubation after pulmonary lobectomy.

METHODS

Among 1301 patients who underwent lobectomy for primary lung cancer at our institute between April 2010 and September 2021 were examined retrospectively. We applied conventional extubation of DLTs (DLT group) until December 2012 and SGA before awakening under adequate anesthesia for all patients since January 2013 (SGA group).

The following parameters were evaluated: gender, age, surgical approach, duration of operation and anaesthesia, management for intraoperative air leakage, coughing at extubation, sore throat on POD 2/7/28, postoperative cough on POD 2/7/28, prolonged air leakage (> POD5), duration of postoperative stay, use of antitussitus.

RESULTS

Among 1301 patients, 550 patients were in DLT group and 751 patients in SGA group. There were no significant differences between these two groups in Male, surgical approach, emphysema, and operative time. Coughing at extubation was found in only DLT group 100 in 550 patients (18.2%); $p < 0.01$. Sore throat (24.1% vs. 0%; $p < 0.01$), postoperative cough on POD 2 (22.1% vs. 1.2%; $p < 0.01$), sore throat on POD 2 (30.9% vs. 2.1%; $p < 0.01$), prolonged air leakage on 5 POD (25.2% vs. 13.2 %; $p < 0.01$), and use of antitussitus (13.1% vs. 0.3 %; $p < 0.01$), were significantly lower in SGA group.

CONCLUSIONS

SGA is effective in preventing coughing at extubation, prolonged coughing, or sore throat and prolonged air leakage after lobectomy.

Disclosure: No significant relationships.
Keywords: Lobectomy, Air Leakage, Cough.

O-087

A NOVEL ARTIFICIAL TRACHEA USING A POLYGLYCOLIC ACID TUBE IN A RAT CERVICAL TRACHEAL DEFECT MODEL

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OBJECTIVES
To verify the effect of a polyglycolic acid (PGA) artificial trachea.

METHODS
PGA fibers were layered in the shape of a tube. Experiments were performed using a semicircular tracheal defect (critical size defect) in rat. The defect was covered with the material (Fig. a) and the implantation site was evaluated both morphologically and functionally two weeks, one month, two months, and six months after the surgery using the following four categories; 1: bronchoscopy, 2: pathology, 3: regenerated ciliary area (%, electron microscope), 4: ciliary beat frequency (Hz) and transport function (high-speed camera). The transport function was measured through the moving distance of the microspheres dropped onto the trachea (μm/sec). The ciliary beat and transport function in the center of the PGA were compared with the ones (12 Hz and 30 μm/sec) in the normal area in each period (n = 5).

RESULTS
1: Neither stenosis nor granulation were observed in each period. Neovascularization across the material was bronchoscopically observed after one month (Fig. b). 2: No inflammatory reaction was observed. Regenerated cilia were observed and gradually increased after two weeks. Chondrocyte regeneration was observed in the center of the PGA after six months (Fig. c). 3: The area of regenerated cilia was 13.0, 28.8, 30.4, and 30.2%, respectively (Fig. d) and significantly increased from two weeks to one month (p = 0.0216). 4: The average frequency in each period was 7.00, 6.90, 8.15, and 10.29 Hz, respectively. The ciliary frequency significantly improved from two weeks to six months (p = 0.0122). The average function was 5.65, 12.39, 15.06, and 19.57 μm/sec, respectively. The transport function significantly improved from two weeks to two months (p = 0.0216).
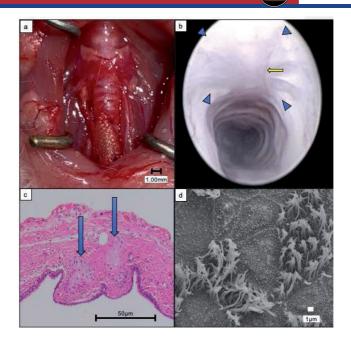
CONCLUSIONS
The novel PGA tube showed excellent biocompatibility and tracheal regeneration both morphologically and functionally six months after surgery.

O-088

IMPLANTING THE RIGHT LUNG FIRST IN OFF-PUMP SEQUENTIAL SINGLE-LUNG TRANSPLANTATION LOWERS THE NEED FOR INTRAOPERATIVE ECMO WITH LESS PRIMARY GRAFT DYSFUNCTION

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[1]University Hospitals Leuven, Leuven, Belgium
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OBJECTIVES

In selected patients, double-lung transplantation (Tx) can be performed off-pump by sequential single-lung (SSL) implantation. To avoid ECMO implantation for acute right heart failure, the choice for the first side is usually dictated by the lung with lowest perfusion on pre-Tx scintigraphy.

Conversely, we hypothesise that implanting the right lung first, despite a higher proportional perfusion ($\geq$50-75%), may result in lower need for intraoperative ECMO and less primary graft dysfunction (PGD).

METHODS

We reviewed all 774 SSLTx procedures between 2008-2020. Bridge-to-Tx with ECMO, lobar or combined organ Tx, strict need for ECMO, or cardiopulmonary bypass were excluded (n=125).

In 649 patients, SSLTx was started with a-priori intention to continue off-pump (table). We focused on the 381 patients with $\geq$50% pre-Tx perfusion on the right side. These were divided into two groups: left lung implanted first [LF] versus right lung implanted first [RF].

The need for and timing of intraoperative ECMO, PGD grade 3 within 72 hours, mechanical ventilation, tracheostomy, ICU/hospital stay, and hospital survival were analysed.

RESULTS

Intraoperative ECMO support was needed in 20% for [LF] versus 9% for [RF] (p=0.0018). ECMO was needed to implant the first graft in 6% in both groups. ECMO was initiated during the second side in 14% in [LF] versus 3% in [RF] (p<0.0001).

PGD 3 within 72 hours was 34% in [LF] versus 23% in [RF] (p=0.0231). No significant differences were seen in other outcome parameters (table).

CONCLUSIONS

In most patients off-pump SSLTx is possible with good outcome and PGD incidence within the internationally reported range. Implanting the right lung first, despite higher proportional pre-Tx perfusion ($\geq$50-75%), results in a lower need for intraoperative ECMO and less PGD 3. We speculate that the larger vascular bed of the right lung makes the graft less susceptible for reperfusion edema during implantation of the left lung graft.

Disclosure: No significant relationships.
Keywords: Off-Pump, Lung Transplantation, ECMO, Primary Graft Dysfunction.

Perfusion on pre-Tx scintigraphy		Right <50%		Right ≥50%		
	N	268		381		
First side implanted		Left	Right	Left - [LF]	Right - [RF]	p-value
	N	23	245	184	197	
Donor characteristics						
Age (years)	median (IQR)	53 (28-62)	50 (39-61)	51 (41-61)	52 (41-61)	0.4900 (ns)
Female	n/N %	6/23 (26%)	112/245 (46%)	88/184 (48%)	96/197 (49%)	0.9183 (ns)
Mechanical Ventilation (hours)	median (IQR)	72 (25-144)	70 (38-122)	58 (33-111)	68 (45-126)	0.0148*
PaO2/FiO2 ratio	median (IQR)	459 (411-484)	445 (375-496)	441 (381-506)	432 (390-497)	0.4740 (ns)
DCD	n/N (%)	3/23 (13%)	62/245 (25%)	42/184 (23%)	48/197 (24%)	0.8094 (ns)
DBD	n/N (%)	20/23 (87%)	183/245 (75%)	142/184 (77%)	149/197 (76%)	
Smoking History	n/N (%)	5/20 (25%)	79/228 (35%)	54/162 (33%)	62/174 (36%)	0.7306 (ns)
Normal chest X-ray	n/N (%)	11/17 (65%)	111/172 (65%)	85/140 (60%)	96/144 (67%)	0.3245 (ns)
Recipient characteristics						
Age (years)	median (IQR)	56 (48-60)	58 (49-61)	57 (49-61)	58 (51-62)	0.0584 (ns)
Female	n/N (%)	7/23 (30%)	122/245 (50%)	92/184 (50%)	101/197 (51%)	0.8378 (ns)
Indication emphysema	n/N (%)	14/23 (61%)	162/245 (66%)	102/184 (56%)	130/197 (66%)	0.0363*
Indication ILD	n/N (%)	3/23 (13%)	32/245 (13%)	51/184 (27%)	35/197 (18%)	0.0270*
Indication CF	n/N (%)	4/23 (17%)	37/245 (15%)	17/184 (9%)	24/197 (12%)	0.4096 (ns)
Indication other	n/N (%)	2/23 (9%)	14/245 (6%)	14/184 (8%)	8/197 (4%)	0.1869 (ns)
50% ≤ perfusion right lung ≤75%	n/N (%)	NA	NA	171/184 (93%)	196/197 (99%)	0.0006***
2008-2012	n/N (%)	15/23 (65%)	70/245 (29%)	93/184 (51%)	45/197 (23%)	
2013-2016	n/N (%)	7/23 (30%)	79/245 (32%)	76/184 (41%)	51/197 (26%)	<0.0001****
2017-2020	n/N (%)	1/23 (5%)	96/245 (39%)	15/184 (8%)	101/197 (51%)	
Outcome						
Need for intra-operative ECMO	n/N (%)	2/23 (9%)	19/245 (8%)	37/184 (20%)	17/197 (9%)	0.0018**
ECMO during first side	n/N (%)	2/23 (9%)	11/245 (5%)	12/184 (6%)	12/197 (6%)	>0.9999 (ns)
ECMO during second side	n/N (%)	0/23 (0%)	8/245 (3%)	25/184 (14%)	5/197 (3%)	<0.0001****
PGD3 T0-T72	n/N (%)	2/23 (9%)	75/245 (30%)	63/184 (34%)	46/197 (23%)	0.0231*
Mechanical ventilation (days)	median (IQR)	3.0 (2-4)	2.0 (2-4)	3.0 (2-4)	2.0 (1-4)	0.5898 (ns)
Tracheostomy	n/N (%)	3/23 (13%)	22/245 (9%)	18/184 (10%)	21/197 (11%)	0.8661 (ns)
ICU stay (days)	median (IQR)	5.0 (4-10)	5.0 (3-10)	6.0 (4-12)	6.0 (4-10)	0.1639 (ns)
Hospital stay (days)	median (IQR)	28 (24-30)	28 (22-37)	29 (23-39)	27 (23-38)	0.8004 (ns)
Hospital survival	n/N (%)	22/23 (96%)	236/245 (96%)	182/184 (99%)	192/197 (97%)	0.4525 (ns)

TUESDAY 21 JUNE 2022
INNOVATIVE/EXPERIMENTAL II
15:30 - 16:30

O-089

PAIN OUTCOMES AFTER RIB FIXATION FOR ACUTE CHEST TRAUMA: A RETROSPECTIVE MATCHED-COHORT STUDY

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OBJECTIVES
Rib fractures present heavy pain and functional burdens. Surgical stabilisation of rib fractures (SSRF) improves mortality, morbidity, and length of stay (LOS). However, the literature is limited regarding functional outcomes after SSRF. Our primary outcome was to determine if SSRF reduced pain in patients with acute rib fractures compared to non-operative management. Our secondary outcomes were return to work (RTW) and quality of life (QOL).

METHODS
A retrospective matched cohort study was conducted of patients with rib fractures between 2008-2020. Inclusion and exclusion criteria were applied to ensure relevance to the study. All eligible patients who underwent surgery were matched by age and date and severity of injury (AIS ≥3) to non-surgically managed patients. Validated PROMs were used to collect data: the Brief Pain Index (BPI), the Work Productivity and Activity Impairment Instrument (WPAI), and the EQ-5D-5L for pain, RTW, and QOL respectively.

RESULTS
Of 1841 trauma patients with rib fractures 66 underwent SSRF. After inclusion and exclusion criteria, 38 pairs of patients were eligible; 30 pairs (79%) completed the questionnaires. Time from injury ranged from 12-96 months. There was no significant difference in pain (p=0.82) or pain interference scores between the two groups. Less patients who had SSRF were using opiate medication, but the difference was not significant (p=0.36). There was no difference in RTW or QOL scores. Importantly, the SSRF group had significantly higher hospital LOS (p=0.03) and ICU LOS (p=0.02), indicating a difference in the injury profile of the two groups.

CONCLUSIONS
Patients who undergo SSRF for rib fractures have similar pain, RTW and QOL scores compared to patients managed conservatively. However, retrospective comparison studies in this patient population are challenging due to the confounding factors of polytrauma injuries and lack of an appropriate comparison group. Further prospective studies are needed to determine outcomes of SSRF versus conservative management.

Disclosure: No significant relationships.
Keywords: Rib Fractures, Rib Fixation, Pain Scores, Return To Work, Patient-Reported Outcome Measures.

		Pre-Injury Non-Fixed	Fixed	p-value	Post-Injury Non-Fixed	Fixed	p-value
Employed	**Not Employed**	14 46.7%	9 30%	0.304	18 60%	14 46.7%	0.147
	Non-Physically Demanding	3 10%	4 13.3%		2 6.7%	3 10%	
	Physically Demanding	13 43.3%	17 56.7%		10 33.3%	13 43.3%	
Rib Fracture Work Hrs Missed 7 days (IQR, Range)		0	0	1.000	0 (IQR 0, Range 0-15)	0 (IQR 0, Range 0-12)	0.983
Other Reasons Work Hrs Missed 7 days (IQR, Range)		0	0 (IQR 0, -35)	0.154	0	0 (IQR 0, Range 0-20)	0.154
Hrs Worked 7 days (IQR, Range)		20.0 (IQR 0-40, Range 0-60)	40.0 (IQR 0-45, Range 0-72)	**0.019**	0 (IQR 0-30, Range 0-60)	0 Range 0-40) Range 0-48)	0.237
Productivity Affected (Scale 1-10)		0	0	1.000	0 (IQR 0, Range 0-5)	0 (IQR 0-2, Range 0-8)	**0.044**
Daily Activities Affected (Scale 1-10)		0	0	1.000	0 (IQR 0-4.5, Range 0-9)	3.0 (IQR 0-5.5, Range 0-10)	0.087

		Pre-Injury Non-Fixed	Fixed	p-value	Post-Injury Non-Fixed	Fixed	p-value
BPI Questionnaire							
Pain Today	**No**	27 90%	29 96.7%	0.307	15 50%	13 43.3%	0.403
	Yes	3 10%	1 3.3%		15 50%	17 56.7%	
Pain in 24 hrs (Scale 1-10)	**Worst**	0 (IQR 0.0, Range 0-10)	0 (IQR 0.0, Range 0-6)	0.299	2.0 (IQR 0-7.0, Range 0-10)	3.0 (IQR 0-7.5, Range 0-10)	0.534
	Least	0 (IQR 0.0, Range 0-10)	0 (IQR 0.0, Range 0-3)	0.558	0 (IQR 0-4.5, Range 0-10)	0 (IQR 0-3.0, Range 0-10)	0.493
	Average	(0 IQR 0.0, Range 0-10)	0 (IQR 0.0, Range 0-5)	0.314	2.0 (IQR 0-6.0, Range 0-10)	3.0 (IQR 0-5.0, Range 0-10)	0.874
Current Pain (Scale 1-10)		0 (IQR 0.0, Range 0-10)	0 (IQR 0.0, Range 0-5)	0.558	0 (IQR 0-5.0, Range 0-10)	0 (IQR 0-4.0, Range 0-10)	0.822
Pain Relief	**None**	28 93.3%	29 96.7%	0.602	14 46.7%	14 46.7%	0.363
	Non-Opiate	1 3.3%	1 3.3%		8 26.7%	7 23.3.%	
	Weak Opiate	0	0		4 13.3%	7 23.3%	
	Strong Opiate	1 3.3%	0		4 13.3%	2 6.7%	

		Pre-Injury Non-Fixed	Fixed	p-value	Post-Injury Non-Fixed	Fixed	p-value
Pain Relief Achieved (%)		0 (IQR 0, Range 0-80)	0	0.154	20 (IQR 0-60, Range 0-100)	30 (IQR 0-75, Range 0-100)	0.606
24hrs, has pain interfered (Scale 1-10)	**General Activities**	0 IQR 0, Range 0-10)	0 (IQR 0, Range 0-5)	0.175	1.0 (IQR 0-6.5, Range 0-10)	3.0 (IQR 0-5.0, Range 0-10)	0.623
	Mood	0 (IQR 0, Range 0-9)	0 (IQR 0, Range 0-5)	0.558	0 (IQR 0-7.5, Range 0-10)	0 (IQR 0-5.5, Range 0-10)	1.000
	Walking Ability	0 (IQR 0, Range 0-9)	(IQR 0, Range 0-5)	0.314	0 (IQR 0-7.0, Range 0-10)	2.0 (IQR 0-5.0, Range 0-10)	0.580
	Normal Work	0 (IQR 0, Range 0-2)	0	0.317	0 (IQR 0-1.0, Range 0-10)	0 (IQR 0-3.0, Range 0-10)	0.223
	Relationship	0 (IQR 0, Range 0-10)	0 (IQR 0, Range 0-5)	0.983	0 (IQR 0-5.0, Range 0-10)	0 (IQR 0-2.0, Range 0-9)	0.846
	Sleep	0 (IQR 0, Range 0-10)	0 (IQR 0, Range 0-5)	0.558	0 (IQR 0-7.5, Range 0-10)	3.0 (IQR 0-5.5, Range 0-10)	0.576
	Enjoyment of Life	0 (IQR 0, Range 0-10)	0 (IQR 0, Range 0-5)	0.983	0 (IQR 0-8.0, Range 0-10)	3.0 (IQR 0-7.5, Range 0-10)	0.433
EQ-5D	**Median Index Score (IQR, Range)**	1.000 (IQR 0.864-1.000, Range -0.230-1.000)	1.000 (IQR 1.000-1.000, Range 0.426-1.000)	0.504	0.679 (IQR 0.201-0.919, Range -0.427-1.000)	0.642 (IQR 0.333-0.781, Range -0.427-1.000)	0.802
	VAS (Scale 1-100)	100 (IQR 82.5-100, Range 50-100)	100 (IQR 85.0-100, Range 55-100)	0.629	75 (IQR 50-87.5, Range 10-100)	70 (IQR 50-87.5, Range 10-100)	0.486

O-090

LOCAL AND GENERAL ANAESTHESIA IN VIDEO-ASSISTED THORACOSCOPIC SURGERY AND THEIR IMPACT ON PATIENTS SATISFACTION - RESULTS OF THE FIRST RANDOMIZED CONTROLLED TRIAL WITH A NON-RANDOMISED SIDE ARM

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[2]*University Witten/Herdecke, Witten, Germany*
[3]*Bundeswehr Central Hospital, Koblenz, Germany*
[4]*Helios Hospital, Hildesheim, Germany*

OBJECTIVES
Whilst the feasibility of VATS in local anaesthesia (LA) and its pathophysiological benefits over general anaesthesia (GA) have been proven, the patients' satisfaction and its influencing factors have not been investigated yet. We report the results of PASSAT, the first randomised-controlled trial comparing the anaesthesia-related patient satisfaction, containing a non-randomised side-arm.

METHODS
Randomized controlled trial, WHO-registry-ID DRKS00013661. Patients with indication for VATS for pleural disorders or wedge resections were randomised to LA (intervention group) or GA (control group). The primary endpoint was patient satisfaction according to psychometrically validated questionnaires. Patients who refused randomisation could participate in a separate preference-based arm.

RESULTS
In total, 50 LA and 57 GA patients were randomised. Age, smoking habits, and lung function were similar. Patient satisfaction with anaesthesiologic care was 2.4 vs. 2.6 (p=0.2), with general perioperative care 2.2 vs. 2.3 (p=0.8), with recovery after surgery 2.1 vs. 2.0 (p=0.3; 3-point-Likert-scales). Patient's overall satisfaction with anaesthesia was 8.9 vs. 8.8 (p=0.6, 10-point-Likert-scale). Surgeons and anaesthesiologists were both less satisfied with feasibility (p<0.01 each). LA-patients were slightly more hypercapnic at the end of operation (pCO2 54 vs. 46mmHg, p<0.01), which resolved within 30min. GA-patients were hyperoxic at the end of operation (105 vs. 173mmHg, p<0.01). Operation time (35 vs. 34min), postoperative pain scales, delirium, and complication rate were similar in both groups. LA-patients were shorter in hospital (3.9 vs. 6.0 days, p<0.01). Of 18 non-randomised patients, 17 chose LA. They were equally satisfied as the randomised patients.

CONCLUSIONS
Patients were equally satisfied with both types of anaesthesia, regardless of whether they could choose the type of anaesthesia. LA is as safe as GA but correlated with shorter length of stay. Almost all patients who could delibaretely choose, preferred LA. Considering the benefits

of LA, it should be offered to patients as equivalent alternative to GA whenever medically possible.

Disclosure: No significant relationships.
Keywords: VATS, Local Anaesthesia, General Anaesthesia, Satisfaction, Safety.

O-091

BIOARTIFICIAL HUMAN THREE DIMENSIONAL (3D) AIRWAY MODELS FROM SURGICAL SPECIMEN FOR BASIC AND APPLIED RESEARCH

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OBJECTIVES

In-vitro airway models facilitate patho-mechanistic analyses of viral and bacterial infections of the human respiratory system. Existing models are limited by their absent cellular complexity to mimic the physiological anatomy. To overcome these obstacles, we generated a three-dimensional (3D) airway model from surgical specimen following surgical lung resection.

METHODS

Bronchial segments were obtained from 7 patients undergoing lung resection. Primary human bronchial epithelial cells (hBEC) were cultured in two different media (AECG or PC ExPlus) and characterized by immunofluorescence stainings (cytokeratin-14, Ki-67). To generate differentiated 3D tissue models, hBEC were transferred onto the BioVaSc® collagen matrix and co-cultured with bronchial fibroblasts. Models were cultured for 21 days under air-lift conditions. Two different culture media were tested to allow tissue differentiation (AECG or PC ALI, n=6 each). 3D tissue models were characterized by histology and immunofluorescence stainings (ZO-1, Muc5B/AC, p63, E-Cadherin and Vimentin). Epithelial barrier function was quantified by transepithelial electrical resistance (TEER) measurements. Presence and function of ciliated epithelium were determined by western blot and microscopy with high-speed camera.

RESULTS

In 2D cultures, a higher number of cytokeratin 14-positive hBEC was present when cultured with AECG (p=0.0006). In 3D models, AECG accounted for high cell proliferation, but low cell differentiation, resulting in hypertrophic epithelial tissue layers (p=0.0004). In contrast, tissue models cultured with PC ALI developed a fully differentiated epithelium (Fig. 1). In these models, TEER measurements up to 346 Ω*cm2 confirmed a stable epithelial barrier function, while values for models cultured with AECG were strongly fluctuating. Western blots showed more acetylated alpha-tubulin (cilia component) with PC ALI (p=0,0288). There was no difference detected in cilia beating frequency (n.s.).

CONCLUSIONS

We established new 3D tissue models for the respiratory epithelium with an unprecedented morphological and functional in-vivo – in-vitro correlation. Therefore, our models are interesting for pharmacological, infectiological and inflammatory research.
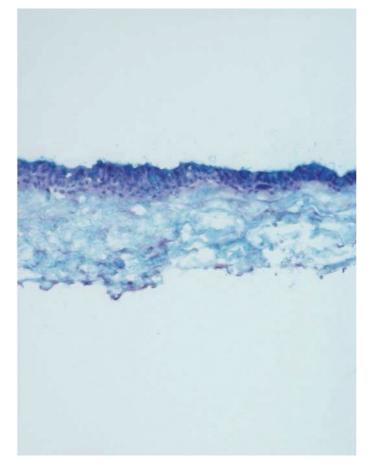
Disclosure: No significant relationships.
Keywords: Airway Model, Tissue Engineering, Bronchial Epithelium.

O-092

EARLY COMPARISON ROBOTIC BRONCHOSCOPY VERSUS ELECTROMAGNETIC NAVIGATIONAL BRONCHOSCOPY FOR BIOPSY OF PULMONARY NODULES IN A THORACIC SURGERY PRACTICE

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OBJECTIVES
Pulmonary nodules are frequently encountered in high risk patients. Often these require biopsy which can be challenging. We relate our experience comparing use of electromagnetic navigational bronchoscopy (ENB) to a robotic bronchoscopy system (ION by Intuitive).

METHODS
A retrospective review of single institution data was performed of patients undergoing bronchoscopic biopsy within the thoracic surgery division from 2015 to 2021. The timeframe overlapped with transition from ENB biopsy to the robotic ION endoluminal bronchoscopy system by Intuitive. Patient and nodule characteristics were collected. Primary end point was overall diagnostic yield; secondary outcomes include diagnostic yield based on overall size of nodules and need for further work up and testing. Diagnostic yield was defined by pathologic confirmation of either a malignancy or benign finding.

RESULTS
A total of 93 patients underwent ENB or ION biopsy of 111 nodules. No perioperative complications occurred. The diagnostic yield of ENB was 49.5% (41/91 nodules) versus 85% (17/20 nodules) for robotic bronchoscopy. Overall average nodule size for ENB was 2.55 cm compared to 1.96 cm for robotic. When divided based on size, ENB had a 30% diagnostic yield for nodule 1 – 2 cm (11/37 nodules, mean size 1.46 cm) and a 64% yield for nodules 2 – 3 cm (14/22 nodules, mean size 2.38 cm). Robotic bronchoscopy comparatively had a 79% yield for nodules 1 -2 cm (mean size 1.41 cm) and 100% yield for nodules 2 – 3 cm (mean 2.3 cm).
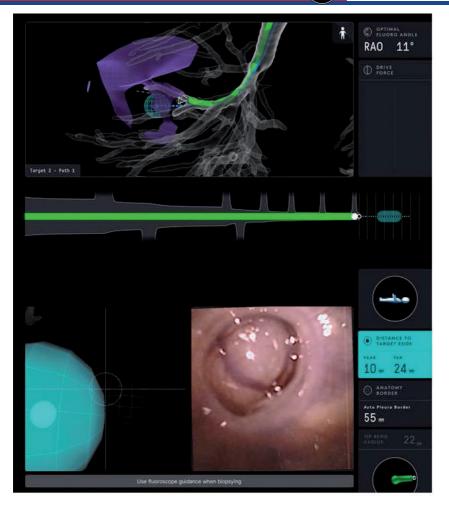
CONCLUSIONS
Robotic bronchoscopy showed a dramatic superiority over ENB in early implementation trials for biopsy of suspicious pulmonary lesions. It is a safe technology allowing for increased access to all lung fields including the periphery. We believe that adaptation and utilization in the thoracic surgical practice will be paramount to advancing the field.

Disclosure: No significant relationships.
Keywords: Robotic Bronchoscopy, Electromagnetic Navigational Bronchoscopy, Pulmonary Nodule, Transbronchial Biopsy.

Tuesday P.M.
Abstract 089-094.

O-093

ACUTE POSTOPERATIVE PAIN MANAGEMENT AFTER VIDEO-ASSISTED THORACOSCOPIC LUNG RESECTION: A SYSTEMATIC REVIEW AND META-ANALYSIS

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OBJECTIVES
Pain after video-assisted thoracoscopic surgery (VATS) may increase the incidence of postoperative complications and impair quality of recovery. Enhanced recovery after thoracic surgery protocols lack consensus regarding postoperative analgesia after VATS. The aim was to perform a systematic review and meta-analysis on mean pain scores (0-10 scale) 24, 48 and 72 hours after VATS anatomical lung resection treated by 1) thoracic epidural analgesia, 2) continuous or 3) single-shot unilateral regional analgesia and 4) only systemic analgesia. Secondary end-points included length of stay (LOS), postoperative nausea and vomiting (PONV), postoperative complications and additional opioids.

METHODS
The Medline, Embase and Cochrane databases were searched until 25 of August 2021. Adult patient populations undergoing at least >70% anatomical resections through VATS and at least 20 patients per subgroup reporting postoperative pain scores were included. The meta-analysis comprises means and medians transformed into means. Descriptive and study heterogeneity statistics were used to analyse the results.

RESULTS
A total of 44 studies comprising 4,278 patients were included. Mean 24-hour pain scores with 95% confidence interval were 2.0 (1.7-2.3; I2=76%) after thoracic epidural analgesia, 1.8 (1.4-2.4, I2=95%) after continuous regional analgesia, 2.1 (1.8-2.5, I2=97%) after single-shot regional analgesia and 3.0 (2.6-3.6, I2=99%) after only systemic analgesia. LOS was 6.7 (5.9-7.7), 4.6 (3.3-6.5), 4.4 (3.8-5.0) and 6.3 (5.6-7.2) days, respectively. Incidence of PONV was 18% (13-25), 11% (5-23), 14% (10-18) and 18% (10-30), respectively. Postoperative complications were 5% (2-13), 10% (6-16), 7% (2-22) and 10% (7-14), respectively. Additional opioid use in milligrams was 12.4 (1.3-23.6), 33.2 (21.5-51.3), 22.2 (12.4-39.8) and 26.1 (9.5-42.7), respectively (Table 1).

CONCLUSIONS
After VATS anatomical lung resection unilateral regional analgesic techniques, either continuous or single-shot, suggest comparable pain scores as TEA, whereas only systemic analgesia demonstrated slightly higher pain scores. Reduced LOS and PONV in unilateral regional analgesia groups may favour improved recovery.

Disclosure: No significant relationships.
Keywords: Acute Postoperative Pain, Pain Management, Video-Assisted Thoracic Surgery, Anatomic Lung Resection, Thoracic Epidural Analgesia Regional Analgesia.

Table 1. Mean postoperative pain scores and secondary outcomes

Type of analgesia	TEA	Sample size	Continuous regional	Sample size	Single shot regional	Sample size	Only Systemic	Sample size
Mean postoperative pain scores								
Pain scores 24h[1]	2.0 (1.7-2.3)	599	1.8 (1.4-2.4)	418	2.1 (1.8-2.5)	1,488	3.0 (2.6-3.6)	1,773
Pain scores 48h[1]	1.6 (1.2-1.9)	599	1.4 (0.9-2.1)	418	1.6 (1.4-1.9)	1,268	1.9 (1.5-2.5)	520
Pain scores 72h[1]	1.1 (0.9-1.5)	599	0.8 (0.4-1.5)	162	1.6 (1.3-2.1)	887	2.8 (2.3-3.4)	1,026
Secondary outcomes								
LOS in days[1]	6.7 (5.9-7.7)	234	4.6 (3.3-6.5)	166	4.4 (3.8-5.0)	1,174	6.3 (5.6-7.2)	1,220
PONV[2]	18 (13-25)	390	11 (5-23)	256	14 (10-18)	719	18 (10-30)	708
Cardio-pulmonary complications[2]	5 (2-13)	151	10 (6-16)	140	7 (2-22)	246	10 (7-14)	1,256
Additional opioids in milligrams[1]	12.4 (1.3-23.6)	343	33.2 (21.5-51.3)	217	22.0 (12.4-39.8)	830	26.1 (9.5-42.7)	294

[1] mean and 95% confidence interval
[2] incidence in percentage and 95%-confidence interval
TEA= thoracic epidural analgesia; LOS=length of hospital stay; PONV=postoperative nausea and vomiting

O-094

PRIMARY NON-SMALL CELL LUNG CANCER ORGANOIDS RETAIN THE MORPHOLOGICAL CHARACTERISTICS AND ONCOGENIC DRIVERS OF THE PARENTAL TUMOR

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OBJECTIVES

Recent advances in personalized treatment of non-small cell lung cancer (NSCLC) require representative in-vitro model systems that reflect tumor heterogeneity and maintain the characteristic genetic aberrations. Since clonally expanded cell lines do not generally maintain heterogeneity and three-dimensional structure, they are fundamentally limited in representing the complexity of NSCLC. For clinical applications such as an early assessment of personalized cancer treatments, patient-derived organoids have been suggested as promising models. We therefore aimed to establish representative NSCLC organoids that offer a reliable platform for further investigations.

METHODS

Between May 2020 and February 2021, surgically resected NSCLC tissue specimens were collected and mechanically and enzymatically processed. For organoid culture, cell suspensions were mixed with a gelatinous extracellular matrix and submersed in advanced DMEM/F12-based growth medium. Organoids were cultured at 37°C and expanded over up to 3 months. Histomorphological validation was performed by histology and immunohistochemistry. For genetic validation, DNA and RNA were extracted from tissue and organoid specimens and targeted next generation sequencing was performed using the Oncomine Focus Assay (ThermoFisher Scientific).

RESULTS

From 34 resected NSCLC samples, 10 primary organoid cultures were successfully established and expanded during early passages. Upon histological and immunohistochemical validation (Thyroid Transcription Factor-1, p40 and Pan-Cytokeratin), organoids showed matching characteristics when compared to the resected parental tumor, including adenocarcinoma, squamous-cell carcinoma, mucoepidermoid carcinoma and lung carcinoid morphology. Among 5 parental tumors, traceable genetic alterations were detected and 2 corresponding organoids lines retained this mutational profile including a KRAS p.Gly12Val mutation and a RET-fusion.

CONCLUSIONS

The establishment of primary NSCLC organoids from surgically resected tissue is feasible. Histological, immunohistochemical and genetic validation is essential to identify representative NSCLC organoids that maintain the morphological characteristics and genetic alterations
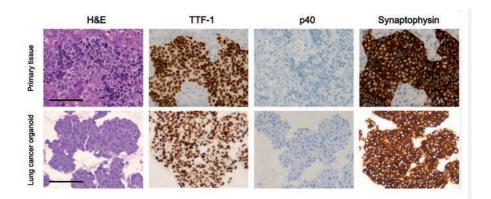
of the parental tumor. Overall, low establishment rates remain a challenge for broad clinical applications.

Disclosure: No significant relationships.
Keywords: Non-Small Cell Lung Cancer, Primary Organoids, Cancer Models, Tumor Heterogeneity, Genetic Alterations.

MONDAY 20 JUNE 2022
VIDEOS

V-095

RIGHT VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) ANTERIOR SEGMENETCTOMY (S1) VIA A SINGLE PORT AND UTILISING INDOCYANINE GREEN (ICG) TECHNOLOGY

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OBJECTIVES
In thoracic surgery there had been a trend to parenchymal sparing surgery. This is evident in the transition from pneumonectomy to sleeve resection. Provided the margins are clear. The recent JCOG0802 phase III trial have demonstrated the segmentectomy achieved an overall survival advantage (HR 0.663; 95% CI 0.47-0.93) in stage 1A NSCLC, when compared to lobectomies.

VIDEO DESCRIPTION
We present a case of an 83-year-old male who has been followed up for a PET avid (SUV 4.1), apical segment (S1) right upper lobe enlarging nodule (21mm in its greatest dimensions). His past medical history is significant for hypertension, deep vein thrombosis (DVT) and a previous colonic resection (2012) for a Duke A adenocarcinoma. He has a good functional status, and a CT biopsy was non-diagnostic. Lung function test were satisfactory (FEV1 93% & DLCO 91%).
In this video of our Bristol Thoracic Surgery series and following a single port (4cm incision with a soft tissue retractor) and primary lung adenocarcinoma of frozen section, an apical (S1) segmentectmoy was performed. The patient had an uneventful recovery. The drain was removed on postoperative day 1 and discharged home on day 3. The final pathology revealed a pT1b adenocarcinoma with a separate incidental nodule pT1a in the same segment, nodes negative and R0 resection making the final stage of pT3N0M0 (IIB). The camera is placed at the apex of the incision. The video describes in detail the instruments, and the steps of the procedure. We also used Indocyanine Green (ICG) Near Infra-Red fluorescent technology (5-7mg) to demarcate the intersegmental plane

CONCLUSIONS
Single port VATS complex segemntectomies could be performed safely and replicated with trainee's, achieving good resection margins and sparing parenchyma.

Disclosure: No significant relationships.
Keywords: Segmentectomy, Single Port, ICG.

V-096

TRANSTHORACIC ROBOTIC CHEST WALL MASS RESECTION AND RECONSTRUCTION WITH GORE-TEX PATCH

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Brigham and Women's Hospital, Boston, United States

OBJECTIVES

This video demonstrates a novel robotic approach to an incidentally found extrapleural intercostal chest wall mass. We sought to remove the mass en-bloc with adequate margins including the rib above and below the lesion.

VIDEO DESCRIPTION

The patient is a 51 year old healthy female who was incidentally found to have a 4.1 x 3.1 x 1.9 cm mass in the intercostal space between the left posterior 5th and 6th ribs. PET CT scan revealed FDG update with an SUV of 4. A needle biopsy was suggestive of myofibroblastic proliferation. She provided informed consented for robotic assisted chest wall resection.

Left lung isolation was obtained with a double-lumen endotracheal tube. The patient was positioned in the right lateral decubitus position. 3- port robotic thoracoscopic access was obtained with CO_2 insufflation, as well as an assistant port. The mass was resected en-bloc with the intercostal muscles, as well as a portion of the 5th and 6th ribs. A Gigli saw was used to robotically transect the ribs. Gore-Tex mesh was used to cover the defect. A chest tube was placed and the patient was extubated and awoken without issue. She was discharged home on post-operative day 4.

CONCLUSIONS

Pathology revealed a 4.7 cm cellular myxoma with negative margins. Robotic chest wall resection and reconstruction can be safely performed, including rib removal to achieve adequate margins.

Disclosure: No significant relationships.
Keywords: Cancer, Robotic, Minimally Invasive, Chest Wall Resection.

V-097

A VERY RARE PULMONARY PATHOLOGY FROM SYMPTOM TO DIAGNOSIS: DENDRIFORM PULMONARY OSSIFICATION

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Istanbul University Cerrahpasa Medical Faculty, Istanbul, Turkey

OBJECTIVES
Pulmonary ossification is a rare, chronic, progressive disease with a characteristic branching in which mature bone is found in the lung parenchyma. It is mostly detected as an incidental finding at autopsy. It has two forms, nodular and dendriform. A case of dendriform pulmonary ossification diagnosed by videothoracoscopic wedge resection is presented.

VIDEO DESCRIPTION
A 49-year-old male patient, who had no chronic disease and no history of smoking, had a history of working as an aluminum casting worker for 3 years and applied to the chest diseases outpatient clinic due to fatigue and exertional dyspnea.After pulmonary function tests and lung imaging, with a preliminary diagnosis of interstitial lung disease.His treatment was started by pulmonologists with a preliminary diagnosis of interstitial lung disease, and he was referred to our polyclinic for diagnostic biopsy after worsening in pulmonary function tests in his follow-ups.The right videothoracoscopic lower lobe was found suitable for wedge resection. In the surgery of the patient, 3 staples were broken during the operation due to the rigid structure of the lung before the wedge could complete the resection.After the operation was completed without complications, he was followed up in the service for 2 days and he was discharged. The final pathology report was reported as dendriform pulmonary ossification. The patient was followed up in the outpatient clinic and has been followed up in the outpatient clinic for 1 year.

CONCLUSIONS
Dendriform pulmonary ossification is a rare condition characterized by bone tissue infiltrating the lung parenchyma, mostly diagnosed in surgical materials or autopsies. Although it is known that the disease often develops in the presence of idiopathic pulmonary fibrosis, COPD, organizing pneumonia, and asbestosis, it should be considered that the profession of aluminum casting worker may also cause DPO due to chronic inflammation of the lung, as in our case.

Disclosure: No significant relationships.
Keywords: Dendriform Pulmonary Ossification, Chronic Inflammation, Videothoracoscopic Surgery.

V-098

RIGHT LOWER LOBE SLEEVE LOBECTOMY: UNIPORTAL VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) SUTURE TECHNIQUE

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OBJECTIVES
The aim of this video is to illustrate the technique for right-lower lobe sleeve lobectomy under uniportal VATS approach.

VIDEO DESCRIPTION
The video describes the technique for right-lower lobe (RLL) sleeve lobectomy. In contrast to upper-lobes sleeve lobectomies, RLL sleeve has some added difficulties. First, the difference between bronchial lumen between intermediate bronchus and middle-lobe bronchus (MLB), thus an oblique division of MLB is mandatory to manage the anastomosis. Second, the running suture technique is easier by minimally invasive approach than interrupted sutures, and both absorbable (4/0 PDS) and non-absorbable (4/0 Polipropilene) sutures are possible. Third, the disposition of arterial stump makes surgical management more challenging. Fourth, the usefulness of parietal pleura attachment of the passive needle in each half of the anastomosis, getting the needle then out of the utility incision in order to avoid intertwining of the threads. Final radiological exam proves right ventilation of right-middle lobe, and fiberbonchoscopy shows normal lumen entrance to MLB despite the anatomical angle between intermediate and MLB.

CONCLUSIONS
Right lower sleeve lobectomy can be safely performed under uniportal VATS approach, sparing 2 segments (middle lobe) compared to bilobectomy, and avoiding an open thoracotomy. Some useful tricks can be easily reproduced in order to succesfully perform the anastomosis.

Disclosure: No significant relationships.
Keywords: Video-Assisted Thoracic Surgery, Uniportal, Sleeve Lobectomy.

V-099

CARINAL RESECTION VIA RIGHT THORACOTOMY

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Tata Memorial Hospital, Mumbai, India

OBJECTIVES
To demonstrate a carinal resection via a right thoracotomy in a post radiated patient

VIDEO DESCRIPTION
The video demonstrated the technique of Carinal Resection as described by Grillo et al. The patients is a 40 year gentleman, had recurrent adenoid cystic carcinoma of the carina, had received radiation prior for an unresectable disease and presented back 2 years later with a local recurrence. The video demonstrates the classical open technique, with annotations to make the anatomy more clear. The video describes in step-by-step fashion the steps for a carinal resection via the Grillo method. The video also provides details regarding the technique of cross-field ventilation and how in a low-resource setting, in the absence of ECMO or jet-ventilation, this procedure can still be performed successfully

CONCLUSIONS
Carinal Resection can be safely performed via a right thoracotomy with good short term post operative outcomes in a low-resource setting.

Disclosure: No significant relationships.
Keywords: Carinal Resection, Adenoid Cystic, Open Technique, Grillo'S Method.

V-100

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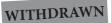
V-101

VIDEO-ASSISTED THORACOSCOPIC COMPLETION LEFT UPPER LOBECTOMY AND BRONCHOPLASTY FOR BRONCHIAL FIBROEPITHELIAL POLYP IN A PATIENT WHO UNDERWENT IPSILATERAL THORACOTOMY

Hüseyin Melek, Tolga Evrim Sevinç, Erhan Özer, Cengiz Gebitekin
Uludag University, School of Medicine, Department of Thoracic Surgery, Bursa, Turkey

OBJECTIVES

Although video-assisted thoracoscopic surgery (VATS) is widely performed for pulmonary diseases, only a few small studies have evaluated the role of VATS in patients who have had an ipsilateral thoracotomy. Fibroepithelial polyps of the bronchus are uncommon. This video presents a rare case of completion left upper lobectomy and bronchoplasty with VATS for a bronchial fibroepithelial polyp in a patient who underwent ipsilateral thoracotomy ten years ago

VIDEO DESCRIPTION

A 40-year-old female was admitted to the hospital due to cough and hemoptysis. Her past medical history revealed that 10 years prior she had, by means of thoracotomy, left upper lobectomy and decortication surgery for bronchiectasis. Thoracic computed tomography showed a 12mm lesion in the bronchial stump, left pleural effusion, and volume loss in the hemithorax. On positron emission tomography, the endobronchial mass had a SUVmax of 3.5. Rigid bronchoscopy performed for total atelectasis revealed a mobile polypoid tumor protruding from the left upper lobe bronchus. We performed endobronchial laser vaporization and resection, and pathological examination revealed that the mass was a fibroepithelial polyp. However, follow-up bronchoscopy three months after tumor resection detected a recurrence. We performed intrapericardial completion upper lobectomy with bronchoplasty using a 3-port VATS approach. The operation time was 270 minutes, and total blood loss was 75. The postoperative follow-up was unremarkable and the patient was discharged after five days without any complications. The patient has been in our outpatient follow-up for two years, and there is no recurrence of symptoms

CONCLUSIONS

Completion lobectomy with VATS is a safe and feasible approach in patients with previous ipsilateral thoracotomies. Treatment of Bronchial fibroepithelial polyps varies mainly to size and symptoms. Small lesions can be treated with corticosteroids and antibiotics, while excision, including bronchoscopic resection of the polyp or lobectomy, are used for larger lesions.

Disclosure: No significant relationships.
Keywords: Vats, Minimal, Invaziv Surgery, Fibroepithelial Polyp.

Tuesday P.M.
Abstract 095-105

V-102

MANUAL CLOSURE OF BRONCHIAL STUMP IN A ROBOTIC RIGHT UPPER LOBECTOMY

Lucía Milla Collado, Mercedes Álvarez Fernández, Inés Luque Vázquez, Beatriz Moreno Morueco, Mónica Sangrador Andreu, Almudena Zudaire Díaz-Tejeiro, <u>María Rodríguez Pérez</u>
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OBJECTIVES

We present the case of a 53-year-old man with a newly detected right upper lobe 2.8 cm nodule. The nodule was close to the right upper lobe bronchus take-off and was associated with an enlarged hilar lymph node. A bronchoscopy was performed for diagnosis, with inconclusive results.

After multidisciplinary team discussion and radiological and invasive mediastinal staging (with Brain MRI, PET-CT Scan and EBUS) a bronchoplastic right upper lobectomy, both diagnostic and therapeutic was offered.

VIDEO DESCRIPTION

Patient was submitted to standard preoperative work-up, including pulmonary function tests (FEV1: 88% and DLCO) and cardiological evaluation (within normal limits).

As this evaluation did not contraindicate surgery, he underwent the planned resection. Intraoperative frozen analysis of N2 and hilar lymph nodes did not show metastatic disease.

We transected the right upper lobe vein first, then the first branch of the pulmonary artery, both with robotic staplers, and finally we transected the airway manually. Frozen section of the bronchial proximal margin did show a non-small cell lung cancer more than 5 mm away of the transection area.

Distal bronchial margin was negative for malignancy on frozen section.

After assuring the R0 resection, we proceeded to manual bronchial closure with absorbable barbed suture.

Air-leak of both the parenchyma and the bronchoplasty were checked under water and a 24 Fr chest tube placed. No buttressing of the bronchial closure was considered necessary.

Patient was extubated in the operating room and after 4 hours in the recovery room, he was discharged to the thoracic surgery ward. Oral pain medication was started on postoperative day one and after satisfactory pain control; he was discharged home on postoperative day 2.

Final pathology showed pT1cN1M0 (stage IIB) poorly differentiated large cell carcinoma.

CONCLUSIONS

Complex lung resections are safely performed with robotic platforms.

Disclosure: Teaching fees and grants from Abex/Intuitive.
Keywords: Robotic, Brochoplastic, Lung Cancer.

V-103

PREVIOUS THORACIC TRAUMA AND PNEUMOTORAX IS NOT A CONTRAINDICATION FOR VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) PHRENIC NERVE HARVESTING IN BRACHIAL PLEXUS TRAUMATIC LESIONS

Matteo Roffinella, Paraskevas Lyberis, Paolo Titolo, Francesca Vincitorio, Federico Femia, Eleonora Della Beffa, Francesco Paolo Busardò, Enrico Ruffini
AOU Città della Salute e della Scienza di Torino - S. Giovanni Battista Hospital, Torino, Italy

OBJECTIVES
Nerve transfer is actually the best therapeutic strategy for brachial plexus traumatic lesions (BPTLs). Phrenic nerve (PN) is a powerful source of transferable axons and can be harvested through video-assisted thoracoscopic surgery (VATS). Previous thoracic trauma, rib fractures and pneumothorax are considered contraindications for VATS harvesting. However, BPTLs are often associated with thoracic trauma: this could be a reasonable justification for reconsidering those contraindications.

VIDEO DESCRIPTION
After a motorcycle accident, a 27-year-old male suffered severe thoracic trauma with lung contusion, bilateral rib fractures, left massive pneumothorax (requiring chest tube) and left BPTL with C7-C8-T1 avulsion. After a 6-month physiotherapy program he recovered an autonomous quality of life; therefore, was considered for neurotization using left PN. Because of young age and left side lesion, deleterious respiratory effects arising from diaphragmatic paralysis were considered negligible. Under general anesthesia, a 10mm port at 7th intercostal space on anterior axillary line was made for pleural inspection. Multiple mediastinal adhesions were found and, once considered addressable, a second 30mm port at 4th intercostal space was done for biportal VATS. PN was then successfully freed from adhesions, dissected from pericardium and tunnelized through the 2nd intercostal space to be sutured to desired target.

CONCLUSIONS
No intra or post-operative complications were observed. After 3 days of hospitalization, he was discharged with no respiratory discomfort. After 45 days no clinically relevant impact on respiratory function is observed. Follow up will continue up to 18 months to monitor recovery of elbow flexion strength.
PN is a powerful axon donor for BPTLs. VATS approach provides a full-length PN harvesting allowing to reach the most distal portions of brachial plexus. Previous thoracic trauma, rib fractures and pneumothorax should not be considered contraindications to VATS harvesting in experienced centers.

Disclosure: No significant relationships.
Keywords: Phrenic Nerve Harvest, VATS, Minimally Invasive Surgery, Pleural Adhesions, Contraindications.

V-104

VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) COMPLEX DOUBLE RIGHT S1+2 AND S6+9+10 SEGMENTECTOMY: A RADICAL LUNG-SPARING STRATEGY FOR BIFOCAL SYNCHRONOUS LUNG CANCER

Dorian Rojas, Jules Iquille, Bernard Lenot, Karel Pfeuty
Saint-Brieuc hospital, Saint-Brieuc, France

OBJECTIVES

The aim of this video is to demonstrate the feasability and the oncological efficience of an original VATS double complex right segmentectomy, in the specific case of a patient presenting a bifocal synchronous ipsilateral primary lung cancer.

VIDEO DESCRIPTION

This video describes the case of a 66 year old woman, with emphysematous COPD, presenting 2 synchronous mixed ground glass opacities, one 2 cm tumour deeply located in right S1 near intersegmental plane with S2 and another 3cm S6 tumour clearly invading intersegmental plane with S9 and S10. A VATS double complex right S6+9+10 and S1+2 segmentectomy was conducted through a standardized subxiphoid approach. This radical lung-sparing resection strategy was based on preoperative 3D reconstruction and assisted by fluorescence imaging system for accurate intersegmental plane delimitation and adequate safety margins. The patient was integrated in an ERAS opioid-free program and was discharged on postoperative day 1 with an uneventful follow-up. The final pathological examination showed the complete resection of 2 lepidic invasive adenocarcinoma pT2aN0 and pT1cN0 with sufficient margin and 19 nodes resected.

CONCLUSIONS

VATS double complex segmentectomy was a very efficient surgical approach for this patient, leading to an oncologically appropriate radical treatment while optimally preserving lung function in the same time through a challenging lung-sparing resection strategy.

Disclosure: No significant relationships.
Keywords: Complex Segmentectomy, VATS, Lung Cancer, Synchronous.

V-105

THORACIC ENDOMETRIOSIS: HOW WE MANAGE IT

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OBJECTIVES
Thoracic endometriosis is a rare disease defined as the presence of endometrial mucosa outside the uterine cavity. Anamnesis and imaging studies are important to achieve the diagnosis but even with them, the preoperative identification may be difficult. We present a case of a patient with pleural endometriosis

VIDEO DESCRIPTION
A thirty-two year old woman diagnosed with endometriosis, presented in our hospital with right exudative pleural effusion who requires videoassisted thoracoscopic surgery, finding endometrial tissue spread in lung and pleura with fenestrations in the diaphragm. A Pleural biopsy mas performed and a polyglactina mesh was fixed in the diaphragm covering perforations. The histology confirmed endometrial cells.
The patient had a favorable postoperative evolution and were treated with hormonal therapy without recurrence after six months of follow up.

CONCLUSIONS
This rare condition is usually underdiagnosed, that why is important to be considered in women of childbearing age with recurrent pneumothorax or unexplained pleural effusion. Surgery combined with hormonal therapy were the chosen treatment to this case.

Disclosure: No significant relationships.
Keywords: Thoracic Endometriosis Syndrome, Pleural Endometriosis.

Tuesday P.M.
Abstract 095-105

TUESDAY 21 JUNE 2022
VIDEOS

V-106
TRANSCERVICAL AND SUBXIPHOID THORACOSCOPIC DRAINAGE OF DESCENDING NECROTIZING MEDIASTINITIS

Bisanne Hamdi Shaqqura[1], Mayar Ishaq idkedek[2], Ramez Abu Khalil[1], Bayan Fathi Al-Qtishat[2], Firas Abu Akar[1]
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[2]Al-Quds University, Jerusalem, Palestine

OBJECTIVES
Descending Necrotizing mediastinitis is a life-threatening condition caused usually by an oropharyngeal infection that spreads and descends to the mediastinum.
Aggressive debridement and thorough drainage via stereotomy incision is the traditional approach for this condition. Treatment with a minimally invasive approach has been described in the literature. However, combined subxiphoid and transcervical approaches sound feasible and offer a good alternative for sternotomy with a possibility for performing an extensive debridement and drainage

VIDEO DESCRIPTION
A fifty-six-year-old patient presented to our department with severe Descending necrotizing mediastinitis following a dental procedure.
Subxiphoid uniportal VATS approach was utilized to explore the anterior mediastinum and both pleural cavities. Drainage of the pus and debridement of the necrotic tissue was done. Another small incision was performed over the sternal notch, where saline irrigations were performed through it.
After the surgery, the patient's condition was rapidly improved, and discharged home 14 days later.

CONCLUSIONS
combined subxiphoid and transcervical approaches sound feasible and offer a good alternative for sternotomy in the cases of descending necrotizing mediastinitis.

Disclosure: No significant relationships.
Keywords: Descending Necrotizing Mediastinitis, Subxiphoid VATS.

V-107

REMOVAL OF A SHARP LUNG PENETRATING OBJECT VIA UNIPORTAL THORACOSCOPIC APPROACH

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[2]Al-Quds University, Jerusalem, Palestine

OBJECTIVES
Penetrating chest trauma is a significant cause of mortality and morbidity in thoracic surgery. Removing sharp, penetrating objects from the chest usually demands a thoracotomy or sternotomy incision to explore the chest cavity and control the bleeding and the damage caused by the penetrating object. In our case, we succeeded in removing the sharp object under the vision of uniportal thoracoscopy and repairing the damaged lung tissue.

VIDEO DESCRIPTION
Thirty-seven years old healthy construction worker came to our emergency department with a work accident after falling on a sharp metal object that penetrated his left chest. The penetrating object has penetrated the lung parenchyma and reached the aortic arch area without aortic injury. Left uniportal VATS surgery was done, The penetrating object was removed under the vision of the thoracoscope, and lung repair was done. Postoperative recovery was uneventful.

CONCLUSIONS
Removal of penetrating objects in case of penetrating chest trauma is feasible in stable patients. Experience in VATS and a very low threshold for thoracotomy conversion are mandatory in these cases.

Disclosure: No significant relationships.
Keywords: Penetrating Chest Trauma, Uniportal VATS For Trauma.

Videos P.M.
Abstract 106-115

V-108

VATS LOBECTOMY VIA RIB METASTASECTOMY WINDOW FOR STAGE 4 LUNG CANCER

Suat Gezer
ÇUKUROVA University, Adana, Turkey

OBJECTIVES
Physibility of VATS lobectomy by using the partial 9th rib resection window and curative surgery for a stage 4 lung cancer.

VIDEO DESCRIPTION
I present a VATS right upper lobectomy for lung adenocarcinoma via a partial 9th rib resection window as the utility incision. The 9th rib is being resected partially in the beginning of the operation for a possible metastasis. The result is totally resected T1N0M1 lung adenocarcinoma.

CONCLUSIONS
VATS lobectomy could be performed via unusual utility incisions and can be used for rare stage 4 lung cancer treatments.

Disclosure: No significant relationships.
Keywords: VATS Lobectomy, Rib Resection, Metastasectomy.

V-109

PREOPERATIVE, INFRARED THORACOSCOPIC SIMULATION AFTER INTRAVENOUS INDOCYANINE GREEN ADMINISTRATION ENSURES SAFE SURGICAL MARGINS OF EXTENSIVE LOBECTOMIES

Hitoshi Igai, Natsumi Matsuura, Kazuki Numajiri, Fumi Ohsawa, Mitsuhiro Kamiyoshihara
Japanese Red Cross Maebashi Hospital, Maebashi, Japan

OBJECTIVES

Malignant tumors that invade the adjacent lobes require extended lobectomy. It is helpful if the surgeon is preoperatively acquainted with the dividing line of the adjacent lobe; this allows creation of a safe surgical margin. We describe here a case of a tumor in an incomplete fissure; preoperative simulation of infrared, thoracoscopic extended lobectomy after intravenous indocyanine green (ICG) administration was helpful.

VIDEO DESCRIPTION

The tumor was located in the right middle lobe but had invaded the upper lobe via an incomplete fissure. The required surgical margin after thoracoscopic middle-lobe lobectomy combined with resection of the anterior segment of the upper lobe was preoperatively simulated using Ziostation ver. 2 software (Ziosoft, Tokyo, Japan). The recommended surgical margin was 24 mm; we considered this during surgery.

We employed a uniportal approach with the patient in a lateral decubitus position under general anesthesia. Initially, we thoracoscopically identified the tumor location on the incomplete fissure between the upper and middle lobes. The major relevant bronchi and pulmonary vessels (both arteries and veins) evident on the preoperative simulation were divided. Then, we used infrared light to follow the course of intravenous ICG administration. The anterior segment and middle lobe were isolated by the ischemia induced by vessel treatment; the other segments of the upper lobe fluoresced green. We marked the boundary line by electrocautery and divided the segments using staplers. The pathological surgical margin was 21 mm; the difference between the simulated and pathological surgical margins was thus only 3 mm.

CONCLUSIONS

Preoperative simulation can ensure adequate surgical margins. It is not necessary to palpate the tumor when performing extended lobectomy informed by infrared thoracoscopy.

Disclosure: No significant relationships.
Keywords: Infrared Thoracoscopy, Indocyanine Green, Preoperative Simulation, Extended Lobectomy.

Videos P.M.
Abstract 106-115

V-110

UNIPORTAL POSTERIOR BASAL SEGMENTECTOMY COMBINING INTRAVENOUS ADMINISTRATION OF INDOCYANINE GREEN WITH PREOPERATIVE IMAGE SIMULATION BY THREE-DIMENSIONAL COMPUTED TOMOGRAPHY

Natsumi Matsuura, Hitoshi Igai, Kazuki Numajiri, Fumi Ohsawa, Mitsuhiro Kamiyoshihara
Japanese Red Cross Maebashi Hospital, Maebashi, Japan

OBJECTIVES
When performing segmentectomy for malignant tumors, ensuring a sufficient margin around the tumor is crucial. However, we thoracoscopically struggle to ensure it as the tumor is unpalpable or located near intersegmental plane. To overcome it, we examined several patterns of preoperative simulation using intravenous indocyanine green (ICG) and near infrared light thoracoscopy, and finally obtained successful result using one of them.

VIDEO DESCRIPTION
We planned pulmonary segmentectomy for a 43-year-old woman with a 12-mm solid tumor in the right lower lobe. The tumor was clinically diagnosed as metastatic lung tumor. Contrast-enhanced, high-resolution computed tomography (CT) data was transferred to a workstation and 3-dimensional CT angiography and bronchography were created automatically. The target segment was confirmed in the posterior basal segment, but the tumor was near the medial basal segment. Therefore, we created three patterns of simulation and adopted the pattern that dissected A10, A7a, and A7b, which was the most suitable to ensure sufficient margins. The surgery was performed via a uniportal approach. After division of all dominant vessels and bronchi that were planned in the simulation, an intravenous bolus of ICG (0.3 mg/kg/10 mL) was administered and observation was performed with the near infrared light thoracoscope. After marking the boundary between colored and non-colored areas by electrocautery, all intersegmental planes were divided by staplers. The tumor was diagnosed as metastatic lung tumor, and sufficient surgical margins >20 mm were achieved, as simulated. The postoperative course was uneventful. The patient was discharged on postoperative day 3.

CONCLUSIONS
Sufficient surgical margin can be thoracoscopically ensured by examining several patterns of preoperative image simulation and choosing suitable one even if the tumor was unpalpable or located in the marginal area.

Disclosure: No significant relationships.
Keywords: Segmentectomy, Uniport VATS, Preoperative Simulation, Indocyanine Green.

V-111

UNIPORTAL VIDEO-ASSISTED THORACIC SURGERY IVOR-LEWIS ESOPHAGECTOMY WITH CIRCULAR STAPLING ANASTOMOSIS

Dania Nachira[1], Alberto Biondi[2], Venanzio Porziella[1], Domenico D'Ugo[2], Stefano Margaritora[1]

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[2]*Department of General Surgery, Fondazione Policlinico Universitario Agostino Gemelli IRCCS, Università Cattolica del Sacro Cuore, Rome, Italy*

OBJECTIVES

Among all minimally-invasive esophagectomies, Ivor-Lewis remains the most challenging procedure and several approaches are described for it. We present a Uniportal-VATS Ivor-Lewis esophagectomy with circular stapling anastomosis.

VIDEO DESCRIPTION

A 65-year old man, in good clinical condition (BMI 25), with a diagnosis of adenocarcinoma of the gastroesophageal junction (Siewert type I), was scheduled for a Uniportal-VATS Ivor-Lewis after induction therapy (4 cycles FLOT scheme). The first step of surgery was abdominal (supine position), using a totally laparoscopic approach (4 ports) for performing lymphadenectomy, gastric tubulization (excising the lesser curve by 45mm linear stapler) and piloroplasty. The second step was thoracic (left lateral decubitus), through a 4cm Uniportal access in the V intercostal space. The esophagus was dissected and mobilized from the diaphragm to the azygos vein. A longitudinal esophagostomy was performed 6cm below the azygos to introduce the anvil of the 25mm-circular stapler into the esophageal lumen, then the esophagus was resected below by a 45mm linear stapler. Pull-out of the anvil shaft through the staple line. Pull-up of the gastric tube into the thorax and exteriorization through the Uniportal access. The polar part of the gastric tube en-bloc with the lower esoAdephagus and lesser gastric curve was resected. Then a circular stapler was introduced through a gastrostomy, pushing the stapler trocar out from the posterior wall of gastric tube, to perform an intrathoracic termino-lateral anastomosis. Resection of the distal part of the gastric tube including the gastrostomy by 45mm-linear stapler. Six days after surgery a gastrografin swallow was negative for anastomotic leak and the patient started oral intake without complication. The patient underwent adjuvant therapy (6 cycles of DeGramont) for a ypT3pN1M0 (1/27) adenocarcinoma and he was disease-free 9 months after surgery.

CONCLUSIONS

Uniportal-VATS Ivor-Lewis esophagectomy after induction therapy seems to be safe and feasible with good post-operative and short-term results.

Disclosure: No significant relationships.

Keywords: Esophageal Cancer, Ivor Lewis, Uniportal-VATS Minimally Invasive Esophagectomy.

V-112

VIDEOTHORACOSCOPICAL APPROACH FOR THE RESECTION OF MEDIASTINAL PARATHYROID ADENOMAS

Odile Ojanguren Martiarena, Rafael Rojo Marcos, Juan Carlos Rumbero Sánchez, Naia Uribe-Etxebarria Lugariza-Aresti, Mónica Lorenzo Martín, Unai Jiménez Maestre, Lucía Hernández Pérez, Marta Fernando Garay, Oscar Ruiz Molina, Joaquín Pac Ferrer
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OBJECTIVES

Primary hyperparathyroidism is a frequent entity for endocrine surgeons that can be cured by excision of the overactive gland. However there is a not negligible number of cases of mediastinal parathyroid adenomas that can present a challenge both for diagnosis and treatment. The aim of this video is to present our technique for the resection of mediastinal parathyroid adenomas.

VIDEO DESCRIPTION

- Prior to surgery:

We perform either Technetium sestaMIBI or PET-CT scans in order to locate the mediastinal adenoma.

We also infuse 99mTc-sestaMIBI 1 hour prior to surgery to locate intra operatively the adenoma with a mini gamma camera.

- Surgery:

The patient is located in supine position with 30 degree tilt to the contralateral side.

We use one lung ventilation.

Ports: We use a 3 port approach, like in a thoracoscopic thymectomy.

We open the mediastinal pleura after identification of the theoretical location of the adenoma and proceed to dissect it.

Blood tests are performed in minutes 0, 5, 10 and 20 after excision of the adenoma to confirm the decrease in PTH levels. A pathologist analyses the specimen intraoperatively to confirm the presence of an adenoma.

After confirmation a 28F chest tube is placed.

RESULTS

In one case, the patient had to forego a cervical parathyroidectomy because he had a second adenoma.

We were not able to find the adenoma in one patient.

In the third case we found lung adhesions to the mediastinum as he had had two cervical explorations before our surgery. We had to use gamma camera to find the adenoma, as the patient was obese.

CONCLUSIONS

Minimally invasive mediastinal parathyroidectomy offers good results with less complication risks for the patient. Marking the adenoma with 99mTc-sestaMIBI is helpful when performing VATS surgery.

Disclosure: No significant relationships.
Keywords: Ectopic Parathyroid Adenoma, Videothoracoscopy.

V-113

PLEURECTOMY/DECORTICATION FOR RIGHT PLEURAL DISSEMINATION OF PSEUDOMYXOMA PERITONEI

Kazunori Okabe, Takuya Kimura, Nao Furukawa, Hikaru Miyamoto, Kantarou Hara
Bell Land General Hospital, Sakai, Japan

OBJECTIVES
The purpose of this video is to show Pleurectomy/Decortication can successfully treat the right pleural dissemination of pseudomyxoma peritonei.

VIDEO DESCRIPTION
The patient was late-40s female. In April 2016, she underwent complete reduction surgery (10 hours 41 minutes) with intra-peritoneal heated chemotherapy for pseudomyxoma peritonei. Thirteen months after the operation, she was referred to us to treat right pleural dissemination of pseudomyxoma peritonei. In June 2017, she underwent right Pleurectomy/Decortication. Operation time was 8 hours 15 minutes. Bleeding was 1,650 g. The operation was comprised of the following procedures, total resection of the right parietal pleura, total resection of the right visceral pleura, and partial resection of the right diaphragm and the liver. In her left decubitus position, a 23 cm postero-lateral incision was made. The seventh rib was shingled posteriorly. The extrapleural plane was entered in the sixth interspace. The entire parietal pleura was dissected. It was also dissected from the pericardium and the diaphragm. The phrenic nerve was preserved. The tendon center of the diaphragm was resected, because we suspected the tumor entered the chest cavity through it. Due to the severe adhesion caused by the previous abdominal surgery, the liver was partially resected with the tendon center. The entire visceral pleura was dissected using a periosteum elevator with the lung inflated. Pathologically, the tumor was consistent with pseudomyxoma peritonei. No invasion into lung parenchyma was detected. This operation was classified as R0. Elevated blood CA19-9 of 234 U/ml and CA125 of 117 U/ml went down to normal after the operation. Although no tumor in the right chest cavity was pointed out, and the tumor markers were normal, she passed away 2 years 9 months after the operation due to aggressive pneumonia during COVID-19 pandemic.

CONCLUSIONS
Pleurectomy/Decortication is feasible and effective for selected patients with pleural dissemination of pseudomyxoma peritonei.

Disclosure: No significant relationships.
Keywords: Pleurectomy/Decortication, Pleural Dissemination, Pseudomyxoma Peritonei.

V-114

ADVANCED MALIGNANT PLEURAL MESOTHELIOMA WITH SERIOUS COMORBIDITIES SUCCESSFULLY TREATED BY EXTRAPLEURAL PNEUMONECTOMY

Kazunori Okabe, Takuya Kimura, Nao Furukawa, Hikaru Miyamoto, Kantarou Hara
Bell Land General Hospital, Sakai, Japan

OBJECTIVES

The purpose of this video presentation is to show extrapleural pneumonectomy (EPP) which successfully treated very advanced right epithelioid malignant pleural mesothelioma (MPM) with many serious comorbidities.

VIDEO DESCRIPTION

The patient was a 61-year-old gentleman at EPP. In June 2013, CT showed right pleural effusion without pleural thickness or tumor. Thoracentesis revealed bloody effusion, however the cytology was class I. Six months later, high urine protein and blood low albumin were pointed out. He was diagnosed as Nephrotic syndrome, and steroid therapy was started. Because of the steroid, he was suffered from diabetes mellitus. And also, he developed atrial fibrillation. Follow up CT and PET/CT in July 2014 showed right pleural thickness of more than 3 cm and right pleural tumor of more than 8 cm, and enlarged subcarinal lymph nodes. All of them were PET positive. MPM was strongly suspected, and he was referred to our hospital. Blood albumin was 2.7 g/dL and HbA1c was 7.1%. Urine sugar was 3+ and protein was 2+. He was on prednisolone 20 mg once a day. We performed VATS right pleural biopsy in July 2014. The pathological diagnosis was epithelioid MPM. He underwent right EPP in August 2014. Operation time was 7 hours 57 minutes. Blood transfusion of 1,680 ml was given during the EPP. The pathological diagnosis and stage were epithelioid MPM and T3 (pericardium) N1 (#7 5/5 and pericardial 1/2) M0, stage IIIA. His positive urine protein disappeared in a week after EPP, and the Nephrotic syndrome was cured. Because of the withdrawal of steroid, his diabetes mellitus got better. He completed 50.4 Gy hemi-thoracic radiotherapy followed by chemotherapy. Six years after the bloody pleural effusion was detected, and four years nine months after EPP, he passed away due to mesothelioma.

CONCLUSIONS

EPP is very effective to treat MPM.

Disclosure: No significant relationships.

Keywords: Extrapleural Pneumonectomy, Malignant Pleural Mesothelioma, Treatment.

Videos P.M.
Abstract 106-115

V-115

VIDEO ASSISTED THORACOSCOPIC SURGRY (VATS) UPPER LOBECTOMY AFTER PRIOR MIDDLE LOBECTOMY AND CONTRALATERAL UPPER LOBE SEGMENTAL RESECTION

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[1]*Harvard Medical School, Boston, United States*
[2]*Brigham and Women's Hospital, Boston, United States*

OBJECTIVES

A 55-year-old woman developed three metachronous primary lung cancers within two years of presentation. She presented in January 2020 for evaluation of a 2cm FDG-avid nodule in the right middle lobe (RML) and a 1cm FDG-avid ground-glass nodule in the right upper lobe (RUL). Biopsy indicated adenocarcinoma. The next month, she underwent a VATS right middle lobectomy for a pT2aN0 invasive adenocarcinoma and a VATS RUL wedge biopsy which was negative for malignancy. In October 2020, a 7.2mm FDG-avid nodule in the left upper lobe (LUL) was noted. She underwent VATS LUL anterior segmentectomy for a pT1bN0 small cell lung carcinoma (SCLC). By April 2021, she completed 4 cycles of adjuvant chemotherapy. In September 2021, PET-CT demonstrated a 1.4cm RUL FDG-avid nodule. IR-guided biopsy indicated adenocarcinoma. Radiation therapy was considered, however, given the prior wedge biopsy was benign and PFTs were adequate (FEV1 108%), aggressive curative resection was pursued. She underwent VATS right upper lobectomy in December 2021 for a pT1cN0 adenocarcinoma.

VIDEO DESCRIPTION

All procedures were conducted in standard fashion with no intraoperative complications. During the right upper lobectomy, the upper pulmonary vein was scarred and markedly adherent posteriorly and inferiorly in the location of the prior middle lobe stump. The phrenic nerve pedicle was scarred into the hilum. The ongoing pulmonary artery was difficult to dissect. The specimen removed had negative margins. There were no significant intraoperative or postoperative complications. She is now being monitored closely for recurrence.

CONCLUSIONS

This patient developed three primary lung cancers with different histopathology, qualifying as metachronous primary lung cancer. In cases like this, care must be taken to identify anatomic structures in the setting of distortion and scarring from prior resection. Even with dense adhesions from multiple prior surgeries, precise attention to anatomic detail permits a video assisted approach and obviates the need for thoracotomy.

Disclosure: No significant relationships.
Keywords: Pulmonary Neoplastic, Technique, Metachronous Primaries, VATS, Adhesions.

SUNDAY 19 JUNE 2022
JUNIOR POSTERS SESSION
17:00 - 18:00

P-001

ANALYSIS OF THE TUMOUR IMMUNE MICROENVIRONMENT IN RESECTED OLIGOMETASTATIC NON SMALL CELL LUNG CANCER (NSCLC)

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[1]University Hospital of Parma - Thoracic Surgery Department, Parma, Italy
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OBJECTIVES
Patients with oligometastatic non-small-cell lung cancer(OM-NSCLC) could benefit from local ablative therapies. Tumour-Infiltrating-Lymphocytes(TILs) are critically implicated in cancer growth and progression and their spatial distribution is a novel descriptor of the Tumour-Immune-Micro-Environment(TIME). The present study investigates the immune profile of the primary lung tumour and the corresponding metastatic site. The aim of the study is to assess if OM-NSCLC has a specific TIME.

METHODS
Digital microscopy was performed on immunohistochemically stained specimens of oligometastatic patients who underwent radical resection for primary lung cancer and their corresponding metastatic site. Different markers (CD3,CD4,CD8,PD-L1) were analysed and the densities and location of TILS in the primary tumours and metastases were compared.

RESULTS
We retrospectively analysed 24 patients, 19 (79%) were men, mean age was 60.4±9 and the most frequent histologic type was adenocarcinoma (n=22, 91.7%). Fifteen patients (62.5%) had positive pathologic N-stage. The most common metastatic site was brain (n=16, 66.7%). Induction treatments were administered in 9 (37.9%) of cases. The density of CD3☐ TILs, were statistically higher in primary lung cancer specimens when compared to metastatic site(p<0.01). The most of TILs in the primary lung cancer were located within the tumour (p=0.03), compared with the stromal location. A trend of higher density of CD4+ and CD8+ was observed in the primary tumour. Comparing TILs densities of different metastatic sites, lower density in the brain compared with the adrenal gland was observed, although not statistically significant.

CONCLUSIONS
Despite the extensive use of immunotherapeutic drugs, a continuous effort in basic research to understand the biological principles behind this therapeutic success is needed. Primary lung cancers have more TILs than the paired metastatic sites, supporting the immune-escape as mechanism of cancer metastasis. The specific localization of TILs-subpopulations composing
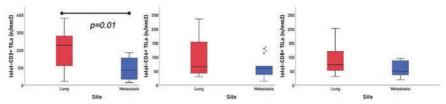
Videos P.M.
Abstract 106-115

TIME impact on OM-NSCLC clinical outcome. Using Immunotherapy to modify TIME in surgically resected patients could improve disease control.

Disclosure: No significant relationships.
Keywords: Oligometastatic NSCLC, TIME, TILs.

Keywords: Oligometastatic NSCLC, TIME, TILs

P-002

LUNG VOLUME REDUCTION SURGERY IN PATIENTS WITH MILD TO MODERATE PULMONARY HYPERTENSION AND NON-HETEROGENEOUS EMPHYSEMA

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OBJECTIVES
Previous studies report favorable results for lung volume reduction surgery (LVRS) in patients with mild to moderate pulmonary hypertension (PH), although PH has been serving as exclusion criteria for many years. However, those studies focus on patients with heterogeneous emphysema. We hypothesize good outcome of LVRS in PH patients with non-heterogeneous emphysema morphology.

METHODS
From July 2016 until October 2021, LVRS was performed in 227 patients. Although 78 patients had a preoperative and postoperative transthoracic echocardiography only 48 had quantitative measures in both echocardiography. Twenty-three patients had a preoperative systolic pulmonary artery pressure (sPAP) above 35mmHg and served as PH group. The remaining patients served as the control group. Heterogeneous emphysema was defined as upper or lower lobe predominant emphysema, non-heterogeneous was defined as target areas maximally in the area of one or more than one but not in adjacent lung segments of either lung.

RESULTS
Median preoperative sPAP was 34,5mmHg (44mmHg in PH group). In patients with heterogeneous emphysema sPAP was 35mmHg (43mmHg) vs. 34mmHg in non-heterogeneous emphysema group (45mmHg).
In the PH group, sPAP decreased after LVRS, but without statistically significant difference (p =0.223). The same occurred in the control group. In patients with PH and markedly heterogeneous emphysema, sPAP decreased (p =0.338) as well as in patients with PH and non-heterogeneous emphysema (p =0.352).
The postoperative course did not differ significant between PH and control group, and both groups had a significant improvement of forced expiratory volume in 1s 3 months postoperatively.

CONCLUSIONS
LVRS in patients with mild to moderate PH and non-heterogeneous emphysema morphology has the same outcome as in patients with PH and heterogeneous morphology and even as in patients without PH. We advise careful examination of pulmonary hemodynamics while screening emphysema patients, without accepting PH as a priori exclusion criteria for LVRS.

Disclosure: No significant relationships.
Keywords: Lung Volume Reduction Surgery, Pulmonary Hypertension, Emphysema.

Junior Posters
Abstract 001-012

P-003

PREDICTION OF POSTOPERATIVE COMPLICATIONS IN OPERATED NON-SMALL CELL LUNG CANCER PATIENTS WHO WERE IMPLEMENTED A PROTOCOL OF ENHANCED RECOVERY AFTER SURGERY

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OBJECTIVES
Surgical treatment remains the standard treatment approach in non-small cell lung carcinomas. Postoperative processes are tried to be improved with ERAS protocols. In our study, we aimed to evaluate the impact of application status of ERAS protocols on postoperative complications.

METHODS
Between January 2001 and January 2021, 845 patients were operated on with the diagnosis of non-small cell lung cancer (NSCLC) in our clinic. Patients between 2001-2010 were evaluated as pre-ERAS period (Group 1=285 patients), patients between 2011-2015 were evaluated as the period of non-consistent implementation of ERAS (Group 2=269 patients), and ERAS period (Group 3; between 2016-2021) were evaluated as ERAS period (n=291). Demographic, biochemical parameters, hospital stay, morbidity, mortality rates and unplanned re-admissions were analyzed.

RESULTS
Smoking history was statistically significantly less in the 3rd group (p=0.005). FEV1/FVC, albumin were statistically significantly higher in group 3 (p<0.001; p=0.019). Leukocyte and tumor Suvmax were statistically significantly higher in the 1st group (p=0.018; p=0.014). Postoperative hospitalization day, complication rate and intensive care hospitalization rate were statistically significantly lower than those of the third group (p<0.001). The rate of comorbid disease was statistically significantly higher in the 1st group compared to 3rd group (p=0.030). Serum albumin level(<2.8 g/dL), lymphocyte/monocyte ratio(<1.35), and hemoglobin level(<8.3g/dL) were found to be predictive factors for postoperative complications(Table).

CONCLUSIONS
With the application of ERAS protocols, postoperative hospitalization decreased in clinically similar patient groups as well as the rate of complications and ICU stay. ERAS protocols seems to be beneficial for the patients undergoing resectional surgery for NSCLC.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Thoracic Surgery, Enhance Recovery After Surgery.

Table 1: Comparison of Parametric Data for Groups 1-2-3 (Mean Values ??Given.) (Anova Test was used as a statistical test.)

	Group 1 (2001-2010) (285 Patients)	Group 2 (2011-2015) (269 Patients)	Group 3 (2016-2021) (291 Patients)	p Value
Age	60	61	60	0,189
Cardiac Risk Index	1	1	1	0,318
Cigarette Pack x Years	45	41	37	**0,005**
FVC	3320	3260	3380	0,604
FEV1	2350	2300	2330	0,765
%FVC	91	92	91	0,930
%FEV1	81	80	80	0,959
FEV1/FVC	89	82	90	**<0,001**
DLCO	18,7	19,8	18,6	0,226
%DLCO	72	79	73	0,076
Albumin	3,7	4,2	4,6	**0,019**
CRP	35,4	20,6	21,3	0,072
LDH	221,5	319,1	232,4	**<0,001**
Leukocyte	8790	8090	8280	**0,018**
Lymphocyte	1,5	1,9	2,0	0,612
Monocyte	0,5	0,7	0,6	0,262
Neutrophil	5,0	5,7	6,0	0,582
Lymphocyte/Monocyte	2,9	3,2	3,2	0,811
Neutrophil/Lymphocyte	3,5	3,4	18,6	0,629
Hemoglobin	13,1	13,0	13,1	0,848
Tumor Suvmax Value	13,9	12,0	11,7	**0,014**
Tumor Diameter	4,3	3,7	3,8	0,183
Postoperative Hospitalization Day	8,5	7	5,5	**<0,001**

Junior Posters
Abstract 001-012

P-004

SURVIVAL AFTER RESECTION OF COLORECTAL LUNG METASTASES: THE IMPACT OF PREVIOUS LIVER METASTASECTOMY

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OBJECTIVES
Thirty percent of patients undergoing resection for pulmonary metastases (PM) from colorectal cancer previously underwent surgical therapy for liver metastasis (LM). This study investigates whether a history of LM impacts long-term survival outcomes after resection of PM.

METHODS
A multicentre observational cohort study was conducted, including patients undergoing resection for PM between 2000 and 2020. Kaplan-Meier and multivariable Cox regression models (including age, pT- and N-stage, synchronicity, size and number of PM, history of LM) were used for the survival analyses. Main endpoints of the study were overall survival and disease-free survival.

RESULTS
In total 111 patients were included, the majority of which was male (N=66, 60%). Median age was 64 years (interquartile range 57-69). PM were treated with wedge (N=52, 47%) or lobe (N=43, 39%) resections in most cases. Neoadjuvant chemotherapy was administered in 23 patients (21%). Forty-nine patients (44%) had a history of previous metastasectomy, often for LM (N=45, 92%). Median follow-up amongst survivors was 67 months (interquartile range 43-105). Recurrence rates were equal between patients with (N=30, 68%) or without (N=46, 68%) a history of LM. Disease-free (p=0.669) and overall survival (p=0.233) did not differ between both groups. Correction for confounders did not alter outcomes (adjusted hazard ratio; 95% confidence interval), both with regards to disease-free (0.85; 0.54-1.36, p=0.509) and overall survival (0.68; 0.40-1.18, p=0.167).

CONCLUSIONS
No significant impact of prior surgery for LM on long-term survival outcomes was observed in patients undergoing resection for PM.

Disclosure: No significant relationships.
Keywords: Colorectal Cancer, Pulmonary Metastasis, Liver Metastasis, Survival.

P-005

INTRAPLEURAL THERMOCHEMOTHERAPY TO CONTROL MALIGNANT PLEURA MESOTHELIOMA

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OBJECTIVES
The management of malignant pleural mesothelioma (MPM) by intrapleural hyperthermic chemotherapy (IPTC) has shown interesting patient overall and disease free survival. However, the mechanism by which IPTC improves tumor control is unknown. Here we hypothesized that IPTC promoted an immune response directed against MPM.

METHODS
We developed a syngeneic murine IPTC treatment model of MPM (AB12 luciferase cells implanted in the pleura of BALBc mice). Tumor growth was assessed by bioluminescence. The effect of IPTC (cisplatin 100μM at 42°C for 60min) on tumor growth/mouse survival was compared to controls (saline 37°C and cisplatin 100μM at 37°C for 60min). In a separate experiment, the immune signature induced by IPTC in MPM was assessed by 16-color flow cytometry at 7 days after therapy and compared to controls.

RESULTS
Intrapleural hyperthermic chemotherapy limited MPM growth and improved mice survival significantly compared to controls (Figure 1). Furthermore, MPM infiltration by CD45+ leucocytes increased significantly in IPTC treated MPM compared to controls. Interestingly, the overall proportion of antigen presenting cells (CD11b+ dendritic cells, F4/80 macrophages and CD11b+Ly6C+CD11c-Ly6G- bone marrow derived myeloid cells) was comparable in tumors of the different treatment groups. However, IPTC caused a significant decrease in the MPM content of M2 immunosuppressive macrophages (F4/80+MCHII-CD80-) and a significant increase of tumor infiltration by CD8+ and CD4+ T lymphocytes compared to controls.

CONCLUSIONS
Intrapleural hyperthermic chemotherapy improved MPM control and was associated with a cytotoxic immune signature within tumors. Further studies are ongoing to determine the mechanism linking IPTC to the immune system.
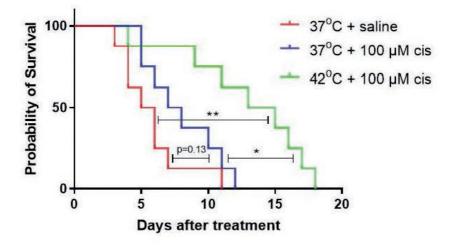
Disclosure: No significant relationships.
Keywords: Intrapleural Thermochemotherapy, Malignant Pleural Mesothelioma, Tumor Control, Immune Cells Infiltration.

Junior Posters
Abstract 001-012

survival curve

P-006

GENETIC DRIVER ALTERATIONS OF PRIMARY OLIGOMETASTATIC NON-SMALL CELL LUNG CANCER ARE COMMONLY PRESERVED IN BRAIN METASTASES

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OBJECTIVES

More than one fourth of all patients with metastatic non-small cell lung cancer (NSCLC) present with a low systemic tumor burden and a limited number of metastases. In this oligometastatic state, systemic therapy in combination with local ablative treatment (LAT) of the primary tumor and all metastatic sites is associated with improved overall survival. However, current evidence on patient selection criteria for LAT is limited and in particular, molecular markers are scarce. Here, we aimed to perform a genetic characterization of primary NSCLC and its corresponding brain metastases.

METHODS

We identified 88 patients with synchronous or metachronous oligometastatic NSCLC and brain metastases, who underwent surgical resection of the primary tumor and the brain metastases between 2001 and 2020. Representative matching formalin-fixed paraffin embedded tissue specimens were available for 51 patients. Genetic characterization was performed by targeted next-generation sequencing using the Oncomine Focus Assay (ThermoFisher Scientific).

RESULTS

A successful targeted sequencing was achieved for 48 paired samples including 38 adenocarcinomas, 4 squamous-cell carcinomas, 4 adeno-squamous carcinomas and 2 other histologies. In 32 cases with oncogenic driver alterations in the primary tumor, the driver alteration was preserved in the brain metastasis. Most common driver alterations included KRAS-mutations (n=21), EGFR-mutations (n=4) and CDK4-amplifications (n=2). Among 15 cases with wild type state of the primary tumor, 9 cases showed private alterations in the brain metastases (2 KRAS mutations, 1 EGFR mutation, 1 EML4-ALK fusion, 2 MYC-amplifications and 1 FGFR1-, 1 MET- and 1 PDGFRA-amplification). One case showed no shared mutations.

CONCLUSIONS

In oligometastatic NSCLC, genetic alterations of the primary tumor were maintained in the majority of all brain metastases. KRAS-mutations play a central role in brain metastases, suggesting that this patient cohort may notably benefit from novel KRAS-inhibitors.

Junior Posters
Abstract 001-012

Disclosure: No significant relationships.
Keywords: Oligometastatic Lung Cancer, Brain Metastases, Molecular Profiling, Oncogenic Drivers, Local Ablative Treatment.

P-007

SARCOPENIA AND MEDIASTINAL ADIPOSE TISSUE AS A PROGNOSTIC MARKER FOR SHORT AND LONG-TERM OUTCOME AFTER ANATOMIC VIDEO-ASSISTED THORACOSCOPIC RESECTION FOR LUNG CANCER

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OBJECTIVES
Surgical resection remains the gold standard of treatment for early stage lung cancer. Several risk models exist to predict postoperative morbidity and mortality. Psoas muscle sarcopenia has successfully been used for morbidity prediction in lung transplantation and is not included in available risk scores for pulmonary resections. We hypothesized that skeletal muscle index and mediastinal adipose tissue also have an impact on postoperative outcome after primary surgery for primary lung cancer.

METHODS
The institutional database was queried for patients with primary lung cancer who were treated with primary surgery between 02/2009 and 11/2018. A total of 311 patients was included for analysis. Patients receiving neo-/adjuvant chemotherapy or with positive nodal status were excluded. Sarcopenia was defined according to Derstine et al. as a skeletal muscle index <34.4 cm²/m² for women and <45.4 cm²/m² for men.

RESULTS
Sarcopenia was diagnosed in 78 (25.1%) of 311 patients. Male patients were significantly more likely to suffer from sarcopenia (31.5% vs. 18.1%, p=0.009). Comorbidities, lung function, tumour histology, pathologic tumour staging, mediastinal adipose tissue and age did not differ between groups with or without sarcopenia. Sarcopenic patients had a significantly longer length of stay with 13.0 days vs. 9.5 (p=0.003) and a higher rate of overall and major postoperative complications (59.0% vs. 44.6%, 20.5% vs. 9.9%; p=0.036/0.018). There was no difference in recurrence rate or long-term morbidity. Five-Year overall survival was significantly better in the patient cohort without sarcopenia (75.6% vs. 64.5%, p=0.044). Mediastinal adipose tissue showed no significant impact on length of stay, postoperative complications, recurrence rate, long-term morbidity or survival.

CONCLUSIONS
Sarcopenia shows to be a risk factor for postoperative morbidity and reduced survival for primary lung cancer. Efforts should be taken to preemptively screen for sarcopenia and start countermeasures (e.g. physical prehabilitation, protein-rich nutrition, etc.) during the preoperative workup phase.

Disclosure: No significant relationships.
Keywords: Sacropenia, Lung Cancer, Mediastinal Adipose Tissue, VATS.

Junior Posters
Abstract 001-012

P-008
SPLENECTOMY DURING ESOPHAGEAL RESECTION AND GASTRIC PULL-UP. INFLUENCE ON THE PERIOPERATIVE COURSE AND ON LONG-TERM SURVIVAL

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OBJECTIVES
During esophageal resection and subsequent reconstruction by gastric pull-up splenectomy is sometimes unavoidable due to anatomical or oncological reasons. The condition has been reported to be linked to an increased risk for postoperative complications. We retrospectively analyzed the impact of splenectomy on the perioperative course (complications according to the Clavien scale) and on long-term survival in patients who underwent esophagectomy for benign or malignant indications.

METHODS
Between January 2000 and December 2021, 636 patients (114 females, 522 males; mean age 62,2; range 21,2 – 90,7) underwent esophageal resection/reconstruction for benign (N=137) or malignant disease (N=499), 49 thereof had splenectomy. While the patients with benign disease were significantly younger than the ones with malignancies, splenectomy was equally distributed between the two groups.

RESULTS
In the total collective and both subgroups splenectomy had no statistically significant influence on overall postoperative complications (Clavien 1 – 5; p=0,06). There was, however, significant increase of SIRS/sepsis (p=0,02) and of pleural empyema (p=0.019). When analyzing the two groups separately, patients with benign conditions still showed the highly significant effect of splenectomy on SIRS, sepsis or pleural empyema, whereas it was not any longer present in the group with malignancies. In neither uni- nor in multivariable analysis did splenectomy show a significant influence on survival in the total collective or the two subgroups.

CONCLUSIONS
Whereas neither the overall rate of complications following esophagectomy and reconstruction by gastric pull-up nor long-term survival were influenced by splenectomy, there was an increased rate of SIRS/sepsis and pleural empyema in patients with benign disease.

P-009

IMPACT OF PULMONARY ARTERY PRESSURE ON EARLY OUTCOMES AND SURVIVAL AFTER LUNG TRANSPLANTATION IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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OBJECTIVES
Whether a double lung transplant (DLT) rather than a single lung transplant (SLT) should be performed in patients with chronic pulmonary obstructive disease (COPD) and pulmonary artery hypertension remains controversial. We aimed at investigating the influence of pre-transplant pulmonary artery pressure (PAP) on survival after either SLT or DLT.

METHODS
Retrospective analysis of 208 COPD consecutive patients transplanted at a single Centre. Patients were compared based on their PAP (normal mPAP <25 mmHg vs. high mPAP ≥25 mmHg), type of transplant (SLT vs. DLT) and age (≤60 years vs. >60 years). Early mortality and survival were analyzed by univariable, Kaplan-Meier, and Cox regression analyses, adjusting for age and type of transplant.

RESULTS
There were 136 (65%) SLT and 72 (35%) DLT. Normal mPAP in 130 (63%) and high mPAP in 78 (37%). 30-day mortality: 22 patients (10%), presenting higher mPAP (25±6 mmHg vs. 29±10 mmHg; p=0.002). mPAP groups did not differ in terms of age, BMI and lung allocation score. There was no difference in survival between SLT vs. DLT patients (80%, 70%, 62%, 59% vs. 73%, 64%, 59%, 55%, at 1,3,5,7 years respectively; p=0.50). Patients with high mPAP did not have different survival from patients with normal mPAP (figure). There was also no difference in survival between the two age groups (p=0.44). Only those high mPAP patients older than 60 years and receiving a SLT presented worse survival (normal mPAP: 88%, 78%, 61%, 61% vs. high mPAP 65%, 58%, 58%, 44%, at 1, 3, 5, 7 years respectively; p=0.04). The Cox model identified the ichemic time in DLT patients as the unique independent predictor of survival (OR: 1.02; p=0.02).
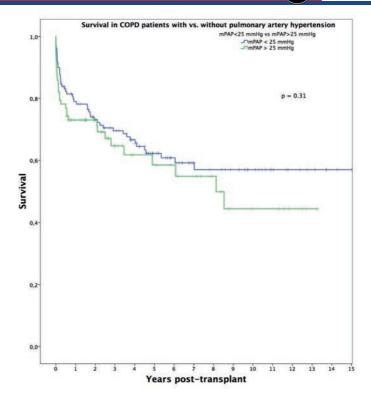
CONCLUSIONS
COPD patients with pre-transplant pulmonary artery hypertension present higher 30-day mortality after lung transplantation, but they can safely undergo a SLT with similar long-term survival than those receiving a DLT.

Disclosure: No significant relationships.
Keywords: Lung Transplantation, Pulmonary Artery Pressure, Outcomes, Survival.

Junior Posters
Abstract 001-012

P-010

ESOPHAGEAL STENTING AS A BRIDGE TO SURGERY IN THE NEOADJUVANT SETTING IN CURATIVE-INTENT ESOPHAGECTOMY: A PROPENSITY-SCORE ANALYSIS

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OBJECTIVES
To evaluate whether inserting an esophageal stent in the neoadjuvant setting as a bridge to curative-intent esophagectomy is associated with increased rates of perioperative complications and post-operative mortality.

METHODS
Retrospective study of a single-center prospective registry containing patients with primary esophageal or gastroesophageal junction cancer having undergone neoadjuvant therapy prior to curative-intent resection between January 2012 and June 2021. Patients were classified into "stented" and "non-stented" groups according to having received an esophageal stent during the neoadjuvant period for treatment of severe dysphagia. A propensity-score (PS) model adjusted for differences in baseline patient characteristics, and perioperative outcomes were evaluated.

RESULTS
There were 371 esophagectomies (35 stented, 336 non-stented) included. Of the 57 patients who received stents in the neoadjuvant period, 22 (38.6%) did not progress to surgery (3.5% due to stent-related events), whereas stent migration (11.4%) and bleeding (11.4%) represented the most frequent adverse events, without stent-related deaths.

The majority of patients in the stented and non-stented group had adenocarcinoma (65.7 vs 86.6%, $p=0.004$, adjusted $p=0.94$), received neoadjuvant chemotherapy +/- radiation (100 vs 100%, $p=0.91$), and underwent an Ivor Lewis esophagectomy (80 vs 75.9%, $p=0.57$), respectively.

After adjusting for PS, complete resection rate (100 vs 100%), lymph nodes resected (18 vs 16, $p=0.88$), surgical time (183 vs 200 min, $p=0.82$), need for reoperation (3 vs 8%, $p=0.39$), anastomotic leak rate (8.8 vs 10.7%, $p=0.12$), median in-hospital length of stay (11 vs 12 days, $p=0.75$), readmission (3 vs 12.2%, $p=0.69$) and 90-day mortality (8.8 vs 3.7%, $p=0.80$) were similar in the stented and non-stented groups, respectively.

CONCLUSIONS
In this study evaluating a propensity-score adjusted population, esophageal stenting as a bridge to surgery was not associated with inferior surgical outcomes and, therefore, should be considered in patients with severe dysphagia and resectable disease in order to get them to surgery with an adequate nutritional status.

Junior Posters
Abstract 001-012

Disclosure: No significant relationships.
Keywords: Esophageal Stent; Esophageal Cancer; Neoadjuvant Treatment

Table 1. Baseline characteristics, and operative, post-operative and pathological outcomes of stented and non-stented patients, with non-adjusted and adjusted p-values (after propensity-score).

	Stented (n=35)	Non-stented (n=336)	P-value	Adjusted P-value
Baseline Characteristics				
Age (years), median (IQR)	68.7 (13)	65 (11)	0.087	0.9993
Sex (female), n (%)	7 (20)	80 (23.9)	0.606	0.9906
Chronic obstructive pulmonary disease, n (%)	9 (25.7)	76 (22.6)	0.678	0.9912
Tumor location (distal and gastroesophageal junction), n (%)	32 (91.4)	309 (92)	0.739	0.9992
Histological type - adenocarcinoma, n (%)	23 (65.7)	290 (86.6)	0.004	0.9415
Neoadjuvant treatment, n (%)	35 (100)	336 (100)	0.907	0.9965
Chemoradiation therapy, n (%)	21 (60)	205 (61)		
Chemotherapy alone, n (%)	14 (40)	131 (39)		
Ivor Lewis esophagectomy, n (%)	28 (80)	255 (75.9)	0.575	0.8872
Minimally invasive esophagectomy, n (%)	22 (62.9)	100 (29.8)	<0.001	0.007
Operative Outcomes.				
Intraoperative blood loss (cc), median (IQR)	200 (350)	250 (250)	0.159	0.6779
Operating time (minutes), median (range)	183 (79)	220 (85)	0.123	0.8195
Post-operative Outcomes.				
Reoperation (%)	1 (3.0)	27 (8.0)	0.493	0.3934
Anastomotic leak, n (%)	3 (8.8)	36 (10.7)	0.408	0.1194
ICU length of stay (days), median (IQR)	0 (1)	0 (0)	0.745	0.0653
In-hospital length of stay (days), median (IQR)	11 (8)	12 (8)	0.896	0.2213
Hospital readmission, n (%)	1 (3.0)	40 (12.2)	0.178	0.6896
30-day mortality, n (%)	2 (5.7)	6 (1.8)	0.169	0.9778
90-day mortality, n (%)	3 (8.8)	12 (3.7)	0.161	0.8003
Pathological Outcomes.				
Complete resection (R0), n (%)	35 (100)	336 (100)		
Abdominal resected lymph nodes, median (IQR)	14 (11)	13 (11)	0.175	0.9903
Total resected lymph nodes, median (IQR)	18 (11)	16 (12)	0.113	0.8826

Abbreviations: ICU, Intensive Care Unit; IQR, Interquartile Range; LOS, Length of Stay

P-011

PREDICTORS OF RECURRENCE AND DISEASE-FREE SURVIVAL IN RADICALLY RESECTED PULMONARY CARCINOIDS

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OBJECTIVES

Pulmonary carcinoids are rare neuroendocrine lung tumors which may recur, thus worsening their otherwise favorable overall prognosis. Hoping to identify patients at risk, we examined parameters affecting recurrence rate and disease-free survival (DFS) in patients who underwent surgery for typical or atypical carcinoids.

METHODS

A retrospective single-center analysis of 82 patients undergoing lung resection for primary carcinoid tumor between 2010 and 2019 was carried out. Kaplan-Meier method was utilized for survival analysis including log-rank testing. Independent prognostic factors for DFS and recurrence were determined using multivariable blockwise Cox regression and backward elimination in multivariable logistic regression, respectively.

RESULTS

This study included 82 patients, 48 females (58.5%) and 34 males (41.5%) with mean age of 58.9 ± 14.2 years, representing 84 cases of pulmonary carcinoids, 56 typical (66.7%) and 28 atypical (33.3%) carcinoids. Median follow-up time was 22 months. Five-year overall survival was 87.5% and 84.7%, 5-year DFS 97.5% and 74.9% (p = .012) for typical and atypical carcinoids, respectively. Recurrences occurred in 1 patient (1.8%) with typical and 5 patients (17.9%) with atypical carcinoid (p = .014). Tumor size (cm) was determined being an independent prognostic factor for reduced DFS (p = .018; HR: 1.77; 95% CI: 1.10 - 2.83). In logistic regression, nodal involvement (p = .043; OR: 2696; 95% CI: 1.30 - 5606388) and tumor size (p = .023; OR: 11.88; 95% CI: 1.41 - 99.92) emerged as statistically significant, independent prognostic predictors indicating higher risk of recurrence. Age, sex, smoking, location, and Ki-67 index did not display independent, statistically significant prognostic value for recurrence or DFS.

CONCLUSIONS

Recurrence in pulmonary carcinoids after complete resection is relatively rare. However, DFS is reduced in atypical compared to typical carcinoids. Tumor size and nodal involvement appear as the most important prognostic factors associated with recurrence of resected pulmonary carcinoids.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Carcinoids, Surgery, Recurrence, Survival

P-012

PRIMARY MEDIASTINAL EWING´S SARCOMA: POST HOC ANALYSIS FROM TWO INTERNATIONAL MULTICENTER PROSPECTIVE RANDOMIZED TRIALS

Theresa Stork[1,2], Andreas Ranft[3,2], Clemens Aigner[1,2], Uta Dirksen[3,2], Stéphane Collaud[1,2]
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OBJECTIVES
Mediastinal soft tissue sarcomas (STS) represent about 1% of all soft tissue sarcomas. Reported survival is poor with 5-year overall survival of about 30%. Ewing´s sarcoma (ES) of the mediastinum is extremely rare, with only few cases reported in the literature. Here we aimed to gain better understanding of primary mediastinal ES in describing patients treated within two international multicenter prospective randomized ES trials.

METHODS
Data from patients with primary mediastinal ES were retrieved from database of the EURO-E.W.I.N.G.99 (ClinicalTrials.gov identifier: NCT00020566) and EWING-2008 (ClinicalTrials.gov identifier: NCT00987636) trials. Patient and treatment characteristics were analyzed.

RESULTS
Out of 2969 patients with ES, nine (0.3%) had primary mediastinal ES. Median age at diagnosis was 30.5 years (4 to 49). Eight (89%) patients had biopsy prior to multimodal treatment, while one (11%) had upfront surgery. At the time of diagnosis, three patients had synchronous metastases to the lung (n=1, 11%), bone (n=1, 11%) or lung and bone (n=1, 11%). All patients underwent multiagent chemotherapy consisting of vincristine, ifosfamide, actinomycin D, etoposide (VIDE) and vincristine, actinomycin D, ifosfamide (VAI) in most patients (n=5, 55%).

Local therapy for non-metastatic primary mediastinal ES was surgery alone (n=2, 22%), combined surgery and radiotherapy (n=2, 22%), radiation alone (n=1, 11%) or none (n=1, 11%). Surgery consisted in extended resections in most patients (n=3, 33%) including resection of lung parenchyma, pericardium, oesophageal muscle layer, atrium and diaphragm. Median follow-up was 170 months (18-293). Overall 5-year survival for the whole cohort was 64%. Beside one patient who was lost of follow-up after 42 months, all patients who had surgery, were alive at the end of follow-up.

CONCLUSIONS
Primary mediastinal ES is extremely rare. Surgery can provide excellent long-term outcome when feasible.

Disclosure: No significant relationships.
Keywords: Mediastinal, Ewing, Sarcoma.

Junior Posters
Abstract 001-012

MONDAY 20 JUNE 2022
MODERATED POSTERS SESSION
17:00 - 18:00

P-013
OUTCOME OF EMERGENCY LOBECTOMY UNDER EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) SUPPORT IN PATIENTS WITH SEVERE CORONAVIRUS-19 (COVID-19) DISEASE

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OBJECTIVES
Not much is known about the results of non-elective anatomical lung resections in COVID-19 patients put on ECMO. Aim of this study is to analyze the outcome of emergency lobectomy under ECMO support in patients with acute respiratory failure due to severe COVID-19 disease.

METHODS
All COVID-19 patients undergoing emergency anatomical lung resection with ECMO support at a German university hospital were included into a prospective database. The university hospital serves as only ECMO center for a population of approximately 2 million people in one of Germany´s most severely affected regions. Study period was 01.04.2020 to 30.04.2021 (first, second and third wave in Germany). Patients characteristics, indications for surgery, clinical course and outcome were analyzed.

RESULTS
A total of 9 patients (median age 61 years, IQR 10 years) were included. There was virtually no pre-existing comorbidity (Median Charlson Score of Comorbidity 0.2). The mean interval between first positive COVID test and surgery was 21.9 days. Clinical symptoms at the time of surgery were sepsis (9/9), respiratory failure (9/9), acute renal failure (5/9), pleural empyema (5/9), lung artery embolism (4/9) and pneumothorax (2/9). Mean ICU and ECMO days before surgery were 15.4 and 6, respectively.

Indications for surgery were bacterial superinfection with lung abscess formation and progressive septic shock (7/9) and abscess formation with massive pulmonary hemorrhage (2/9). All patients were under veno-venous ECMO with femoral-jugular configuration. Operative procedures were lobectomy (8) and pneumonectomy (1). Weaning from ECMO was successful in 4/9. In-hospital-mortality was 5/9. Mean total ECMO days were 10.3 ±6.2 and mean total ICU days 27.7 ±9.9. Mean lengths of stay was 28.7 ±8.8 days.

CONCLUSIONS

Emergency surgery under ECMO support seems to open up a perspective for surgical source control in COVID-19 patients with bacterial superinfection and localized pulmonary abscess. A multi-institutional research project is needed to obtain more evidence.

Disclosure: No significant relationships.
Keywords: COVID-19, ECMO, Thoracic Surgery.

Moderated Posters
Abstract 013-025

P-014

THE HYPOTHETICAL ROLE OF THE OXIDATIVE STRESS IN THE NEUROENDOCRINE LUNG TUMORS

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OBJECTIVES

The neoplastic angiogenesis is an aberrant process associated with an heterogenous distribution of the oxygen through the tumor. Since the neuroendocrine tumors (NET) are characterized by a high vascular supply and angiogenesis, our goal is to verify if the oxidative stress could have a preeminent role in the lung NET (well and poorly differentiated).

METHODS

From April 2010 to October 2021 84 patients were operated radically for typical (TC), atypical carcinoid (AC) and large cell neuroendocrine carcinoma (LCNEC). We compared serum oxidative stress parameters (soluble-Nox2-derived peptide, H_2O_2), break-down activity (HBA) and endothelial-dysfunction in 20 patients operated for NET, 20 patients operated for NSCLC and 20 healthy non-operated patients (control group). Furthermore, we analyzed angiogenesis by VEGFA (A.U.) receptor expression.

RESULTS

The VEGFA/β-actin was higher in the NET compared with NSCLC ($p < 0.005$).

The oxidative stress was different between groups ($p < 0.001$). The median sNOX2-dp (pg/ml) in the NET (45, IQR 35.8;47.8) was higher compared with NSCLC (31.2, IQR 26.9;38) and control group (31.2, IQR 24.6;42.2) respectively. The same can be said for H_2O_2 (μM, $p < 0.001$) where in the NET the median was higher (41.0, IQR 33.4;44.8) compared with NSCLC (27.3, IQR 22.7;36.0) and control group (10.3, IQR 9.1;12.7).

The HBA inhibition (%) is different ($p < 0.001$) but, conversely, the NET showed a lower activity (32, IQR 26;41) compared with NSCLC (41, IQR 34;53) and control group (54, IQR 47;62). There was a negative linear correlation between HBA and H_2O_2 ($r = -0.60$).

Finally, endothelial dysfunction evaluation (NO, μM) confirmed the difference ($p < 0.001$) between groups. The median in the NET was lower (9.9, IQR 9.5;11.6) compared with NSCLC (13.5, IQR 10.8;19.5) and control group (25.9, IQR 20.2;29.1).

CONCLUSIONS

If further studies confirmed the role of the oxidative stress in the lung NET as shown, they would give new perspectives especially in new drug treatments.

Disclosure: No significant relationships.
Keywords: Neuroendocrine Tumors, Oxidative Stress, Serum Markers, Neoangiogenesis, Future Therapy.

P-015

CANCER STEM CELLS AND CELL CYCLE GENES AS INDEPENDENT PREDICTORS OF RELAPSE IN NON-SMALL CELL LUNG CANCER: SECONDARY ANALYSIS OF A PROSPECTIVE COHORT STUDY

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OBJECTIVES

Cancer stem cells (CSCs) are described as resistant to chemo-radio therapy. It has been shown that CSCs influence the disease-free survival in patients undergoing surgery for lung cancer (NCT04634630). Moreover, CSCs have been assessed for the expression of a genes panel, previously validated by Bueno et al. in epithelial lung cancer cells, to predict lung cancer mortality. We recently described an overexpression of these recurrence-related genes (RG) in CSCs for early and locally advanced stages (IIIA) in ACL and squamous cell carcinoma (SCCL) of the lung. This study aims to investigate CSC frequency and RG expression as independent predictors of relapse in lung cancer.

METHODS

This secondary analysis of a prospective cohort study involved 22 surgical tumor specimens from 22 patients in early (I-II) and locally advanced (IIIA) stages of ACL and SCCL. Cell population frequency analysis of ALDHhigh (CSC) and ALDHlow (cancer cells) was performed on each tumor specimen. In addition, RG expression was assessed for 31 target genes separately in ALDHhigh and ALDHlow populations. CSC frequency and RG expression were assessed as predictors of disease-free survival by Cox analysis.

RESULTS

Cox analysis showed that CSC frequency and RG expression were two independent predictors of disease-free survival. CSC frequency was not related to disease-free survival in early stage patients (HR=0.84, 95%CI=0.53-1.33, p=0.454), whereas it was a risk factor in locally advanced stage patients (HR=1.22, 95%CI=1.09-1.35, p=0.000). RG expression – if measured in CSC - was related to a higher risk of recurrence (HR=1.19, 95%CI=1.03-1.39, p=0.021). If considering RG expression measured in cancer cells, its effect on disease-free survival was lower and was not statistically significant (HR=1.12, 95%CI=0.94-1.33, p=0.196).

CONCLUSIONS

CSC frequency and RG expression are independent predictors of relapse in lung cancer. Considering these results, CSCs and RG may need to be considered for both target therapy and prognosis.

Disclosure: No significant relationships.
Keywords: Cancer Stem Cells, Non-Small Cell Lung Cancer, Predictors, Prognosis, Relapse.

P-016

LONG-TERM ONCOLOGICAL OUTCOMES OF COMPLEX SLEEVE LOBECTOMY FOR NON-SMALL-CELL LUNG CANCER

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OBJECTIVES
Bronchoplasty offers the same oncological results as pneumonectomy (P) and it is recommended every time it should achieve a complete resection in the treatment of non-small-cell lung cancer (NSCLC). Complex sleeve lobectomies (CSLs), including double sleeve and extended-sleeve lobectomy, are unfrequently performed and their oncological results are unclear. The aim of our retrospective analysis was to evaluate the post-operative complications and oncological outcomes of CSL comparing them with P and standard-sleeve lobectomies (SSL).

METHODS
From 2014 to 2021, we collected the clinical data of patients who underwent P, CSL and SSL for NSCLC, excluding neuroendocrine tumors. The Kaplan-Meier method with log-rank test were used to estimate and compare survivals and Cox regression analysis to identify prognostic risk factors.

RESULTS
We performed n= 55 Ps, n=38 CSLs and n=38 SSLs; n=7 (12.7%), 13 (34.2%) and n=8 (21.1%) patients were considered unfit (p=0.046); post-operative mortality was n=2 (3.6%), 0 and n=1 (2.6%), p=0.5 respectively. Major complications (Clavien-Dindo >3b) were reported in n=10 (18.2%), n=5 (13.2%) and 3 (7.9%); n=4 (7.3%), n=2 (5.3%) and n=2 (5.3%) developed bronchial complications. Multivariable logistic regression revealed impaired lung function (OR 7.41, p=0.028) as risk factor for complications. Median overall survival (OS) was 35, 23 and 59 months and the 5-year OS was 36%, 33.5% and 53%, rates not different between groups. Cancer recurrence (HR 4.87, p<0.01) and P (HR 2.35, p=0.024) were identified as risk factors of decreased OS. Recurrence developed in n=26 (47.3%), n=20 (52.6%) and 22 (57.9%); distant recurrence was the most frequent pattern in the three groups. Disease-free survival (DFS) was not different between groups (25, 18 and 16 months; 3-years DFS: 46.5%, 30% and 45.5%).

CONCLUSIONS
Oncological long-term results were similar between P and CSL, then CSL could be considered an oncologically sound option in the treatment of NSCLC, also in non-compromised patients.
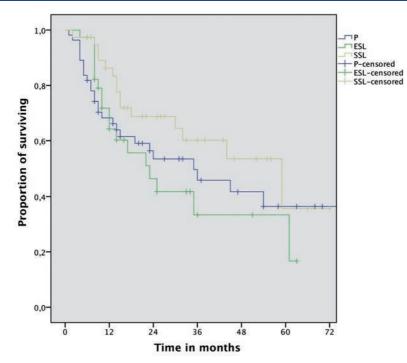
Disclosure: No significant relationships.
Keywords: Extended Sleeve Lobectomy; Overall Survival; Disease-Free Survival; Complications

P-017

LESS IS MORE? A MULTI-INSTITUTIONAL EXPERIENCE WITH COMPUTED TOMOGRAPHY (CT)-GUIDED TRANSTHORACIC TRACERS FOR INTRAPARENCHYMAL LUNG LESIONS

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OBJECTIVES

To provide a multi-institutional comparison of computed tomography–guided tracers.

METHODS

A retrospective cross-sectional study was conducted. All patients admitted to undergoing computed CT–guided tracers with microcoil (GROUP 1), hook wire (GROUP 2), and bioabsorbable hydrogel plug (GROUP 3) lung surgery were included. Primary outcome variables were successful nodule localization and severity of adverse events associated with placement. Secondary outcomes included nodule characteristics on preoperative computed tomography chest and nodule surgical pathology. Data are represented as the mean and range for continuous variables and as n (%) for categorical variables. A $\chi2$ test (or Fisher's test for expected numbers less than 5), Kruskal Wallis, or Mann-Whitney tests were used to analyze the categorical and continuous variables, respectively.

RESULTS

A total of 183 lung nodules were resected in 177 patients using the tracer technique of them 98 (53%) were primary tumours, 62 (35%) metastases and 23 (12%) benign lesions. Data is described in the figure. There were 74 cases (41.8%) of placement-related events noted on CT of the chest. All were minor (67/74, 90%), self-limited, and did not require treatment. Significant data was detected in respiratory function and the Charlson comorbidity index with GROUP 3 (p<0.0001). GROUP 1 with the distance of the tracer from the pleural surface (p=0.002) and rarer complications (p<0.0001).

CONCLUSIONS

While CT guided microcoil lung surgery is safe with a favourable clinical adverse event profile, bioabsorbable hydrogel plug is suitable for poor-risk patients and extend safely the

period for surgical intervention. All methods were efficient, yielding 100% for microcoil and bioabsorbable hydrogel plug and 96% for hook wire in the diagnostic intraoperative localization. CT-guided transthoracic tracers deployment eliminates the need for thoracotomy and palpation to localize worrisome deep intraparenchymal small-size nodules.

Disclosure: No significant relationships.
Keywords: Microcoil, Plug, Hook Wire, CT, Surgery.

Variables	GROUP 1 Microcoil	GROUP 2 Hook Wire	GROUP 3 Plug	p-value
Age	66 (24-83)	61 (9-85)	63 (23-79)	0.058
Sex				0.425
Male	27	43	20	
Female	31	43	13	
Smoking History				0.507
Never	21	35	13	
Current	11	8	6	
Previously smoker	26	43	14	
Cancer History				0.030
None	16	38	13	
Lung	2	9	2	
Other	40	38	16	
Both	0	1	2	
Respiratory Function (mean and range)				
FEV1 %	97 (33-134)	85 (38-118)	97 (33-134)	0.004
DLCO %	76 (33-137)	100 (62-139)	76 (18,49-119)	<0.0001
Charlson Comorbidity Index (mean and range)	6 (1-10)	5 (0-9)	5 (2-9)	0.018
Lesion type				<0.0001
Groung Glass Opacitiy	10	22	11	
Sub-solid	0	27	9	
Solid	48	37	13	
Size of the lesion at CT (mean and range)	1,23 cm (0,4-7)	1,25 cm (0,14-4,3)	1,38 cm (0,1-4)	0.200
Distance from the pleura surface	1,63 (0-4)	0,87 (0-3,1)	1,55 (0,4-4,1)	<0.0001
Major complications from the procedure	1	4	2	0.124
Minor complications from the procedure	2	46	19	<0.0001
Surgical procedure upfront				0.071
Wedge resection	56	72	25	
Sub-lobar resection	1	3	4	
Lobectomy	1	10	4	
Length of surgical time (mean minutes and range)	112 (30-240)	93 (20-240)	150 (15-355)	0.001
Tracer visible	0	80	29	< 0.0001
Tracer palpable	0	45	30	<0.0001
Completion lobectomy	10	8	1	0.096
Lymphadenectomy	0	27	0	<0.0001
Post-surgical complications (mean and range)	6	8	2	0.785
Days of drainage on site	3 (1-19)	3 (1-20)	3 (1-13)	0.244
Days of hospitalization	4 (3-21)	5 (3-20)	6 (2-16)	<0.0001
Alive at the last follow-up date	47	74	31	0.100
Relapse	2	11	1	0.258
Metastases	4	8	3	0.761

P-018

HOW DEMOGRAPHICS AND TREATMENT OF NEUROENDOCRINE TUMORS OF THE LUNG HAVE BEEN CHANGING ACROSS THE YEARS: LESSON LEARNED FROM THE EUROPEAN SOCIETY OF THORACIC SURGEONS (ESTS) LUNG NEUROENDOCRINE TUMOR(NETS) DATABASE

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OBJECTIVES
ESTS Lung Neuroendocrine Tumor Database (NET-DB) started in 2012 and rapidly collected (first retrospectively, then prospectively) a significant number of operated cases that made it one of the largest clinical series in the world. Aim of our work was to evaluate any changes in demographics and treatment over the years, by using NET-DB.

METHODS
Descriptive methods have been used to describe demographics and clinical characteristics of the NET-DB. Results have been summarized as counts and percentages for categorical variables and as median, interquartile range (IQR) and range (min-max) for continuous variables. Bar-charts and box-plots have been produced to graphically show the distribution of categorical and continuous variables respectively. Years have been grouped in decades for the purpose of the analysis.

RESULTS
A total of 1725 observations were available in the NET-DB ; 1670 have been included in this analysis and 55 have been removed due to missing date of operation. The oldest record was dated 1980 and the most recent one 2021. We have observed the following results across the decades: 1) upward trend for median age (Figure 1-A); 2) a quite similar gender distribution (Fig.1-B); 3) a decrease of central lesions with a raise of peripheral ones (Fig.1-C); 4) a reduction of thoracotomy in favor of VATS procedures (Fig.1-D); 5) a declining number of extended lung resection (bilobectomy-pneumonectomy) and an increasing number of lobectomy-segmentectomy(Fig.1-E); 6) a similar distribution of resection status, with radical resections (R0) being predominant.

CONCLUSIONS
Improved awareness and better diagnostic techniques have boosted the number of lung NETs across the years. Screening programs and the increased use of low-dose CT scans have allowed the diagnosis of a significant number of peripheral tumors, which are increasingly treated
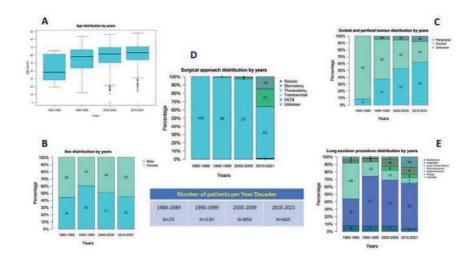
with lobectomies-segmentectomies, and reducing major lung resections; minimally invasive surgical approaches have increased in recent decades, as observed for other primary lung cancers.

Disclosure: No significant relationships.
Keywords: Lung, Neuroendocrine Tumors, Demographics, Treatment.

P-019

THYMOMECTOMY OR THYMOTHYMECTOMY FOR NON-MYASTHENIC PATIENTS WITH STAGE I THYMOMA

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OBJECTIVES
There is a debate on ideal surgical treatment of the early stage thymoma patients without myasthenia gravis (MG). We aimed to evaluate whether simple thymomectomy is equivalent to thymothymectomy in stage I non-myasthenic patients for oncological outcomes.

METHODS
The study included 83 (44.6% female) stage I thymoma patients without MG. Thymomectomy was performed in 40 (48.2%) patients and thymothymectomy was performed in 43 (51.8%) patients. Surgical margin positivity, WHO subtypes of thymomas, adjuvant treatment status, recurrence free survival and overall survival was recorded and analysed.

RESULTS
The two group of patients didn't have any difference on WHO subtype distribution (p=0.063), surgical margin positivity rates (p=1) and adjuvant treatment rates (p=0.727). The five year overall survival rate for thymomectomy group was 96.4% and 97.6% for thymothymectomy group (p=0.099) also five year recurrence free survival rate was similar (95% / 96.6%, p=0.873 respectively).(Figure 1)
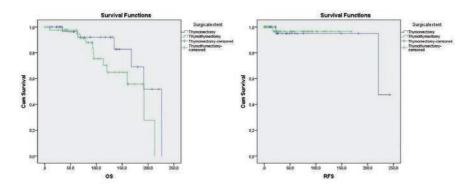
CONCLUSIONS
This study showed that for stage I thymoma patients without MG both thymomectomy and thymothymectomy have equal oncological outcomes.

Disclosure: No significant relationships.
Keywords: Thymomectomy, Thymothymectomy, Thymoma.

P-020

PERCUTANEOUS TRANSSEPTAL EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) TO RESCUE A FAILING RIGHT VENTRICLE IN AN ANIMAL MODEL

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OBJECTIVES
To determine if a percutaneous atrial transseptal Extra-Corporeal Membrane Oxygenator (ECMO) cannulation strategy is technically feasible and will rescue a failing right ventricle (RV) in a porcine animal model.

METHODS
We tested a percutaneous trans-septal ECMO cannulation strategy in 4 live, non-survival swine models. We used the right internal jugular (IJ) vein as a single cannulation site with the Protek Duo rapid deployment catheter. Once transseptal cannulation was achieved, RV failure was induced by partial clamping of the main pulmonary artery. Transseptal ECMO flow was initiated to rescue the failing RV. Multiple measurements were made alternating the ECMO between high and low flow. Cannula stability was assessed over the course of 4 hours.

RESULTS
Percutaneous transseptal cannulation from the right IJ was successfully achieved in 3 out of the 4 animals. In the porcine anatomy, intracardiac echocardiography was necessary for accurate transseptal puncture. The right ventricle was successfully rescued with initiation of ECMO flow to the left atrium (figure 1). In the three transseptal experiments, mean arterial pressure (standard deviation) with low ECMO flow was 39.8 (6.8) versus 68.7 (3.8) with high ECMO flow with P-value of 0.004. The transseptal cannula maintained a stable position in all 3 animals.

CONCLUSIONS
Percutaneous transseptal ECMO cannulation with a single venous access point was technically feasible, rescued the failing right ventricle and functioned like right atrial to left atrial bypass. This is encouraging preclinical evidence to support a transseptal ECMO cannulation strategy in lung transplant candidates with failing right ventricles.

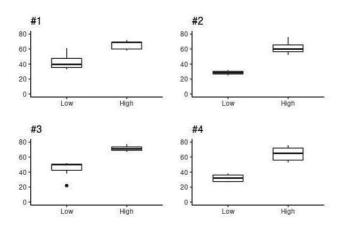**Disclosure:** No significant relationships.
Keywords: ECMO, Transseptal, Lung Transplant, Right Ventricle Failure, End Stage Lung Disease.

Moderated Posters
Abstract 013-025

P-021

ENDOSCOPIC TREATMENT OF ESOPHAGEAL FISTULAS BY INJECTION OF EMULSIFIED ADIPOSE TISSUE STROMAL VASCULAR FRACTION: PRELIMINARY RESULTS

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OBJECTIVES

Esophageal fistula is a life-threatening condition and its treatment is still challenging, often requiring a complex management. We propose the preliminary results of an innovative, inexpensive, endoscopic technique for the treatment of esophageal fistulas.

METHODS

From July 2019 to December 2021, 7 patients affected by esophageal fistula, unfit for or not responder to traditional treatments, were treated by endoscopic injection of autologous adipose tissue stromal vascular fraction (tSVFem), rich of mesenchymal stromal cells with regenerative properties. The tSVFem was obtained in real time by harvesting 30 ml of fat from subcutaneous tissue by a 2.1mm microcannula, emulsifying the microfat mechanically through sequential 600/400 µm filters and removing oil and adipocytes by centrifugation. Then an esophagoscopy was performed and the tSVFem was injected into the submucosa of the 4 quadrants of the fistula borders by a 22G endoscopic needle.

RESULTS

Four patients were male, and the mean age was $51,1 \pm 12.3$years. The fistula was located in the upper esophagus in 1 case (post-traumatic) and in the distal part in 6 (2 in Boerhaave syndrome and 4 after Ivor-Lewis esophagectomy). The mean diameter was 8 mm (range 4-14mm) and the timing of treatment was 25 days after (range 10-110) the diagnosis. In 5 cases the fistula was completely healed and covered by new mucosa at the first endoscopic check 8-10 days after the treatment. In 2 cases a second or a third looks were necessary due to post-radiotherapy fibrotic tissues. No complications were recorded.
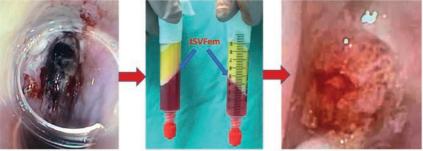
CONCLUSIONS

According to these preliminary results, the tSVFem endoscopic injection seems to be a safe and effective treatment for esophageal fistulas, that requires an easy, and reproducible mechanical manipulation of autologous adipose tissue without expensive enzymatic processes and cell expansions. Further data are necessary to drive stronger conclusions.

Moderated Posters
Abstract 013-025

Disclosure: No significant relationships.
Keywords: Esophagus; Adipose Tissue Stromal Vascular Fraction; Fistula; Endoscopic Treatment.

Pre-Treatment   tSVFem   Post-Treatment

P-022

IMPLEMENTATION OF A NEW ROBOTIC SURGICAL SYSTEM FOR GENERAL THORACIC SURGERY, EARLY EXPERIENCE

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OBJECTIVES
The Versius Surgical System (CMR Surgical, Cambridge, UK) is a commercially available European robotic platform that represent an alternative to the well-structured US robotic system. The aim of this study is to describe the clinical implementation of the Versius in a tertiary university hospital following the IDEAL development framework for surgical innovation.

METHODS
The study was conducted following the IDEAL Stage 2a ("Development") protocol. Patients with thoracic disease requiring surgical procedure were prospectively included. Patient were informed that the procedure could be a hybrid surgery (robotic-thoracoscopic). Main outcome measures included success rate, complication rates and pathological results.

RESULTS
From October 2021 to January 2022, eighteen patients underwent thoracic surgery with Versius System; the procedures were: 9 typical pulmonary resections, 5 mediastinal procedures (thymectomy, node biopsy, neuroma resection), 2 wedge resections, 2 pleurodesis. The mean age was 55 years. Estimated blood loss was 100-150 mL. The average operative time was 236 minutes (106-415 min). All procedures were completed according to pre-operative strategy except one which required open surgery conversion to fix a small bronchial lesion. In one case occurred a console failure; therefore, the procedure was completed by VATS without any surgical trouble. Globally the success rate was 88,2%. Two patients experienced Grade II morbidities (11,8%). The average length of stay was 5 days (2-8 days). All the 12 oncological procedures were R0. A statistical monitoring techniques (CUSUM) were performed.

CONCLUSIONS
Our technical-feasibility-study on Versius Surgical System suggests that this innovative European robotic platform is a successful and safe device for thoracic surgery. The versatility and the small footprint allowed us to have our original setting, personal surgical approaches and good integration with the table assistant. Thoracic procedure carried out with the European robotic platform could be considered stable enough to allow multicenter replication following IDEAL Stage 2b ("Exploration") protocol.

Disclosure: No significant relationships.
Keywords: Robotic-Assisted-Thoracic-Surgery (RATS).

Moderated Posters
Abstract 013-025

P-023

IMPACT OF SURGICAL SAFETY CHECKLIST COMPLIANCE IN NEAR MISSES, INCIDENT DETECTION AND 30 DAY-COMPLICATIONS IN THORACIC SURGERY: AN OBSERVATIONAL STUDY

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OBJECTIVES
Surgical safety checklists are widely used to improve quality of perioperative care. However, evidence related to surgical safety checklist compliance and impact in thoracic surgery is scarce. Our aim was to evaluate surgical safety checklist compliance in the thoracic surgery department of a university hospital and to assess its effectiveness to detect near misses and incidents in a real world scenario. We also investigated its influence in the incidence of 30-day complications.

METHODS
This is a retrospective study based on the review of electronic medical records. Eligibility criteria included patients that underwent thoracic surgical interventions in our institution between August 2018 and December 2021. Surgical checklist compliance was expressed as a proportion using the Agresti–Coull method to calculate the corresponding 95% confidence interval. Fisher's exact test was used to assess the association between surgical checklist compliance and near misses and incidents detection and between checklist compliance and incident detection with the occurrence of 30-day complications.

RESULTS
A total of 230 surgical procedures were analyzed. 212 (92.2%) were elective cases and 18 (7.8%), urgent. Overall checklist compliance was 84.3% (95% confidence interval: 79.1% to 88.5%), regardless of the urgency (p=0.746). A near miss occurred in 33 of the 36 procedures (92%, p=0.000) whose checklist was not duly completed. No incident was detected among procedures with not completed checklist. However, 26 (13.4%) incidents were detected in procedures with completed checklist (p=0.018). 53 patients (23%) presented any type of complication. Neither checklist compliance nor incident detection were related to the incidence of 30-day complications (p= 0.761 and p= 0.997, respectively).

CONCLUSIONS
This study shows a relatively high compliance of surgical safety checklist in the setting evaluated, although with room for improvement. Checklist compliance may facilitate near misses and incidents detection in thoracic surgery, although it does not seem to influence the incidence of 30-day complications.

Disclosure: No significant relationships.
Keywords: Safety, Checklist, Incident, Thoracic Surgery, Complications.

Moderated Posters
Abstract 013-025

P-024

CLINICOPATHOLOGICAL FEATURES AND SURVIVAL ANALYSIS OF PATIENTS WITH PATHOLOGICAL COMPLETE RESPONSE AND MAJOR RESPONSE AFTER NEOADJUVANT/INDUCTION THERAPY

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OBJECTIVES

In patients who underwent surgery for locally advanced non-small cell lung cancer (NSCLC) after neoadjuvant/induction (N/I) therapy, absence of viable tumor cells in the specimen is defined as pathological complete response (pCR), and a viable tumor cell count of 10% or less is considered pathological major response (pMR) and has been shown to be a good prognostic factor. However, the place of pCR and pMR in the lung cancer staging system and the survival differences are not clear. The aim of this study was to evaluate the clinicopathological features and survival of patients with pCR and pMR after N/I treatment

METHODS

The data of 1502 patients who underwent anatomic lung resection due to NSCLC between 1996 and December 2020 in our clinic were prospectively recorded and analyzed retrospectively. Six-hundred and nine (40.5%) patients who underwent surgery after N/I treatment due to clinical locally advanced NSCLC were included in the study. The 8th ypTNM system was used for pathological staging. Survival of the patients and influencing factors were analyzed

RESULTS

Of the patients, 561 were male (92.4%), 46 were female (7.6%), and the mean age was 60.5 ± 8.52 (26-85). Four hundred and fifty four patients (74.5%) received chemotherapy, 155 patients (25.5%) received chemoradiotherapy. In the histopathological examination, 106 (17.5%) patients had pCR, 44 (7.2%) pMR, 136 (22.4%) ypStage 1, 150 (24.7%) ypStage 2, and 171 patients were ypStage 3-4.(28.2%). Five-year survival was as follows; 70.5% in pCR, 56.1% in pMR, 68.5% in ypStage 1, 52.2% in ypStage 2, 33.1% in ypStage 3 and 33.8% in ypStage 4 (p<0.05) (graphic 1).

CONCLUSIONS

In patients with locally advanced NSCLC who underwent surgical treatment after N/I, the best survival is achieved in patients with pCR. Our study shows that the presence of a pMR, independent of tumor size, cannot be a prognostic factor alone.
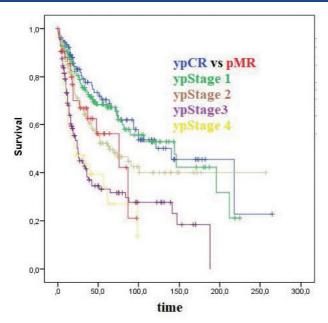
Disclosure: No significant relationships.
Keywords: Non-small cell lung cancer, NSCLC, Neoadjuvant Therapy, Complete Response.

P-025

LEARNING CURVE FOR THORACOSCOPIC LOBECTOMY: DO PATIENTS HAVE THE SAME LONG-TERM SURVIVAL CHANCE?

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OBJECTIVES
Safety of the Video-assisted thoracic surgery (VATS) lobectomy performed in the learning curve (LC) period has been widely evaluated while long term oncological results of patients operated during it had not been reported yet. We analyzed the long-term results of our VATS lobectomy program, comparing the LC patients with subsequent cases.

METHODS
We include in our analysis all the VATS lobectomy (n=381) performed for non-small cell lung cancer (NSCLC) in the period between June 2012 (start of our VATS lobectomy program) and December 2018. The first 50 cases represented the LC group. All patients completed a follow-up of at least 60 months, 15 patients were lost at follow-up and then excluded. Kaplan-Meier method along with a log-rank test for statistical significance were used to estimate and compare overall survival (OS) and disease-free survival (DFS).

RESULTS
Classified by pathological stage we founded: in the LC group 39 (78%) stage I, 7 (14%) stage II and 4 (8%) advanced stage (IIIA and IVA) patients; in the post-LC group 257 (81%) stage I, 27 (9%) stage II and 32 (10%) advanced stage (IIIA, IIIB and IVA). Regardless of stage, the 5-years OS of patients of LC group was 84% vs 67% (p=0.110) of other treated patients. Also, the 5-years DFS of LC group was 76% vs 64% (p=0.957) of the post-LC group. Stage I patients of LC group compared with those of post-LC group demonstrated a 5-years OS respectively of 86% vs 70% (p=0.156) and a 5-years DFS respectively of 82% vs 68% (p=0.976).

CONCLUSIONS
Based on our results patients underwent VATS lobectomy during learning period has the same oncological long-terms survival results of patients treated after this period.
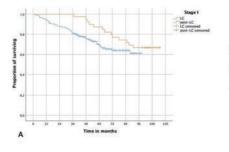
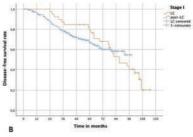**Disclosure:** No significant relationships.
Keywords: Lung Cancer, VATS Lobectomy, Learning Curve, Survival, NSCLC.

POSTERS

P-026

IMPACT OF THE INTERNATIONAL ASSOCIATION FOR THE STUDY OF LUNG CANCER (IASLC) PROPOSED GRADING SYSTEM IN SELECTING SUBLOBAR RESECTION VERSUS LOBECTOMY FOR CLINICAL STAGE IA LUNG ADENOCARCINOMA

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OBJECTIVES
The International Association for the Study of Lung Cancer has proposed a new grading system that could well stratify the prognosis for patients with surgically resected lung adenocarcinoma (LUAD). However, its role in surgical management of early-stage LUAD remains undetermined.

METHODS
We retrospectively reviewed 1022 patients with clinical stage IA LUAD who underwent surgery between 2011 and 2014. The effect of the new grading system on recurrence-free survival (RFS) and overall survival (OS) following lobectomy, segmentectomy, and wedge resection were investigated. Three-dimensional reconstruction of CT image was retrospectively performed to ensure enough margin distance for segmentectomy.

RESULTS
In multivariable Cox analysis, segmentectomy was associated with worse RFS ($p = .039$) and OS ($p = .060$) than lobectomy in patients with grade 3 LUAD, but not in grade 1 (RFS, $p = .964$; OS, $p = .522$) and grade 2 LUAD (RFS, $p = .073$; OS, $p = .122$). With wedge resection, worse RFS and OS were observed in patients with grade 2 LUAD (RFS, $p = .001$; OS, $p = .001$) and grade 3 LUAD (RFS, $p < .001$; OS, $p = .002$) than lobectomy in multivariable Cox analysis, but not in those with grade 1 LUAD (RFS, $p = .872$; OS, $p = .726$). Moreover, we found that a higher tumor grade was significantly correlated with the presence of spread through air spaces ($p < .001$) and visceral pleural invasion ($p < .001$).

CONCLUSIONS
Lobectomy showed a better prognosis than sublobar resection for patients with grade 3 LUAD. Segmentectomy could be recommended for grade 2 LUAD, whereas surgeons could rely on the patient profile to decide surgical strategy between segmentectomy and wedge resection for grade 1 LUAD.

Disclosure: No significant relationships.
Keywords: Lung Adenocarcinoma, Tumor Grading, Segmentectomy, Wedge Resection.

Table 1. Baseline characteristics according to the surgical extent in patients with clinical stage I lung adenocarcinoma (n = 1022).

Variables	Lobectomy (n = 729)	Segmentectomy (n = 180)	Wedge resection (n = 113)	*p* value
Age, years				**< 0.001**
< 65	504 (68.6)	97 (53.9)	57 (50.4)	
≥ 65	225 (31.4)	83 (46.1)	56 (49.7)	
Mean age, ± SD	59.0 ± 8.5	61.2 ± 12.5	62.6 ±9.7	**< 0.001**
Sex				0.582
Male	334 (45.8)	78 (43.3)	56 (49.6)	
Female	395 (54.2)	102 (56.7)	57 (50.4)	
Smoking history				0.825
Non-smoker	473 (64.9)	120 (66.7)	76 (67.3)	
Current or ever smoker	256 (35.1)	60 (33.3)	37 (32.7)	
Tumor location				0.794
Upper or middle lobe	488 (66.9)	123 (68.3)	79 (69.9)	
Lower lobe	241 (33.1)	57 (31.7)	34 (30.1)	
IASLC grading system				**0.011**
Grade1	110 (15.1)	45 (25.0)	23 (20.4)	
Grade2	286 (39.2)	70 (38.9)	48 (42.5)	
Grade3	333 (45.7)	65 (36.1)	42 (37.2)	
Clinical T stage				**< 0.001**
T1a	84 (11.5)	39 (21.7)	23 (20.4)	
T1b	286 (39.2)	82 (45.6)	51 (45.1)	
T1c	359 (49.2)	59 (32.8)	39 (34.5)	
LN status				**0.006**
Negative	618 (84.8)	165 (91.7)	105 (92.9)	
Positive	111 (15.2)	13 (8.3)	16 (7.1)	
VPI				0.874
Presence	103 (14.1)	28(15.5)	17 (15.0)	
Absence	626 (85.9)	152 (84.5)	96 (75.0)	
STAS				0.076
Presence	246 (33.7)	46 (25.6)	32 (28.3)	
Absence	483 (66.3)	134 (74.4)	81 (71.7)	
Predominant histological subtype				0.070
Lepidic	116 (15.9)	48 (26.7)	23 (20.4)	
Acinar	311 (42.7)	77 (42.8)	52 (46.0)	
Papillary	122 (16.7)	23 (12.8)	16 (14.2)	
Micropapillary	50 (6.9)	8 (4.4)	7 (6.2)	
Solid	28 (3.8)	8 (4.4)	2 (1.8)	
Complex glands	102 (14.0)	16 (8.9)	13 (11.5)	

Abbreviation: IASLC, International Association for the Study of Lung Cancer; SD, standard deviation; VPI, visceral pleural invasion; STAS, spread through air space; LN, lymph node.

Posters
Abstract 026-146

Table 2. Univariate and multivariate Cox regression analysis of recurrence-free survival and overall survival in patients with clinical stage I lung adenocarcinoma (n = 1022)

Variables	Recurrence-free survival				Overall survival			
	Univariate		Multivariate		Univariate		Multivariate	
	HR (95% CI)	p value	HR (95% CI)	p value	HR (95% CI)	p value	HR (95% CI)	p value
Age (≥ 65 vs. < 65)	1.017 (0.832-1.379)	0.597			1.165 (0.875-1.550)	0.295		
Sex (Male vs. female)	1.04 (0.858-1.395)	0.470			1.210 (0.917-1.596)	0.178		
Smoking history (Current or ever vs. non-smoker)	0.973 (0.754-1.256)	0.832			0.981 (0.733-1.313)	0.896		
Tumor location (upper or middle vs. lower lobe)	1.039 (0.800-1.350)	0.772			1.144 (0.844-1.550)	0.386		
Surgical extent		< 0.001		< 0.001		0.001		< 0.001
Segmentectomy vs. Lobectomy	1.321 (0.960-1.817)	0.087	1.669 (1.205-2.311)	0.002	1.369 (0.949-1.975)	0.093	1.867 (1.286-2.711)	0.001
wedge resection vs. Lobectomy	1.974 (1.423-2.736)	<0.001	4.234 (2.988-6.000)	< 0.001	1.978 (1.366-2.864)	< 0.001	3.721 (2.530-5.472)	< 0.001
Clinical T stage		< 0.001		< 0.001		< 0.001		0.001
T1a vs T1c	0.262 (0.159-0.432) 0.412	< 0.001	0.393 (0.235-0.659) 0.547	0.001	0.226 (0.123-0.418) 0.399	< 0.001	0.385 (0.204-0.726) 0.571	0.003
T1b vs T1c	(0.314-0.542)	< 0.001	0.413-(0.725)	< 0.001	(0.291-0.546)	< 0.001	(0.413-0.790)	0.001

Variables	Recurrence-free survival				Overall survival			
	Univariate		Multivariate		Univariate		Multivariate	
	HR (95% CI)	*p* value	HR (95% CI)	*p* value	HR (95% CI)	*p* value	HR (95%	*p* value
Pathological N stage (positive vs. negative)	10.180 (7.890-13.135)	< 0.001	9.173 6.973-(12.068)	< 0.001	10.159 (7.661-13.472)	< 0.001	8.188 (6.072-11.042)	< 0.001
VPI (presence vs. absence)	1.327 (0.968-1.820)	0.079			1.116 (0.765-1.629)	0.568		
STAS (presence vs absence)	1.765 (1.381-2.254)	< 0.001	1.092 (0.816-1.461)	0.554	1.663 (1.256-2.201)	< 0.001	1.001 (0.717-1.397)	0.997
IASLC grading system		< 0.001		< 0.001		< 0.001		0.001
Grade 1 vs Grade 3	0.160 (0.091-0.281)	< 0.001	0.271 (0.148-0.497)	< 0.001	0.099 (0.044-0.226)	< 0.001	0.181 (0.077-0.428)	<0.001
Grade 2 vs Grade 3	0.529 (0.408-0.686)	< 0.001	0.630 (0.463-0.857)	0.003	0.577 (0.430-0.772)	< 0.001	0.731 (0.516-1.036)	0.078

Abbreviation: SMLD, systematic mediastinal lymph node dissection; HR, odds ratio; CI, confidence interval; VPI, visceral pleural invasion; STAS, spread through air space; IASLC, the International Association for the Study of Lung Cancer.

Posters
Abstract 026-146

Table 3. Univariate and multivariate Cox regression analysis of recurrence-free survival and overall survival in clinical stage I NSCLC patients with different grades.

Grade 1	Recurrence-free survival				Overall survival			
	Univariate		Multivariate		Univariate		Multivariate	
	HR (95% CI)	*p* value	HR (95% CI)	*p* value	HR (95% CI)	*p* value	HR (95%	*p* value
Age (≥ 65 vs. < 65)	1.321 (0.432-4.041)	0.625	/	/	1.051 (0.192-5.741)	0.954	/ /	/ /
Sex (Male vs. female)	1.781 (0.596-5.321)	0.301	/	/	2.969 (0.543-16.226)	0.209	/	/
Smoking history (Current or ever vs. non-smoker)	1.336 (0.448-3.982)	0.603	/	/	1.530 (0.309-7.580)	0.603	/	/
Tumor location (upper or middle vs. lower lobe)	0.797 (0.245-2.597)	0.707	/	/	0.695 (0.127-3.808)	0.675	/	/
Surgical extent		0.987	/	/		0.805	/	/
Segmentectomy vs. Lobectomy	1.031 (0.273-3.897)	0.964	/	/	1.795 0.299-10.758)	0.522	/	/
wedge resection vs. Lobectomy	1.136 (0.241-5.350)	0. 872	/	/	1.499 (0.156-14.416)	0.726	/	/
Clinical T stage		0.151	/	/		0.997	/	/
T1a vs T1c	0.307 (0.073-1.289)	0.107	/	/	1.055 (0.095-11.708)	0.965	/	/

	Recurrence-free survival				Overall survival			
	Univariate		Multivariate		Univariate		Multivariate	
	HR (95% CI)	p value	HR (95% CI)	p value	HR (95% CI)	p value	HR (95%	p value
T1b vs T1c	0.343 (0.099-1.193)	0.093	/	/	1.097 (0.114-10.584)	0.936	/	/
VPI (presence vs. absence)	2.004 (0.551-7.284)	0.291	/	/	0.040 (0.000 - >1×103)	0.534	/	/
STAS (presence vs absence)	1.560 (.346-7.040)	0.563	/	/	1.682 (0.197-14.405)	0.635		/
Grade 2								
Age ($\geq$ 65 vs. < 65)	0.866 (0.562-1.335)	0.515			0.762 (0.466-1.248)	0.280		
Sex (Male vs. female)	1.272 (0.836-1.935)	0.262			1.486 (0.9333-2.367)	0.095		
Smoking history (Current or ever vs. non-smoker)	1.284 (0.826-1.996)	0.266			1.355 (0.832-2.205)	0.222		
Tumor location (upper or middle vs. lower lobe)	1.142 (0.729-1.788)	0.563			1.368 (0.816-2.296)	0.235		
Surgical extent		**0.002**		**< 0.001**		**0.005**		**< 0.001**
Segmentectomy vs. Lobectomy	1.652 (0.953-2.861)	0.073	1.388 (0.790 2.439)	-0. 254	1.635 (0.876-3.051)	0.122	1.691 (0.891-3.207)	0.108
wedge resection vs. Lobectomy	2.479 (1.465-4.196)	0. 001	5.125 (2.890-9.090)	< 0.001	2.549 (1.433-4.537)	0.001	5.301 (2.874-9.779)	< 0.001

	Recurrence-free survival				Overall survival			
	Univariate		Multivariate		Univariate		Multivariate	
	HR (95% CI)	p value	HR (95% CI)	p value	HR (95% CI)	p value	HR (95%	p value
Clinical T stage		**< 0.001**		**0.009**		**< 0.001**		**0.011**
T1a vs T1c	0.146 (0.046-0.468)	0.001	0.162 (0.049-0.535)	0.003	0.060 (0.008-0.434)	0.005	0.062 (0.008-0.460)	0.007
T1b vs T1c	0.470 (0.301-0.733)	0.001	0.736 (0.456-1.181)	0.204	0.408 (0.246-0.676)	< 0.001	0.639 (0.369-1.107)	0.110
Pathological N stage (positive vs. negative)	11.475 (7.428-17.726)	**< 0.001**	13.929 (8.393-23.117)	< 0.001	11.186 (6.966-17.964)	**< 0.001**	11.697 (6.800-20.121)	**< 0.001**
VPI (presence vs. absence)	1.810 (1.004-3.265)	**0.049**	1.946 (1.062-3.565)	**0.031**	1.641 (0.840-3.204)	0.147		
STAS (presence vs absence)	1.643 (0.928-2.909)	**0.089**	2.049 (1.145-3.669)	**0.016**	1.712 (0.920-3.185)	**0.090**	2.431 (1.291-4.578)	**0.006**
Grade 3								
Age (≥ 65 vs. < 65)	1.307 (0.946-1.808)	0.105			1.639 (1.143-2.350)	**0.007**	1.322 (0.912-1.917)	**0.140**
Sex (Male vs. female)	0.807 (0.592-1.101)	0.175			0.873 (0.613-1.244)	0.453		
Smoking history (Current or ever vs. non-smoker)	0.782 (0.563-1.085)	0.141			0.777 (0.534-1.131)	0.187		
Tumor location (upper or middle vs. lower lobe)	1.066 (0.763-1.490)	0.707			1.114 (0.758-1.638)	0.583		

	Recurrence-free survival				Overall survival			
	Univariate		Multivariate		Univariate		Multivariate	
	HR (95% CI)	*p* value	HR (95% CI)	*p* value	HR (95% CI)	*p* value	HR (95%	*p* value
Surgical extent		**< 0.001**		**< 0.001**		**0.004**		**< 0.001**
Segmentectomy vs. Lobectomy	1.541 (1.021-2.324)	0.039	2.022 (1.333-3.067)	0.001	1.572 (0.981-2.517)	0.060	2.138 (1.326-3.447)	0.002
wedge resection vs. Lobectomy	2.296 (1.484-3.554)	< 0.001	4.370 (2.752-6.940)	< 0.001	2.201 (1.335-3.629)	0.002	3.327 (1.986-5.572)	< 0.001
Clinical T stage		**0.001**		**0.005**		**0.005**		**0.012**
T1a vs T1c	0.497 (0.346-0.714) 0.709	< 0.001	0.484 (0.334-0.701) 0.639	< 0.001	0.504 (0.333-0.765)	0.001 0.680	0.528 (0.345-0.807) 0.718	0.003
T1b vs T1c	(0.381-1.319)	0.277	(0.341-1.199)	0.171	(0.330-1.405)	0.298	(0.344-1.498)	0.377
Pathological N stage (positive vs. negative)	7.185 (5.191-9.946)	**< 0.001**	8.484 (6.035-11.929)	**< 0.001**	6.983 (4.869-10.013)	**< 0.001**	7.385 (5.110-10.673)	**< 0.001**
VPI (presence vs. absence	0.952 (0.643-1.410)	0.807			0.849 (0.535-1.347)	0.487		
STAS (presence vs absence)	0.989 (0.720-1.358)	0.946			0.917 (0.640-1.313)	0.635		
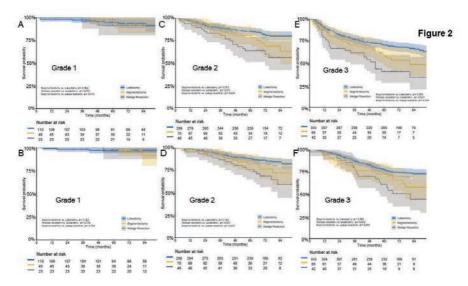
Abbreviation: HR, odds ratio; CI, confidence interval; VPI, visceral pleural invasion; STAS, spread through air space; IASLC, the International Association for the Study of Lung Cancer.

Figure 2

P-027

DEVELOPMENT AND VALIDATION OF A WEB-BASED DYNAMIC NOMOGRAM PREDICTIVE OF OVERALL SURVIVAL IN PATIENTS WHO UNDERWENT PNEUMONECTOMY FOR LUNG CANCER

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OBJECTIVES

The TNM staging is not sufficient to precisely distinguish the long-term outcome of patients who underwent pneumonectomy for lung cancer. We sought to develop and validate a web-based dynamic nomogram predictive of OS for this specific population.

METHODS

A total of 1261 consecutive patients who underwent pneumonectomy for lung cancer at Sun Yat-sen University Cancer Center from January 2008 to December 2018 were retrospectively collected. Patients were randomized into a training cohort (n=1009) and a validation cohort (n=252) in an 80:20 ratio. In the training cohort, clinical, laboratory, and pathological variables for predicting survival were screened using LASSO, and Cox proportion hazards model was used to construct the predicting nomogram. The predictive accuracy and discriminative ability of the nomogram were determined by C-index and calibration curve. The results were validated using bootstrap resampling in the validation cohort. In addition, DCA assessed the clinical utility.

RESULTS

Through LASSO-Cox regression analyses in the training cohort, 5 variables significantly associated with OS were incorporated into a nomogram: disconnection of pulmonary artery (pericardium/extrapericardium, P=0.015), disconnection of pulmonary vein (pericardium/extrapericardium, P=0.023), T stage (T0-1/T2/T3/T4, P<0.001), N stage (N0/N1/N2, P<0.001), and adjuvant therapy (yes/no, P<0.001). The nomogram showed a relative good discriminative ability, with C-index of 0.675 ± 0.025 in the training cohort and 0.697 ± 0.048 in the validation cohort. The calibration curves showed a good match between the nomogram-predicted probabilities and the actual probabilities. Moreover, DCA demonstrated that in terms of clinical usefulness, the nomogram outperformed the traditional TNM staging system. In addition, the nomogram has been translated into an online calculator that is freely available to thoracic surgeons (https://thoracicsurgery-nccchina.shinyapps. io/Overall-survival/).

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CONCLUSIONS
Our novel prediction model–based interactive calculator could serve as a reliable, powerful, and free tool for prognosis prediction in patients who underwent pneumonectomy for lung cancer, and could be incorporated into practice management guidelines.

Disclosure: No significant relationships.
Keywords: Pneumonectomy, Lung Cancer, Nomogram.

Table 1. Clinical, laboratory, and pathological variables of patient who underwent pneumonectomy for primary lung cancer in the training cohort and validation cohort.

Variable	Overall (N = 1261)	Training cohort (N = 1009)	Validation cohort (N = 252)	*P* value
Year of operation, n (%) 2008-2011 2012-2015 2016-2018	455 (36.0%) 466 (37.0%) 340 (27.0%)	356 (35.3%) 376 (37.3%) 277 (27.5%)	99 (39.3%) 90 (35.7%) 63 (25.0%)	0.478
Mean age at diagnosis, years (range)	57.4 (20-77)	57.4 (20-77)	57.3 (-)	0.859
Sex, n (%) Female Male	171 (13.6%) 1090 (86.4%)	140 (13.9%) 869 (86.1%)	31 (12.3%) 221 (87.7%)	0.514
Mean duration of chief complaint, months (range)	3.3 (0.08-48.0)	3.3 (0.08-48.0)	3.2 (0.1-36.0)	0.707
Smoking history, n (%) Yes No	1028 (81.5%) 233 (18.5%)	823 (81.6%) 205 (81.3%)	186 (18.4%) 47 (18.7%)	0.937
Mean BMI, kg/m^2 (range)	23.8 (14.2-36.5)	23.7 (14.2-36.5)	24.2 (-)	0.028
Median weight loss in preoperative 3 months, kg (range)	0.0 (0.0-15.0)	0.0 (0.0-15.0)	0.0 (0.0-10.0)	0.123
Induction therapy, n (%) Yes No	131 (10.4%) 1130 (89.6%)	104 (10.3%) 905 (89.7%)	27 (10.7%) 225 (89.3%)	0.850
Mean FEV1, (range)	2.21 (0.77-3.99)	2.21 (0.77-3.98)	2.20 (0.92-3.99)	0.692

Variable	Overall (N = 1261)	Training cohort (N = 1009)	Validation cohort (N = 252)	*P* value
Mean FEV1 %pred, % (range)	72.4 (26.7-127.6)	72.7 (26.7-118.0)	71.4 (30.0-127.6)	0.286
Mean DLCO, (range)	7.07 (1.33-32.88)	7.05 (1.33-17.39)	7.16 (2.38-32.88)	0.465
Mean DLCO %pred, % (range)	78.0 (1.4-359.0)	77.9 (1.4-197.0)	78.5 (31.0-359.0)	0.711
Median NLR, (range)	2.43 (0.25-65.87)	2.46 (0.25-65.87)	2.71 (0.59-11.17)	0.004
Mean PLR, (range)	148.30 (16.35-1264.52)	149.03 (16.35-1264.52)	145.47 (50.53-500.00)	0.510
Median CAR, (range)	0.00 (0.00-0.93)	0.00 (0.00-0.84)	0.00 (0.00-0.93)	0.338
Incision method, n (%) Open Uniportal VATS Three-portal VATS	1225 (97.1%) 17 (1.3%) 19 (1.5%)	978 (96.9%) 14 (1.4%) 17 (1.7%)	247 (98.0%) 3 (1.2%) 2 (0.8%)	0.564
Disconnection of pulmonary artery, n (%) Pericardium Extra-pericardium	180 (14.3%) 1081 (85.7%)	144 (14.3%) 865 (85.7%)	36 (14.3%) 216 (85.7%)	0.995
Disconnection of pulmonary vein, n (%) Pericardium Extra-pericardium	226 (17.9%) 1035 (82.1%)	181 (17.9%) 828 (82.1%)	45 (17.9%) 207 (82.1%)	0.976
Disconnection of main bronchus, n (%) Stapler Manual suture	23 (1.8%) 1238 (98.2%)	992 (98.3%) 17 (1.7%)	246 (97.6%) 6 (2.4%)	0.460
Pathology, n (%) Squamous cell carcinoma Adenocarcinoma Adenosquamous carcinoma Neuroendocrine Tumor Other	897 (71.1%) 221 (17.5%) 31 (2.5%) 58 (4.6%) 54 (4.3%)	722 (71.6%) 175 (17.3%) 24 (2.4%) 46 (4.6%) 42 (4.2%)	175 (69.4%) 46 (18.3%) 7 (2.8%) 12 (4.8%) 12 (4.8%)	0.970

Variable	Overall (N = 1261)	Training cohort (N = 1009)	Validation cohort (N = 252)	*P* value
Grade, n (%)				
Well	70 (5.6%)	52 (5.2%)	18 (7.1%)	
Moderately	632 (50.1%)	506 (50.1%)	126 (50.0%)	0.451
Poorly	559 (44.3%)	451 (44.7%)	108 (42.9%)	
Mean tumor size, cm (range)	4.7 (0.0-22.0)	4.7 (0.2-22.0)	4.6 (0.0-15.0)	0.447
Pathological T stage, n (%)				
T0-1	100 (7.9%)	83 (8.2%)	17 (6.7%)	
T2	562 (44.6%)	449 (44.5%)	113 (44.8%)	0.580
T3	406 (32.2%)	318 (31.5%)	88 (34.9%)	
T4	193 (15.3%)	159 (15.8%)	34 (13.5%)	
Pathological N stage, n (%)				
N0	262 (20.8%)	205 (20.3%)	57 (22.6%)	
N1	580 (46.0%)	476 (47.2%)	104 (41.3%)	0.243
N2	419 (33.2%)	328 (32.5%)	91 (36.1%)	
Pathological TNM stage, n (%)				
0-I	122 (9.7%)	97 (9.6%)	25 (9.9%)	
II	425 (33.7%)	342 (33.9%)	83 (32.9%)	0.917
IIIA	487 (38.6%)	392 (38.9%)	95 (37.7%)	
IIIB-IV	227 (18.0%)	178 (17.6%)	49 (19.4%)	
Adjuvant therapy, n (%)				
Yes	597 (47.3%)	465 (46.1%)	132 (52.4%)	0.073
No	664 (52.7%)	544 (53.9%)	120 (47.6%)	
Laterality, n (%)				
Right	233 (18.5%)	193 (19.1%)	40 (15.9%)	0.234
Left	1028 (81.5%)	816 (80.9%)	212 (84.1%)	
30-day mortality, n (%)	18 (1.4%)	12 (1.2%)	6 (2.4%)	0.154
90-day mortality, n (%)	27 (2.1%)	20 (2.0%)	7 (2.8%)	0.435
5-year overall survival rate, %	51.6%	52.1%	49.5%	0.893

Abbreviations: BMI, body mass index; FEV1, forced expiratory volume in 1 second; DLCO, carbon monoxide diffusing capacity; NLR, neutrophil to lymphocyte ratio; PLR, platelet to lymphocyte ratio; CAR, C-reactive protein to albumin ratio; VATS, video-assisted thoracoscopic surgery.

Table 2. The 5-year overall survival rate and univariate survival analysis among patients who underwent pneumonectomy for primary lung cancer in the training cohort.

Variable	No. (%)	5-year OS rate (%)	*P* value
Age at diagnosis, years < 60 ≥ 60	584 (57.9%) 425 (42.1%)	53.3% 50.5%	0.419
Sex Female Male	140 (13.9%) 869 (86.1%)	52.4% 52.1%	0.719
Duration of chief complaint, months ≤ 1 1-3 > 3	400 (39.6%) 320 (31.8%) 288 (28.6%)	53.4% 48.3% 54.9%	0.059
Smoking history Yes No	823 (81.6%) 186 (18.4%)	52.3% 51.3%	0.710
BMI, kg/m^2 ≤ 18.4 18.5-23.9 ≥ 24.0	37 (3.7%) 519 (51.4%) 453 (44.9%)	44.6% 51.9% 53.1%	0.141
Weight loss in preoperative 3 months Yes No	174 (17.2%) 835 (82.8%)	42.5% 54.1%	0.030
Induction therapy Yes No	104 (10.3%) 905 (89.7%)	48.7% 52.4%	0.418
FEV1 %pred ≥ 80% 50-79% <50%	329 (32.6%) 592 (58.7%) 88 (8.7%)	55.9% 51.5% 40.9%	0.043
DLCO %pred ≥ 80% 60-79% < 60%	422 (41.8%) 402 (39.8%) 185 (18.4%)	56.7% 51.7% 43.3%	0.008

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Variable	No. (%)	5-year OS rate (%)	*P* value
NLR ≤ 4.28 > 4.28	857 (84.9%) 152 (15.1%)	53.9% 40.9%	0.003
PLR ≤ 226.85 > 226.85	909 (90.1%) 100 (9.9%)	53.9% 33.7%	<0.001
CAR ≤ 0.01 > 0.01	568 (56.3%) 441 (43.7%)	56.8% 45.4%	0.005
Incision method Open Uniportal VATS Three-portal VATS	978 (96.9%) 14 (1.4%) 17 (1.7%)	51.3% 92.9% 75.5%	0.017
Disconnection of pulmonary artery Pericardium Extra-pericardium	144 (14.3%) 865 (85.7%)	29.3% 56.1%	<0.001
Disconnection of pulmonary vein Pericardium Extra-pericardium	181 (17.9%) 828 (82.1%)	31.9% 56.6%	<0.001
Disconnection of main bronchus Stapler Manual suture	992 (98.3%) 17 (1.7%)	52.2% 48.4%	0.289
Pathology Squamous cell carcinoma Adenocarcinoma Other	722 (71.6%) 175 (17.3%) 112 (11.1%)	54.5% 48.0% 43.4%	0.017
Grade Well Moderately Poorly	52 (5.2%) 506 (50.1%) 451 (44.7%)	70.0% 54.7% 47.1%	<0.001

Variable	No. (%)	5-year OS rate (%)	*P* value
Tumor size, cm			
≤ 3	195 (%)	70.0%	
> 3, ≤ 5	486 (%)	54.0%	<0.001
> 5, ≤ 7	219 (%)	38.0%	
> 7	109 (%)	41.2%	
Pathological T stage			
T0-1	83 (8.2%)	84.6%	
T2	449 (44.5%)	58.1%	<0.001
T3	318 (31.5%)	41.7%	
T4	159 (15.8%)	41.2%	
Pathological N stage			
N0	205 (20.3%)	73.3%	
N1	476 (47.2%)	57.5%	<0.001
N2	328 (32.5%)	31.6%	
Pathological TNM stage			
0-I	97 (9.6%)	83.7%	
II	342 (33.9%)	65.8%	<0.001
IIIA	392 (38.9%)	46.4%	
IIIB-IV	178 (17.6%)	23.8%	
Adjuvant therapy			
No	544 (53.9%)	48.5%	0.016
Yes	465 (46.1%)	56.9%	
Laterality			
Right	193 (19.1%)	48.7%	0.082
Left	816 (80.9%)	52.9%	

Abbreviations: BMI, body mass index; FEV1, forced expiratory volume in 1 second; DLCO, carbon monoxide diffusing capacity; NLR, neutrophil to lymphocyte ratio; PLR, platelet to lymphocyte ratio; CAR, C-reactive protein to albumin ratio; VATS, video-assisted thoracoscopic surgery.

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Table 3. The Least Absolute Shrinkage and Selection Operator (LASSO) and Cox proportion hazards analyses (LASSO-Cox) of prognostic variables for patient who underwent pneumonectomy for primary lung cancer in the training cohort.

Variable	Hazard ratio (95% confidence interval)	*P* value
Weight loss in preoperative 3 months No Yes	Reference 1.183 (0.948-1.477)	0.137
FEV1 %pred ≥ 80% 50-79% <50%	Reference 1.196 (0.977-1.464) 1.228 (0.865-1.742)	0.082 0.251
DLCO %pred ≥ 80% 60-79% < 60%	Reference 0.949 (0.774-1.163) 1.107 (0.859-1.427)	0.612 0.430
NLR ≤ 4.28 > 4.28	Reference 1.129 (0.860-1.482)	0.383
PLR ≤ 226.85 > 226.85	Reference 1.255 (0.917-1.720)	0.156
CAR ≤ 0.01 > 0.01	Reference 1.186 (0.982-1.432)	0.077
Disconnection of pulmonary artery Pericardium Extra-pericardium	Reference 0.717 (0.549-0.937)	0.015
Disconnection of pulmonary vein Pericardium Extra-pericardium	Reference 0.747 (0.581-0.960)	0.023
Pathology Squamous cell carcinoma Adenocarcinoma Other	Reference 1.120 (0.880-1.426) 1.285 (0.981-1.683)	0.356 0.068
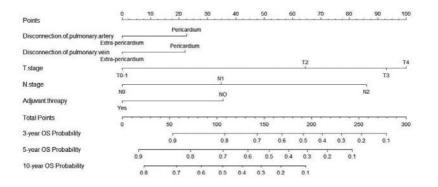
Variable	Hazard ratio (95% confidence interval)	*P* value
Grade Well	Reference	
Moderately	1.517 (0.923-2.493)	0.100
Poorly	1.708 (1.036-2.815)	0.036
Pathological T stage T0-1	Reference	
T2	2.339 (1.356-4.035)	0.002
T3	3.239 (1.874-5.598)	<0.001
T4	3.108 (1.750-5.519)	<0.001
Pathological N stage N0	Reference	
N1	1.679 (1.275-2.212)	<0.001
N2	3.264 (2.462-4.327)	<0.001
Adjuvant therapy No	Reference	
Yes	0.592 (0.494-0.709)	<0.001

Abbreviation: FEV1, forced expiratory volume in 1 second; DLCO, carbon monoxide diffusing capacity; NLR, neutrophil to lymphocyte ratio; PLR, platelet to lymphocyte ratio; CAR, C-reactive protein to albumin ratio.

P-028

IMPACT OF A GROUND-GLASS OPACITY COMPONENT FOR C-STAGE IA LUNG ADENOCARCINOMA FROM THE CHINESE PERSPECTIVE

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OBJECTIVES

We aimed to verify the impact of a GGO component on clinical (c)-stage IA lung adenocarcinoma and describe the biological discrepancies between the part-solid and pure-solid groups from the Chinese perspective.

METHODS

We evaluated 1333 cases of surgically resected c-stage IA lung adenocarcinomas, including 484 part-solid and 849 pure-solid tumors. Furthermore, we matched the solid size between the two groups and examined 470 patients. We compared the prognoses between the two groups before and after matching. The prognostic and biological differences were described before and after matching.

RESULTS

Among the 1333 cases, the multivariable analyses revealed that GGO component appearance was a predictor of better overall survival. Compared with the pure-solid group, the part-solid group was associated with favorable outcomes [5-year overall survival (OS) 99.4% vs. 87.6%, hazard ratio 0.085, P < 0.001, 95% confidence interval (CI) 0.056–0.129; 5-year relapse-free survival (RFS) 96.9% vs. 82.2% hazard ratio 0.147, P < 0.001, 95% CI 0.105–0.207]. Similar results were obtained after matching (5-year OS 98.9% vs. 92.2%, hazard ratio 0.273, P = 0.012, 95% CI 0.114–0.657; 5-year RFS 95.0% vs 88.5%, hazard ratio 0.377, P = 0.007, 95% CI 0.195–0.732). The part-solid tumor, regardless of the size of the solid component, had a similar outcome to the pure-solid tumor of c-stage T1a classification. Also, more epidermal growth factor receptor (EGFR) human epidermal growth factor receptor-2 (HER-2) mutations, and receptor tyrosine kinase ROS-1-positive were observed in the part-solid group. In comparison, more wild types and Kirsten-Ras (K-Ras) were observed in the pure-solid group.

CONCLUSIONS

Adenocarcinomas with a GGO component were associated with superior outcomes. The GGO component should be considered a new clinical T descriptor. Early-stage lung adenocarcinomas with and without a GGO component might be two distinct lesions with different origins and natural courses.

Disclosure: No significant relationships.

Table 1. Clinicopathological characteristics of clinical stage T1 lung adenocarcinoma between part-solid and pure-solid groups

Characteristics	Before matching			After matching		
	Part-solid (n = 484)	Pure-solid (n = 849)	*P* value	Part-solid (n = 235)	Pure-solid (n = 235)	*P* value
Gender, n (%)	< .001			.250		
Male	156 (32.2)	372 (43.8)		79 (33.6)	92 (39.1)	
Female	328 (67.8)	477 (56.2)		156 (66.4)	143 (60.9)	
Age, y, median (IQR)	60 (53, 66)	60 (53, 67)	.455	61 (55.5, 67)	58 (50, 64)	< .001
Smoking history, n (%)	41 (8.5)	148 (17.4)	< .001	19 (8.1)	28 (11.9)	.219
Solid component size, mm, median (IQR)	7 (5, 11)	18 (13, 24)	< .001	11 (9, 14)	11 (9, 14)	.979
CTR, median (IQR)	0.48 (0.33, 0.61)	1.0 (1.00, 1.00)	< .001			
WHO classification, n (%)	< .001			< .001		
AIS	10 (2.1)	23 (2.7)		3 (1.3)	12 (5.1)	
MIA	94 (19.4)	53 (6.2)		22 (9.4)	37 (15.8)	
Invasive adenocarcinoma	375 (77.5)	712 (83.9)		169 (71.9)	149 (63.4)	
Variants and undetermined	5 (1.0)	61 (7.2)		41 (17.4)	37 (15.7)	
Grade, n (%)	< .001			< .001		
Well, Grade I	116 (24.0)	136 (16.0)		35 (14.9)	67 (28.5)	
Moderate, Grade II	325 (67.1)	662 (78.0)		171 (72.8)	163 (69.4)	
Poor, Grade III	43 (8.9)	51 (6.0)		29 (12.3)	5 (2.1)	
Predominant subtype (IASLC/ATS/ERS Classification)			< .001			< .001
AIS	10 (2.1)	22 (2.6)		3 (1.3)	12 (5.1)	
MIA	93 (19.2)	49 (5.8)		22 (9.4)	37 (15.7)	
Invasive adenocarcinoma						
Lepidic predominant	43 (8.9)	24 (2.8)		23 (9.8)	11 (4.7)	
Acinar predominant	242 (50.0)	465 (54.8)		135 (57.4)	112 (47.7)	
Papillary predominant	13 (2.7)	51 (6.0)		8 (3.4)	11 (4.7)	
Micropapillary predominant	2 (0.4)	12 (1.4)		2 (0.9)	3 (1.3)	
Solid predominant with mucin production	0 (0)	49 (5.8)		0 (0)	6 (2.6)	
Two or more predominant	76 (15.7)	111 (13.0)		1 (0.4)	6 (2.6)	

Characteristics	Before matching			After matching		
	Part-solid (n = 484)	Pure-solid (n = 849)	*P* value	Part-solid (n = 235)	Pure-solid (n = 235)	*P* value
Variants						
Invasive mucinous adenocarcinoma	1 (0.2)	28 (3.3)		40 (17.0)	22 (9.4)	
*Undetermined	4 (0.8)	38 (4.5)		1 (0.4)	15 (6.4)	
c-stage T classification, n (%)			< .001			.008
c-stage T1mi	160 (33.1)	0 (0)		0 (0)	0 (0)	
c-stage T1a	192 (39.7)	116 (13.7)		103 (43.8)	103 (43.8)	
c-stage T1b	116 (23.9)	402 (47.3)		116 (49.4)	96 (40.9)	
c-stage T1c	16 (3.3)	331 (39.0)		16 (6.8)	36 (15.3)	
p-stage T classification, n (%)			< .001			< .001
p-stage T1mi	17 (3.5)	0 (0)		2 (0.9)	0 (0)	
p-stage T1a	183 (37.8)	129 (15.2)		53 (22.5)	96 (40.9)	
p-stage T1b	220 (45.5)	357 (42.0)		129 (54.9)	91 (38.7)	
p-stage T1c	45 (9.3)	233 (27.4)		39 (16.6)	24 (10.2)	
p-stage T2a (including T2a-PL1/2)	19 (3.9)	118 (13.9)		12 (5.1)	23 (9.8)	
p-stage T2b	0 (0)	9 (1.1)		0 (0)	1 (0.4)	
p-stage T3-PL3	0 (0)	3 (0.4)		0 (0)	0 (0)	
Pathological pleural invasion, n (%)	16 (3.3)	54 (6.4)	.023	9 (3.8)	14 (6.0)	.392
Pathological lymph node, n (%)			< .001			.002
N0	482 (99.6)	766 (90.2)		233 (99.1)	222 (94.5)	
N1	0 (0)	26 (3.1)		2 (0.9)	3 (1.3)	
N2	2 (0.4)	56 (6.6)		0 (0)	10 (4.2)	
Nx	0 (0)	1 (0.1)		0 (0)	0 (0)	
Pathological metastasis, n (%)			.558			1
M0	484 (100)	846 (99.6)		235 (100)	234 (99.6)	
M1	0 (0)	3 (0.4)		0 (0)	1 (0.4)	
Surgical approach, n (%)			< .001			< .001
VATS	472 (97.5)	745 (87.8)		228 (97.0)	208 (88.5)	
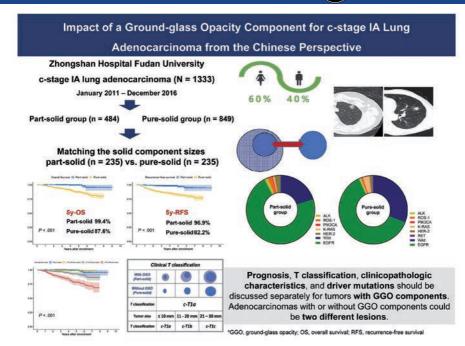
Characteristics	Before matching			After matching		
	Part-solid (n = 484)	Pure-solid (n = 849)	*P* value	Part-solid (n = 235)	Pure-solid (n = 235)	*P* value
Thoracotomy	12 (2.5)	104 (12.2)		7 (3.0)	27 (11.5)	
Operative procedure, n (%)			< .001			.955
*Pneumonectomy	0 (0)	3 (0.3)		0 (0)	0 (0)	
Lobectomy	281 (58.1)	726 (85.5)		169 (71.9)	170 (72.4)	
Segmentectomy	77 (15.9)	49 (5.8)		39 (16.6)	40 (17.0)	
Wedge resection	126 (26.0)	71 (8.4)		27 (11.5)	25 (10.6)	
Gene aberration (n = 245/378/146/108), n (%)			.016			.075
Wild type	49 (20.0)	117 (30.9)		32 (21.9)	35 (32.4)	
EGFR (exon 18/19/20/21)	177 (1/75/0/101) (72.3)	235 (3/104/5/123) (62.2)		102 (0/41/0/61) (69.9)	68 (0/28/4/36) (63.0)	
ALK	4 (1.6)	4 (1.0)		2 (1.4)	1 (0.9)	
ROS-1	5 (2.0)	2 (0.5)		3 (2.0)	0 (0)	
PIK3CA	1 (0.4)	1 (0.3)		1 (0.7)	0 (0)	
K-RAS	2 (0.8)	12 (3.2)		1 (0.7)	3 (2.8)	
HER-2	7 (2.9)	6 (1.6)		5 (3.4)	0 (0)	
RET	0 (0)	1 (0.3)		0 (0)	1 (0.9)	

Values are number (%) or median (interquartile range, IQR). CTR, consolidation tumor ratio; WHO classification, World Health Organization classification; IASLC/ATS/ERS, International Association for the Study of Lung Cancer, the American Thoracic Society, and the European Respiratory Society; AIS, adenocarcinoma in situ; MIA, minimally invasive adenocarcinoma; VATS, video-assisted thoracic surgery; Nx, lymph node status unknown; EGFR, epidermal growth factor receptor; ALK, anaplastic lymphoma kinase; ROS-1, receptor tyrosine kinase; PI3KCA, phosphatidyl-inositol 4,5-bisphosphate 3-kinase catalytic subunit alpha isoform; K-Ras, Kirsten-Ras; HER-2, human epidermal growth factor receptor-2; RET, receptor-tyrosine kinase. *P value determined by unpaired t test or chi-square test. *Undetermined refers to the pathological types that are still difficult to classify after reanalysis by pathologists or the loss of pathological information (very few). * Pneumonectomy: reasons for 3 patients of pure solid group performed pneumonectomy: Case 1: intrathoracic adhesion, intraoperative bleeding (> 1500ml), and pulmonary edema and atelectasis; Case 2: the anatomical location of the nodule the left bronchus; Case 3: the intraoperative exploration found that hilar lymph nodes (10L) and subcarinal lymph nodes (7L) had invaded to the left main bronchus and the main pulmonary artery (PA). The intraoperative pathology confirmed the lymph node metastasis.

Impact of a Ground-glass Opacity Component for c-stage IA Lung Adenocarcinoma from the Chinese Perspective

P-029

SQUAMOUS CELL CARCINOMA COMPONENT MAY BE A WORSE PROGNOSTIC FACTOR FOR COMBINED SMALL-CELL LUNG CARCINOMA AFTER SURGICAL RESECTION

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OBJECTIVES
Combined small-cell lung carcinoma (CSCLC) is a rare subtype of small-cell lung carcinoma. This study aims to investigate clinicopathological features and surgical outcomes of CSCLC.

METHODS
A multi-institutional retrospective review of patients who underwent surgery and were pathologically confirmed to be CSCLC from 1993 to 2021 was performed. Potential prognostic predictors including detailed histology were evaluated. The overall survival and progression-free survival rates were calculated. Propensity score matching was used to minimize bias.

RESULTS
Forty-two patients with CSCLC were enrolled. The combined histologic subtype components were large cell neuroendocrine carcinoma (N=17, 40.5%), adenocarcinoma (N=16, 38.1%), squamous cell carcinoma (N=13, 31.7%), sarcomatoid carcinoma (N=3, 7.1%) and large cell carcinoma (N=2, 4.7%). Complete resection was achieved in 35 patients (83.3%). Postoperative chemotherapy was conducted in 34 patients (81.0%). The 5-year overall survival and progression-free survival rates were 31.3% and 30.3%, respectively. Patients with CSCLC combined with squamous cell carcinoma had significantly worse 5-year overall survival rate than otherwise (44.9% vs. 0.0%, P=0.04). After propensity score matching accounting for sex, age, surgical procedure, status of complete resection, presence of lymph node metastasis and presence of chemotherapy, CSCLC with squamous cell carcinoma was significantly associated with worse prognosis in terms of overall survival (HR, 4.05; 95% CI, 1.03-16.0, P<0.05) and progression-free survival (HR, 4.87; 95% CI, 1.28-18.6, P=0.02).

CONCLUSIONS
Squamous cell carcinoma component can be a worse prognostic indicator for surgically resected CSCLC.

Posters
Abstract 026-146
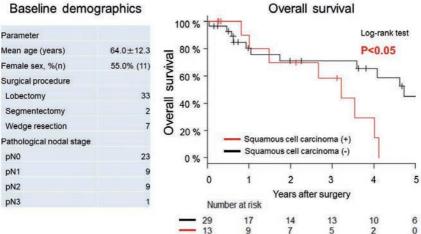
Baseline demographics

Parameter	
Mean age (years)	64.0 ± 12.3
Female sex, %(n)	55.0% (11)
Surgical procedure	
Lobectomy	33
Segmentectomy	2
Wedge resection	7
Pathological nodal stage	
pN0	23
pN1	9
pN2	9
pN3	1

Overall survival

P-030

CD271 COULD SERVE AS A PROGNOSTIC MARKER IN EARLY-STAGE NON-SMALL CELL LUNG CANCER

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OBJECTIVES
CD271, a nerve growth factor receptor, is highly expressed in cancer stem cells. However, the clinical significance of CD271 in non-small cell lung cancer (NSCLC) remains to be elucidated. This study aimed to examine whether CD271 could serve as a predictor for tumor recurrence in early-stage NSCLC.

METHODS
CD271 expression in tumor cells was analyzed by immunohistochemistry in 154 consecutive patients with pN0M0 NSCLC who underwent radical surgery at Shiga University of Medical Science Hospital between January 2016 and December 2017. Patients who had received preoperative anticancer therapy, such as radiotherapy or chemotherapy, were excluded. CD271 expression was considered high when more than 10% of tumor cells were stained positively. The Mann–Whitney U and $\chi 2$ tests were applied to investigate any significant differences between the groups. Relapse-free survival curves were calculated by employing the Kaplan–Meier method and compared using the log-rank test. $P < 0.05$ was considered to be statistically significant.

RESULTS
CD271 was highly expressed on tumor cells in 44 of the 154 cases (28.6%). Univariate analysis showed that CD271 expression significantly correlated with histological grade ($p = 0.021$), pleural invasion ($p = 0.006$), and vascular invasion ($p < 0.001$). Kaplan–Meier curves for relapse-free survival after surgery revealed that patients with a higher level of CD271 expression (n = 44) had a significantly lower relapse-free survival than those with lower levels of CD271 (n = 110; $p < 0.001$).
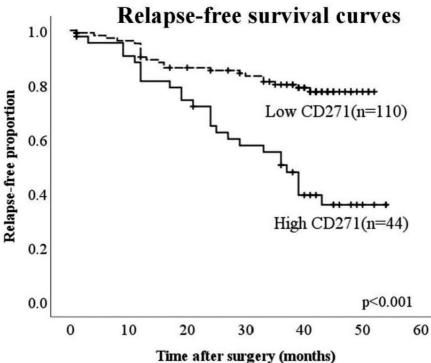
CONCLUSIONS
The study findings suggest that CD271 expression in tumor cells can potentially serve as a prognostic factor in early-stage NSCLC. High expression of CD271 was significantly correlated with poorer histological grade, pleural invasion, and vascular invasion, indicating that CD271 might influence NSCLC progression and poor prognosis.

Disclosure: No significant relationships.
Keywords: CD271, Non-Small Cell Lung Cancer, Prognosis.

Posters
Abstract 026-146

Relapse-free survival curves

Low CD271(n=110)

High CD271(n=44)

p<0.001

P-031

PROGNOSTIC SIGNIFICANCE OF PATHOLOGIC LEPIDIC COMPONENT IN STAGE IA LUNG ADENOCARCINOMA

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OBJECTIVES
A ground glass opacity component of a lung nodule is generally known as a radiological finding basically corresponding to a lepidic growth of cancer cells observed in pathological examination. We evaluated the prognostic effect of the presence of lepidic component in early-stage lung adenocarcinoma (LUAD).

METHODS
We retrospectively analyzed 887 patients who underwent curative resection for pathologic stage IA LUAD between 2011 and 2016 at Seoul National University Bundang Hospital. We defined the absence of the lepidic component when its proportion was 10% or less. The patients were categorized into the lepidic (-) group and lepidic (+) group, and we compared clinicopathologic features and risk factors of recurrence between the two groups.

RESULTS
Of all, 475 (53.6%) patients were lepidic (-) group. Lepidic (-) group was associated with a higher CEA (p = 0.005), SUVmax (p < 0.001), pathologic invasive size (p < 0.001), lymphatic invasion (p < 0.001), vascular invasion (p < 0.001), and spread through air spaces (p < 0.001). The 5 year freedom from recurrence probability of lepidic (-) and lepidic (+) groups were 89.0% and 98.9%, respectively. (p < 0.001). Multivariable analyses revealed that higher SUVmax (p = 0.013) and the absence of lepidic component (p = 0.003) were independent risk factors for recurrence, regardless of pathologic invasive size.

CONCLUSIONS
The absence of lepidic component could be an important pathologic poor prognostic factor in early-stage LUAD. Postoperative surveillance and treatment should be differently applied according to the lepidic component status.

Disclosure: No significant relationships.
Keywords: Lepidic, Adenocarcinoma, Ground Glass Opacity, Surgery.
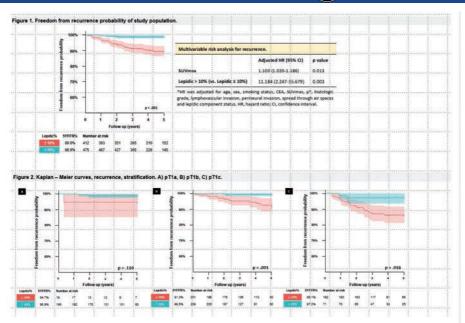
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Figure 1. Freedom from recurrence probability of study population.

Figure 2. Kaplan – Meier curves, recurrence, stratification. A) pT1a, B) pT1b, C) pT1c.

P-032

THE IMPACT PREDICTOR OF ATELECTASIS AFTER LOBECTOMY

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OBJECTIVES
The wide variation in the incidence of postoperative atelectasis is attributed to the lack of consensus about a definition of clinical atelectasis. The aim of this study was to define the incidence of and factors predisposing to post lobectomy atelectasis.

METHODS
A retrospective study of 1320 patients who underwent lobectomy at our institute between April 2010 and November 2021 was performed. Pulmonary atelectasis was defined as a chest computed tomography (CT) finding of a complete ipsilateral lobar collapse. We divided our patients into those with a pulmonary atelectasis and those without pulmonary atelectasis. The following variables were considered in the analysis: comorbidities, respiratory functions, smoking status, performance status, type of resection, surgical procedure, operating time, and blood loss. Univariate and multivariate analyses were performed to identify whether any of the recorded parameters served as prognostic variables in the development of pulmonary atelectasis.

RESULTS
Of 1320 anatomical pulmonary resections performed, 105 (7.5%) developed pulmonary atelectasis. Current smoker (15.0 % vs. 6.5 %; p = 0.020), mental disorder (20.7% vs. 5.2%; p = 0.005), operation time (228.2±12.8 vs. 189.8±2.3; p< 0.01), and right upper lobectomy (RUL) (15.0 % vs. 5.2 %; p = 0.0035) were significantly higher in pulmonary atelectasis group. Multivariate analysis revealed that current smoker (odds ratio (OR) = 1.72, 95% CI 0.29-0.94, p = 0.029), mental disorder (4.09 (1.48-11.33), p = 0.007), blood loss (2.48 (1.05-5.86), p = 0.031), operating time (1.00 (1.00-1.01), p = 0.045) are RUL (3.01 (1.59-5.69), p < 0.001) were independent risk factors.

CONCLUSIONS
Patients with current smoker, mental disorder, massive blood loss, long operating time, and RUL are at high risk of pulmonary atelectasis.

Disclosure: No significant relationships.
Keywords: Lobectomy, Atelectasis.

Posters
Abstract 026-146

P-033

WEDGE RESECTION VERSUS STEREOTACTIC BODY RADIATION THERAPY FOR STAGE I NON-SMALL CELL LUNG CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS

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OBJECTIVES
Whether wedge resection or stereotactic body radiation therapy(SBRT) has a better effectiveness in treatment of stage I non-small cell lung cancer(NSCLC) patients remains unclear. Here we conducted the first meta-analysis to directly compare the survival outcomes of stage I NSCLCs treated with wedge resection and SBRT.

METHODS
We systematically searched studies from PubMed, Embase, and Corchrane Library up to October 1, 2021. Data for analysis mainly included overall survival (OS) and disease-free survival (DFS), which were obtained directly from the text results or calculated from the Kaplan–Meier survival curve. We used the standard random-effect model test (DerSimonian and Laird method) to analyze the pooled hazard ratios (HRs) and 95% confidence intervals (CIs). The Q-test and I2-test were used to assess heterogeneity. The stability of pooled HRs was examined by sensitivity analysis.

RESULTS
Six retrospective studies with a total of 11813 stage I NSCLCs who received wedge resection or SBRT were included. The results showed that patients receiving wedge resection had a significantly better OS (HR = 1.20, 95% CI = [1.07, 1.34], P = 0.002) than those with SBRT, but no significant difference of DFS(HR 1.53, 95% CI = [0.83–2.83], P = 0.17) was observed. There was no significant heterogeneity during our analysis, but there may be potential publication bias among these studies.

CONCLUSIONS
Our meta-analysis showed that stage I NSCLCs treated with wedge resection had superior OS than those treated with SBRT. However, more prospective clinical trials should be well designed to evaluate the optimal treatment modality of early-stage NSCLCs.

Disclosure: No significant relationships.
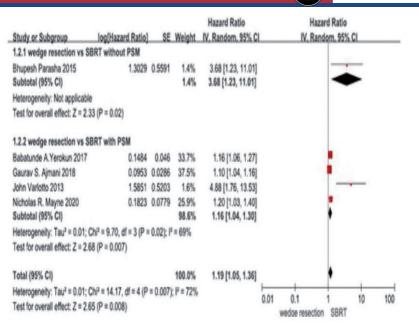
Study	Language	Period	Stage	Median age (years)		Radiation dose (Gy/no.)	Sample number			Median follow-up (months)	Study type	Quality assessment
				WR	SBRT		Total	WR	SBRT			
Yerokun BA *et.al*[21] 2017	English	2008-2011	IA	73	73	NR	3168	1584	1584	NR	ROS	NOS:8
Parashar B *et.al*[20] 2015	English	1993-2012	I	77		30-60/3-5	220	123	97	17.5	ROS	NOS:7
Ajmani GS *et.al*[22] 2018	English	2003-2015	I	73.9	73.8	NR	7734	3867	3867	66	ROS	NOS:9
Varlotto J *et.al*[18] 2013	English	1999-2008	I	67.5	73.3	48-60/3-5	34	17	17	25.8	ROS	NOS:7
Mayne NR *et.al*[23] 2020	English	2004-2015	IA	73	73	NA	558	279	279	27.6	ROS	NOS:8
Port JL *et.al*[19] 2014	English	2001-2012	IA	72	76	0-60/33-5	99	76	23	35	ROS	NOS:7

P-034

LYMPH NODE DISSECTION AFTER NEOADJUVANT THERAPY FOR ESOPHAGEAL SQUAMOUS CELL CARCINOMA: HOW MANY IS ENOUGH?

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OBJECTIVES
Neoadjuvant therapy followed by surgery has become a cornerstone of the treatment for locally advanced esophageal squamous cell carcinoma (ESCC). Principles of lymphadenectomy in patients who received neoadjuvant therapy might be different from those who did not. The number of lymph nodes (LN) dissected is crucial and warrants further research. We aimed to determine the least number of lymph nodes that should be dissected in ESCC patients after neoadjuvant therapy.

METHODS
This is a retrospective monocentric study. Patients with ESCC who received neoadjuvant therapy in our institution between November 2014 and September 2019 were reviewed. The primary outcomes were disease-free survival (DFS) and overall survival (OS). The optimal cutpoint for the number of LN dissected was determined by using the maximally selected rank statistics from the 'maxstat' R package. Kaplan-Meier curves and Cox regression analyses were conducted with R software 3.6.3.

RESULTS
One hundred and seventy-two patients (58 female, 114 male) with a median age of 62 (Interquartile range [IQR], 57, 66.25) years were eligible for analysis. The optimal cutpoint for the number of LN dissected was 28. Kaplan-Meier curves showed that the DFS in patients who had more than 28 LN dissected was in trend (p=0.16) better than that in the patients who had no more than 28 LN dissected. In multivariable analysis, dissection of more than 28 LN was significantly (Hazard ratio [HR] 0.389, 95% confidence interval [CI] 0.1605-0.9425, p=0.0365) associated with better DFS. However, benefits in OS (HR 0.4368, 95% CI 0.4368-2.2894, p=0.2084) were not observed in patients with a larger number of LN dissected.

CONCLUSIONS
Lymphadenectomy in patients with ESCC after neoadjuvant therapy is important. A number of LN dissection larger than 28 might be associated with better DFS, but not OS.

Disclosure: No significant relationships.
Keywords: Neoadjuvant Therapy, Esophageal Squamous Cell Carcinoma, Lymphadenectomy, Disease Free Survival, Overall Survival.

Clinical characteristics	Level	Number, n=172
Sex	Female	58 (33.7%)
	Male	114 (66.3%)
Age (median [IQR]), year		62 [57, 66.25]
Neoadjuvant therapy	Chemotherapy	159 (92.4%)
	Chemoradiotherapy	10 (5.8%)
	Other	3 (1.7%)
Response	PR	119 (86.9%)
	SD or PD	18 (13.1%)
Surgical approach	MIE	133 (77.3%)
	Open	39 (22.7%)
ypTNM stage	0	14 (8.1%)
	I	53 (30.8%)
	II	35 (20.3%)
	IIIA	18 (10.5%)
	IIIB	39 (22.7%)
	IVA	13 (7.6%)
ypT	T0-Tis	15 (8.7%)
	T1a	10 (5.8%)
	T1b	18 (10.5%)
	T2	48 (27.9%)
	T3	69 (40.1%)
	T4	12 (7%)
ypN	N0	106 (61.6%)
	N1	46 (26.7%)
	N2	16 (9.3%)
	N3	4 (2.3%)
Total LN dissected (median [IQR])		22 [15, 31.25]
Postoperative complication	No	150 (87.2%)
	Yes	22 (12.8%)
Adjuvant therapy	No	50 (29.1%)
	Yes	122 (70.9%)

IQR= Interquartile range; PR= Partial response; SD= Stable disease; PD= Progression disease.

P-035

OPTIMAL TREATMENT REGIMEN FOR POSTOPERATIVE LEAKAGE AFTER ESOPHAGECTOMY: A HISTORICAL COMPARISON OF ENDOSCOPIC VACUUM THERAPY (EVT) AND OTHER REGIMENS

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OBJECTIVES
Recently, endoscopic vacuum therapy (EVT) was introduced and has been successfully used as a new treatment regimen in the management of postoperative leakage after esophagectomy. However, few comparative outcome analyses for the different treatment regimens are yet available. The purpose of this study was to compare the clinical outcomes of EVT and other regimens in the management of postoperative leakage.

METHODS
Medical records of patients who underwent esophagectomy and esophagogastrostomy between November 2003 and August 2021 were retrospectively reviewed. Among them, 34 patients with postoperative leakage were selected, and classified into 2 groups; the EVT group (n = 21) and other regimens group (n = 13).

RESULTS
The median hospital stay was 35 (23-142) days in the EVT group and 68 (25-124) days in the other regimens group (p = 0.071). The median time interval between the detection of leakage and clinical success was 16 (4-142) days in the EVT group and 85 (8-604) days in the other regimens group (p = 0.010). The successful healing within 1 month from diagnosis was 81.0% and 33.3% in the EVT group and other regimens group (p = 0.010). During the follow-up period, anastomotic stricture was developed in 3 patients (14.3%) in the EVT group and 5 patients (50.0%) in the other regimens groups (p = 0.044), and there was a trend towards improved freedom from anastomotic stricture in the EVT group (p = 0.105).

CONCLUSIONS
EVT might be an adequate alternative treatment option for postoperative leakage after esophagectomy. EVT might be considered preferentially for the treatment of postoperative leakage after transthoracic esophagogastrostomy, and the effectiveness of EVT should be further investigated after cervical esophagogastrostomy.

Disclosure: No significant relationships.
Keywords: Esophagectomy, Leakage, Endoscopic Vacuum Therapy.
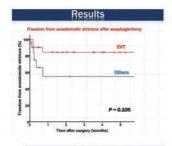
Results (All Locations)

	EVT (n = 21)		Others (n = 13)	P-value
Esophagectomy to leakage (days)	10.8 ± 4.1		11.4 ± 5.9	0.741
Time to clinical success (days)	26.4 ± 35.8		114.5 ± 162.9*	0.097
Time to clinical success (median, days)	16 (4–142)	<	85 (8–604)*	0.010
Success within 1 month	17 (81.0%)	>	4 (33.3%)*	0.002
Success within 2 month	19 (90.5%)	>	6 (50.0%)*	0.015
Success within 3 month	19 (90.5%)	>	8 (66.7%)*	0.159
Operative mortality	0		1 (7.7%) *ARDS	0.382
Hospital stay (days)	48.5 ± 32.1		65.6 ± 31.5	0.129
Stricture	3 (14.3%)	<	5 (50.0%)*	0.044

*except mortality (1 case)

Results

Freedom from anastomotic stricture after esophagectomy

P = 0.105

Thoracic

	EVT (n = 14)		Others (n = 6)	P-value
Esophagectomy to leakage (days)	9.3 ± 3.3		13.7 ± 7.6	0.222
Time to clinical success (days)	24.4 ± 28.8		204.6 ± 226.8*	0.150
Time to clinical success (median, days)	17 (6–120)	<	109 (55–604)*	0.008
Success within 1 month	12 (85.7%)	>	0 (0%)*	0.002
Success within 2 month	13 (92.9%)	>	1 (20.0%)*	0.006
Success within 3 month	13 (92.9%)	>	2 (40.0%)*	0.037
Operative mortality	0		1 (16.7%) *ARDS	0.300
Hospital stay (days)	42.6 ± 27.6	<	90.3 ± 24.3	0.002
Stricture	0 (0%)		2 (33.3%)*	0.058

Cervical

	EVT (n = 7)		Others (n = 7)	P-value
Esophagectomy to leakage (days)	13.9 ± 4.1		9.4 ± 3.6	0.053
Time to clinical success (days)	36.4 ± 48.6		50.1 ± 52.4	0.621
Time to clinical success (median, days)	15 (4 – 142)	≈	25 (8 – 152)	0.286
Success within 1 month	5 (71.4%)	≈	4 (57.1%)	1.000
Success within 2 month	6 (85.7%)	≈	5 (71.4%)	1.000
Success within 3 month	6 (85.7%)	≈	6 (85.7%)	1.000
Operative mortality	0		0	1.000
Hospital stay (days)	44.4 ± 18.9	≈	59.0 ± 39.6	0.403
Stricture	3 (42.9%)	≈	4 (66.7%)	0.592

P-036

WITHDRAWN

P-037

VIDEO MEDIASTINOSCOPY IN THE ERA OF ENDOBRONCHIAL ULTRASOUND (EBUS) - STILL ESSENTIAL, EXPERIENCE FROM A TEACHING INSTITUTE

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OBJECTIVES
EBUS has become the de facto invasive mediastinal staging modality for NSCLC in recent years. The results from trials and specialised centres have shown exceptional accuracy. However, the ESTS 2014 guidelines still recommend the use of video mediastinoscopy(VM) to confirm negative results; probably keeping in mind the impossibly high standards maintained in these trials. The objective of this study is to evaluate the incremental benefit of combined EBUS+VM for invasive mediastinal staging in routine clinical practice.

METHODS
This is a retrospective analysis of a prospectively maintained database of patients who underwent invasive mediastinal staging for NSCLC between 1st April 2012 and 30th November 2021. Prior to February 2017, patients underwent VM alone whereas in the latter period they underwent EBUS and if negative, VM. The procedures were performed by different consultants and rotating trainees. Sensitivity and negative predictive value (NPV) were calculated using the final histopathology of mediastinoscopy/ surgery as reference standard.

RESULTS
During the study period, 872 patients underwent invasive staging. Prior to Feb 2017, 405 patients underwent only VM, whereas post Feb 2017, 294 underwent EBUS+/-VM. A few patients underwent VM directly for logistical reasons in this period and were excluded from analysis. Sensitivity and NPV of VM alone were 92.5% and 94.7 %. The same values for those undergoing EBUS + /- VM were 94.3% and 96.9%. VM picked up an additional 22 patients with mediastinal nodal metastases among the 112 with negative EBUS. VM had a complication rate of 12.2% and the combined approach helped avoid 182 mediastinoscopies.

CONCLUSIONS
In clinical practice, the sensitivity and NPV of EBUS may not be as exceptional as seen in trials or specialised centres. The complimentary use of VM, along with EBUS as primary modality increases the accuracy of invasive staging while reducing complication rates and should be standard clinical practice.

Disclosure: No significant relationships.
Keywords: Invasive Mediastinal Staging, NSCLC, EBUS, Mediastinoscopy.

Posters
Abstract 026-146

P-038

A NOVEL LONG NON-CODING RNA LOC100507002 ACCELERATES THE DEVELOPMENT AND PROGRESSION OF ESOPHAGEAL SQUAMOUS CELL CARCINOMA BY TARGETING MIR-6785-5P/NRSN2 AXIS

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OBJECTIVES
Esophageal squamous cell carcinoma (ESCC) is one of the most prevalent gastrointestinal malignancies with high mortality worldwide. Growing evidence indicates that long non-coding RNAs (lncRNAs) play essential roles in multiple human malignant cancers, including ESCC. However, the detailed mechanisms of lncRNAs in the regulation of tumor progression remains largely unknown. The current study was designed to investigate the functions and mechanisms of LOC100507002 in ESCC.

METHODS
High-throughout sequencing was performed to detect the differential expressed lncRNAs in ESCC using ESCC clinical tissues. The expression of LOC100507002, and its target genes NRSN2 in ESCC samples were examined by RT-qPCR followed by MTS, colony formation, wound healing, transwell assays and xenografts models derived from ESCC cells to confirm the functions of LOC100507002 and NRSN2 in ESCC. High-throughput mRNA sequencing (RNA-seq), competitive endogenous RNA (ceRNA) network analysis, and luciferase reporter assays were carried out to identify the downstream target genes regulated by LOC100507002 and the microRNAs (miRNAs) bind to LOC100507002 to demonstrate the underlying mechanism of LOC100507002 in ESCC progression.

RESULTS
The expression of LOC100507002 was remarkedly upregulated in ESCC tissues and ESCC cells compared with that in normal tissues and normal esophageal epithelial cells, which was correlated with invasive depth, lymph node metastasis, and poor clinical outcomes. Furthermore, LOC100507002 silencing significantly suppressed cell proliferation, colony formation, migration, and invasion in vitro and tumor growth in vivo. Mechanistic investigation indicated that LOC100507002 functions as a ceRNA by sponging miR-6785-5p to enhance NRSN2 expression. Importantly, ASO targeting LOC100507002 substantially retarded ESCC tumor growth both in vitro and in vivo.

CONCLUSIONS
In this study, a novel lncRNA called LOC100507002 was found to exert its oncogenic role during ESCC tumorigenesis by sponging miR-6785-5p to promote NRSN2 expression. Hopefully, the LOC100507002/miR-6785-5p/NRSN2 axis may serve as potential diagnostic markers and therapeutic targets for ESCC patients.

Disclosure: No significant relationships.
Keywords: ESCC, LncRNA, LOC100507002, CeRNA, MiR-6785-5p.
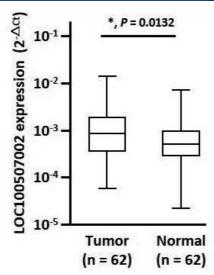
Characteristics	LOC100507002 expression			P value
	N	Low	High	
Gender				0.0151*
Male	48	20	28	
Female	14	11	3	
Age (years)				0.799
>60	29	14	15	
≤60	33	17	16	
Smoke history				0.409
No	43	23	20	
Yes	19	8	11	
Tumor size				0.263
≤4 cm	44	20	24	
>4 cm	18	11	7	
Tumor location				0.839
Upper	6	3	3	
Middle	40	21	19	
Lower	16	7	9	
Depth of invasion				0.037*
T1-2	24	16	8	
T3-4	38	15	23	
LN metastasis				0.041*
Negative (N0)	28	18	10	
Positive (N1/2/3)	34	13	21	
TNM stage				0.61
I-II	34	18	16	
III-IV	28	13	15	
Pathological differentiation				0.071
Well/moderate	53	24	29	
Poor	9	7	2	

Posters
Abstract 026-146

P-039

INTRAOPERATIVE CONE-BEAM COMPUTED TOMOGRAPHY (CT) IMAGING FOR PERIPHERAL SMALL PULMONARY NODULES

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OBJECTIVES
Peripheral small pulmonary nodules require surgeons to pre-operative percutaneous or bronchoscopic marking, and then intra-operative localization is achieved using roentgenographic fluoroscopy or near-infrared thoracoscopy. The aim of this study is to develop a new marking technique, named sandwich marking technique, for identification of peripheral small pulmonary nodules using cone-beam computed tomography (CBCT) in a hybrid-operating room.

METHODS
This is a retrospective study including patients with resected peripheral pulmonary nodules between November 2017 and December 2021 at Teikyo University Hospital, and Saitama Cardiovascular and Respiratory Center. All surgical procedure was wedge resection, and the tumor size was equal to or less than 20mm which were detected by CBCT (Philips Allura Xper FD 20, Philips). To make reference of CBCT images, we tried to mark 2 or 3 metal clips on visceral pleura, which could be 20mm or more from the target lesion. CBCT scanning and clip marking were performed repeatedly until we confirmed the target lesion was sandwiched by metal clips.

RESULTS
Among 112 enrolled patients, all 136 pulmonary lesions were detected in success by sandwich marking technique, and no marking-related complication was recorded. Average age was 64.1 years old and there were 59 males (52.7%). There were 59 primary lung cancers (43.4%), 49 metastatic lung tumors (36.0%), 5 fibrosis (3.7%), 4 infectious lesions (2.9%), 2 benign tumor (1.5%), and 17 others (12.5%). Average CBCT scan was 2.66 times (2-8 times). Average tumor size was 9.3mm on preoperative multi-detector computed tomography (MDCT), 8.7mm on CBCT, and 9.5mm in pathology. The correlation coefficient of tumor size was 0.80, 0.70, and 0.74 between CBCT and MDCT, between CBCT and pathology, between MDCT and pathology, respectively.

CONCLUSIONS
Sandwich marking technique was definitely safe and reliable for localization of peripheral small pulmonary nodules.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Minimally Invasive, Intraoperative Navigation, Hybrid Operating Room, Cone-Beam Computed Tomography.

Posters Abstract 026-146

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P-040

CLINICOPATHOLOGICAL FACTORS AFFECT THE PERFORMANCE OF LUNG CANCER NODULES NEAR-INFRARED FLUORESCENCE IMAGING

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OBJECTIVES
Near-infrared fluorescence imaging techniques can identify lung cancer nodules in real-time. However, the imaging performance of different lung cancer nodules is heterogeneous. This study aims to research the relationship between the clinicopathological factors and the near-infrared imaging performance of lung cancer nodules.

METHODS
The Peking University People's Hospital Institutional Review Board approved this study, and all patients gave informed consent. From January to December 2021, 60 solitary lung cancer patients enrolled in the study. These patients were injected with 5 mg/kg indocyanine green by peripheral vein 24 hours before the operation. After pulmonary nodule resection, it was immediately dissected ex vivo, and near-infrared imaging was performed in the operation room. Clinicopathological factors were evaluated using multiple linear regression to determine their impact on the signal-to-background ratio (SBR).

RESULTS
Of the 60 nodules, near-infrared fluorescence identified 56 (93.3%) nodules during exploration. The mean SBR of lung cancer nodules was 2.4 ± 0.56. Significant predictors of SBR were nodule's solid component and pathological types. Ground-glass nodules and adenocarcinoma were risk factors for low SBR ($p < 0.001$). Both four lung nodules with no near-infrared fluorescence imaging were ground-glass nodules, and the pathological results were adenocarcinoma. In addition, SBR was associated with lung cancer nodule's SUVmax ($R^2=0.18$, $p < 0.05$) and there was no correlation between SBR with gene mutation.

CONCLUSIONS
Near-infrared fluorescence imaging of solid lung cancer nodules has a better imaging performance on ground-glass nodules. The relationship between SBR with different pathological types and SUVmax can provide clues for the further study of the mechanism of lung cancer nodules near-infrared fluorescence imaging.

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Table 1. Multivariable Linear Regression Predictors of Signal-to-background Ratio of Lung Cancer Nodules

Variable	B	SE of B	Beta	t	p Value
Constant	1.796	0.438		4.097	<0.001
Age (year)	0.004	0.005	0.062	0.925	0.359
Gender	0.083	0.079	0.074	1.042	0.302
Smoking history	-0.143	0.122	-0.091	-1.169	0.248
Albumin (g/l)	-0.009	0.005	-0.111	-1.840	0.072
FEV1 (l)	0.079	0.075	0.082	1.056	0.296
DLCO %	-0.001	0.002	-0.035	-0.572	0.570
Solid component	0.771	0.065	0.679	11.878	<0.001
Tumour size (mm)	0.006	0.004	0.096	1.523	0.134
Pathology	1.010	0.148	0.450	6.814	<0.001
Stage	0.093	0.108	0.068	0.858	0.395

FEV1 = forced expiratory volume in one second; DLCO = diffusing capacity of the lungs for carbon monoxide.

P-041

WITHDRAWN

P-042

PREDICTION OF PULMONARY METASTASIS IN ESOPHAGEAL CARCINOMA PATIENTS WITH INDETERMINATE PULMONARY NODULES

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OBJECTIVES
The lungs are one of the common site of metastatic deposition of malignant tumors because the lungs are highly vascular and have ample lymphatic drainage, which occurs at a rate of between 8.6%-12.1%.The presence of lesions in distant parenchymal organs outside the lungs in the postoperative period is highly suspicious of recurrent metastases; however, when indeterminate pulmonary nodules (IPN) are present, it is difficult to determine whether the nodules are recurrent lesions. We therefore designed this trial to collect patients with new postoperative pulmonary nodules and analyzed the treatment outcomes and prognostic factors in this subgroup of patient.

METHODS
We retrospectively collected clinical data, CT image data and follow-up results of patients with esophageal squamous cell carcinoma who underwent surgery in the Department of Thoracic Medicine, Union Hospital of Fujian Medical University from January 2013 to December 2016. The clinical characteristics and radiologic characteristics were collected.Univariate and multivariate logistic regression analysis was used to identify independent predictors of the probability of Pulmonary metastases. Statistically signifcant variables (P<0.05) from the multivariate Cox regression analysis were entered into the predicted model.

RESULTS
Of the 816 esophageal cancer patients reviewed, 221 (27.1%) were identified as having new IPN, of which 66 (29.9%) were diagnosed with pulmonary metastases.Univariate and multivariate analyses of potential predictors of IPNv

CONCLUSIONS
In summary, we established and validated a clinical model that accurately identifies cryptococcosis from suspected malignant PNs. While comprehensively assessing patient's living environment and the dynamic course of the disease, the RAS score can be applied to identify cryptococcosis from suspected malignant nodules, which may be helpful to avoid unwanted surgery and guide decision making.

Disclosure: No significant relationships.
Keywords: Esophageal Cancer,Surgery,Pulmonary Metastasis,Indeterminate Pulmonary Nodules.

Variable	Univariable Analysis *P*	Multivariable Analysis Hazard Ratio	P
Pathologic N category	0.020		0.020
0		Reference	
1		0.985	
2		2.484	
3		1.802	
No. of IPN	<0.001		<0.001
<3		Reference	
≥3		3.217	
Shape of IPN	<0.001		0.012
Round or round-like		1.167	
Others		Reference	
Mediastinal lymph nodes enlargement	<0.001		0.036
No		Reference	
Yes		1.462	
Diameter of IPN	<0.001		0.008
< 5 mm		Reference	
5-10 mm		3.282	
10-30 mm		4.364	
>30 mm		5.345	
Age	0.487		
History of lung infection	0.337		
Yes		1.470	0.039
No		Reference	
Neoadjvant therapy	0.230		
None		Reference	
Chemotherapy		0.867	0.499
Chemoradiotherapy		0.446	0.010
Postoperative therapy	<0.001		
None		Reference	
Chemotherapy		0.867	0.499
Chemoradiotherapy		0.446	0.010
Pathologic T category	0.225		
1		Reference	
2		1.278	0.591
3		1.914	0.032
4		1.985	0.134

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Variable	Univariable Analysis *P*	Multivariable Analysis	
		Hazard Ratio	P
Differentiation	0.016		
Well(G1)		Reference	
Moderate(G2)		1.489	0.952 to 2.328
Poor (G3)		2.071	1.157 to 3.707
Shape of IPN(round)	<0.001		
Mediastinal lymph nodes enlargement	<0.001		
Time for IPN	<0.001		
No. of IPN (≥3)	<0.001		
Ct value of IPN	<0.001		
IPN location	<0.001		
MRexplung	0.098		
Liver	0.600		
Bone	0.002		
Pleura	0.619		
Peritoneum	0.298		
Tumor Location	0.005		
Ipnsizemm1	<0.001		
LOCOL R	0.006		
densityofipn	<0.001		
Numfollow1	<0.001		
Sizefollow1	<0.001		
Ctvaluefollow1	0.532		
Field	0.406		
CN	0.194		
TN	0.154		
PN	0.335		
Calci	0.098		
Location1	0.561		
Infield	0.178		
Numfollow	0.196		
Sizefollow	<0.001		
Ctvaluefollow1	0.999		
Surgery approach	0.451		
Gender	0.628		

Variable	Univariable Analysis *P*	Multivariable Analysis	
		Hazard Ratio	P
Pathologic N category	0.020		0.020
0		Reference	
1		0.985	
2		2.484	
3		1.802	
No. of IPN	<0.001		<0.001
<3		Reference	
≥3		3.217	
Shape of IPN	<0.001		0.012
Round or round-like		1.167	
Others		Reference	
Mediastinal lymph nodes enlargement	<0.001		0.036
No		Reference	
Yes		1.462	
Diameter of IPN	<0.001		0.008
< 5 mm		Reference	
5-10 mm		3.282	
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Age	0.487		
History of lung infection	0.337		
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Neoadjvant therapy	0.230		
None		Reference	
Chemotherapy		0.867	0.499
Chemoradiotherapy		0.446	0.010
Postoperative therapy			<0.001
None		Reference	
Chemotherapy		0.867	0.499
Chemoradiotherapy		0.446	0.010
Pathologic T category	0.225		
1		Reference	
2	1.278	0.591	
3		1.914	0.032
4		1.985	0.134

Variable	Univariable Analysis P	Multivariable Analysis	
		Hazard Ratio	P
Differentiation	0.016		
Well(G1)		Reference	
Moderate(G2)		1.489	0.952 to 2.328
Poor (G3)		2.071	1.157 to 3.707
Shape of IPN(round)	<0.001		
Mediastinal lymph nodes enlargement	<0.001		
Time for IPN	<0.001		
No. of IPN ($\geq$3)	<0.001		
Ct value of IPN	<0.001		
IPN location	<0.001		
MRexplung	0.098		
Liver	0.600		
Bone	0.002		
Pleura	0.619		
Peritoneum	0.298		
Tumor Location	0.005		
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Numfollow	0.196		
Sizefollow	<0.001		
Ctvaluefollow1	0.999		
Surgery approach	0.451		
Gender	0.628		

Predictive marker	Model points
Pathologic N category	
0	0
1	1
2	2
3	2
No. of IPN	
<3	0
≥3	3
Shape of IPN	
Round or round-like	1
Others	0
Mediastinal lymph nodes enlargement	
No	0
Yes	1
Diameter of IPN	
<5mm	0
5-10mm	3
10-30mm	4

P-043

ASSOCIATION BETWEEN HLA CLASS II EPLET MISMATCH AND DE NOVO DONOR-SPECIFIC ANTIBODY OR CLINICAL ANTIBODY-MEDIATED REJECTION AFTER DECEASED-DONOR LUNG TRANSPLANTATION

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OBJECTIVES
HLA class II eplet mismatch has been recognized as a risk factor for de novo donor-specific antibody (dnDSA) and antibody-mediated rejection (AMR) in solid organ transplantation recipients other than lung transplantation. We assessed the association between HLA class II eplet mismatch number and HLA class II dnDSA or clinical AMR (cAMR) in lung transplantation.

METHODS
Retrospective chart review was performed. Data of 120 recipients who underwent deceased-donor lung transplant between October 2009 and September 2020 were examined. HLA-matchmaker 2.1 version was used for antibody-verified eplets mismatch analyses.

RESULTS
The cumulative incidence of dnDSA was 17.5% (class I only, n = 7; class II only, n = 10; both class I&II, n = 4). A higher number of HLA class II eplet mismatch ($\geq$19) affected HLA class II DSA-free survival (log-lank test, p = 0.029), despite the number of HLA class I eplet mismatch did not affect HLA class I DSA-free survival (p = 0.291). When HLA class II dnDSA patients with graft dysfunction (cAMR, n = 6) were compared to those without graft dysfunction (n = 8), cAMR patients had higher DSA Mean Fluorescence Intensity (MFI) (13744 [IQR 6556–17327] vs. 5008 [IQR 2890–6291]) and higher mismatch number in HLA-DQ eplet (12.8±1.3 versus 8.9±1.1; p = 0.04). No significant difference was observed in the mismatch number of HLA-DR eplet. The HLA-DQ eplet mismatch number was positively correlated to the DSA MFI (r^2= 0.435; p = 0.01) in HLA class II dnDSA patients.

CONCLUSIONS
Higher number of HLA class II eplet mismatch significantly affected HLA class II DSA-free survival. The eplet mismatch number of HLA-DQ, not HLA-DR, was associated with the development of graft dysfunction in patients with HLA class II dnDSA.

Disclosure: No significant relationships.

P-044

WITHDRAWN

P-045

WITHDRAWN

P-046

THE EFFECT OF LYMPHATIC INVASION ON SURVIVAL IN EARLY STAGE PRIMARY LUNG CANCER

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OBJECTIVES
Lymphatic invasion is defined as a negative factor for survival in malignancies such as breast, colon, and gastric cancer and has been accepted as a valid parameter in treatment selection and staging. Our aim is to present survival results by comparing tumor size, stage, histologic type according to lymphatic invasion of patients who were operated for primary lung cancer.

METHODS
Between 2004 and 2021, 919 patients who underwent anatomical resection for primary lung cancer were included in the study. The patients retrospectively divided into two groups according to the presence of lymphatic invasion. In the group with lymphatic invasion, survival analysis was performed according to tumor type and dominant type in the subgroup analysis.

RESULTS
Lymphatic invasion was detected in 388 (42.21%) of 919 patients who underwent anatomic resection for primary lung cancer. The group without lymphatic invasion had a significantly better overall survival ($p<0.001$). The significant difference was found in the incidence of lymphatic invasion compared to other adenocarcinoma types in terms of acinar and solid type in adenocarcinoma subtyping. ($p<0.001$)
There was a statistically significant difference in survival in 73 patients compared to 257 patients without lymphatic invasion in the group of patients (n:330) who did not require post-operative adjuvant therapy (smaller than 3 cm, had no pleural and vascular invasion, and did not receive neoadjuvant therapy).In the survival analysis for a statistically significant result was obtained with a mean difference of 20 months in adenocarcinoma ($p<0.001$).

CONCLUSIONS
In our study, additional treatment options such as adjuvant chemotherapy should be considered in the presence of lymphatic invasion, especially in cases with early-stage acinar and solid-type dominant adenocarcinoma. We believe that it will be among the markers of treatment modalities that will change in the near future due to the differences in survival found in many studies.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Lymphatic Invasion, Lymphovascular Invasion.

Posters
Abstract 026-146

P-047

MULTIPORTAL VIDEO-ASSISTED THORACOSCOPIC LOBECTOMY WITH NEW MULTI-JOINT WRISTED INSTRUMENTS: NINE MONTHS EXPERIENCE

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OBJECTIVES
Robotic lobectomy for non–small cell lung cancer (NSCLC) offers outstanding precision via robotic wristed instruments, but robotic surgery is expensive and has potential safety implications as the surgeon is un-scrubbed away from the patient's side without haptic feedback. By using the robotic-like wristed Artisential® instruments - especially for vessel dissection and lymphadenectomy - benefits of robotic surgery can be achieved by the patient's side. We report our results in duo/triportal anatomic pulmonary resections with these articulating instruments during the first nine months of experience.

METHODS
From April 2021 – January 2022, 16 consecutive VATS-lobectomies due to NSCLC have been performed using the wristed instruments through a duo/triportal approach. We have analyzed early outcomes of Artisential-assisted lobectomies. Various parameters and experiences of these procedures were compared to a control group of 20 standard VATS lobectomies with exclusive use of conventional curved VATS instruments.

RESULTS
In the Artisential group, of 16 VATS lobectomies, 15 were successfully completed with the wristed instruments (one operation was converted to open surgery). The usual set up with the wristed instruments (anterior utility port, 1-2 ports in the 7th intercostal space) took the same time as standard VATS cases. Propensity-matched comparison showed that Artisential-assisted procedures yielded a higher number of lymph nodes (16.5 ± 5 vs. 12 ± 6), $p<0.05$). Ergonomics and comfortability for the surgeon, especially during lymphadenectomy, were better in the Artisential procedures. Operative time, postoperative pain score, conversion rate, 30-day complication rate, and length of hospital stay were similar between the two groups.

CONCLUSIONS
Multiportal VATS lobectomy with wristed instruments is a safe procedure with good perioperative results. Especially the ability to angle the instruments to 90 degrees in all directions with improved ergonomics enabled accurate dissection of the lymph nodes around the vessels and mediastinal nodal stations, with clear superiority to standard VATS instruments.

Disclosure: No significant relationships.
Keywords: VATS Lobectomy, Wristed Instruments, Surgeon-Powered Robotics.

P-048

IS THERE A ROLE FOR MEDIASTINAL LYMPH NODE DISSECTION IN PULMONARY CARCINOIDS?

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OBJECTIVES
Pulmonary carcinoids are indolent tumours. Histology (typical/atypical) and nodal status are known prognostic markers. The incremental value of mediastinal nodal dissection in these tumours is unknown. We aim to assess any survival benefit afforded by addressing mediastinal nodes in pulmonary carcinoids.

METHODS
This is a retrospective analysis of a prospectively maintained database of surgery in pulmonary carcinoids. Data regarding histology, type of surgery, imaging, nodal status, margin status and follow up were captured from the database and electronic medical records. Statistical analysis was performed using SPSS version 20.

RESULTS
221 patients with pulmonary carcinoids treated with curative intent in a single center from August 2004 to December 2020 were included. Median follow up was 63.57 months. 174 (78.7%) were typical carcinoids and 40 (18.1%) were atypical carcinoids. 199 (90.05%) patients underwent mediastinal nodal sampling or systematic clearance. In the rest, mediastinal nodes were not addressed. 31 (14.03%) patients were node positive. Node positivity in typical carcinoids was 12.64% and atypical carcinoids was 22.58%. Median survival was not reached. 5 year overall survival(5yOS) in patients who had mediastinal nodes addressed was 92.3% , while it was 73.8% in those without (p=0.062). 5yOS in patients with typical and atypical carcinoids was 97.5 % and 58.5 % (p<0.001). Patients with positive nodes had a 5yOS of 82.3 % while that in node negative patients was 91.7% (p= 0.392).

CONCLUSIONS
Node positivity confers poorer prognosis with decreased survival in patients with pulmonary carcinoids. Addressing mediastinal lymph nodes showed a trend towards improved survival. In view of the relatively low morbidity of the procedure and the lack of any other curative treatment options, we suggest that systematic lymph node dissection be performed in all cases of pulmonary carcinoids.
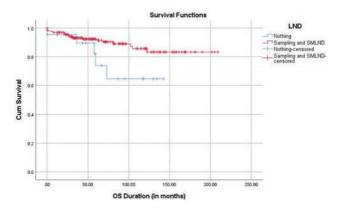
Disclosure: No significant relationships.
Keywords: Mediastinal Lymph Node Dissection, Carcinoids.

Posters
Abstract 026-146

P-049

BIOLOGICAL FUNCTION OF A TUMOR-PROMOTING CIRCULAR RNA, CIRCME1, IN ESOPHAGEAL SQUAMOUS CELL CARCINOMA

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OBJECTIVES

Esophageal cancer is one of the most common malignancies worldwide, with high morbidity and mortality. It is pathologically divided into esophageal squamous cell carcinoma (ESCC) and esophageal adenocarcinoma (EAC). The sensitivity and specificity of current screening and treatment methods are not ideal in the diagnosis and treatment of esophageal cancer. A large number of studies have shown that circRNAs are closely related to various diseases, including cancers. Therefore, it is urgent to screen and find new biomarkers and targets for the diagnosis and treatment of esophageal cancer.

METHODS

Next generation sequencing (NGS) of total RNA and transcriptomic analysis was performed to identify dysregulated circRNAs in ESCC tissue samples. PCR, Sanger sequence and RT-qPCR were used to prove the authenticity and expression of circME1 in ESCC tissues and cell lines. Small interference RNA transfection and short hairpin RNA infection were used to knockdown the expression of circME1 in ESCC cells followed by cell proliferation, colony formation, wound healing assays, transwell assays, and animal experiments to explore the function of circME1 in ESCC development and progression.

RESULTS

High-throughput sequencing data showed that there were a large number of differentially expressed circular RNAs in ESCC. The expression of circME1 was significantly higher in ESCC tissues and ESCC cells than that in normal tissues and normal esophageal epithelial cell lines ($P < 0.05$). Knocking down circME1 expression significantly inhibited the ability of cell proliferation, colony formation, migration and invasion in vitro and tumor growth in vivo.

CONCLUSIONS

In the current study, circME1 was demonstrated to be up-regulated in ESCC tissues and cell lines. CircME1 silencing remarkedly inhibited the malignant behaviors of ESCC, which indicated that circME1 may exert an oncogenic role in the occurrence and development of ESCC. CircME1 may be an oncogene and serve as a potential diagnostic biomarker and therapeutic target for ESCC patients.
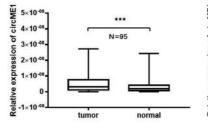
Disclosure: No significant relationships.
Keywords: ESCC; CircRNA; Biomarker; CircME1.
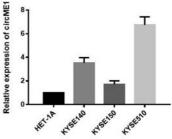
Posters
Abstract 026-146

P-050

DOES ROBOTIC ASSISTED LUNG RESECTION FOR LUNG CANCER PROVIDE ADVANTAGES IN HIGH-RISK PATIENTS COMPARED TO VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS)?

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OBJECTIVES

Compare robotic-assisted lung resection (RATS) with traditional video-assisted lung resection (VATS) for lung cancer in high-risk patients.

METHODS

Single-centre prospective database. Minimally invasive consecutive anatomical lung resections for lung cancer performed in high risk patients, at Guy's Hospital, by two surgeons, from July 2015 to December 2020. Inclusion criteria were PS >= 2, FEV1 < 40% and/or TLCO < 40%.

RESULTS

746 patients underwent minimally invasive lung resections. 157 patients (72 RATS and 85 VATS) were classified as high-risk. Significantly higher number of anatomical resections achieved with RATS 98.6% vs 69.4% with VATS (p<0.001). Median lymph node stations harvested was 6 in RATS and 5 in VATS group. Lymph node upstaging was 8.6% in RATS vs 7.9% in VATS. The conversion rate was lower in RATS. Significantly lower number of patients with blood loss > 50 ml in RATS 83.3% vs 95.3% in VATS (p=0.017). Mean operating time was lower in VATS: 104.5 +/- 32.0 vs. 138.2 +/- 41.5 minutes in RATS. R0 resection was 100% in RATS vs 86.5% in VATS.

There was no intraoperative death. There were more complications in the RATS vs VATS group: atelectasis 16.7% vs 2.4% of atelectasis (p=0.003) and GI complications 11.1% vs1.2% of GI complications (p=0.012).

Median length of drainage and in-hospital stay were 3 and 7 days in RATS vs 2 and 6 days in VATS (p=0.027), respectively. The 30-day mortality rate was 5.6% in RATS and 1.2% in VATS. The readmission rate was 13.9% and 2.4% respectively in RATS and VATS.

CONCLUSIONS

RATS allows to perform higher number of anatomical resection even in high-risk patients providing a more appropriate treatment for lung cancer. Operating time and complications rate were higher but still acceptable in the RATS group. Increased number of R0 resection and better lymph node staging were also noticed in the RATS group.

Disclosure: No significant relationships.
Keywords: Robotic Surgery, Lung Cancer, VATS, Postoperative Outcome, High-Risk Patients.

P-051

ACUTE RESPIRATORY DISTRESS SYNDROM (ARDS) PATIENTS WITH EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) DURING SARS-COV-2 PANDEMIC: IS THERE A TIME-TREND?

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OBJECTIVES
During the second wave of the SARS CoV-2 pandemic, the management of patients has been modified, including invasive mechanical ventilation delayed. The purpose of our study was to evaluate if the difference of the management has any impact on the outcomes of patients who had suffered from ARDS and been supported with ECMO. We aimed to study in-hospital mortality, death prognosis factors and compare patients according to the wave in which they were treated.

METHODS
We prospectively included all the patients referred to one of the 5 Intense Care Units of our University Hospital for severe Covid-19 ARDS and who had been supported with ECMO. We collected and analyzed data all along the different waves. Group 1 involved the patients recorded during the first wave, from March 3rd to April 22nd. Group 2 involved the patients recorded during the following waves, from November 10th to November 24th. The whole set counts 93 patients until now and will be updated at the time of the presentation.

RESULTS
We included 78 patients: in group 1, n=36 and in group 2, n=42. We had proceeded 75 veno-venous ECMO and 3 veno-arterial ECMO. The average invasive ventilation duration before ECMO was 7.66 days in group 1 and 5.58 days in group 2 (p=0.1601). Considering in-hospital mortality, there were 40 deaths, 14 patients in group 1 (40%) and 26 patients in group 2 (60,5%), p=0,0721. In both groups, we had identified pre-implantation SOFA gravity score as death prognosis factor. In group 1, pre-implantation SOFA was 7.89 (+/- 3.49) while it was 10.95 (+/- 2.44) in group 2; p<0.0001.

CONCLUSIONS
The management of patients has varied from first to other waves of the pandemic. Considering both groups of patients, we found a significative difference regarding pre-implantation gravity scores. Nevertheless, it seems to produce no significant difference in in-hospital mortality.

Disclosure: No significant relationships.
Keywords: ARDS, Pandemic, ECMO.

P-052

RISK FACTORS IN TREATMENT OF DESCENDING NECROTIZING MEDIASTINITIS: MULTICENTER EXPERIENCE

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OBJECTIVES

Descending Necrotizing Mediastinitis (DNM) is a rare, acute condition with high mortality rate. In this multicenter study, we analyzed the results obtained in treatment of patients with DNM, with the aim of identifying risk factors conditioning the course of this potentially fatal disease.

METHODS

We retrospectively evaluated patients treated for DNM from 2002 to 2020, analyzing the following data: age, gender, etiopathogenesis, degree of diffusion (Endo's classification), time between diagnosis and treatment, type and duration of surgery, need for tracheostomy, intensive care unit (ICU) stay, post-operative complications, chest tubes duration, length of hospital stay, post-operative mortality, pre-operative risk factors.

RESULTS

Twenty-one patients (20 males, 1 female), mean age 50,76+15,59 (range 12-74) years, were treated. Etiopathogenesis was cervico-pharyngeal in 11 (52%), peri-tonsillar/tonsillar in 6 (29%), odontogenic in 3 (14%), post-surgical in one (5%). Six (29%) had DNM type I, 7 (33%) type IIA and 8 (38%) type IIB (Endo's classification). Mean time between diagnosis and treatment was 2,81+2,70 days (range 8 hours-10 days). In all cases thoracotomy (15 right, 71%; 6 left, 29%; mean duration 111,79+39,06 minutes) followed cervicotomy, associated to tooth treatment in 3. Tracheostomy was performed in 11/21 (52%); 7/21 (33%) required ICU stay; 11/21 (52%) developed post-operative complications. Mean chest tubes duration was 17,63+11,38 (range 8-52) days, mean hospital stay 29,65+13,06 (range 13-61) days, without post-operative mortality. Main pre-operative risk factors were: smoking/COPD (38%), overweight (33%), cardiopathy/vasculopathy (29%), diabetes mellitus (14%). On multivariate analysis smoking/COPD resulted statistically significant (p=0.0496) for development of post-operative complications and cardiopathy/vasculopathy for longer hospital stay (p=0.0122) and chest tube duration (p=0.0154).

CONCLUSIONS

DNM requires an early diagnosis and treatment, to reduce mortality and morbidity. The most effective treatment should provide combined cervicotomy and toracotomy to drain all

infectious collections. Smoking/COPD and cardiopathy/vasculopathy represent risk factors negatively conditioning the course of the disease.

Disclosure: No significant relationships.
Keywords: Descending Necrotizing Mediastinitis, Surgical Treatment, Risk Factors.

P-053

PREOPERATIVE PREDICTION OF VISCERAL PLEURAL INVASION IN NON-SMALL CELL LUNG CANCER

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OBJECTIVES
Lung cancer with pleural invasion is prone to pleural dissemination and lymph node metastasis, so it is important to identify it at the time of diagnosis. The purpose of this study is to identify the predictive factors of pleural invasion of lung cancer on preoperative CT.

METHODS
Preoperative CT findings, pathological pleural invasion, and prognosis were examined in 100 patients with cTis-T2bN0M0 non-small cell lung cancer treated surgically between 2009 and 2015, excluding those with previous lung cancer history or incomplete resection.

RESULTS
Preoperative CT revealed contact of the lung cancer lesion with the pleura in 68 cases and no contact in 32 cases. Pleural dissemination (n=1), malignant pleural effusion (n=1), and positive pleural lavage cytology before lung resection (n=6) were observed in the former group; R0 resection was performed in the other 92 cases. Pathological diagnosis revealed pleural invasion in pl1/pl2/pl3=8/13/6 cases. The postoperative follow-up time ranged from 1 to 144 months (median, 70 months). After excluding 1 patient with pleural dissemination and 1 with malignant pleural effusion, 23/98 patients had postoperative recurrence (local/distant/local+distant=14/5/4), which was significantly more frequent in patients with pathological pleural invasion (p=0.01). Pathological pleural invasion was correlated with total lesion size (p<0.001), size of the solid portion of the lesion (p<0.001), presence of solid portion abutting the pleura (p<0.001), and interface length of the pleural contact (p<0.001). Using the ROC curve, interface length of the pleural contact for positive pleural invasion was determined to be 1.9 cm (sensitivity, 0.73; specificity, 0.81).

CONCLUSIONS
The risk of pleural invasion increases if the solid portion, rather than the ground-glass opacity portion, of a lung cancer lesion is in contact with the pleura according to preoperative CT, and if the interface length of the pleural contact is greater than 1.9 cm.

Disclosure: No significant relationships.
Keywords: Non-Small Cell Lung Cancer, Visceral Pleural Invasion, Preoperative Prediction, CT Findings.

P-054

SAFETY ANALYSIS IN SUBLOBAR RESECTIONS IN A MULTICENTER PROPECTIVE REGISTER OF 360 CASES

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OBJECTIVES
Anatomical sublobar resections (SLR) are an alternative treatment for cIA peripheral NSCLC less than 2 cm. We present the largest prospective European register of SLR. Primary endpoint is intra and postoperative morbidity and mortality. Secondary endpoint analyzes differences between approach.

METHODS
360 SLR were included between september 2018 and december 2019. Median age was 69 year-old, 60% were male. 76.8% had past or current smoking habit, and 37% had COPD diagnosis. Median preoperative FEV1 and DLCO were 90% and 79%. 85% of the procedures were performed under VATS approach, being uniportal and biportal the most commonly used (39.7% each).

RESULTS
Median operative time was 146 minutes and conversion rate was 2.6%. ICU stay was 24 hours, chest tube duration 48 hours and median postoperative stay was 3 days.
Postoperative complications appeared in 28% of patients, with pulmonary complications as the main cause in 20%. Age, preoperative FEV1 and DLCO and adhesions were predictors of overall complications. Preoperative DLCO, adhesions and COPD predicted pulmonary complications. Globally, 12% of patients presented prolonged air leak (more than 5 days), 3% required reoperation and 5% readmission after hospital discharge. There was no intraoperative mortality, and postoperative and 90-day mortality were 1.3% and 1.9% respectively.
Uniportal and biportal VATS were significant protection factors for ICU stay (p 0.000 y 0.004). Multiportal VATS predicted longer chest tube duration (p 0.003). There were not significant differences in postoperative stay between approaches, in conversion rate (p 0.128), overall postoperative complications (p 0.268) and pulmonary complications (p 0.055)(Figure 1), but prolonged air leak (p 0.000) and readmission rate were more common in multiportal VATS.
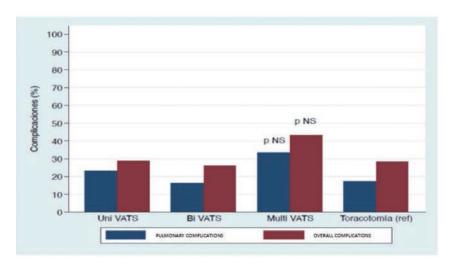
CONCLUSIONS

SLR presented low postoperative complication rate, mainly pulmonary events. Chest tube duration and postoperative stay were within standards, but multiportal VATS approached presented worse postoperative profile without differences in morbidity and mortality.

Disclosure: No significant relationships.
Keywords: Video-Assisted Thoracic Surgery - Sublobar Resection - NSCLC.

P-055

PHOTODYNAMIC THERAPY RELIEVES TUMOR VASCULAR ANERGY AND PROMOTES IMMUNE CELL TRAFFICKING IN AN ORTHOTOPIC MOUSE MODEL OF MALIGNANT PLEURAL MESOTHELIOMA

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OBJECTIVES
Malignant pleural mesothelioma (MPM) is a deadly disease with limited treatment options. Recently, dual immune checkpoint inhibition therapy (ICI) showed improved patient survival. However, only a fraction of patients were responsive to immunotherapy. One potential mechanism of MPM resistance to ICIs could be their endothelial anergy that hampers leukocyte trafficking to the tumor bulk. Here, we hypothesized that vascular-targeted low dose photodynamic therapy (L-PDT), treatment of MPM could relieve tumor endothelial anergy and improve immunotherapy efficacy.

METHODS
Using an orthotopic syngeneic MPM murine model (AB12 cells injected in the pleura of BALB/c mice), we determined the impact of L-PDT on the endothelial expression of E-Selectin, a key molecule involved in leukocyte diapedesis by immunohistochemistry. Furthermore, to confirm the role of E-selectin, we determined the extravasation of effector T cells (CD8+/CD4+) by immunostaining in L-PDT treated tumors in the presence or absence of an E-selectin blocking antibody. Finally, we assessed tumor growth/survival of our MPM murine model treated with L-PDT alone or combined to ICIs.

RESULTS
L-PDT pre-treatment enhanced MPM endothelial E-Selectin expression in vivo. The latter was associated with increased CD4+ and CD8+ lymphocyte infiltration of MPM following L-PDT which did not occur after E-Selectin blockade. Also, L-PDT pre-treatment of MPM influenced favorably tumor control, mouse survival and the impact of ICIs compared to controls.

CONCLUSIONS
L-PDT pre-treatment relieves endothelial anergy in MPM which improves antitumor immunity and response to ICI. This approach could constitute a promising pre-treatment option, in combination with ICIs, for the management of this deadly disease.

Disclosure: No significant relationships.
Keywords: Malignant Pleural Mesothelioma - Photodyamic Therapy - Immunotherapy - Thoracic Surgery.

P-056

STRUCTURED USE OF AN AUDIT AND FEEDBACK (A&F) SYSTEM: THE WAY TO ACHIEVE HIGH LEVELS OF PROTOCOL ADHERENCE (≥80%) IN THE ENHANCED RECOVERY AFTER THORACIC SURGERY (ERATS)-TRIAL? – PRELIMINARY RESULTS

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OBJECTIVES

After publication of the ESTS/ERAS-guidelines in 2019, the Dutch ERATS-protocol was developed. Implementation of this protocol is currently under evaluation in the national multicentre ERATS-Trial.

ERAS-protocols are most effective if ≥80% protocol adherence is achieved. A&F is expected to contribute to high protocol adherence and, consequentially, fewer complications and shorter length of stay (LOS).

This preliminary analysis focusses on the effect of structured reporting, data collection and use of A&F, as introduced late 2020, on protocol adherence in 1 of the 10 ERATS-Trial hospitals.

METHODS

Descriptive statistics were used to present results on number(%) of patients that fulfilled each individual ERATS-element, median ERATS-protocol adherence (% fulfilled; interquartile range(IQR)); number(%) of patients with ≥80% protocol adherence.

LOS (median;(IQR)) and rate of complicated postoperative recovery were compared to national benchmark data, as well as to historical data.

RESULTS

N=57 patients were included in the ERATS-Trial, in this centre, in 2021. ERATS-protocol adherence per ERATS-element is presented in Figure 1.

With a structured reporting and A&F system in place, median protocol adherence was 82.4%(IQR 76.5-88.2); n=41(72%) patients had ≥80% protocol adherence.

In 2021, LOS was 2 days shorter (3;(IQR 2-4)), compared to national benchmark data, with comparable complicated postoperative course rates (15.5%). In 2018, LOS was 5 days(IQR 3-9) in our institution, with complicated postoperative course rates comparable to the national benchmark.

CONCLUSIONS

This preliminary, single centre, analysis focussing on the effect of structured reporting, data collection and use of A&F, supports the assumption that a structured A&F system contributes to high protocol adherence rates (≥80%) and associated improved outcome.
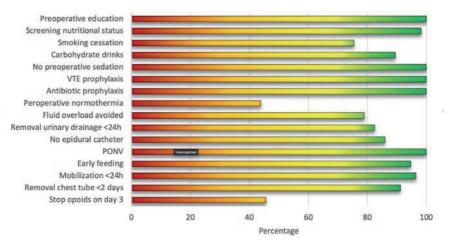
When completed in 2023, the ERATS-Trial will be able to provide a more detailed analysis of the relation between protocol adherence and outcome, as well as the effect of a structured A&F system.

Disclosure: No significant relationships.
Keywords: Enhanced Recovery After Surgery, Lung Cancer, Lung Resection, Perioperative Care.

ERATS-elements

P-057
IS THE FISSURELESS TECHNIQUE SAFE AND PREFERABLE IN THORACOSCOPIC LOWER LOBECTOMIES? COMPARATIVE ANALYSIS OF 254 CASES

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OBJECTIVES
Thoracoscopic interventions have come to the fore as the preferred method. We aimed to compare and present the results of thoracoscopic lower lobectomies performed with fissureless and with traditional technique.

METHODS
Thoracoscopic lower lobectomy cases performed in the last 10 years were included. Of these cases, 165 were performed with fissurless technique and 89 with the traditional technique. Patients who underwent segmentectomy or non-anatomical resection, switched to open surgery, and patients who did not undergo mediastinal lymph node dissection were excluded from the study. A comparison was made between two groups, in terms of duration of surgery, length of hospital stay, duration of the drain, and the number of lymph nodes dissected.

RESULTS
Number of fissureless lobectomy was 165 (64.9%) while traditional lower lobectomy was 89 (35.1%). Prolonged air leak was observed in 19 (11.5%) of the cases in the fissureless group and 20 (22.4%) in conventional method. There was a significant difference in favor of the fissurless group in terms of both duration of air leakage and hospital stay ($p<0.005$). There was no statistical difference in the number of lymph nodes dissected between the two groups, and between lymph nodes. Duration of surgery was shorter, both sides. The mean stapler use was found to be similar in both groups, the mean difference in hospitalization costs was 1061.83 euros, in favor to the fissureless group.

CONCLUSIONS
The fissureless lower lobectomy technique showed similar results to the traditional method in terms of the number of lymph node dissections and survival rate, was found to be superior in terms of complications such as prolonged air leak and associated hospital stay. Also shorter duration of surgery is preferableç We believe that the fissureless technique can be safely applied in lower lobectomies, which is viewed with suspicion in the literature.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Videothoracoscopy, Fissureless.

P-058

TRANSBRONCHIAL LUNG CRYOBIOPSY AND SURGICAL LUNG BIOPSY IN THE SAME ACT FOR DIAGNOSIS OF INTERSTITIAL LUNG DISEASE

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OBJECTIVES
To compare the diagnostic yield, complications and morbidity of transbronchial lung cryobiopsy (TBLC) and surgical lung biopsy (SLB) by VATS in the diagnosis of interstitial lung disease (ILD) performed sequentially in the same patient.

METHODS
Comparative and prospective study of patients with suspected ILD who have been previously assessed in a multidisciplinary board (MDB) between January/2017- March/2021, who underwent first TBLC and subsequently SLB.
Specimens was blindly assessed by two pathologists both individually and by consensus. Each tissue sample will then be considered in conjunction with clinical and radiological data, within a MDB.

RESULTS
A total of 38 patients, men:21(55.3%). Mean age: 68+/-7 years.
The mean number of specimens: SLB:3; CB:5.
The diameter of the specimens: SLB:39mm±11 and in the CB:4.9mm±1.5.
Complications:
-SLB: Hemothorax:2(5.3%), pneumothorax:1(2.6%), wound hematoma:1(2.6%) and empyema 2(5.3%).
-TBLC: pneumothorax:1(2.6%), pulmonary hematoma:1(2.6%) and moderate bleeding 4(10.5%).
Length of stay was 1.16±0.55 days.
4(10.5%) patients were readmitted due to surgical wound hematoma, empyema and exacerbation of ILD.
Definitive diagnoses after MDB assessment: chronic hypersensitivity pneumonitis:16(42.1%), idiopathic pulmonary fibrosis:12(31.6%), central airway fibrosis:3(7.9%), ILD Associated with smoking:2(5.3%), other ILD:2(5.3%), fibrosing ILD: 2(5.3%) and unknown ILD:1(2.6%).
After obtaining the histological results and reevaluation of the MDB, in 13/38(34%) patients a diagnosis could have been reached with TBLC, so it would not have been necessary to perform a SLB.
In 4/38(11%) patients, different results were obtained with both techniques, so TBLC provided a complementary diagnosis to SLB.
In 5/38(13%) patients, the TBLC sample was not sufficient for diagnosis.

CONCLUSIONS

The TLCB can provide a complementary diagnosis to SLB in some patients with ILD. The union of the two techniques could increase diagnostic yield in these patients, without a significant increase in morbidity/mortality or length of stay. This raises the possibility of continuing to perform them in a protocolized manner in selected cases after being assessed in an MDB.

Disclosure: No significant relationships.

Keywords: Transbronchial Lung Cryobiopsy (TBLC); Surgical Lung Biopsy (SLB); Interstitial Lung Disease (ILD).

P-059

DIABETES MELLITES IS ASSOCIATED WITH POOR SHORT AND LONG-TERM OUTCOME AFTER LUNG RESECTION

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OBJECTIVES
Systemic inflammation is a potentially debilitating complication of thoracic surgeries with significant physical and economic morbidity. There is compelling evidence that diabetes mellites (DM) is associated with systemic inflammation. The current work analyzed the DM as a risk factor for perioperative morbidity and overall survival in patients undergoing lung surgery.

METHODS
DM retrospective analysis was conducted on the prospectively-maintained database of 6958 patients, who underwent lung resection at our department between 2008 and 2021.

RESULTS
Repeated measure ANOVA revealed that the preoperative serum concentrations of C-reactive protein (CRP) and leukocytes count were comparable between diabetic and non-diabetic patients. However, diabetic patients showed a higher concentrations of serum CRP and leukocytes count (170 ± 88 mg/L & 13 ± 6 109/L) over the 5 postoperative days as compared to non-diabetic patients (107 ± 85 mg/L & 11 ± 4 109/L respectively; $p < 0.01$). Diabetic patients had prolonged hospitalization time (10 ± 7 days) comparing to 6 ± 2 days in non-diabetics ($p < 0.002$). Chest tube duration and postoperative drainage amount were comparable between groups. Kaplan Meier analysis with Log-Rank test revealed that diabetic patients are associated with poor 1-year ($p < 0.009$) and overall survival after lung surgery ($p < 0.001$).

CONCLUSIONS
The current results present DM as an independent risk factor for postoperative systemic inflammation. Furthermore, DM is associated with poor 1-year and overall survival after lung resection.

Disclosure: No significant relationships.
Keywords: Lung, Inflammation, Diabetes, Survival.

P-060

COULD MICRO-COMPUTED (CT) BE A NEW AND NON-DESTRUCTIVE METHOD TO DIFFERENTIATION OF TUMORAL AND NON-TUMORAL REGIONS IN PARAFFIN EMBEDDED TISSUE BLOCKS OF THE MEDIASTINAL LYMPH NODES OF PATIENTS WITH OPERATED NON SMALL CELL LUNG CANCER (NSCLC)? A PILOT STUDY FOR METHOD VALIDATION

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OBJECTIVES
The patients without lymph node (LN) metastases have different survival, even if their T status is same. This may be due to the fact that not all tissue from LNs dissected during surgery is sampled with current histopathological methods. Micro-computed tomography (micro-CT) can provide detailed information about the internal structure of materials without destructing the material and also can obtain 3D view of the whole material.

In this study, it was aimed to evaluate the presence of metastasis in mediastinal lymph nodes (MLNs) embedded in paraffin blocks with micro-CT by quantitative parameters.

METHODS
Twelve paraffin blocks obtained from 8 NSCLC patients with pathological MLNs metastasis were scanned with micro-CT.

Forty seven region of interest (ROI) (17 metastatic focus, 11 normal lymphoid tissue, 10 adipose tissue, 9 antrachotic area) were marked with circles which were in different colors (red, yellow, green, blue, gray) in each MLNs in virtual slides. Each color represented a different ROI in each block to avoiding bias. Quantitative structural parameters obtained by micro-CT from the tumoral and non-tumoral (11 lymphoid tissue and 9 anthracotic area) ROIs were statistically analyzed.

RESULTS
Parameters of structure linear density, connectivity, connectivity density, closed porosity percent were significantly different regarding the tumoral and non-tumoral ROIs (Table-1). In ROC analysis, tumoral and non-tumoral ROIs were successfully differentiated by the parameters of structure thickness, structure linear density, connectivity, connectivity density and percent of closed porosity.

CONCLUSIONS
Using the quantitative parameters obtained by micro-CT, tumoral and non-tumoral areas in paraffin blocks of MLNs can be distinguished from each other. Making this distinction with

quantitative data obtained from micro-CT can therefore be the basis of creating artificial intelligence algorithms in the future.

Disclosure: No significant relationships.
Keywords: Micro-CT, Mediastinal Lymph Nodes, Lung Cancer.

	Intersection surface n, (%)		Structure thickness		Structure linear density		Connectivity		Connectivity density		Closed porosity (%)		Open porosity (%)	
	Cluster number of case		Cluster number of case		Cluster number of case		Cluster number of case		Cluster number of case		Cluster number of case		Cluster number of case	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Tumor Area (n:17)	17 (100%)	0	0	17 (100%)	17 (100%)	0	0	17 (100%)	17 (100%)	0	0	17 (100%)	17 (100%)	0
Lymphoid tissue + Anthracotic Area (n:20)	10 (50%)	10 (50%)	10 (50%)	10 (50%)	0	20 (100%)	18 (90%)	2 (10%)	0	20 (100%)	20 (100%)	0	11 (55%)	9 (45%)
Kappa Value	0.48		0.52		1		0.90		1		0.99		0.43	

P-061

RESULTS OF SURGERY VERSUS STEREOTACTIC BODY RADIOTHERAPY FOR EARLY-STAGE OF LUNG CANCER - A RETROSPECTIVE STUDY

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OBJECTIVES
Historically the best outcomes for early-stage lung cancer have been achieved through surgery via lobectomy, however stereotactic body radiotherapy (SBRT) has emerged as an effective treatment for stage I lung tumors unsuitable for surgery. Our goal was to appraise the different between the two groups (surgery vs. SBRT) included comorbidities, survival and progression rates.

METHODS
From August 2012 until June 2018, 49 patients with lung cancer were submitted to SBRT and 232 patients underwent surgical resection (neuroendocrine subtype were excluded). We also compared the surgical stage IA (n=99) vs. SBRT stage IA (n=41). The SBRT group were patients considered not fit to surgery, 32 due to severe chronic obstructive pulmonary disease (COPD). We used the 8th TNM classification for lung cancer and all the stage were updated. The progression was defined as imagological progression.

RESULTS
Lobectomy was the most frequent surgery (92,2%) and the most frequent dose scheme for SBRT was 46-60grays in 4 fractions (38,8%).SBRT group showed more comorbidities, were older, the mean value of forced expiratory volume in 1 second (FEV1) was lower and the incidence of COPD was higher than in the surgical group. The groups not revealed differences in median overall survival (OS) and distant progression free survival (PFS). There were significant differences between surgical and SBRT group on PFS (69 vs. 31months) and local PFS (73 vs. 34months). The stage IA SBRT group had a lower FEV1 and a higher incidence COPD. The stage IA median survival rates are significantly higher in the surgical group for OS (71 vs.43months), PFS (77 vs. 33months), local (78 vs. 36months) and distant (79 vs.36months) PFS.

CONCLUSIONS
Survival analysis showed significantly higher values in surgical group, specialty in stage IA, but SBRT remains a suitable option for inoperable patients. Our study .had some limitations like confounding by indication (operability).

Disclosure: No significant relationships.
Keywords: Stereotactic Body Radiotherapy; Surgery; Lung Cancer.

Posters
Abstract 026-146

P-062

THE IMPORTANCE OF TUMOR MARKERS IN PATIENTS UNDERGOING RESECTION FOR LUNG METASTASIS OF COLORECTAL CARCINOMA

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OBJECTIVES
Colorectal cancer is the most common malignancy among gastrointestinal system cancers.One of the most common sites of metastasis is the lung.In this study,preoperative-postoperative CEA and CA19-9 markers were evaluated in patients who had undergone lung resection for colorectal cancer metastasis and their relationship to overall survival was investigated.

METHODS
In the study,53 patients who underwent lung resection for colorectal cancer metastasis between 2015-July,2021-December in our department were retrospectively analyzed.Preoperative-postoperative CEA,CA19-9 marker levels, tumor characteristics and survival times of the patients were analyzed.

RESULTS
The demographic characteristics of the patients are summarized in Table 1.Values above 5 µg/L for CEA and over 27 U/mL for CA19-9 were considered high.The overall survival of patients with high preoperative CEA value was $26.57\pm14.913(3-58)$ months,patients with low CEA value were $62.75\pm20.241(2-72)$ months($p\leq 0.001$).The overall survival of patients with high postoperative CEA value was $31.68\pm18.765(3-61)$ months,patients with low CEA values were $57.51\pm19.829(2-72)$ months($p=0.009$).The overall survival of patients with high preoperative CA19-9 value was $35.9\pm20.693(2-72)$ months,patients with low CA19-9 value were $68.49\pm19.875(2-68)$ months($p\leq 0.001$).The overall survival of patients with a high postoperative CA19-9 value was $19.88\pm12.112(5-37)$ months, patients with low CA19-9 value were $59.354\pm20.254(2-72)$ months($p\leq 0.001$). It was determined that there was a weak positive correlation between preoperative CEA value and tumor size($p=0.008$, pearson correlation coefficient=0.360),a strong positive correlation between preoperative CA19-9 value and tumor size($p\leq0.001$,pearson correlation coefficient=0.603).

CONCLUSIONS
A highly reliable biomarker in the screening,diagnosis,follow-up and prognosis of colorectal carcinomas has not yet been determined.The existence of a relationship between CEA and prognosis has been reported in various studies.However,there is no defined relationship between CA19-9 and prognosis.In our study,it was revealed that preoperative-postoperative CEA and CA19-9 levels were associated with worse overall survival in patients with colorectal carcinoma and lung metastases.This suggests that the CA19-9 tumor marker can be used as a prognostic predictor in addition to CEA.

Disclosure: No significant relationships.

Keywords: Colorectal Carcinoma, Lung Metastasis, Tumor Markers.

Variables	Number of patients (n = 53)	Ratio (%)
Gender		
Male	29	54,7
Female	24	45,3
Age		
Under 60	13	24,5
Over 60 years old	40	75,5
Average of ages (mean±SD, range) (year)	64,60 ± 9,332 (39-83)	
Localization of metastatic lesions		
Right lung	32	39.5
Left lung	17	20.9
Bilateral lungs	16	19.7
Number of metastases		
One	41	77,4
Two	6	11,3
Three and more	6	11,3
Tumor size		
< 20 mm	13	24,5
≥ 20mm	40	75,5
Average of size (mean±SD, range) (mm)	18,13 ± 12,748 (1-70) mm	
Surgical procedure		
Anatomical resection	11	21,7
Sublobar resection	42	79,3
Relapse or metastasis		
Yes	19	35,8
No	34	64,2
Localization of recurrence or metastasis		
Lung	13	68,4
Liver	4	21,1
Colon	2	10,5
Mortality		
Yes	15	28,3
No	38	71,7

P-063

MICROMETASTASIS DETECTION OF DIFFERENT REGIONS OF LEFT RECURRENT LARYNGEAL NERVE PARA-LYMPH NODES IN ESOPHAGEAL SQUAMOUS CELL CARCINOMA WITH CYTOKERATIN 19

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OBJECTIVES

The optimal extent of left recurrent laryngeal nerve para-lymph nodes dissection (LRLN-LND) for esophageal squamous cell carcinoma (ESCC) is still controversial. Different surgeons have different extents according to different experience, technical proficiency and habit. Immunohistochemistry has been proved to be a feasible method to detect micrometastasis of lymph nodes in ESCC. We tried to explore the optimal extent of LRLN-LND by detecting the routine pathological and micrometastasis positive rates of lymph nodes in different regions.

METHODS

We retrospectively reviewed patients who underwent R0 resection and LRLN-LND from September 2018 to July 2019. We divided lymph nodes into four groups based on the LRLN and cervicothoracic junction plane. 263 lymph nodes were collected from 52 patients, detected micrometastasis with Cytokeratin 19 immunohistochemical method for the lymph nodes with negative histological detection, calculated the positive rates of routine pathological and micrometastasis detection, and analyzed metastasis status in different regions.

RESULTS

The positive rates of routine histological and micrometastasis detection results showed that lymph nodes of cervical regions (gourp 1 and group 2) which always be ignored for technically difficulty and poor exposure showed higher positive rate, and even the rate of group 3 was higher than that of group 4. In routine histological detection result. the positive rates of 4 groups were 8.9%, 6.7% . 1.6% and 0.9%, respectively. After detection of micrometastasis with Cytokeratin 19 immunohistochemical method, all the incidence of positive rates increased.

CONCLUSIONS

As far as we know, few studies focused on the optimal extent of LRLN-LND. According to our results, because of high positive rates both in routine pathological detection and Cytokeratin 19 Immunohistochemical micrometastasis detection, thorough LRLN-LND during esophagectomy for ESCC is necessary, including the cervical region and anterior nerve region next to the trachea.

Disclosure: No significant relationships.
Keywords: Cytokeratin 19(CK-19);Esophageal Squamous Cell Carcinoma; Left Recurrent Laryngeal Nerve Para-Lymph Nodes; Regions; Micrometastasis.

Groups	Cases(%)	Number of positive cases tested for Conventional histology(%)	P Value	Positive cases of CK19 Immunohistochemical examination (%)	P Value
Total patients	52(100%)	7(13.5%)		31(59.6%)	
Gender			0.093		0.226
Male	37(71.2%)	7(13.5%)		24(46.2%)	
Female	15(28.8%)	0		7(13.5%)	
Age			0.438		0.026
≤60y	28(53.8%)	3(5.8%)		14(26.9%)	
>60y	23(44.2%)	4(7.7%)		17(32.7%)	
Stage of tumor infiltration(pT)			0.951		0.547
pT0	1(1.9%)	0		1(1.9%)	
pT1	15(28.8%)	2(3.8%)		9(17.3%)	
pT2	11(21.2%)	1(1.9%)		8(15,3%)	
pT3	24(46.2%)	4(7.7%)		12(23.1%)	
pT4	1(1.9%)	0		1(1.9%)	
Stage of lymph node(pN)					0.404
pN0	36(69.2%)	0		22(42.3%)	
pN2	11(21.2%)	3(5.8%)		5(9.6%)	
pN2	5(9.6%)	4(7.7%)		4(7.7%)	
Tumor size			1.000		0.0532
≥3cm	32(61.5%)	4(12.9%)		18(34.6%)	
<3cm	20(38.5%)	3(5.8%)		13(25.0%)	
Tumor differentiation degree			0.165		0.450
Gx	11(21.2%)	1(1.9%)		6(11.5%)	
G1	9(17.3%)	3(5.8%)		7(13.5%)	
G2	22(42.3%)	1(1.9%)		11(21.1%)	
G3	10(19.2%)	2(3.8%)		7(13.5%)	
Preoperative neoadjuvant therapy			0.670		0.261
Yes	17(32.7%)	3(5.8%)		12(38.7%)	
No	35(67.3%)	4(12.9%)		19(61.3%)	
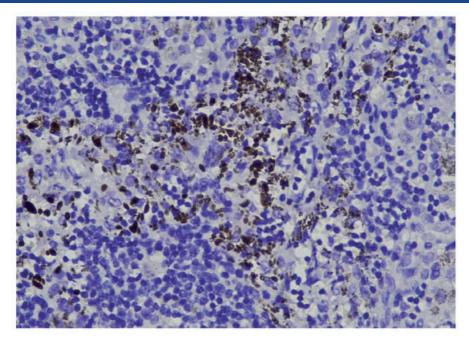
Groups	Cases	Conventional histological examination positive	CK9 Immunohistochemical test positive
left recurrent laryngeal nerve para-lymph nodes in the anterior thoracic and cervical segment	56(100%)	5(8.9%)	13(23.2%)
left recurrent laryngeal nerve para-lymph nodes in the posterior thoracic and cervical segment	30(100%)	2(6.7%)	6(20.0%)
left recurrent laryngeal nerve para-lymph nodes in the anterior thoracic	61(100%)	1(1.6%)	14(23.0%)
left recurrent laryngeal nerve para-lymph nodes in the posterior thoracic	116(100%)	1(0.87%)	14(12.1%)
All left recurrent laryngeal nerve para-lymph nodes	263(100%)	9(3.4%)	47(17.9%)

		Expression of CK19-IHC Method		Total
		Negative	Positive	
Expression of Conventional histological examination	Negative Positive Total	21 0 21	24 7 31	45 7 52

P-064

COMPARISON OF CONVENTIONAL CULTURE CONTAINERS AND BACTEC BLOOD CULTURE MEDIA METHODS FOR DETECTION OF BACTERIAL MICROORGANISM IN EMPYEMA.

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OBJECTIVES
The rate of culture negativity in patients with empyema has been reported between 18-30% in different series. This high rate of negativity in conventional culture containers leads to prolonged length of hospital stay due to nonspecific empirical antibiotic therapy. In various studies showed the rate of detection of causative microorganisms was increased in BACTEC blood culture media. Here we aimed to investigate whether BACTEC was superior to classical culture containers on microorganism growth in cases with empyema.

METHODS
Following the approval of the local ethics committee, the records of patients who applied to our clinic between March 2018 and September 2020 and underwent tube or catheter thoracostomy due to empyema were reviewed retrospectively. Data of patients were analyzed according to age, gender, presence of any
microorganism, method of pleura culture, type of pleural catheterization. Patients whose pleural culture were reported as contamination and those whose follow-up records could not be reached were not included in the study.

RESULTS
A total of ninety one samples that met the criteria were included in the study. The median age was 64 (18-88). 15 of the patients were female (16.5%) and 76 were male (83.5%). While no growth was observed in the classical culture containers in 44% of the patients, growth was observed in the BACTEC blood culture media in 69.2% of the patients. Microorganism growth was found to be significantly higher in the BACTEC.

CONCLUSIONS
It is very important to start culture-specific antibiotic therapy in empyema cases and to produce the causative microorganism for the treatment of the patient, reducing morbidity and length of hospital stay. The success of microorganism production in the BACTEC media found to be significantly superior to the classical culture container.

Disclosure: No significant relationships.
Keywords: Empyema, Culture, Microorganism.

Conventional Containers*BACTEC Crosstabulation

		BACTEC		Total
		Microrganism (-)	Microrganism (+)	
Containers	Microrganism (-) Count	22	29	51
	Expected Count	15,7	35,3	51,0
	% within Containers	43,1%	56,9%	100,0%
	Microrganism (+) Count	6	34	40
	Expected Count	12,3	27,7	40,0
	% within Containers	15,0%	85,0%	100,0%
Total	Count	28	63	91
	Expected Count	28,0	63,0	91,0
	% within Containers	30,8%	69,2%	100,0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8,332[a]	1	,004		
Continuity Correction[b]	7,063	1	,008		
Likelihood Ratio	8,784	1	,003		
Fisher's Exact Test				,006	,003
Linear-by-Linear Association	8,240	1	,004		
N of Valid Cases	91				

a. 0 cells (0,0%) have expected count less than 5. The minimum expected count is 12,31.

b. Computed only for a 2x2 table

P-065

MIR-1301-3P IS A POTENTIAL PROGNOSTIC BIOMARKER FOR ESOPHAGEAL CARCINOMA AND ACTS BY DOWNREGULATING NBL1 EXPRESSION

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OBJECTIVES
The aim of this study was to investigate the correlation between miR-1301-3p/NBL1 axis and prognosis of ESCA patients.

METHODS
We compared the miR-1301-3p expression levels between ESCA and normal esophageal tissues using MiRNAseq data retrieved from The Cancer Genome Atlas (TCGA) database. We employed UALCAN web platform, starBase v3.0 database, R software and GEPIA web platform to perform statistical analysis and data visualization. We then used TargetScan Human, miRDB and DIANA Tools databases to predict the miR-1301-3p target genes. Finally, we analyzed the expression patterns of the target genes as well as their prognostic value in ESCA.

RESULTS
There was an overexpression of miR-1301-3p in most malignancies, including ESCA ($P<0.001$). The miR-1301-3p expression levels were significantly related to age and histologic grade in primary ESCA ($P<0.05$), with high expression of miR-1301-3p being significantly associated with poor prognosis (Hazard ratio [HR]=1.88, P=0.012). NBL1 was identified as a potential target gene for miR-1301-3p and a negatively correlation in expression levels between the two genes was observed (r=-0.282, $P<0.001$). Notably, NBL1 was significantly downregulated in ESCA ($P<0.001$) and its low expression was significantly associated with poor prognosis of ESCA patients (HR=0.53, P=0.0063).

CONCLUSIONS
miR-1301-3p is a potential biomarker for predicting prognosis of ESCA patients. It may regulate ESCA progression by regulating NBL1 expression.
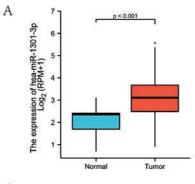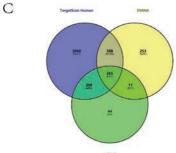
Disclosure: No significant relationships.
Keywords: Esophageal Cancer, MiR-1301-3p, NBL1, Prognostic Biomarker, Survival.
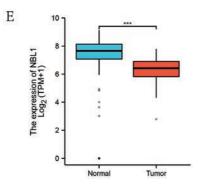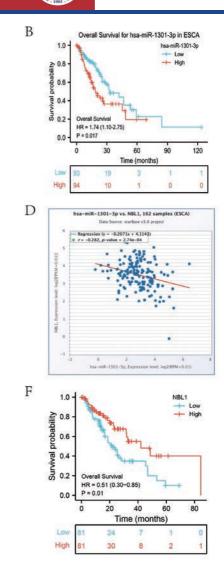
P-066

TRACHEOBRONCHOPLASTY RESULTS WITH RINGED POLYTETRAFLUOROETHYLENE VASCULAR GRAFT

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OBJECTIVES
We describe the outcomes of tracheobronchoplasty (TBP) using ringed polytetrafluoroethylene (PTFE) vascular graft instead of polypropylene mesh.

METHODS
We included patients with diagnosis of severe expiratory central airway collapse (ECAC) who underwent PTFE-TBP from January 2018 to September 2021 at Mayo Clinic Florida. Severe ECAC was defined as airway collapse of ≥90% on dynamic bronchoscopy. We reviewed electronic medical records for demographic information, intervention details, and complications during the first 90 days after surgery. Post-TBP assessment was based on pre and post-operative St. George's Respiratory Questionnaire (SGRQ), Cough Specific Quality of Life Questionnaire (CSQLQ), Pulmonary Function Testing (PFT), and Six Minute Walk Test (6MWT). Pre and post-operative dynamic bronchoscopies were compared.

RESULTS
Fourteen patients underwent PTFE-TBP. The group's median age was 62.5 years (interquartile range, 53.75-68.5 years), and 9 (64.3%) were female. The median operative time was 355 minutes (interquartile range, 292-388 minutes). The median hospital length of stay was 4.5 days (interquartile range, 5-7.75 days) and median ICU length of stay was 1 day (interquartile range, 1-2 days). Seven patients had post-operative complications at 90 days, but only 3 had a major complication requiring reintervention. Comparison of pre and post-operative quality of life questionnaires demonstrated improvement in median SGRQ score by 15.88 (p=.016) and CSQLQ score by 23 (p=.008). Pre and post-operative PFT and 6MWT showed no significant difference. Post-operative dynamic bronchoscopies demonstrated improvement in median collapsibility of mid trachea by 30% (p=.004), distal trachea by 30% (p= <.001), left main bronchus by 30% (p=.002), right main bronchus by 25% (p=.001) and bronchus intermedius by 25% (p=.002).

CONCLUSIONS
Incorporation of ringed PTFE to TBP provides significant improvement in patient's symptoms and ECAC as judged by pre and post-operative quality of life questionnaires and bronchoscopies.

Disclosure: No significant relationships.
Keywords: Tracheobronchoplasty, Trachea, Tracheobronchomalacia, Polytetrafluoroethylene, Thoracic Surgery.

Airway region	Pre-op (N=14)	Post-op (N=14)	*p-value*

Mid Trachea
  Median
  Q1, Q3
  IQR
  Range
	90
	80,90
	10
	 (60-100)
		60
		60, 70
		10
		 (60-90)
			.004

Distal Trachea
  Median (%)
  Q1, Q3
  IQR
  Range
	90
	82.5, 90
	7.5
	(80-100)
		60
		60, 67.5
		7.5
		(60-80)
			<.001

Left Main Bronchi
  Median (%)
  Q1, Q3
  IQR
  Range
	90
	80, 90
	10
	(70-100)
		60
		60, 70
		10
		(60-90)
			.002

Right Main Bronchi
  Median (%)
  Q1, Q3
  IQR
  Range
	85
	80, 90
	10
	(70-100)
		60
		60, 60
		0
		(60-90)
			.001

Bronchus intermedius
  Median (%)
  Q1, Q3
  IQR
  Range
	85
	80, 100
	20
	(70-100)
		60
		60, 77.5
		17.5
		(60-90)
			.002

Posters
Abstract 026-146

P-067

COMPLICATIONS OF PLEURAL SPACE AFTER VIDEO-ASSISTED THORACIC SURGERY LOBECTOMY FOR LUNG CANCER: DOES THE SITE OF THE CHEST DRAIN REALLY MATTER?

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OBJECTIVES
To analyse the complications of the pleural space (CPS) (pneumothorax, subcutaneous emphysema, persistent air leakage, pleural effusion) after VATS lobectomy for lung cancer.

METHODS
We retrospectively investigated patients underwent VATS lobectomy for lung cancer at our Institution (January 2015 – September 2021). Exclusion criteria were: more than one chest drain, neoadjuvant treatments, previous thoracic and/or cardiac surgery, abscess cancer, R+ resection. Finally, 142 patients were eligible for the study. Complications were collected both with the chest drain in place and after its removal. Unpaired Fisher exact test and Mann–Whitney test were used for comparison. All tests were two-tailed. P-value <0.05 was considered statistically significant. Multivariable analysis was performed to identify predictors for CPS.

RESULTS
The incidence of CPS was 71.8% (102/142 patients; air only n=59, liquid n=43), with 58 patients presenting more than one. Subcutaneous emphysema with chest drain was the most frequent (47.9%). No statistical differences were found when stratified for type of lobectomy and site of chest drain (anterior vs posterior for upper lobectomies; posterior vs basal for lower lobectomies), however left lobectomies presented a trend toward a major incidence of pleural effusion with chest drain (p=0.057) (Table 1). Liquid CPS were significantly higher in left lobes (p=0.045), mostly when a systematic lymphadenectomy was performed (p=0.081).
By multivariable analysis, factors independently associated with liquid CPS were left lobectomies (p=0.026,HR2.53,95%CI1.12-5.71) and systematic lymphadenectomy (p=0.037,HR4.08,95%CI1.09-15.38), with air only CPS were right lobectomies (p=0.032,HR2.18,95%CI1.07-4.42) and lymph nodes sampling (p=0.031,HR2.61,95% CI1.09-6.25), while the site of the chest drain was not.

CONCLUSIONS
The site of the chest drain was not associated with any significant difference in the CPS development. Conversely, the side of the lobectomy and the type of lymphadenectomy seem to orient surgeons in what kind of CPS could prolong the length of the hospital of stay. These data should be validated in prospective studies.

Disclosure: No significant relationships.
Keywords: VATS Lobectomy, Chest Drain, Pneumothorax, Subcutaneous Emphysema, Persistent Air Leakage.

	Type of complication of the pleural space	Tot, n=142	Upper lobes*, n=86	Lower lobes, n=56	p-value	Right lobes, n=75	Left lobes, n=67	p-value
With the chest drain in place	Pneumothorax >2 cm, n (%) No Yes	124 (87.3) 18 (12.7)	74 (86) 12 (14)	50 (89.3) 6 (10.7)	0.617	64 (85.3) 11 (14.7)	60 (89.6) 7 (10.4)	0.614
	Subcutaneous emphysema, n (%) No Yes	74 (52.1) 68 (47.9)	41 (47.7) 45 (52.3)	33 (58.9) 23 (41.1)	0.230	39 (52) 36 (48)	35 (52.2) 32 (47.8)	>0.999
	Persistent air leakage, n (%) No Yes	131 (92.3) 11 (7.7)	78 (90.7) 8 (9.3)	53 (94.6) 3 (5.4)	0.527	68 (90.7) 7 (9.3)	63 (94) 4 (6)	0.540
	Pleural effusion, n (%) No Yes	114 (80.3) 28 (19.7)	73 (84.9) 13 (15.1)	41 (73.2) 15 (26.8)	0.130	65 (86.7) 10 (13.3)	49 (73.1) 18 (26.9)	**0.057**
	Insertion of a second chest drain, n (%) No Yes	140 (98.6) 1 (0.4)	85 (98.8) 1 (0.2)	55 (98.2) 1 (0.6)	>0.999	75 (100) 0 (0)	65 (97) 2 (3)	0.221
After the chest drain removal	Pneumothorax >2 cm, n (%) No Yes	126 (88.7) 16 (11.3)	73 (84.9) 13 (15.1)	53 (94,6) 3 (5.4)	0.103	64 (85.3) 11 (14.7)	62 (92.5) 5 (7.5)	0.196
	Subcutaneous emphysema, n (%) No Yes	105 (73.9) 37 (26.1)	60 (69.8) 26 (30.2)	45 (80.4) 11 (19.6)	0.176	56 (74.7) 19 (25.3)	49 (73.1) 18 (26.9)	0.850
	Pleural effusion, n (%) No Yes	116 (81.7) 26 (18.3)	70 (81.4) 16 (18.6)	46 (82.1) 10 (17.9)	>0.999	63 (84) 12 (16)	54 (80.6) 13 (19.4)	0.662
	Chest drain re-insertion, n (%) No Yes	139 (97.9) 3 (2.1)	83 (96.5) 3 (3.5)	56 (100) 0 (0)	0.278	72 (99.5) 3 (0.5)	67 (100) 0 (0)	0.247

*including middle lobectomy

Posters
Abstract 026-146

P-068

NEOADJUVANT CHEMOTHERAPY OR CHEMORADIOTHERAPY FOLLOWED BY MINIMALLY INVASIVE ESOPHAGECTOMY IN PATIENTS WITH ESOPHAGEAL CANCER: DOES ADJUVANT CHEMOTHERAPY MATTER?

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OBJECTIVES
Neoadjuvant chemotherapy or chemoradiotherapy (AC) followed by surgery has become a cornerstone of the treatment for locally advanced esophageal cancer. Minimally Invasive esophagectomy (MIE) is superior to open surgery in terms of perioperative outcomes. However, the efficacy of adjuvant chemotherapy after AC plus MIE remains unclear.

METHODS
A retrospective cohort study based on the patients who received neoadjuvant chemotherapy or chemoradiotherapy plus MIE with complete survival information between November 2014 and September 2019 was conducted. Overall survival (OS) and recurrence free survival (RFS) were investigated as the outcome measures via Kaplan-Meier curves and Cox analysis.

RESULTS
In total, 200 patients (171 (85.5%) squamous cell carcinoma and 29 (14.5%) adenocarcinoma) were enrolled, among which 146 patients received AC while the other 54 patients did not (Non-AC). OS rates at 5-year for AC and Non-AC groups were 74.2% and 86% respectively (p=0.64). RFS rates at 1-year were 64.5% and 20% respectively (p=0.017). Subgroup analysis revealed that RFS was significantly different in 0-2 pathologic stage (p=0.0027), and adjuvant chemotherapy had a tendency to improve RFS in 3-4 stage (p=0.06). Besides, patients with squamous cell carcinoma but not adenocarcinoma (p=0.57) who received adjuvant chemotherapy had a significantly better RFS (p=0.016). Multivariable Cox analyses revealed that adjuvant chemotherapy was associated with better RFS (HR: 0.31 95%CI=0.11-0.90, p=0.031).

CONCLUSIONS
Patients received AC followed by MIE may benefit from adjuvant chemotherapy with RFS.

Disclosure: No significant relationships.
Keywords: Adjuvant Chemotherapy; Neoadjuvant Chemotherapy; Neoadjuvant Chemoradiotherapy; Minimally Invasive Esophagectomy; MIE.
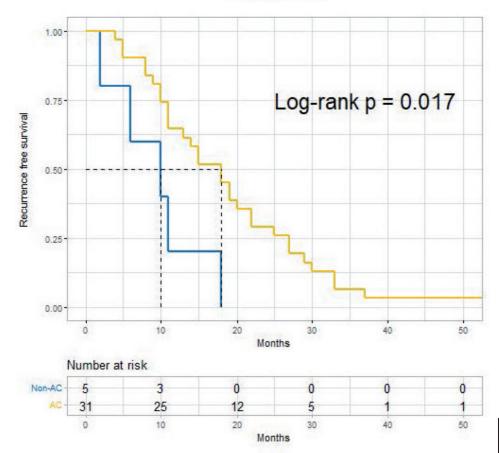
P-069

SURGERY FOR TRACHEOESOPHAGEAL FISTULA, A 25-YEAR EXPERIENCE

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OBJECTIVES
Adult, benign tracheoesophageal fistula is a life-threatening condition. The aim of this study is to report our experience in its surgical treatment, including short- and long-term results.

METHODS
Single-center retrospective review of patients undergoing surgical repair of tracheoesophageal fistula from 1997 to 2022.

RESULTS
Fifty-four consecutive patients were reviewed. Etiologies of the fistula included post-intubation injury in 42 patients (78%), complication of surgical or endoscopic procedures in 6 (11%), and other causes in 6. The fistula was approached by cervicotomy (n=34, 63%), thoracotomy (n=14, 26%) and sternotomy (n=4, 7%). The airway defect was managed by tracheal resection-anastomosis in 27 patients (50%), apposition of a resorbable patch or a muscle flap in 20 (37%), and direct suture in 7 (13%). A protective tracheostomy was performed in 33 cases (61%). The esophageal defect was managed by direct, 2-layered suture in 50 cases and by esophagectomy in 4 cases. A pedicled muscle flap was interposed between trachea and esophagus
Postoperative morbidity rate was 70% (n=38), most common complications included sepsis (n=18) and prolonged mechanical ventilation (n=9). Tracheoesophageal fistula relapsed in 2 cases, leading to death in 1 case. In-hospital mortality occurred in 2 patients (4%).
Median follow-up was 66 months (95%CI 42-104 months). During this time, 15 patients (29%) died due to underlying pathologies (2-, 5- and 10-year survival rates of 83%, 68% and 57.8%, respectively). At last follow-up, the fistula healed in all cases, 45 patients (83%) resumed oral intake and 33 (61%) breathed without a tracheal appliance.

CONCLUSIONS
Surgery for tracheoesophageal fistula is challenging. Resorbable patches and muscle flaps allow repair of complex airway defects. Although healing of the fistula can be achieved in the majority of cases, a significant proportion of patient needs long-term tracheostomy. Underlying pathologies play a major role in determining both short- and long-term outcomes.

Disclosure: No significant relationships.
Keywords: Tracheoesophageal Fistula, Tracheal Surgery, Resorbable Patch, Muscle Flap.

P-070

INFLUENCE OF THE SURGEONS' SENIORITY IN PREVENTION OF PROLONGED AIR LEAKS AFTER VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) LOBECTOMY FOR LUNG CANCER AND IN QUALITY-OF-LIFE OF PATIENTS

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OBJECTIVES

Influence of seniority in Prolonged Air Leaks (PAL) occurrence is being debated, subjective assessment of PAL health-related quality-of-life (HRQoL) has not been assessed.

Aim: i) evaluate association between surgeons' seniority and PAL occurrence; ii) compare HRQoL of PAL vs No-PAL patients and surgeons' seniority.

METHODS

Retrospective analysis of consecutive VATS lobectomies for lung cancer. PAL were digitally collected employing microelectronic mechanical sensor technology.

Surgeons were divided according to seniority (years from end of residency): junior (<5 years), intermediate (5–10 years), senior (>10 years). HRQoL was assessed using national version of EQ-5D-3L questionnaire, for which an algorithm is available to derive utility values between 0–1 based on general population preferences for health states.

Outcomes of interest were PAL occurrence and HRQoL (measured by EQ-5D-3L). Relationship between seniority and PAL was determined using logistic regression analysis; Tobit regression evaluated HRQoL (measured by EQ-5D-3L).

RESULTS

Cohort included 107 patients (2019–2020). Most frequently employed VATS approach was Copenhagen (63.6%), followed by D'Amico (29.9%). 25 patients (23.4%) had PAL. Upper lobectomies were more frequently related to PAL occurrence. Length of hospital stay was significantly shorter in no-PAL. According to seniority and first operator's experience in VATS lobectomies (p=0.32), there were no significant differences in PAL occurrence between groups. First operator's experience was negatively correlated with HRQoL (rho=−0.39, p=0.035). Unadjusted EQ-5D scores were not significantly different between PAL and No-PAL groups (p=0.97). Proportion of individuals reporting highest utility value of 1 was similar between groups (28.0% vs 32.9%). Median utility was 0.85 [range: 0.52–1] in PAL group vs. 0.83 [range: 0.26–1] in No-PAL group (p=0.80).

CONCLUSIONS

Surgeons' seniority and first operator experience in VATS lobectomy for lung cancer are not correlated to PAL's increased incidence. In addition, seniority of first operator is not correlated to better HRQoL. Clinical utility of these findings needs to be validated in larger populations.

Disclosure: No significant relationships.

	PAL cohort (No. = 25)	No-PAL cohort (No. = 82)	*p-value*
Age, mean ± SD	71.4 ± 7.6	63.4 ± 10.0	0.44
BMI, mean ± SD	24.6 ± 4.1	28.9 ± 6.6	0.57
Smoker, No. (%)			
- Never	8 (32.0)	26 (31.7)	
- Former	8 (32.0)	33 (40.2)	0.42
- Current	9 (36.0)	23 (28.1)	
FEV1, mean ± SD	93.3 ± 17.3	98.4 ± 16.9	0.84
DLCO/VA, mean ± SD	83.4 ± 11.7	85.4 ± 15.4	0.55
Charlson Index, mean ± SD	5.8 ± 1.9	4.9 ± 2.0	0.85
Seniority, No. (%)			
- <5 years	3 (12.0)	16 (19.5)	
- 5 – 10 years	10 (40.0)	25 (30.5)	0.21
- >10 years	12 (48.0)	41 (50.0)	
Lobectomy, No. (%)			
- Right upper lobectomy	10 (40)	21 (25.6)	
- Right mean lobectomy	0	6 (7.3)	
- Right lower lobectomy	5 (20)	15 (18.3)	0.021
- Left upper lobectomy	5 (20)	18 (22.0)	
- Left lower lobectomy	5 (20)	22 (26.8)	
Adhesiolysis, No. (%)	11 (44)	17 (20.7)	0.0097
Length of hospital stay, median [range]	9 [5 – 32]	5 [2 – 12]	0.042
EQ-5D-3L			
- Mean ± SD	0.81 ± 0.16	0.82 ± 0.18	0.97
- Median [range]	0.85 [0.52 – 1]	0.83 [0.26 – 1]	0.80

P-071

PNEUMOMEDIASTINUM IN ACUTE RESPIRATORY DISTRESS SYNDROME (ARDS): WHAT IS IMPORTANT TO THE THORACIC SURGEON?

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OBJECTIVES
To analyze the outcomes and clinical evolution of COVID-19 patients with spontaneous pneumomediastinum.

METHODS
A retrospective study was conducted in a tertiary-care hospital. From March 2020 until July 2021, all requests of evaluation for the thoracic surgery staff due to spontaneous pneumomediastinum were reviewed. Data concerning the evolution of those patients were collected.

RESULTS
101 subjects were evaluated, but 25 (24.7%) of them were excluded since pneumomediastinum was due to post-intubation tracheal rupture. Among the remaining 76 patients, 61(80.2%) were under invasive mechanical ventilation when the event occurred. During the study period, 4,680 patients were submitted to invasive mechanical ventilation, resulting in an incidence of 1.3%. This complication was more frequent (76.3%) in men with a mean age of 55.0($\pm$13.2) years. Approximately 80% had associated subcutaneous emphysema which may increase the complexity of further procedures. In 24 (31%) cases the pneumomediastinum progressed to pneumothorax (right-sided: 10; left-sided: 7; bilateral: 7). Only 3 subjects developed malignant pneumomediastinum, although more than 20 times there was a request with this hypothesis. The time for resolution was on average 12.5 days. Mortality in those patients was higher (61.8% vs. 49.2%) when compared to the rate of the institution.

CONCLUSIONS
Spontaneous pneumomediastinum was an uncommon before COVID-19 pandemic, but its occurrence has increased. Men who are under invasive mechanical ventilation will account for the majority of the patients with this complication. A high index of suspicion for tracheal rupture is advisable when it develops right after endotracheal intubation. Malignant pneumomediastinum is even rarer, although it is frequently hypothesized when this condition is present in a patient with hemodynamic instability. One-third of the subjects develops pneumothorax and, thus, is advisable to increase the frequency of chest radiographs and level of suspicion for this complication. Mortality of those patients is higher but needs further investigation of its causes.

Disclosure: No significant relationships.
Keywords: ARDS, Pneumomediastinum.

Posters
Abstract 026-146

P-072

THORACOSCOPIC COMPLEX SEGMENTECTOMY HAS EQUIVALENT EARLY POST-OPERATIVE OUTCOMES THAN SIMPLE SEGMENTECTOMY

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OBJECTIVES
The role of thoracoscopic segmentectomy (VATS-S) in the treatment of non-small-cell-lung cancer (NSCLC) is rising, but the post-operative outcomes are not completely defined. The aim of our retrospective analysis was to evaluate the post-operative results of VATS-S.

METHODS
From 2015 to 2021, data of n= 189 consecutive patients undergoing VATS-S were retrospectively analyzed. Benign lesions (n=11), metastases (n=21) and n=7 VATS-S converted to lobectomy were excluded. We compared the pre-, intra-, post-operative and oncological data between simple and complex VATS-S with parametric, non parametric tests and Kaplan-Meier method to estimate survivals.

RESULTS
In this period, n=150 patients underwent VATS-S for NSCLC: n=33 (22%) were compromised patients; n=113 (76.9%) had a solid appearance on CT-scan and n=95 (63.3%) had a moderate-to-high FDG-PET-CT-scan avidity. We performed n=83 (55.3%) simple and n=67 (44.7%) complex VATS-S with a mean lymph nodes retrieved of 8.7 (SD 4.9) and median margin of 16 mm (IQR 12 mm). Mortality was 0.6%, complications occurred in n=19 (22.9%) and 10 (14.9%), p=0.29 respectively, major complications (> grade 3b Clavien-Dindo classification) developed in n=7 (4.6%) and n=4 (2.6%), p=0.6. Moreover complex VATS-S were not associated with longer hospital stay (5.5 SD 2.6 vs 6.4 SD 3.2 days, p=0.07), chest tube maintenance (4.1 SD 1.6 vs 4.7 SD 2.2 days, p=0.057), white blood cell count (12077 SD 3087 vs 11538 SD 3476, p=0.32), use of antibiotics (46.3% vs 55.4%, p=0.32), lung opacities at the chest-X-ray (50.8% vs 56.6%, p=0.57) and need of chest-CT scan (1.5% vs 3.6%, p=0.76). At the median follow-up of 28.5 months, n=7 (10.4%) and n=14 (16.9%) had recurrence (p=0.34) whereas 0 and n=5 (3.3%) patients died after VATS-S for NSCLC.

CONCLUSIONS
Clinical and radiological complications were similar between complex and simple VATS-S and then complex VATS-S could be considered an effective option in the treatment of early stage NSCLC.

Disclosure: No significant relationships.
Keywords: VATS Segmentectomy, Complex Segmentectomy, Complications.

P-073

ESTABLISHMENT OF A THREE-DIMENSIONAL (3D) HUMAN LUNG CANCER MODEL FOR TRANSLATIONAL ONCOLOCIC RESEARCH

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OBJECTIVES
To establish a 3D lung cancer model from human tissue, which mimics the microenvironment and shows the cellular heterogeneity of lung tumors, and which can be used for translational oncological research.

METHODS
2D cultures and 3D tissue models (TM) were generated from clinical tumor samples (TS) obtained from 11 resected NSCLC specimen. TS were minced into small cubes (1-1.5 mm³). To establish 2D cultures, cells were isolated from TS and seeded on culture dishes. To generate 3D TM , 8-10 TS were cultivated between two layers of a biological collagen matrix (BioVaSc®) in a tissue engineering approach. TM were cultured in DMEM medium with 10% FCS for 21 to 28 days. Medium was changed every two to three days. The morphology of the original tumor and the 3D TM was analyzed by HE stainings on frozen tissue sections. TS and TM were characterized using lung-cancer specific markers (TTF-1, P40, P63) and cancer associated fibroblast (CAF) markers (α-SMA, MCT4).

RESULTS
We used 11 TS from the clinic with the age between 61-78, including 5 adenocarcinoma, 5 squamous cell lung cancer and 1 small cell lung cancer. The tumor cells were successfully isolated and cultivated from 27% (3/11) in 2D cultures and from 82% (9/11) in 3D TM for 28 days, respectively. In 3D TM of 10 TS, histomorphological analyses revealed similarities between the original tumor tissue and the 3D TM. Immune stainings showed the presence of P40- and P63-positive tumor cells and α-SMA-, MCT4-positive CAFs, which may indicate that lung tumor cells and CAFs are both present in our 3D TM.

CONCLUSIONS
Our 3D TM can maintain the original tumor structures for at least 28 days in vitro. They possessed a higher degree of cellular heterogeneity than 2D cultures, which makes them suitable for future translational oncological research.

Disclosure: No significant relationships.
Keywords: Lung Cancer, 3D Model.

Posters
Abstract 026-146

P-074

THERAPEUTIC STRATEGIES FOR LUNG CANCER WITH INTERSTITIAL PNEUMONIA -INSIGHTS FROM PERIOPERATIVE OUTCOMES

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OBJECTIVES
Lung cancer surgery with interstitial lung disease (ILD) is associated with postoperative acute exacerbations. It is important to predict the factors that could cause acute exacerbations in these patients. Recently, Japanese Association for Chest Surgery (JACS) has proposed ILD risk score. However, the problem with this score is that it has a large patient distribution in low- and intermediate-risk groups, and it is important to predict risk for these patient groups.

METHODS
We performed radical surgery in 86 primary lung cancer patients with ILD at our department between January 2010 and December 2021. The patients were divided into two groups: postoperative acute exacerbation group (group A) and non-exacerbation group (group B). Patient background and perioperative outcomes were compared.

RESULTS
There were 50 low-risk, 34 intermediate-risk, and 2 high-risk cases according to the JACS risk score. Nine patients were in group A and 77 in group B. In group A, 8 were intermediate-risk and 1 was high-risk. There were no significant differences in age, gender, respiratory function, or use of preoperative antifibrotic agents between group A and B. The operative time was significantly longer in group A (314 vs 178 min, p<0.001), but there was no significant difference in blood loss (A: 676 vs B: 84 ml, p=0.186). There were significantly more lobectomies in group A (p=0.019), and the duration of drainage associated with air leak tended to be longer in group A (p=0.058). There was a significant correlation between operative time and blood loss (γ=0.633, p<0.001). Multivariate logistic regression analysis showed that duration of drainage and blood loss were significant predictors of acute exacerbation.

CONCLUSIONS
There is a risk of developing postoperative acute exacerbation in lung cancer patients with ILD even if the patient is not at high-risk, and surgery without hemorrhage or air-leak is important to avoid this risk.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Interstitial Pneumonia, Acute Exacerbation.

	Odds ratio	95% Confidence interval	P-value
Blood loss	1.003	1.000-1.006	**0.041**
Duration of drainage	1.265	1.076-1.488	**0.004**

P-075

COMPLICATIONS DO NOT AFFECT QUALITY OF LIFE (QOL) AFTER THE NUSS PROCEDURE WITH TWO BARS FOR PECTUS EXCAVATUM (PE)

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OBJECTIVES
Improvement in the quality of life (QoL) of the patients undergoing a minimally invasive repair of pectus excavatum(PE), is considered one of the main outcomes of such a procedure. The aim of this study was to investigate the effects of complications on the postoperative patient-reported outcomes (PROMs) of the minimally invasive repair with two bars.

METHODS
We retrospectively collected data on consecutive patients older than 16 years undergoing Nuss procedure with two bars (2B) for PE between January 2007 and September 2021 in a single institution.
Unpaired t test or Mann-Whitney U test for non-parametric variables were applied to discrete or continuous data, and the chi-square test was applied to dichotomous or categorical data to compare clinical and patient-reported outcomes. Multivariable regression analysis was used to identify factors associated with clinically meaningful perioperative changes.

RESULTS
A total of 149 patients submitted to Nuss procedure with 2B with complete followup were included in the final analysis. Thirty patients experienced postoperative complications.
No difference between the two groups in terms of preoperative factors such as age, gender PE subtype. Postoperative PROMs analysed were not statistically different: QoL (p=0.554), psychological distress (p=0.808). No preoperative factors were predictive of postoperative PROMs.

CONCLUSIONS
The results of this study confirm that minimally invasive repair of PC deformity with 2B has a positive impact on PROMs regardless of postoperative complications. More investigations are needed to understand predictors of better PROMs in this field.

Disclosure: No significant relationships.
Keywords: Nuss Procedure, Pectus Excavatum, Quality Of Life, Pectus Bar.

Table.1. Characteristics of Patients

	No complications (n=119)	Complications (n=30)	p Value
Age (median) Sex Males Females	25.21 (7.74) 109 (91.6%) 10 (8.4%)	25.90 (7.80) 27 (90.0%) 3 (10.0%)	0.664 0.782
PE type I II III	 86 (80.7%) 15 (12.6%) 8 (6.7%)	 23 (76.7%) 4 (13.3%) 3 (10.0%)	 0.816
Preoperative psychological complaints • no discomfort • slightly uncomfortable, but I live normally • quite uncomfortable. If I can I avoid showing myself in public • very uncomfortable	 17 (14.3%) 19 (16.0%) 52 (43.7%) 31 (26.1%)	 2 (6.7%) 9 (30.0%) 15 (50.0%) 4 (13.3%)	 0.141
Previous correction attempt	2 (1.7%)	1 (3.3%)	0.505
VAS>5	16 (13.4%)	3 (10.0%)	0.613
Bar displacement	0 (0%)	1 (3.3%)	0.046*
Bar removal (pts) Yes No Not know	 38 (31.9%) 68 (57.1%) 13 (10.9%)	 13 (43.3%) 17 (56.7%) 0 (0%)	 0.123
Recurrence	0 (0%)	0 (0%)	-
QoL • Much improved • Improved but not as much as I expected • Unchanged • Worsened	 92 (77.3%) 22 (18.5%) 4 (3.4%) 1 (0.8%)	 23 (76.7%) 5 (16.7%) 2 (6.7%) 0 (0%)	 0.554
Postoperative psychological complaints • no discomfort • slightly uncomfortable, but I live normally • quite uncomfortable. If I can I avoid showing myself in public	 94 (79.0%) 16 (13.4%) 7 (5.9%) 1 (3.3%)	 2 (1.7%) 24 (80.0%) 5 (16.7%) 0 (0%)	 0.808

Notes: Data are presented as mean (SD) or n (%). *p<0.05.

Abbreviations: PE: pectus excavatum; VAS: Visual Analogue Scale; QoL: quality of life.

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P-076

CREATING A CONSENSUS IN THE PERIOPERATIVE CARE FOR PECTUS EXCAVATUM; AN EXPERT-LED MODIFIED DELPHI SURVEY

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OBJECTIVES
Pectus excavatum is the most common anterior chest wall deformity. Primary treatment concerns surgical repair. Prior to repair, all patients receive preoperative work-up. A variety of diagnostics exist to quantify the severity and symptoms, predominantly based on local preferences and experience. Up to now no guidelines exist regarding the work-up, introducing variances and potential treatment differences.

The aim of this study is to create consensus on the pre-operative work-up and perioperative care of pectus excavatum, based on expert opinion. We present our results of the first two rounds of a three-round Delphi study.

METHODS
This research was set up as a multi-round expert-led Delphi Survey. The survey evaluated agreement of national and international experts on statements regarding the pre-operative work-up and perioperative care. The study consisted of three consecutive rounds after which the responses to the survey were analyzed to determine if a consensus had been reached. Information on the expertise of the participants was obtained in round one. Consensus, based on the responses from the second round, was a priori defined as at least 75% of participants providing (dis)agreement with a statement.

RESULTS
Analysis was based on 62 participants who completed all two rounds (response rate: 21% of initially invited experts). Consensus was achieved on 24 statements. Regarding the pre-operative work-up, participants agreed to routinely include conventional photography, perform echocardiography and cardiopulmonary exercise testing upon suspicion of cardiac impairment. Spirometry was deemed justified in the presence of pulmonary impairment. In addition, consensus was reached on the indications for corrective surgery. A consensus guideline was proposed based on the results of the analysis.

CONCLUSIONS
A preliminary consensus statement, based on the first two rounds of a three-round expert-led Delphi Survey, was created concerning the pre-operative work-up and perioperative care for pectus excavatum.

Disclosure: No significant relationships.
Keywords: Pectus Excavatum; Perioperative Care; Delphi Study.

P-077

EVOLUTION OF A MINIMALLY INVASIVE ESOPHAGECTOMY PROGRAM: NUMBERS OR COMPLICATION MANAGEMENT?

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OBJECTIVES

Esophagectomy remains one of the most morbid of cancer resections. The objective of this study is to evaluate the change in patient outcomes with a practice shift from open to totally minimally invasive esophagectomy (MIE).

METHODS

All patients with mid and distal esophageal carcinoma who underwent esophagectomy-gastric interposition between June 2004 – December 2021 were recorded in a prospective database. Demographics, neoadjuvant treatment, operative data, perioperative morbidity/mortality were recorded. Patients were grouped based on surgical approach as Group 1 (2004-2011, open esophagectomy), Group 2 (2011-2015, adoption period of MIE), Group 3 (2015-2021, routine MIE). Results were compared statistically.

RESULTS

167 patients were operated (Group 1 n=48, Group 2 n=44, Group 3 n=75). Group 3 was significantly older (59,5±11.6 vs 54,1±10,6 and 56,2±10,8, p=0,031). Likelihood of successful completion of a MIE increased during the period as well as preference for intrathoracic anastomosis (p<0,0001 for both). Major morbidity rate was stable across groups, but 90-day mortality significantly decreased in group 3 (Table 1).

CONCLUSIONS

Accumulating experience led to a higher rate of adoption of totally MIE and intrathoracic anastomosis. Although rate of complications were similar, early recognition and management of complications were contributors to good perioperative outcomes. In conclusion, surgical mortality decreased through the period despite older patients with more comorbidities.

Disclosure: No significant relationships.
Keywords: Esophagectomy, Minimally Invasive, Complication Management.

	Group 1 (2004-2011, n=48)	Group 2 (2011-2015, n=44)	Group 3 (2015-2021, n=75)	P value
Age (Years ± Standard deviation)	56,2?10.8	54,1?10.6	59,5?11.6	*0,031*
Sex (n, Female/male)	29/19	21/23	34/41	0.24
Neoadjuvant Chemoradiotherapy (n, %)	21 (%44)	16 (%36)	33 (%44)	0.68
Open/Hybrid/Total Minimally Invasive Esophagectomy (n)	34/14/0	1/12/31	4/17/54	*<0,0001*
Cervical/Thoracic Anastomosis (n)	45/3	6/38	17/58	*<0,0001*
Anastomotic Leak (n, %)	6 (%12,5)	9 (%20,4)	11 (%14,6)	0.55
Major Morbidity (n, %)	14(%29)	15(%34)	20(%26,6)	0.69
90 day Mortality (n, %)	5 (%10)	5 (%11)	1 (%1,3)	*0,006*

P-078

SUBXIPHOID APPROACH WITH A NEW STERNUM HOOK RETRACTOR FOR ANTERIOR MEDIASTINAL TUMOR IS SAFE AND FEASIBLE

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OBJECTIVES
Our study aims to describe the experience of a single team in terms of the feasibility and benefits of subxiphoid mediastinal surgery using a sternum hook retractor compared to unilateral surgery.

METHODS
Patients underwent video-assisted thoracoscopic surgery (VATS) with either approach during September 2018 to December 2021 were retrospectively enrolled. A 5-cm vertical incision approximately 1-cm caudal to the xiphoid process is usually performed followed by the installment of a self-developed sternum hook retractor, which can raise the sternum by 6-8 cm. Then a single-port VATS is performed. In unilateral group, three 1-cm incisions are usually performed. Two insicions are located in the 2nd or 3rd and 5th intercostal anterior axillary line and the third in the 5th intercostal midclavicular line. An additional subxiphoid incision may be made in order to take out a large tumor. All the clinical and perioperatvie data including Visual Analogue Scale (VAS) which was prospectively recorded were analyzed.

RESULTS
Sixteen patients with subxiphoid VATS (sVATS) and 28 patients with unilateral VATS (uVATS) were enrolled. Baseline in two groups including sex, age, hypertension and diabetes mellitus status and body mass index (BMI) was comparative, except tumor size (sVATS 7.9±1.6cm vs uVATS 5.1±2.4, p<0.001). Blood loss in surgery, conversion, draining duration, post-operative stay, post-operative complications final pathology and tumor invasion were similar in the two groups. Operation time were significantly longer in sVATS (115±19 vs 83±30, p<0.001), while VAS at 1 pod (1.9±1.1 vs 3.1±1.1, p=0.001) and patients with moderate pain (VAS >3) (6.3% vs 32.1%, p=0.049) were improved in sVATS than in uVATS.

CONCLUSIONS
Subxiphoid surgery is a approach with feasibility and safety, especially for large tumors. This approach with low pain may accelerate recovery. Our self-developed sternum hook retractor is especially useful for creating space during anterior mediastinal surgery. However, long-term follow-up need to be observed.

Disclosure: No significant relationships.
Keywords: Subxiphoid, Retractor, Mediastinal Tumor, Minimally Invasive.

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sVATS	uVATS (n=16)	(n=28)	p value
Age, mean±SD	57±17	52±14	0.327
Sex, male	8 (50.0%)	18 (64.3%)	0.354
BMI[1]>24 kg/m^2, yes	7 (43.8%)	15 (53.6%)	0.531
Hypertension, yes	4 (25.0%)	8 (28.6%)	1.000
Diabetes mellitus, yes	2 (12.5%)	4 (14.3%)	1.000
Pathology			0.689
TET[2]	14 (87.5%)	22 (78.6%)	
Germ cell tumor	1 (6.3%)	3 (10.7%)	
Lymphoma	1 (6.3%)	3 (10.7%)	
Tumor size, cm	7.9±1.6	5.1±2.4	0.001
Invasion to surrounding structure	3 (18.8%)	2 (7.1%)	0.336
Operation time, minute	115±19	83±30	<0.001
Blood loss, >100ml	0	0	
Conversion, yes	0	0	1.000
Draining duration, days	3.1±1.1	3.0±0.7	0.678
Post-operative stay	3.7±1.5	4.2±2.0	0.422
Complications[3], yes	1 (8.3%)	2 (7.1%)	1.000
VAS at 1 pod	1.9±1.1	3.1±1.1	0.001
VAS, >3	1 (6.3%)	9 (32.1%)	0.049
Use of NSAIDS, yes	5 (31.3%)	12 (42.9%)	0.447

[1] body mass index
[2] thymic epithelial tumor
[3] one case of atrial fibrillation in sVATS, 1 case of atrial fibrillation and 1 case of pulmonary embolism in uVATS, no perioperative mortality

P-079

RESULTS AFTER THE NUSS PROCEDURE IN YOUNG ADULTS. A SINGLE CENTER RETROSPECTIVE PROPENSITY SCORE-MATCHED (PSM) STUDY

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OBJECTIVES
The Nuss procedure is the treatment of choice for naive patients with Pectus Excavatum (PE). Nevertheless, the results of the correction do not always match with patients' expectations. In our unit, due to personal experience, our standard approach has been, recently, modified with the application of two bars instead of one. The aim of our study was to retrospectively investigate the usefulness in terms of patient's satisfaction, quality of life and safety of using two bars instead of one.

METHODS
This is a retrospective study of 182 patients older than 16 years who underwent the Nuss procedure for PE between January 2007 and September 2021. They were divided in two groups: correction with one bar or correction with two bars. Propensity score-matched (PSM) analysis was performed, and 30 patients were included in each group. Primary endpoints considered were: quality of life and satisfaction with the cosmetic results; secondary endpoints: complications and recurrence. Unpaired t test or Mann-Whitney U test for non-parametric variables were applied to discrete or continuous data, and the chi-square test was applied to dichotomous or categorical data.

RESULTS
After the PSM, no differences were found in the general characteristics of the patients and in the primary and secondary endpoints (Table.1), except for the psychological effect of surgery (p=0.035). In fact, more frequently, patients in Group B have no psychological complaints after surgery (93.3%vs73.3%).

CONCLUSIONS
Our study shows that patients who underwent the Nuss Procedure for PE using two bars have similar clinical outcomes than patients with one bar. We found better psychological outcomes and satisfaction in patients in the two-bars group compared to the control group, probably thanks to better cosmetic results. Nevertheless, larger randomized studies are eagerly awaited to confirm our results.

Table.1. Characteristics of Patients after PSM analysis

	One bar (n=30)	Two bars (n=30)	p Value
Age (median)	23.0 (17.75-29.75)	24.5 (20.5-29.0)	0.881
Sex Males Females	 27 (90.0%) 3 (10.0%)	 28 (93.3%) 2 (6.7%)	0.640
PE type I II III	 21 (70.0%) 4 (13.3%) 5 (16.7%)	 19 (63.3%) 8 (26.7%) 3 (10.0%)	0.380
Preoperative psychological complaints • no discomfort • slightly uncomfortable, but I live normally • quite uncomfortable. If I can I avoid showing myself in public • very uncomfortable	 11 (36.7%) 3 (10.0%) 11 (36.7%) 5 (16.7%)	 13 (43.3%) 3 (10.0%) 19 (33.3%) 4 (13.3%)	0.955
Previous correction attempt	0 (0%)	0 (0%)	-
Perioperative complications	7 (23.3%)	9 (30.0%)	0.559
VAS>5	2 (6.7%)	2 (6.7%)	1.000
Clavien-Dindo Classification Grade 1 Grade 2 Grade 3A	 2 (6.7%) 3 (10.0%) 2 (6.7%)	 5 (16.7%) 2 (6.7%) 2 (6.7%)	0.665
Long-term complications	0 (0%)	0 (0%)	-
Bar displacement	0 (0%)	0 (0%)	-
Bar removal (pts)	25 (83.3%)	24 (80.0%)	0.739
Recurrence	1 (3.3%)	0 (0%)	0.313
QoL • Much improved • Improved but not as much as I expected • Unchanged • Worsened	 23 (76.7%) 6 (20.0%) 1 (3.3%) 0 (0%)	 27 (90%) 2 (6.7%) 0 (0%) 1 (3.3%)	0.229
Postoperative psychological complaints • no discomfort • slightly uncomfortable, but I live normally • quite uncomfortable. If I can I avoid showing myself in public	 22 (73.3%) 2 (6.7%) 6 (20%)	 28 (93.3%) 2 6.7%) 0 (0%)	0.035*

Notes: Data are presented as mean (SD), median (P25–P75) or n (%). *p<0.05. Abbreviations: PSM: propensity score matching; PE: pectus excavatum; VAS: Visual Analogue Scale; QoL: quality of life.

Posters
Abstract 026-146

P-080

STERNAL REPLACEMENT WITH ALUMINA CERAMIC PROSTHESIS AFTER ONCOLOGICAL RESECTION

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OBJECTIVES
No gold standard method exists for sternal replacement technique. A ceramic prosthesis (CERAMIL) was developed in the scope to comply with "ideal" sternal substitute requirements. We present the experience CERAMIL implantation after oncological resection.

METHODS
CERAMIL is an alumina sternal or manubrium-shaped prosthesis. Appropriate size is chosen during surgery using template and this radiotransparent device is anchored to the thoracic cage with suture. No metallic fixation is needed. Between March 2015 and February 2021, 38 non-infected sternal tumors were managed with CERAMIL prosthesis in 14 centers. We conducted a post-inclusion study to confirm the effectiveness and the safety of the device.

RESULTS
Twenty-five female (66%) and 13 male (33%) patients of 57-median age (13-79) underwent the procedure. Indications were sternal primary tumors (n=15) and metastasis (n=23). We noted 9 IIIA-complications (24%), 5 reoperations (13%): 2 hematoma, 1 seroma, 1 local infection, 1 flap necrosis debridement and no postoperative death. Median hospital length of stay was 14 days (6-52). Microscopic invasion was noted for 7 patients (18%) and 2 patients presented expected non-radical resection (5%). After 21 months of median follow-up (6 to 74), 3 prosthesis removal were required (8%) (2 because of wound dehiscence, 1 for hemomediastinum) and all patients were alive except 5 (13%) due to cancer evolution.

CONCLUSIONS
Sternal replacement with CERAMIL prosthesis is a promising technique with acceptable outcomes to manage this challenging condition. The reproducibility of implantation technique, alumina's scaffold capacity for host tissue and radiological follow-up facility are the main strengths of the device.

Disclosure: No significant relationships.
Keywords: Sternal Replacement, Chest Wall Tumor, Chest Wall Surgery, Ceramic, Prosthesis.

P-081

RESULTS OF DESOBSTRUCTION FOR BLIND-END TRACHEAL STENOSIS USING A HYBRID APPROACH AND PLACEMENT OF A SILICONE T TUBE

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OBJECTIVES
Blind-end post-intubation tracheal stenosis (Myer-Cotton grade IV) results in voice ablation and dependence on a tracheostomy for breathing. Desobstruction and insertion of a silicone T tube may restore breathing and voice through the natural airway while the patient awaits definitive treatment. This study focused on the results desobstruction of the stenosis with stenting.

METHODS
Retrospective analysis of patients submitted to desobstruction between March/2012 to February/2021. Inclusion criteria were: Myer-Cotton IV post-intubation stenosis; spontaneous breathing via tracheostomy; non-eligibility for primary repair. A neck CT scan was used for planning. The hybrid procedure was performed using suspension laryngoscopy and a vertical extension of the tracheostomy under general anesthesia, according to a technique we have previously described (Cremonese M.R et al; doi: 10.1016/j.athoracsur.2021.03.027). Patients were followed every 6 months and the T tube was changed yearly. Decannulation followed previously stated criteria. Analysis included demographics, complications. Outcome was considered favorable when decannulation or tracheal resection were performed successfully during follow-up.

RESULTS
Fifty-nine patients were submitted to the procedure (38 males, 77%), mean age 34,7±16,8 years. The average follow-up was 1082±808 days. Trauma was the most prevalent cause of intubation (52.5%), followed by cardiovascular events (18,6%). The mean extent of the stenosis was 39,6±14,1mm. Thirty-six patients underwent esophageal pH study (25% had abnormal acid reflux). Post-operative complications requiring reintervention occurred in 7 (11.8%), and minor complications in 29 (49.1%). There was no procedure-related mortality. Eleven patients underwent tracheal resection and four were decannulated (25,4%). All patients submitted to desobstruction resumed phonation after the procedure.

CONCLUSIONS
The hybrid technique for desobstruction of blind-end stenosis followed by stenting with a silicone T tube was effective in restoring speech and nasal breathing in all patients. The procedure is safe despite its non-negligible complication rate.

Disclosure: No significant relationships.
Keywords: Tracheal Stenosis; Tracheostomy; Suspension Laryngoscopy; Tracheal Prosthesis.

P-082

OUTCOMES AND CHARACTERISTICS OF PATIENTS WITH SECOND PRIMARY LUNG CANCER AFTER RADICAL TREATMENT

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OBJECTIVES
Patients with non-small lung cancer (NSCLC) are at risk of developing a secondary primary lung cancer (SPLC). However, the characteristics of these group of patients at risk remain largely speculative. This study reviews our experience in the occurrence and the overall survival of SPLC.

METHODS
We retrospectively reviewed 1366 patients undergoing radical treatment of multiple primary lung cancer from January 2010 to October 2021. Using criteria set out by Martini and Melamed [1], we categorised as synchronous SPLC when it was diagnosed within 24months of the first primary lung cancer (FPLC) and after direct histological comparison of the different tumours. Tumours occurring after the 24month interval were categorised as metachronous [1]. We compared the overall survival (OS) for each group.

RESULTS
53 patients were identified with multiple or secondary primary lung cancer [median age 69(50-4);45.2%male] (M:22,F:31). In total 31 were synchronous, 22 were treated for metachronous tumours. The median interval between procedures for metachronous tumours is 39.5months (25-111months). 7 patients had further surgery for a third malignancy, 4 of which were synchronous and 3 metachronous (occurring at 45, 50 and 58 months after the second procedure). The primary lung cancer most commonly occurred in the right upper lobe, with the commonest site of second primary in the right lower lobe. The OS with synchronous SPLC was 82.1% at 1 year, 59.7% at 3 years and 50.6% at 5 years. For metachronous SPLC was 100% at 1 year, 90.9% at 3 years and 76.2% at 5 years. There was no statistical significant difference in OS (p=0.47) between synchronous and metachronous disease (Figure 1).

CONCLUSIONS
The occurrence of SPLC after the initial diagnosis of NSCLC is not a rare event. Aggressive surgical intervention is a safe and effective treatment for metachronous cancer and should highlighted within the MDT setting.
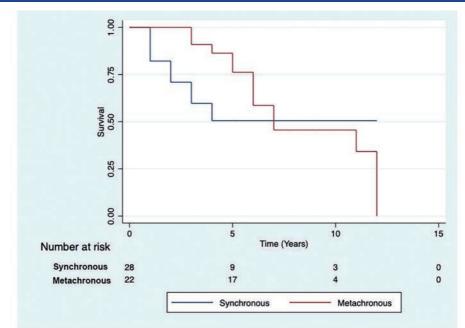
Disclosure: No significant relationships.

P-083

SALVAGE RESECTION FOR LOCAL FAILURE AFTER STEREOTACTIC ABLATIVE RADIOTHERAPY FOR PULMONARY MALIGNANCIES

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OBJECTIVES

Salvage resection after radiotherapy is technically challenging and patients are considered vulnerable to postoperative complications. Outcomes for salvage lung resection after Stereotactic Ablative Radiotherapy (SABR) are not well established. We aimed to assess the feasibility and safety of salvage resection for local failure after SABR.

METHODS

We queried patients who previously treated with SABR for primary and secondary lung malignancies from 2012 to 2018 and underwent salvage resection for failed SABR lesion. Detailed patient data were retrospectively collected. Mid-term postoperative outcomes and recurrence rate were evaluated.

RESULTS

Out of 741 patients who received SABR, 16 patients underwent 17 salvage surgeries for local failures after SABR. Preoperative pulmonary function was not deteriorated after radiotherapy (mean FEV1 = 96% and mean DLCO = 74%). Pulmonary metastasis of colorectal cancer (n = 12, 71%) was the most common pathology. The median time to local recurrence was 15 months. Among 17 surgeries, VATS was conducted in 13 cases (76%) and R0 resection was achieved in 16 cases (94%). Eight lesions (47%) were required anatomical resections to achieve complete resection. A postoperative bleeding requiring surgical intervention occurred in one patient (6%) which was not related to previous radiation. There was no 30 and 90-day mortality. The median hospital day was 4 days. The median follow-up duration was 25.5 months. Three-year disease-free survival was 78.3 % and three-year overall survival was 73.7 % (figure). Three distant failures developed but isolated local failure was not found after salvage resection.

CONCLUSIONS

Salvage resection can be safe and effective in treating local failures after SABR. Eligible patients must be highly selected with care.
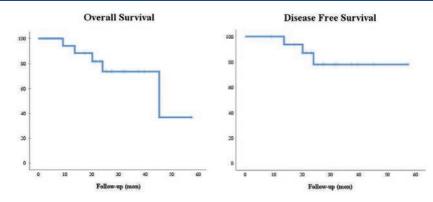
Disclosure: No significant relationships.
Keywords: Salvage; Recurrence; Stereotactic Ablative Radiotherapy; NSCLC; Pulmonary Metastasis.

Overall Survival

Disease Free Survival

P-084

ROLE OF LUNG SURGERY AS INTEGRATED TREATMENT IN METASTATIC MELANOMA

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OBJECTIVES
Metastatic melanoma is the most aggressive skin cancer and challenging to be treated for clinicians, with a median overall survival of less than one year. In the era of target- and immuno-therapy, with good results in prognostic terms, the role of surgery as an integrated treatment remains controversial with little scientific evidence. The aim of this work was to evaluate the oncological outcomes and survival prognostic factors of an ultra-selected group of patients undergoing pulmonary metastasectomy in the context of integrated treatments.

METHODS
Clinical prospectively collected data of 33 patients who underwent pulmonary resection for melanoma metastases, from April 2013 to December 2021, were retrospectively analyzed.

RESULTS
Eighteen patients (54.5%) were male. The mean age was 59.12 ± 13.21 years. Five patients (15.2%) underwent neoadjuvant therapy before metastasectomy. In 7 cases (21.2%) lung metastasis was synchronous with primary melanoma. The mean number of metastases removed was 1.48 ± 0.57 and the mean size of the nodules was 1.74 ± 1.83 cm. Thirty patients (90.9%) underwent a wedge resection, while 3 an anatomical resection. Two patients had a bilateral metastesectomy. Intra- and post-operative mortality were null. Twenty-eight patients (84.8%) underwent target- and immune-therapy after surgery. Disease-free interval between surgery on primary cancer and lung metastasis was 49.46 ± 46 months. One-, 3- and 5-year disease-free survival from lung metastasectomy to disease recurrence were 58%, 15% and 8%, respectively.
One- and 5-year overall survival were 96% and 79%, respectively.
Neoadjuvant therapy before metastasectomy (p: 0.02) and age> 60 years (p: 0.003) seemed to be favourable prognostic factors at univariable analysis.

CONCLUSIONS
Considering the satisfactory results obtained in terms of long-term survival, where technically possible and in carefully selected patients, lung metastasectomy seems to be an effective and safe treatment in the context of integrated therapies for metastatic melanoma.

Disclosure: No significant relationships.
Keywords: Melanoma; Lung Metastases; Integrated Treatment.

P-085

COMPUTED TOMOGRAPHY (CT)-GUIDED PERCUTANEOUS LABELING OF SMALL PULMONARY NODULES IS VERY ACCURATE AND ALLOWS MINIMALLY INVASIVE LUNG-SPARING RESECTION

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OBJECTIVES
The detection of small lung nodules is difficult thoracoscopically when the lesions are not localized within the outer border of the lung. In the case of ground-glass opacities, it is even often impossible to palpate the lesion. The labeling of lung nodules with radiotracer is a known, well-described technique. We analyzed the accuracy and usefulness of the technique and the potential benefits of performing it in a hybrid operating room.

METHODS
Fifty-five patients including 56.4% females with a mean age 63,4 years were analyzed. In 29 patients, we performed the labeling and the resection in a hybrid operating room. In 26 patients, the labeling was performed at the department of radiology the day before operation. We used Technetium99m for the labeling at a dose of 1MBq in the hybrid room and of 3 to 6 MBq the day before operation. Radioactivity was detected by use of the Neoprobe® gamma detection system.

RESULTS
Totally, 70 nodules were labeled and 67 (95.7%) could be detected and resected (wedge resection) in 52 patients. In 94.5% of the patients, thoracoscopic resection was possible. In 3 patients (5.5%), conversion was necessary due to adhesions or technical difficulties. Histology revealed 29 primary lung cancers, 22 metastases and 19 benign lesions. If required, anatomical resection was performed. In 67.3% of patients, the labeling went uneventful whereas in 32.7% minimal intraparenchymal bleeding, very limited pneumothorax, small hemothorax, and vasovagal syncope were observed. None of these complications required additional interventions.

CONCLUSIONS
The detection of small pulmonary nodules with the Neoprobe® system is very accurate and safe after CT-guided labeling. Performing the operation in a hybrid room results in several potential advantages for the patient and in the use of very low dose of Tc99m. The technique allows minimally invasive lung tissue sparing resection, avoiding overtreatment of benign lesions.

Disclosure: No significant relationships.
Keywords: Lung Nodule, Radioactive Labeling, VATS, Interventional Radiology.

Posters
Abstract 026-146

P-086

SPONTANEOUS VENTILATION COMBINED WITH DOUBLE LUMEN TUBE INTUBATION. THE FIRST 100 THORACIC SURGICAL CASES

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OBJECTIVES
To give a "safe airway" to the non-intubated spontaneous ventilation thoracic surgery, a new technique, the spontaneous ventilation combined with double lumen tube intubation (SVI) was developed. The feasibility of the SVI is analyzed in this study.

METHODS
104 SVI operations were performed between 2020.03.11. and 2022.01.17. At the begining of the procedure, the patients were relaxed for a short time and a double-lumen tracheal tube was inserted. After the utility incision for VATS or thoracotomy, the vagus nerve and the 2-5 intercostal nerves were blocked.. As the relaxation ceased, the patients were taking breath spontaneously without any cough during the manipulation. During the spontaneous ventilation, the patients had a bispectral index of 40–60, and received 3-5 positive end expiratory pressure and if necessary, pressure support ventilation. There were 52 females and 52 males with body mass index of ≤30. Intended open SVI was performed in 10 (9.6%) cases and 94 (90.4%) patients had video-assisted thoracic surgery (VATS) SVI resections. The VATS interventions were as follows: 54 lobectomies, 17 segmentectomies, 15 wedge resections, 7 thymectomies and 1 pleural biopsy.

RESULTS
9 of the 104 SVI cases (8.6%) had conversion to relaxation because of 7 hypoxias/hypercapnias, 1 oncological and 1 technical reason and 95 (91.3%) patients had complete SVI procedures. In 30 (31.6%) of the 95 complete SVI cases a pressure support ventilation was necessary during the spontaneous one lung ventilation. The spontaneous one lung ventilation period was 72.4% of the total ventilation time. In the 54 SVI VATS lobectomies the surgical time was 89 (55-130) minutes, the drainage time was 3 (1-19) days, and the morbidity was 12.9% (7/54).

CONCLUSIONS
SVI is a safe spontaneous ventilation thoracic surgical procedure. Conversion from SVI to relaxation was (8.6%). The mechanical one lung ventilation time could be reduced with 72.4%.

Disclosure: No significant relationships.
Keywords: Spontaneous Ventilation, Intubation, VATS, Lobectomy.

P-087

VERY LONG-TERM CONSEQUENCES OF CONSERVATIVELY TREATED BLUNT THORACIC TRAUMA

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OBJECTIVES
Despite the high incidence of blunt thoracic trauma and frequently indicated conservative treatment, studies on very long-term consequences for these patients remain sparce in current literature.

METHODS
The study population consisted of 107 trauma patients with blunt thoracic trauma who were admitted to our hospital after a blunt thoracic trauma between 1997 and 2014, with a median long term follow up of 13 years.

RESULTS
More than 16 percent of patients still experienced moderate pain all these years after trauma (NRS $\geq$ 6). Even 19 percent still experienced shortness of breath during exercise (p<0.001), with logistic regression showing no significant improvement over time (p=0.970). Both higher self-reported ability to perform usual activities (p=0.035), and experienced health (p<0.001) were both predictors of higher quality of life in this population.

CONCLUSIONS
This study suggests long-term morbidity in blunt chest trauma patients is relatively common, and earlier intervention focusing on improving self-care and improving experienced health may decrease long-term morbidity and increase quality of life in thoracic blunt chest trauma populations.

Disclosure: No significant relationships.
Keywords: Thoracic, Trauma, Outcome, Chest Wall.

Posters
Abstract 026-146

P-088

ROBOTIC ASSISTED FIRST RIB RESECTION FOR THORACIC OUTLET SYNDROME

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OBJECTIVES
Thoracic Outlet Syndrome (TOS) is caused by compression of the neurovascular bundle between the first rib and the clavicula, which can cause a large panel of symptoms and has a reported incidence of approximately 2-4/100.000. Surgical treatment consists of the resection of the first rib and is historically performed using an open, mainly transaxillary, approach. Recent developments resulted in a minimally invasive approach using Robotic Assisted Thoracic Surgery (RATS). With this study the investigators wanted to provide a descriptive study of first rib resection using RATS approach at 2 different centers.

METHODS
We reviewed the files of 47 patients affected by TOS and who benefited from first rib resection using RATS approach between 2016 and 2021. Patient characteristics as well as Length of Stay (LOS), affected side, Operative time (OT), complications, etiology, VAS score and QOL were gathered in the database. Statistical analysis was performed using IBM SPSS statistics 25 ® . Results were reported in mean and standard deviation.

RESULTS
47 patients affected by TOS received first rib resection using the RATS. Mean age was 47± 12 yrs. 16 patients were operated on the left side and 31 on the right side. All the patients reported complete resolution of symptoms. At 1 year follow-up no patient suffered from recurrence. There were no intraoperative complications. Postoperative complications occurred in 2 patients, 1 patient developed pneumothorax after chest tube removal and 1 patient developed chronic pleural effusion which required surgery. Mean LOS was 3±1 days and mean OT was 122±40min.

CONCLUSIONS
First rib resection performed using a RATS approach is a safe technique with excellent outcomes and which is beneficial for the patient in terms of LOS, pain and symptom resolution. Nonetheless, because of large number of unspecific symptoms, meticulous workup is needed before definitely establishing TOS diagnosis.

Disclosure: No significant relationships.
Keywords: Robotic Resection, Thoracic Outlet Syndrome, First Rib Resection.

P-089

SURGICAL OUTCOMES IN PATIENTS RECEIVING IMMUNOTHERAPY TREATMENT FOR NON-SMALL CELL LUNG CANCER

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OBJECTIVES

The aim of this study is to evaluate the feasibility, safety and oncological results of surgery in patients with non-small cell lung cancer (NSCLC) who have received immunotherapy treatment.

METHODS

The data of patients who underwent anatomical lung resection and lymph node dissection with the diagnosis of NSCLC in our clinic between January 2018 and 2021 were prospectively recorded and analyzed retrospectively. The patients were divided into 3 groups. Group 1: patients who did not receive oncological treatment before surgery (G1), Group 2: patients who received neoadjuvant/induction chemotherapy or chemoradiotherapy before surgery (G2), and Group 3: patients who received immunotherapy before surgery (G3). Demographic characteristics, clinical stages, treatment regimens, surgical details, postoperative complications and pathological stages of the groups were compared.

RESULTS

The study included 315 patients (G1=174, G2=132, G3=9) with 266 men (84.4%), 49 women (15.6%), and a mean age of 61.9 (26-81). In Group 2, 118 patients received chemotherapy and 14 patients received chemoradiotherapy. Surgical resection was performed videothoracoscopically in 176 (56%) of the patients (G1=125, 75%, G2=45, 34%, G3=6, 66%). 271 patients underwent lobectomy (G1=150, 86%, G2=112, 85%, G3=9, 100%), 17 patients underwent pneumonectomy (G1=3, 2%, G2=14, 10.5%, G3=0). Complications were seen in 116(37%) patients after surgery (G1= 60, 34.5%, G2=52, 39%, G3=4, 44%). The most common complication was prolonged air leakage in all three groups (G1=28%, G2=35%, G3=22%). Mortality was observed in 4 patients (1.2%) (G1=3, 1.7%, G2=1, 0.7%, G3=0). In the histopathological examination, complete response was detected in 16 patients (12.1%) in G2, while it was found in 5 patients (55.5%) in G3.

CONCLUSIONS

Our study showed that lung resection could be performed safely in patients who have received chemotherapy/chemoradiotherapy as well as immunotherapy. Complete response rate increases after immunotherapy treatment, but oncological results need to be supported with large series.

Disclosure: No significant relationships.
Keywords: Non-small cell lung cancer, NSCLC, Immunotherapy, Surgery.

P-090

IS IMMUNOTHERAPY SAFE IN NEOADJUVANT THERAPY MODALITY?

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OBJECTIVES

Neoadjuvant treatment modalities are developing in stage 3 lung cancer and the chance of resectability is increasing day by day with more successful neoadjuvant treatment options. In addition to the chemotherapy and radiotherapy options that have been used in neoadjuvant therapy to increase the disease-free follow-up and survival rates. In our study, we aimed to compare the operative results of patients with stage 3 and 4 lung cancer who received chemotherapy versus chemo-immunotherapy in neoadjuvant therapy.

METHODS

The total number of patients was 36. Sixteen (44,4%) of them received chemoimmunotherapy and 20 (55,5 %) of them received chemotherapy only. The patients were evaluated with the propensity match score according to age and respiratory function data. length of hospital stay, drainage and air leak status. The duration of hospitalization, drainage and air leak status, minor and major complications, and whether additional surgical intervention could be performed in both groups were compared.

RESULTS

There was no statistically significant difference between the duration of hospital stay, complication rates, drainage and air leak durations in the follow-up.

CONCLUSIONS

Adding immunotherapy to chemotherapy in neoadjuvant treatment does not cause additional morbidity in patients and should not be avoided in appropriate patients because it is safe during surgery and post-op follow-up, considering its oncological results.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Immunotherapy, Chemotreatment.

Posters
Abstract 026-146

P-091

HOW TO DISTINGUISH THORACIC AND CERVICAL LYMPH NODES DURING MINIMALLY INVASIVE ESOPHAGECTOMY

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OBJECTIVES
In this article, we aimed to reconstruct the cervical–thoracic junction plane (CTJP) using a three-dimensional reconstruction system. Thus, the CTJP can be judged during surgery to better distinguish cervical–thoracic lymph nodes.

METHODS
We included the patients in Fujian Medical University Union Hospital from December 2019 to March 2020. All patients underwent a thin-slice and enhanced computed tomography scan of the chest with three-dimensional reconstruction using the IQQA System (EDDA technology) to reconstruct the CTJP, brachiocephalic trunk, right common carotid artery, and right subclavian artery. The distance from the intersection of the right subclavian artery and the CTJP to the orgin of the right subclavian artery (ORSA) was measured, and the relationship between this distance and the patient's Sex, BMI and Height was analyzed.

RESULTS
Seventy-three patients were enrolled, of which 12 patients had ORSA above the CTJP , while 61 patients below the plane. There was a significant difference in age between the two groups ($P = 0.04$), compared with Height, Weight and BMI ($p>0.05$). In 61 patients with the ORSA below the CTJP, the average distance was 24.7 ± 7.6 mm. The difference between the distance and BMI ($P = 0.02$) was statistically significant, and it increases with the increase of BMI.

CONCLUSIONS
The relationship between the ORSA and CTJP can be clarified through three-dimensional reconstruction. The cervical-thoracic recurrent laryngeal nerve lymph nodes can be distinguished clearly in minimally invasive esophagectomy, which contribute to the accurate N staging of middle-thoracic esophageal cancer.

Disclosure: No significant relationships.
Keywords: Cervical–Thoracic Junction Plane, Three-Dimensional Reconstruction, Esophageal Cancer.

P-092

EFFICACY AND SAFETY OF RETHYMECTOMY IN PATIENTS WITH REFRACTORY MYASTHENIA GRAVIS

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OBJECTIVES
To study the efficacy and safety of residual thymus removal in patients with progressive myasthenia gravis after a thymectomy.

METHODS
Patients who underwent a repeated thymectomy due to residual thymic tissue along with progressive myasthenia gravis after the previous thymectomy were enrolled in this retrospective study. The indication for surgery was poor control of myasthenia symptoms by corticosteroids and residual thymic tissue detected by CT scan. The primary outcome was a curtailment of steroid dosage and post-intervention status according to MGFA classification. The secondary outcomes were complications rate, length of drainage (LOD) and length of stay (LOS). The median follow–up of patients with myasthenia gravis after a rethymectomy was 30.2 months.

RESULTS
The study included 10 patients, 1 man and 9 female, with a median age of 35 years. The MGFA severity class patients were distributed as IIIa – 3, IIIb – 3, Iva – 1, IVb – 2, V – 1. All primary thymectomies were performed outside of our hospital, and the most common surgical access was VATS (n=5; 50%), followed by partial upper sternotomy (n=4; 40%) and median sternotomy (n=1; 10%). We performed rethymectomy via VATS in 7 (70%) patients. Median prednisolone dose before primary thymectomy was 90 mg (80-100), after – 27 mg (16-60); before rethymectomy – 80 mg (16-100), after the rethymectomy – 24 mg (0-32). A t-test showed this difference was statistically significant, $t(9) = 4.89$, $p = .001$, 95% CI [27.28, 74.32] (fig. 1). In 4 (40%) patients, complete stable remission was achieved. Postoperative complications were diagnosed in 2 patients: a paroxysm of atrial fibrillation and hydrothorax. There was no mortality. Median LOD was 1 (1-2) days and LOS was 6 (4-8) days.

CONCLUSIONS
Rethymectomy is a safe and effective procedure in patients with progressive myasthenia gravis after previous thymectomy in the presence of residual thymus tissue.
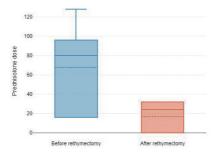
Disclosure: No significant relationships.
Keywords: Thymectomy, Rethymectomy, Myasthenia Gravis, VATS, Mediastinum.

Posters
Abstract 026-146

P-093

DIAGNOSTIC CRITERIA OF EARLY POSTOPERATIVE PNEUMONIA AND ITS RISK FACTORS AFTER LUNG CANCER SURGERY

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OBJECTIVES
Postoperative pneumonia following lung cancer surgery leads to an increased risk of morbidity and is also a benchmark for patient management. However, the diagnostic criteria of postoperative pneumonia have been little studied. The aim of this study is to assess the use and accuracy of biomarkers for pneumonia during the early postoperative period after lung cancer surgery.

METHODS
We reviewed all patients who underwent pulmonary anatomical resection for lung cancer between January 2017 and December 2021. Non-respiratory health care-associated infections (HAI) were excluded from the analysis. Logistic regression was used to investigate the risk factors of pneumonia. Inflammatory biomarkers were recorded during the first 10 postoperative days. We used area under the receiver operating curve (AUROC) to assess the accuracy of biomarkers.

RESULTS
268 patients (median age 67 years) were included; 24 patients (9%) have been treated for pneumonia, all within the first 10 postoperative days. In the multivariate analysis, risk factors for pneumonia were pain >3 (OR 5.6, p=0.04) and the need of postoperative intermediate or intensive care unit admission (OR 3.7, p=0.03 and OR 15, p=0.001, respectively). As compared to patients without infections, patients with pneumonia had higher CRP level (216.7mg/L ± 102.3 vs 99.4mg/L ± 76.4, p<0.001) and higher leukocytosis (14.5G/L ± 5.4 vs 10.9G/L ± 5, p=0.001). In patients with pneumonia, 39% had fever>38°C, 71% met the IDSA/ATS criteria, and 62.5% had a CT scan to confirm the diagnosis. The AUROCs of CRP, leukocytes and temperature were of 0.83, 0.75 and 0.71, respectively. The sensibility/specificity of CRP>100mg/L, leukocytosis>12G/L, fever >38°C and IDSA/ATS criteria were of 96%/63%, 62%/69%, 39%/90% and 91%/63%, respectively.

CONCLUSIONS
Serum CRP level seems a useful marker for establishing the diagnosis of postoperative pneumonia. A cohort study is needed to assess the accuracy of biomarkers for the diagnosis of postoperative pneumonia after lung cancer surgery.
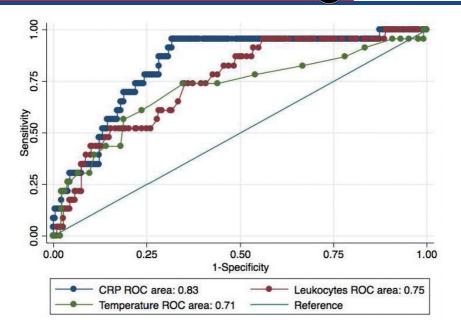
Disclosure: No significant relationships.
Keywords: Lung Cancer Surgery, Thoracic Surgery, Postoperative Complications, Pneumonia.

Posters
Abstract 026-146

P-094

INTRODUCTION OF LUNG CANCER SCREENING AND THE IMPACT ON THORACIC SURGERY DURING THE CORONAVIRUS-19 (COVID-19)PANDEMIC

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OBJECTIVES
The NHS Lung Health Check (LHCP) is a three-year programme (17 locations) in England which aims to reduce mortality for lung cancer through early detection and treatment. Patients aged 55-74 years, with a history of smoking, complete a short consultation and if deemed high-risk have a low-dose CT scan of the chest. We review the impact of the programme launched during the Covid-19 pandemic in our region.

METHODS
A retrospective analysis was performed on prospectively enrolled patients from the LHCP, referred to Thoracic surgery, from inception in April 2021 to December 2021. Patient demographics, time to thoracic review and time to surgery, pre and post operative histology were collected. Only post operative patients with available histology were included in analysis.

RESULTS
1263 low-dose CT scans were performed. 132 (10.4%) patients were positively identified and discussed in the Lung MDT.
20 (1.6%) patients were referred to Thoracic Surgery, mean age of 68.2 years (SD 4.7) and 55% female (n:11). 16 patients were scheduled for surgery with an average of 12.9 days (SD 11.1, range 6-49 days) from referral to clinic appointment.
To date, 11 patients have undergone surgical lung resection within 50.3 days (SD 35.7, range 22-110 days) from diagnosis, well within the 62-day National target. Histology has confirmed 10 (90%) lung cancers (Adenocarcinoma: 7 (70%), Squamous cell carcinoma: 2 (2%) and 1 (10%) typical carcinoid). Pathological staging confirmed 7 (70%) Stage I, 1 (10%) Stage II, and 2 (20%) Stage III (IASLC 8th Edition). 12 (0.9%) additional lung cancers have been identified through the LHCP, and 84% have undergone surgical resection.

CONCLUSIONS
The LHCP has successfully identified 12 lung cancers with an 84% resection rate, accommodated within national timelines during the covid-19 pandemic. The majority were early Stage I and II malignancies with promising survival rates following complete surgical resection.
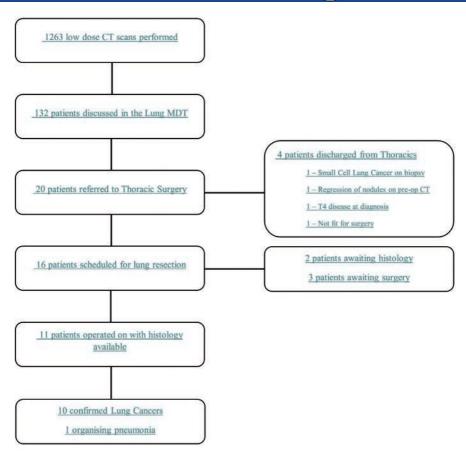
Disclosure: No significant relationships.
Keywords: Lung Cancer, Screening.

Posters
Abstract 026-146

P-095

TREATMENT STRATEGY AND SURGICAL APPROACH IN THORACIC ENDOMETRIOSIS

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OBJECTIVES

Endometriosis is a benign gynecological disease affecting approximately 10% of women of reproductive age. Extra-pelvic localization of Deep Infiltrating Endometriosis (DIE) can occur in the thoracic cavity or diaphragm, causing catamenial pneumothorax, but also more aspecific symptoms of pain in chest or shoulder. The objective of this study was to evaluate diagnostic and treatment strategies and surgical approach in patients with symptoms of suspected endometriosis of the diaphragm or thoracic cavity.

METHODS

Patients treated between June 2015 and January 2022 were included in this retrospective cohort study. Presenting symptoms and previous treatment were obtained from clinical records. Preoperative imaging, surgical approach and intra-operative findings were scored, as well as complications and subjective patient outcomes.

RESULTS

31 patients were included. 25 pts presented with pain of chest and shoulder, 6 with pneumothorax. 11 pts had had previous thoracic treatment. Most patients received an MRI (61,1%) or CT (19,4%) upfront, but only in 25% of patients DIE was seen on diagnostic imaging. Surgical approach was by Laparoscopy only in 45%, combined VATS and laparoscopy in 32%, VATS only in 16% and thoracotomy in 6%. In 27 pts (87%) DIE nodules and/or fenestrations were found. Most affected organ was the diaphragm (77%), followed by the peritoneum near the diaphragm (23%), parietal pleura (10%) and lung (10%). In 17 pts a partial diaphragm resection was performed. 6 pts underwent subsequent chemical pleurodesis. 15 patient experienced evident improvement of symptoms. 3 pts had recurrence of pneumothorax.

CONCLUSIONS

Surgical treatment can result in marked improvement of symptoms in thoracic endometriosis. Since the diaphragm is the most affected organ, a combined approach from both abdominal and thoracic compartment should be performed. This is preferably done by simultaneous laparoscopy and VATS, followed by complete resection of DIE.

Disclosure: No significant relationships.
Keywords: Thoracic Endometriosis, Diaphragm, Minimally Invasive, VATS.

Posters
Abstract 026-146

P-096

A GENDER-SPECIFIC APPROACH IN LUNG CANCER SURGERY IN THE ERA OF DIAGNOSTIC AND THERAPEUTIC MULTIDISCIPLINARITY

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OBJECTIVES
Gender-specific Medicine studies the impact of gender in the physiology, clinic and pathogenesis of diseases. Our research analyzes the relationship between genders and lung cancer, considering different endpoints like smoking habit, histological subtypes and survival after a multidisciplinary tumor board (MTB) approach.

METHODS
This is a retrospective study on 611 patients (180 females, median age 69; 431 males, median age 71) undergoing surgery with curative intent for non-small cell lung cancer between 2008 and 2017. The Mann-Whitney U-test compared the genders and the 5-year survival was defined by Kaplan Meier curves.

RESULTS
Women smoked less and for a shorter period of time than men (20 vs 40 P/Y, $p<0.05$). Women are diagnosed with cancer, mostly adenocarcinoma, at a younger age and live longer than males (median survival -months- 68 vs 48, $p<0.05$). Regarding patients treated in pre- and post-MTB era, a preliminary multidisciplinary discussion produced improved 5-years survival (Figure 1). The advantage of this approach was evident for both genders.

CONCLUSIONS
There is a close correlation between adenocarcinoma, female gender and non-smokers. This suggests that there are other risk factors besides smoking and other pathogenetic pathways, some regulated for example by hormonal factors, which would then lead to the development of adenocarcinoma in women and non-smokers. The different survival in the two genders allows us to hypothesize there are differences with a biological background not yet fully known. Finally, the role of MTB is important in determining a better outcome.
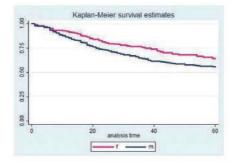
Disclosure: No significant relationships.
Keywords: Multidisciplinary Approach, Quality Of Care, Surgical Treatment, Multidisciplinary Thoracic Tumor Board, Non-Small-Cell Lung Cancer, Patient Outcome.

Kaplan-Meier curve. Comparison of female and male population - 5-year survival

P-097

WITHDRAWN

P-098

CAN NEOADJUVANT THERAPY INCREASE THE FREQUENCY OF VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) LOBECTOMY IN PATIENTS WITH LOCALLY ADVANCED LUNG CANCER?

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OBJECTIVES
Due to technological developments and increasing experience in the last two decades, there have been significant changes in indications and contraindications for videothoracoscopic (VATS) lobectomies. Traditionally, in patients who received neoadjuvant therapy (NT), the approach with VATS is considered to be a relative contraindication. However, if NT causes a reduction in tumor stage and diameter, it may increase the frequency of VATS

METHODS
The data of patients who underwent anatomic lung resection in our clinic between January 2017 and December 2020 for NSCLC were prospectively recorded and analyzed retrospectively. The patients were evaluated in the multidisciplinary oncology council before and after NT. Clinical evaluation in patients for whom surgical treatment was recommended, a tumor greater than 5 cm in diameter was accepted as an indication for thoracotomy. The surgical and oncological results of the patients were analyzed.

RESULTS
A total of 424 patients, 73(17.2%) women and 351(82.8%) men, with a mean age of 60(26-85) were included in our study. Neoadjuvant therapy was chemotherapy in 167 patients and chemoradiotherapy in 26 patients. Lobectomy was performed in 362(85.4%) patients, pneumonectomy in 28(6.6%) patients, and segmentectomy in 34(8%) patients. Lung resection with VATS was performed in 139(60%) of 231 patients who underwent direct surgery, and 50(26%) of 193 patients who underwent surgery after NT. Tumor diameter was found to be above 5 cm before NT in 28%(14/50) of patients who underwent lobectomy with VATS after NT. Morbidity was observed in 163 patients (28% in the VATS group, 46% in the Thoracotomy group), 90-day mortality was observed in 9 patients (1.5% in the VATS group, 2.5% in the thoracotomy group), and as a result of histopathological examination, complete response was detected in 35 (18%) patients.

CONCLUSIONS
Our study shows that neoadjuvant therapy can reduce the tumor size and increase the frequency of VATS.

Disclosure: No significant relationships.
Keywords: Non-small cell lung cancer, NSCLC, Neoadjuvant Therapy, Surgery.

Posters
Abstract 026-146

P-099

SURGICAL MANAGEMENT OF CORONAVIRUS-19 (COVID-19) RELATED PNEUMOTHORAX: INSIGHTS FROM STHOR-COV-2 TRIAL

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OBJECTIVES
About 1% of COVID-19 patients can develop pneumothorax, also iatrogenic. Some of them may benefit from surgery in case of prolonged air leak but literature is lacking about operative indication. Our aim was to investigated efficacy of surgery in COVID-19 patients with related persistent pneumothorax. Primary and secondary end-points were postoperative survival and its prognostic factors.

METHODS
Starting from the SThor-CoV-2 dataset, an observational retrospective study evaluating outcomes of COVID-19 patients undergoing surgery for thoracic complications in nine worldwide centers (ERB n°3822) from 1 March 2020 to 31 May 2021, we focused on patients with COVID-19 induced persistent pneumothorax. Overall mortality was estimated by Kaplan-Meier model. Univariable and multivariable regression model were applied to identify the variables associated with mortality.

RESULTS
33 consecutive patients (39.8%) with persistent pneumothorax undergoing surgical management have been selected. Decortication, pleurodesis, wedge resections and partial pleurectomy were performed, differently combined together. Overall survival was 63,6%; at 30 days follow-up, 23 patients (69.7%) were alive (Figure 1). All the dead patients needed to be intubated for severe respiratory insufficiency before surgery. At univariable analysis, renal insufficiency (p=0.040), ventilation before surgery (p=0.025), decortication (p=0.012), pleurodesis (p=0.003) and open surgical technique (p=0.040) were positively associated with death (Table 1). At multivariable analysis preoperative endotracheal intubation (adjusted OR 16.5 [95%CI: 1.67, 40.95], p=0.017) has revealed to be the only independent prognostic

risk factor for mortality. The main bias was due to the emergency situation and difficulty in collecting data from non-surgical patients which did not allow a control group.

CONCLUSIONS

Heterogeneous data and the absence of a control group do not allow to definitively address the specific question if surgery improve the outcomes or not. High mortality rate, in particular in patients needing for preoperative endotracheal intubation, should lead to considering surgery very carefully and in a context of salvage treatment.

Disclosure: No significant relationships.
Keywords: Pneumothorax, COVID-19, Surgery, Survival, Complication.

Mortality overall	Alive	Dead	p
n	21	12	
Age (median [range])	64 [18. 73]	68 [16. 79]	0.172
Gender = M (%)	15 (71)	9 (75)	1.000
Smoking.History (%)			0.589
Current	3 (17)	2 (20)	
Former	9 (50)	3 (30)	
Nonsmoker	6 (33)	5 (50)	
COPD/Asthma = Yes (%)	8 (38)	4 (33)	1.000
Diabetes.Mellitus = Yes (%)	6 (29)	3 (25)	1.000
Renal.Insufficiency = Yes (%)	0 (0)	3 (25)	0.040
CardiovascularYN = Yes (%)	7 (33)	8 (67)	0.083
Cardiovascular (%)			0.315
Arrhytmia	1 (5)	2 (17)	
Hypertension	3 (14)	3 (25)	
Myocardial infarction	1 (5)	1 (8)	
None	14 (67)	4 (33)	
Other	0 (0)	1 (8)	
Peripheral artery disease	1 (5)	1 (8)	
Stroke	1 (5)	0 (0)	
Pulmonary.Hypertension = Yes (%)	1 (5)	1 (8)	1.000
LMWH (%)			0.845
None	1 (5)	1 (8)	
Prophylaxis	16 (76)	8 (67)	
Therapeutic Anticoagulation	4 (19)	3 (25)	
Ventilation.before.surgery (%)			0.025
Room air	0 (0)	0 (0)	
Venturi mask	4 (19)	0 (0)	
Low flow O2	3 (14)	0 (0)	
cPAP	4 (19)	0 (0)	
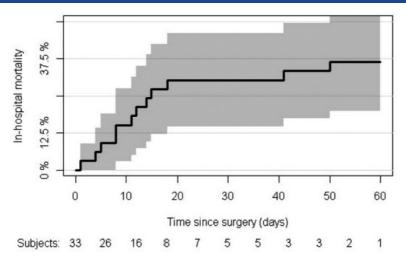
Mortality overall	Alive	Dead	p
Endotracheal Intubation	10 (48)	12 (100)	
Chest.tube = Yes (%)	20 (95)	12 (100)	1.000
CT.Scan = Yes (%)	20 (95)	12 (100)	1.000
Pulmonary.embolism/DVT = Yes (%)	4 (19)	3 (25)	0.686
Days.until.Surgery (median [range])	18 [6. 110]	12 [5. 58]	0.178
Decortication = Y (%)	0 (0)	4 (33)	0.012
Lobectomy = N (%)	21 (100)	12 (100)	NA
Pleuralbiopsy = Y (%)	1 (5)	3 (25)	0.125
Pleurodesis = Y (%)	21 (100)	7 (58)	0.003
Pneumonectomy = N (%)	21 (100)	12 (100)	NA
Toilette = N (%)	21 (100)	12 (100)	NA
Wedge resection = Y (%)	7 (33)	4 (33)	1.000
Surgical.Technique = VATS (%)	21 (100)	9 (75)	0.040
ICU = Yes (%)	15 (71)	12 (100)	0.065
ECMO = Yes (%)	2 (10)	0 (0)	0.523
complications = Yes (%)	5 (24)	5 (42)	0.433
Complications.(after.surgery) (%)			0.167
ARDS	0 (0)	1 (20)	
MOF	0 (0)	1 (20)	
Prolonged air leaks	3 (60)	0 (0)	
subcutaneous emphysema	2 (40)	3 (60)	
Clavien.grade.of.complication (%)			0.167
II	3 (60)	0 (0)	
IIIa	2 (40)	3 (60)	
V	0 (0)	2 (40)	
Therapy.for.complication = subcutaneous drainage (%)	2 (100)	3 (100)	
discharge (median [range])	11 [4. 73]	3 [1. 5]	
Cause.of.Death (%)			
ARDS		5 (42)	
Chest infection		1 (8)	
MOF		4 (33)	
Sepsis		2 (17)	

P-100

MIR-6077 PROMOTES CISPLATIN/PEMETREXED RESISTANCE IN LUNG ADENOCARCINOMA BY TARGETING CDKN1A/CELL CYCLE ARREST AND KEAP1/FERROPTOSIS PATHWAYS

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OBJECTIVES
To investigate the mechanism of lung adenocarcinoma (LUAD)'s resistance to Combination chemotherapy with cisplatin (CDDP) plus pemetrexed (PEM).

METHODS
We applied a genome-wide CRISPR/Cas9 screening to identify the molecules that potentially regulate LUAD cells' sensitivity to CDDP/PEM. Pull-down assay, RNA-Seq, and 10× Genomics single-cell sequencing were used to explore downstream targets and pathways. Dual-luciferase reporter assay was conducted to verify the targeting relationship between miRNA and target genes. Functional experiments in vitro and in vivo were performed to investigate the role of miR-6077 in LUAD's CDDP/PEM resistance.

RESULTS
Through CRISPR/Cas9 screening, we identified miR-6077 as a key driver of CDDP/PEM resistance in LUAD. We also found that miR-6077 was markedly upregulated in chemoresistant LUAD patient samples. Functional experiments verified that ectopic overexpression of miR-6077 desensitized LUAD cells to CDDP/PEM in both LUAD cell lines and patient-derived xenograft models. Through RNA-Seq in cells and scRNA-Seq of samples from patients with or without CDDP/PEM treatments, we observed that exposure to CDDP/PEM induced upregulation of CDKN1A and KEAP1, which in turn activated cell cycle arrest and ferroptosis, respectively, thus leading to cell death. Meanwhile, through miRNA pull-down followed by RNA-sequencing, we identified and validated that miR-6077 directly targets CDKN1A and KEAP1. Furthermore, we demonstrated that miR-6077 protects LUAD cells from cell death induced by CDDP/PEM via CDKN1A-CDK1 mediated cell cycle arrest and KEAP1-NRF2-SLC7A11/NQO1 mediated ferroptosis, respectively, thus resulting in chemoresistance in multiple LUAD cells both in vitro and in vivo. Moreover, we found that two lncRNAs, GMDS-AS1 and LINC01128, sensitized LUAD cells to CDDP/PEM by sponging miR-6077, and resulted in the restoration of CDKN1A and KEAP1.

CONCLUSIONS
This study demonstrated the critical role of miR-6077 in the LUAD response to CDDP/PEM, thus providing a novel therapeutic strategy for overcoming chemoresistance in patients with LUAD.
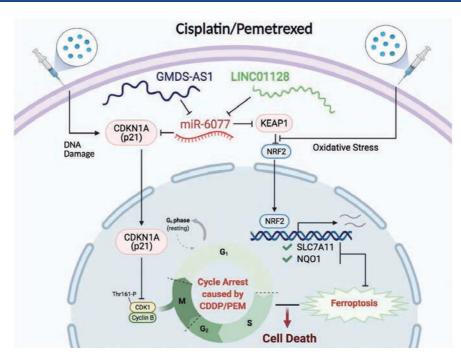
Disclosure: No significant relationships.
Keywords: MiRNA, Cisplatin, Pemetrexed, Ferroptosis, Cell Cycle Arrest.

P-101

IMPLEMENTATION OF AN ENHANCED RECOVERY PATHWAY IN LUNG RESECTION: IMPACT ON 30-DAY COMPLICATIONS, EMERGENCY ROOM CONSULTATIONS AND UNPLANNED READMISSIONS

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OBJECTIVES
Enhanced recovery pathways have shown to improve perioperative care and facilitate early discharge. However, their impact in emergency room consultations or unexpected readmissions (ranging between 4.3% and 15% in different series), is still unknown.
In this study, we aim to evaluate the results of our enhanced recovery pathway in lung resection and its influence in the incidence of 30-day complications, emergency room consultations and hospital readmissions.

METHODS
We retrospectively reviewed all the patients submitted to lung resection in a university hospital between August 2018 and December 2021. 30-day complications, emergency room consultations and hospital readmissions, in any hospital, were routinely registered in patients' electronic medical record. We performed descriptive statistics of the outcomes of interest and univariate logistic regression to investigate the influence of the type of resection and approach in emergency room consultations and hospital readmissions.

RESULTS
In total, 141 lung resections were analyzed. Of them, 66 were wedge resections (46%), 37 anatomical segmentectomies (26%) and 39 lobectomies (27%). 7 were performed through an open approach (4.93%) and 135 (95.07%), minimally invasive. Mean length of stay of the whole series was 2.49 days (median 2, range: 1-21). 38 patients (26.76%) presented any type of complication (79% were Clavien-Dindo grade I and II), being the most frequent: surgical wound infection (11/142 patients, 7.75%), prolonged air leak (6/142 patients, 4.22%) and pneumonia (4/142 patients, 2.82%). 7 patients (4.93%) required an emergency-room consultation within 30 days from discharge and 3 (2.11%) required an unplanned hospital readmission. These rates were not influenced, on logistic regression, by type of approach and extent of resection.

CONCLUSIONS
In our population, lung resections included in an enhanced recovery pathway have an acceptable rate of 30-day complications (most of them Clavien-Dindo grades I and II), emergency room consultations and hospital readmissions within 30 days from surgery.

Disclosure: No significant relationships.
Keywords: Enhanced Recovery Pathways, Complications, Emergency Room Consultations, Readmissions, Lung Resection.

P-102

DESCENDING NECROTIZING MEDIASTINITIS: A PROPOSAL FOR A NEW SURGICAL STRATEGY ADOPTING MEDIASTINAL VACUUM-ASSISTED CLOSURE THERAPY

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OBJECTIVES

Descending necrotizing mediastinitis (DNM) is a rapidly progressing disease from the spread of cervical infection with a 30-40% mortality rate despite surgery. Traditionally, it is approached by exposure of mediastinum and placement of drainages in the belief that mediastinal pleura opening guarantees better outcomes. This case series is aimed to assess efficacy of our alternative mininvasive technique based on 1) mediastinal evacuation and debridement without pleural cavity opening 2) Vacuum-assisted closure (VAC).

METHODS

Retrospective analysis of 8 patients with diffuse DNM treated by surgical mediastinum evacuation/debridement and VAC therapy between 2017 and 2021. Surgery always consisted in a cervicotomy combined with cervical mediastinoscopy; moreover anterior mediastinotomy and/or a subxyphoid incision were considered based on mediastinum involvement at CT scan. Drainage was obtained only by VAC, alternating aspiration and irrigations. Dressing changes were every 1-3 days combining surgical debridement and pulsed lavage. Primary healing occurred when the wound was sterile.

RESULTS

Patients were 6 males and 2 females, median age was 52 years (range 34-76); 6 were firstly assessed in the emergency department; 2 came from Intensive Care Unit of other hospitals. Concerning the origin of infection, 3 patients had a retropharingeal abscess, 1 a cervical abscess caused by a tubercolar adenopaty, 1 by a diabetic foot infected ulcer, 1 by an inguinal abscess, 1 by an odontogenic abscess, 1 with unknown origin. We always managed to successfully evacuate the mediastinum without opening the pleural cavity. Demographics, procedures performed and outcome are reported in table 1. All patients were discharged in good general conditions and are alive at last follow-up. No recurrences occurred.

CONCLUSIONS

Our approach is innovative since, taking advantage of the VAC therapy, allows to avoid sternotomy/thoracotomy, pleural space contamination and chest tube placement. In our experience it was safe and effective.

Disclosure: No significant relationships.
Keywords: Descending Necrotizing Mediastinitis; Vacuum-Assisted Closure Therapy; Mediastinitis; Sepsis.

Posters
Abstract 026-146

No.	Age/sex	Systemic diseases	Etiology	Mediastinal involvement (A, P, A+P, AI, PI)	Bacteriology	Surgical treatment	VAC (n.)	ICU stay (d)	Out-come (POD dis-char-ge)
1	59/M Pakistan	HTN	Scrofula	AI+P	Bk	Cervico-tomy, me-diastinoscopy, transcervical mediastinal VAC, subxyphoid VAC, bilateral pleural drainage	7	23	34
2	55/F ITA	Obesity, depressive syndrome, DM	Left foot	A	MRSA + candida albicans	First finger amputation, cervicomy + left sterno-clavear arti-colation removal, anteriore mediasti-noscopy + mediasti-notomy + vac therapy	4	11	41
3	43/M Senegal	None	Retro-pharyn-geal abscess	P	Beta-hemoly-thic strep-tococci and anaerobics	Cervicotomy + transcervical mediastinoscopy; VAC therapy	4	13	18

No.	Age/sex	Systemic diseases	Etiology	Mediastinal involvement (A, P, A+P, AI, PI)	Bacteriology	Surgical treatment	VAC (n.)	ICU stay (d)	Outcome (POD discharge)
4	38/M Moldavia	HCV, drug addict	Inguinal abscess	A	Streptococcus constellatus	Right inguinal drainage, right cervicotomy, trancervical mediastinoscopy + amterior mediastinotomy III intercostal space (mediastinal abscess); III right sternocostal removal (ostheomielithis); VAC therapy	5	4	23
5	34/M ITA	None	Odontogenic abscess	AI + P	Streptococcus anginosus, Enterobacter cloacae	Dental removal, odontogenic abscess detersion, cervicotomy, transcervical anterior and posterior mediastinoscopy; VAC therapy	5; left pectoralis major flap	42	87
6	76/M	HTN	Peritonsillar and retropharingeal abscess	A + P	None	cervicotomy, transcervical anterior and posterior mediastinoscopy; VAC therapy	4	15	29

No.	Age/sex	Systemic diseases	Etiology	Mediastinal involvement (A, P, A+P, AI, PI)	Bacteriology	Surgical treatment	VAC (n.)	ICU stay (d)	Out-come (POD dis-char-ge)
7	56/F	Previous drug addict, HCV	Right retro-pharingeal abscess	PI	Candida glabrata, klebsiella pneumoniae	Cervicotomy, transcervical mediastinoscopy, VAC therapy	4	16	21
8	54/M	DM	Septic shock (focus unknown)	AI	MSSA	Left cervicotomy, transcervical mediastinoscopy, IV left intercostal space mediasti-noscopy, left retropectoralis and left axylla exploration, VAC therapy	5	18	48
median interval from diagnosis of DNM and surgical treatment							6 hours (range 2-37 hours)		
median duration of hospitalization							37 days (range 18-87)		
intensive care unit stay							18 days (range 4-42)		
Median number of VAC dressing							5		
HTN (hypertension), TB (tubercolosis), DM (diabetes mellitus), A (anterior), P (posterior), AI (antero-inferior), PI (postero-inferior)									

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VARIATION IN SURGICAL PERIOPERATIVE CARE FOR PRIMARY PNEUMOTHORAX IN THE NETHERLANDS – A NATIONAL SURVEY AMONG DUTCH THORACIC SURGEONS

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OBJECTIVES
Surgery is the recommended treatment for patients with recurrent primary spontaneous pneumothorax (PSP). Although frequently performed, there is no consensus about optimal perioperative care due to lack of high quality evidence, potentially resulting in variation of treatment. Standardized protocols in this setting may lead to a decrease in complications and length of hospital stay (LOS), in line with the enhanced recovery programs after pulmonary resections for cancer. The aim of this survey was to evaluate the variation in perioperative care of PSP in the Netherlands, which is considered a first step for future research investigating optimal standardized care for patients with recurrent PSP.

METHODS
An online case-based survey was sent to all members of the Dutch Societies of Lung and Thoracic Surgery (165 members) to obtain details on provided care regarding surgery, diagnostics, chest tube(s) and pain management for patients with recurrent PSP. Results were analysed with descriptive statistics on surgeon level.

RESULTS
Forty-five respondents from 30 hospitals completed the survey, all of whom (100%) used video-assisted thoracoscopic surgery and 82.2% preferred bullectomy plus pleurectomy as surgical technique. Usually one single chest tube was placed postoperatively (97.8%). Only 31.3% of surgeons removed the chest tube instantly when full lung expansion was present without air leakage, while 68.9% routinely left the chest tube in place for 2-5 days. LOS was 3-4 days according to 68.9% of the surgeons. The use of imaging such as Computed tomography scans and X-rays varied widely between the respondents. For postoperative pain management, thoracic epidural analgesia was the preferred technique in 77.8% (Table 1).

CONCLUSIONS
This national survey demonstrates extensive variability in perioperative care of PSP, largely attributed to differences in chest tube removal and pain management. Well-designed studies are needed to provide high-quality evidence for optimal perioperative care and for patients with recurrent PSP.

Disclosure: No significant relationships.
Keywords: Primary Pneumothorax, Perioperative Care.

Survey among lung surgeons			Respondents N (%)
Total			45 (100)
Preoperative			
Chest CT-scan	Yes		28 (62,2)
	No		17 (37,8)
Perioperative			
Surgical approach	VATS		45 (100)
	1-port		15 (33,3)
	2-port		11 (24,4)
	3-port		19 (42,2)
	Thoracotomy		0 (0)
Type of surgery	Pleurectomy		2 (4,4)
	Pleurectomy + bullectomy		37 (82,2)
	Pleurectomy, bullectomy + talcage		1 (2,2)
	Bullectomy + talcage		5 (11,1)
Pleurectomy			
	Upper 1/3		20 (44,4)
	Near-total pleurectomy		19 (42,2)
	Total pleurectomy		3 (6,7)
	None		3 (6,7)
Bullectomy if bullae present on CT scan			
	With air leak	Yes	45 (100)
		No	0 (0)
	Without air leak	Yes	42 (93,3)
		No	3 (6,7)
Routine postoperative chest X-ray	Yes		16 (35,6)
	No		28 (62,2)
	Unknown		1 (2,2)
Postoperative			
Chest tube management			
Number of chest tubes	1		44 (97,8)
	2		1 (2,2)
Drainage modalities	Water seal		19 (42,2)
	Suction < -10cm H20		12 (26,7)
	Suction > -15cm H20		3 (6,7)
	Suction ≥ -10cm H20 and ≤ -15cm H20		11 (24,4)

Survey among lung surgeons			Respondents N (%)
Chest tube removal	Immediately when full lung expansion and no air leak		14 (31,1)
	After a set number of days		31 (68,9)
Number of days with chest tube in place	(2-5)		
	1		4 (8,9)
	2		13 (28,9)
	3		11 (24,4)
	5		2 (4,4)
	n/a		15 (33,3)
Diagnostic management Chest X-ray			
	Before chest tube removal	Yes	21 (46,7)
		No	22 (48,9)
		Unknown	2 (4,4)
	After chest tube removal	Yes	11 (24,4)
		No	33 (73,3)
		Unknown	1 (2,2)
	At the outpatient clinic postoperatively	Yes	12 (26,7)
		No	33 (73,3)
Pain management Technique	Epidural		35 (77,8)
	Intravenous medication		5 (11,1)
	Paraspinal block single shot/continue		5 (11,1)
Hospital length of stay			
	1 - 2		11 (24,4)
	3 - 4		31 (68,9)
	5		1 (2,2)
	> 5		2 (4,4)

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PROSPECTIVE FEASIBILITY STUDY OF TUBELESS THORACOSCOPIC BULLECTOMY FOR PATIENTS WITH PRIMARY SPONTANEOUS PNEUMOTHORAX

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OBJECTIVES
Although early removal of a postoperative chest drainage tube can facilitate postoperative recovery, there is a risk of re-drainage to treat a delayed pulmonary air leak; bleeding might be undetected. Here, we prospectively examined the feasibility of tubeless thoracoscopic bullectomy for patients with primary spontaneous pneumothorax (PSP).

METHODS
Between January 2021 and November 2021, 30 patients with PSP were registered in this prospective study. Conventional surgical steps with a sealing test (15 cmH2O pressure) were performed. A chest drainage tube was placed in the thorax at the end of all operations. After confirmation that air leakage was absent and that lung expansion was radiographically evident, the tube was removed in the operating room. If either condition persisted, the tube was held in place until at least the following day. The primary endpoint was postoperative air leakage requiring re-drainage among patients for whom the tube was successfully removed in the operating room. The secondary endpoints were postoperative pain evaluated using a numerical rating scale on approximately postoperative days (PODs) 1, 7, and 28; morbidity; and the postoperative hospitalization time.

RESULTS
Table 1 lists the patient characteristics and perioperative outcomes. Four patients (13.3%) were excluded because underlying pulmonary disease was intraoperatively detected in two, while air leaks were detected in the operating room in two. Of the remaining 26 patients, none required re-drainage. The postoperative hospitalization time was 1.2 ± 0.4 days. The numerical rating scale scores were 4.2 ± 2 (median, 4.5) on POD1, 1.6 ± 1.6 (median, 1) on POD7, and 0.4 ± 0.8 (median, 0) on POD28. No patient exhibited radiographic lung collapse on POD7 or any increase in subcutaneous emphysema on POD28.

CONCLUSIONS
Tubeless thoracoscopic bullectomy for PSP is feasible and may reduce the postoperative hospitalization time; it did not greatly reduce postoperative pain on POD1.

Disclosure: No significant relationships.
Keywords: Tubeless, Thoracoscopic Bullectomy, Primary Spontaneous Pneumothorax.

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Variables	Results (n=30, %)
Age (years)	26.2 ± 11.4
Sex Female/Male (n)	10 (33.3)/20 (66.7)
Laterality Left /Righr (n)	20 (66.7)/10 (33.3)
Body Mass Index	19 ± 2
Smoking history +/- (n)	5 (16.7)/25 (83.3)
Comorbidities +/- (n)	1 (3.4)/29 (96.6)
Past history of sponteneous pneumothorax none/ipsilateral/contralateral/bilateral (n)	22 (73.3)/2 (6.7)/5 (16.7)/1 (3.4)
Degree of the pneumothorax mild/moderate/severe (n)	12 (40)/18 (60)/0 (0)
Detection of bullae on computed tomography +/- (n)	30 (100)/0 (0)
Preoperative thoracic drainage +/- (n)	13 (43.3)/17 (56.7)
Surgical approach uniportal/transareolar (n)	27 (90)/3 (10)
Operative time (min.)	38 ± 14
Blood loss (g)	minimal
Treated lobe LUL/LLL/RUL/RML/RLL (n)	18 (60)/2 (6.7)/10 (33.3)/0 (0)/0 (0)
The number of used staplers	3.2 ± 1.3
Postoperative hospitalization time (days)	1.5 ± 1.1
Morbidity postoperative air leak/hemoptysis/- (n)	2 (6.7)/1 (3.3)/27 (90)

P-105

OUTCOMES FROM IMPLEMENTATION OF A ROBOTIC FELLOWSHIP PROGRAM IN THORACIC SURGERY IN A TERTIARY CARDIOTHORACIC CENTRE

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OBJECTIVES
The construction of a robotic theatre in our department to accommodate the introduction of the da Vinci Xi Robot (Intuitive Surgical, Sunnyvale, California), dedicated to thoracic surgical procedures, resulted in significant shift of routine practice from video-assisted lobectomies to robotic-assisted sub-lobar resections. Early on, we recognised the need to establish a fellowship program, aimed at senior trainees wishing to develop sub-specialty interest and skills in the evolving field of thoracic robotic surgery. Our aim was to document and demonstrate the outcomes since the introduction of the robotic fellowship program in our centre.

METHODS
During a challenging period overlapping the COVID-19 pandemic, between January 2019 to October 2021, we performed 187 robotic-assisted anatomical lung resections; 73 (39.04%) were performed by senior trainees as primary operators. Data was collected and analysed from prospectively populated surgical databases and patient's medical records.

RESULTS
Comparison of pre-operative parameters such as body-mass index and lung function (FEV1, DLCO) between patients operated by a trainer or a trainee showed no statistically significant difference. Intra-operative parameters such as operation times, fissure completeness and surgical complexity scores (considering adhesions, redo, completion, sub-lobar resections) were also comparable between the two groups (Table 1) with only blood loss during the operation recorded higher in cases performed by the trainer (mean 165ml Vs 87ml; p=.01). Post-operative complications were similar between the two groups; while overall length of post-operative stay was less for patients operated by the trainer, it was not significantly different (mean 6days Vs 7days; p=.48).

CONCLUSIONS
With increased adoption of robotic resectional surgery, surgical technical skills increasingly need to be supplemented with online learning, simulation, and hands-on training. Our experience shows that appropriately formulated, surgeon-led training programs targeted at future thoracic surgeons can be safe and effective, providing trainees with unique career opportunities, to pursue higher level of mentoring and professional development.

Disclosure: No significant relationships.
Keywords: Thoracic Surgery, Robotic-Assisted Thoracoscopic Surgery, Lung Resection, Lung Cancer.

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Table 1. Comparative outcomes between trainer and trainees.

Parameter	Training status	N	Mean	Std. Deviation	Levene's Test for Equality of Variances	Significance (2-tailed)
Pre-operative **Age** (years)	Trainer Trainees	114 73	67.77 71.47	9.41 7.94	.088	*.006*
BMI (kg/m²)	Trainer Trainees	110 72	27.75 27.76	5.98 5.37	.799	*.989*
FEV1 (% pred)	Trainer Trainees	112 72	81.57 84.33	16.94 19.79	.257	*.315*
DLCO (% pred)	Trainer Trainees	106 71	70.60 73.83	17.97 19.83	.345	*.262*
Peri-operative **Operation time** (mins)	Trainer Trainees	112 73	218.15 202.26	81.85 61.53	.051	*.158*
Fissure difficulty* (score)	Trainer Trainees	110 71	2.35 2.10	.93 .93	.230	*.073*
Blood loss (ml)	Trainer Trainees	83 70	165.66 87.14	234.25 113.15	.001	*.008*
Lymph node dissection (n)	Trainer Trainees	113 73	3.71 3.82	1.37 1.10	.070	*.546*
Stapler firings (n)	Trainer Trainees	114 73	8.77 8.92	4.11 2.99	.064	*.794*
Overall complexity† (score)	Trainer Trainees	114 73	1.54 1.47	.63 .56	.130	*.388*
Post-operative **Number of complications‡**(score)	Trainer Trainees	44 25	1.20 1.36	.41 .81	.012	*.377*
Length of stay (days)	Trainer Trainees	114 73	6.12 7.12	7.16 12.17	.156	*.480*
Pain severity§ (score)	Trainer Trainees	114 73	.63 .62	.94 .88	.794	*.912*

	Score
Fissure difficulty *Complete with entirely separate lobes.* *Complete visceral cleft but parenchymal fusion at the base of the fissure.* *Visceral cleft evident for part of the fissure.* *Complete fusion of the lobe with no evident fissure line.*	*Score* *1* *2* *3* *4*
*†***Overall complexity*** *Anatomical resection – Lobectomy.* *Anatomical resection – Segmentectomy.* *Extensive adhesiolysis.* *Redo +/- Completion procedure.* *Bilobectomy, Bronchoplasty / bronchial sleeve.*	*Score* *1* *2* *+ 0.5* *+ 1.5* *+ 2*
*‡***Number of complications*** *No complications.* *Surgical (Bleeding, Haemo-/Chylothorax, Persistent leak, Surgical emphysema, Further procedure).* *Lung related (Chest infection, Pulmonary embolism, Respiratory failure, Respiratory arrest).* *Heart related (Atrial fibrillation, Pericardial effusion, Pulmonary oedema).* *Other (Acute Kidney Injury, Ileus).*	*Score* *0* *+1 for each* *+1 for each* *+1 for each* *+1 for each*
*§***Pain severity*** *No significant or restricting pain reported following the procedure and on follow-up.* *Significant pain reported on POD 2.* *Significant pain reported on POD 4.* *Persisting pain reported on routine post-op follow-up.* *Neuropathic pain requiring medication at any time after the procedure.*	*Score* *0* *+1* *+1* *+1* *+1*

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SINGLE-STAGE LOCALIZATION AND THORACOSCOPIC REMOVAL OF PULMONARY NODULES IN A HYBRID OPERATING ROOM

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OBJECTIVES
The use of hybrid operating room for the simultaneous localization and thoracoscopic removal of pulmonary nodules (iVATS) is gaining popularity. We report our experience with iVATS procedures, with a special attention to our workflow based on the alternative use of two different markers according to the location of the lesion.

METHODS
All patients with non-palpable lesions requiring VATS wedge resection underwent localization of the targets in hybrid operating room. Lesions were considered non-palpable if they were small (<1cm), deep (>1cm from surface), subsolid or located within a dystrophic area. Anesthetized patients were placed in lateral decubitus. Cone-beam CT was performed, and the needle trajectory was planned by means of dedicated software. A coil was placed in case of lesions deeper than 2 cm or located behind the scapula. In all the remaining situations, a hook-wire was used. The device position was verified by cone-beam CT or fluoroscopy.

RESULTS
From April 2016 to July 2021, 56 iVATS were performed. The median lesion size and distance from the pleural surface were 10 mm (range 5 - 25 mm) and 25 mm (range 6 - 55 mm) respectively. The localization was performed with 26 hook-wires and 30 coils, median length of the procedure was 24 minutes (range 11 - 65 minutes). iVATS was successful in 52 patients (96.4%). 53 wedge resections were completed by VATS, 3 (5.4%) required conversion to thoracotomy. In 15 patients with intra-operative diagnosis of NSCLC a lobectomy was performed. All patients had a regular postoperative course; median length of stay was 3 days.

CONCLUSIONS
iVATS seems to be a helpful tool for simultaneous localization and removal of non-palpable pulmonary nodules. A versatile approach using different devices seems advisable for the removal of targets in every clinical scenario. Future research is required to compare iVATS with traditional localization techniques.
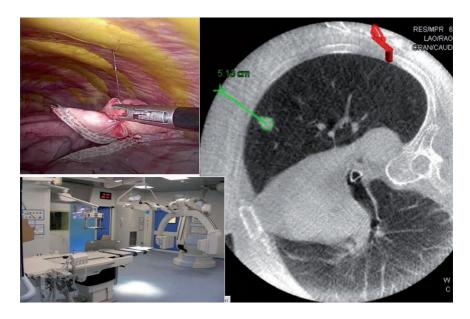
Disclosure: No significant relationships.
Keywords: Hybrid Operating Room, IVATS, Cone-Beam CT, Lung Cancer.

Marker (number)	Nodule mean diameter (mm)	Nodule mean depth (mm)	fluoroscopy duration (sec)	Surgery duration (min)
Coil (30)	13 (±6.2 SD)	28 (±8.7 SD)	335 (± 301 SD)	128 (± 70 SD)
Hook-wire (26)	10 (±4.5 SD) p=0.04	21 (±9.8 SD) p<0.01	186 (± 113 SD) p=0.04	81 (± 49 SD) p<0.01

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TRIPORTAL ANATOMICAL PULMONARY RESECTION WITH A NEW ROBOTIC PLATFORM: EARLY EXPERIENCE

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OBJECTIVES
The purpose of this study is to compare the first experiences in typical lung resections carried out with the robotic Versius Surgical System versus the thoracoscopic procedure.

METHODS
Commonly using the uniportal or biportal VATS technique we were puzzled to practice pulmonary lobectomy with 4-5 robotic accesses. For this reason, we tested a triportal RATS technique in the wet-lab, then we transferred it to clinical practice. Thoracic accesses: 3.5 cm anterior utility incision in 6th intercostal space hosting one operative robotic arm plus instruments managed by assistant; 12mm camera port in 8th intercostal space on posterior axillary line; 5mm port dedicated to the second robotic arm in the 6th space posterior to scapula tips. Data of the first consecutive patients treated with RATS were collected prospectively and compared with the first corresponding interventions carried out with VATS by the same surgeons.

RESULTS
From November 2021 to January 2022, we performed 8 typical lung resections with triportal RATS using the Versius System (6 lobectomy, 2 segmentectomy). Corresponding VATS patients were reviewed. Patients in both groups were similar for age, sex, smoking addiction and comorbidities but Versius patients had higher preoperative clinical stage. The average operative time was 316±71 and 236±39 minutes for Versius and VATS group, respectively. No operative death nor reoperation occurred. One RATS case required conversion to open surgery to manage little bronchial lesion. Two patients experienced Grade II morbidities in both groups. Chest tube and length of stay was shorter in Versius patients.

CONCLUSIONS
With our technique, the Versius robotic arm is free to move in the utility incision allowing the assistant to manage staplers, extract lymph-node samples and help mobilize the parenchyma. Our experience suggests that typical pulmonary resection with Versius system is possible, limiting the thoracic access to a classical triportal technique

Disclosure: Relationship with CMR surgical as HCP
Keywords: Robotic Surgery, Lung Cancer, RATS Lobectomy, VATS Lobectomy.

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LONG-TERM SURVIVAL AFTER OPEN AND THORACOSCOPIC SEGMENTECTOMY IN PATIENTS WITH STAGE IA LUNG CANCER

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OBJECTIVES
Segmentectomy has been established as a parenchymal-sparing alternative in addition to lobectomy for early-stage lung cancer and in patients with limited pulmonary reserve. Advantages of minimally invasive procedures, such as shorter length of stay and lower complication rates, have also been demonstrated for segmental resection. In this study, in which data from 291 patients were retrospectively analyzed, open versus thoracoscopic segmentectomy was compared in terms of long-term survival.

METHODS
Data from 291 patients with clinical stage IA lung cancer who underwent segmentectomy between 2006 and 2017 were retrospectively analyzed.

RESULTS
Open segmentectomy was performed in 143 patients (49%) and thoracoscopic segmentectomy in 148 patients (51%). The median tumor size was 1.8 cm. Upstaging in pathologic tumor classification due to hilar or mediastinal lymph node metastases occurred in approximately 6% of the cases. Patients who underwent thoracoscopic surgery had a shorter length of stay and a lower rate of respiratory complications than patients who underwent open surgery. There were no significant differences in long-term survival between the groups. The median survival was 79 months.

CONCLUSIONS
Segmentectomy is suitable for patients with stage IA lung cancer and for patients with functional limitations. In this study, the surgical technique was shown to have no effect on long-term survival. In addition, this study confirmed existing data demonstrating the advantages of thoracoscopic segmentectomy over open surgery.

Disclosure: No significant relationships.
Keywords: Segmentectomy, Early Stage Lung Cancer, VATS.

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ROBOTIC ASSISTED MAJOR LUNG RESECTION IN ELDERLY PATIENTS: RESULTS FROM A RETROSPECTIVE STUDY

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OBJECTIVES
The incidence of lung cancer increases with aging. With life expectancy increasing over the last three decades, there are 143 millions of people worldwide aged 80years old. Elderly used to represent a challenge in thoracic surgery due to a higher risk of complications. Several studies demonstrated that robotic-assisted thoracic surgery (RATS) enhances patients recovery lessening surgical trauma. The aim of this study was to evaluate the outcome in both elderly and younger patients who underwent anatomic lung resection in RATS.

METHODS
Clinical data were pooled retrospectively from two major hospitals performing high volume thoracic surgery for lung cancer, and divided in two groups: below and above 80years old. Statistical analysis was performed using R software. The association of continuous variables with categorical ones was evaluated using the nonparametric Kruskal-Wallis test. Comparison of categorical variables was performed using the Wilcoxon signed-rank test.

RESULTS
From 2015 to 2021, 247 consecutive patients were enrolled. Twenty-four were above and 223 below 80years old (82±2 vs 67±9 years, respectively; p <0.001). Male sex was more represented in the elderly group (79.2% vs 57.8%; p= 0.043), along with ASA score (p= 0.01) and clinical stage (p= 0.02). Elderly patients underwent bilobectomy and pneumonectomy more frequently (p=0.008) with squamous cell being the main histotype (34.8% vs 12.3%; p= 0.008). Postoperative stay (5.8 ±2.9 vs 5.7 ±3.2 days; p= 0.443), complication rate (37.5% vs 29.3%; p= 0.696) and a Clavien-Dindo grade >2 (16.7% vs 16.3%; p= 0.443) did not significantly differ between groups.

CONCLUSIONS
Despite a higher ASA score, clinical stage of the disease and a higher extent of pulmonary resection in the elderly group the postoperative stay, complication rates and grading did not significantly differ between the two groups. This suggests that RATS approach was able to counterbalance the higher surgical risk of elderly patients.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Robotic Surgery, Major Lung Resection, Elderly, Octogenarian.

		younger (n=223)	elderly (n=24)	p-value
Sex, n (%)	Male	129 (57.8)	19 (79.2)	0.043
Female		94 (42.2)	5 (20.8)	
Age, mean (SD), years		67 (9)	82 (2)	<0.001
BMI, mean (SD)		26.1 (4.4)	25.5 (3.1)	0.588
Smoking status, n (%)	Never	45 (20.7)	4 (17.4)	0.427
	Former	95 (43.8)	14 (60.9)	
	Current	73 (33.6)	5 (21.7)	
	Unknown	4 (1.8)	0 (0)	
Pack/years, mean (SD)		44.8 (27.7)	47 (25.6)	0.630
ASA score, n (%)	1	6 (3)	0 (0)	0.010
	2	131 (65.5)	7 (35)	
	3	63 (31.5)	13 (65)	
FEV1%, mean (SD)		90.9 (18.9)	92.3 (23.8)	0.856
DLCO%, mean (SD)		79.60	81.4	0.812
Clinical Stage, n (%)	I	155 (76.7)	9 (50)	0.021
	II	29 (14.4)	7 (38.9)	
	III	18 (8.9)	2 (11.1)	
Adjuvant Chemo, n (%)	No	208 (93.7)	23 (100)	0.215
	Yes	14 (6.3)	0 (0)	
Surgical procedure, n (%)	Segmentectomy	46 (20.6)	5 (20.8)	0.008
	Lobectomy	171 (76.7)	15 (62.5)	
	Bilobectomy	2 (0.9)	2 (8.3)	
	Pneumonectomy	4 (1.8)	2 (8.3)	
Side, n (%)	Right	124 (55.6)	16 (66.7)	0.299
	Left	99 (44.4)	8 (33.3)	
Histology, n (%)	Adenocarcinoma	141 (64.1)	13 (56.5)	0.008
	Squamous cell carcinoma	27 (12.3)	8 (34.8)	
	Other	52 (23.6)	2 (8.7)	
Complication, n (%)	No	157 (70.7)	15 (62.5)	0.696
	Yes	65 (29.3)	9 (37.5)	
Complication grade, n (%)	0	158 (71.2)	15 (62.5)	0.443
	1	8 (3.6)	2 (8.3)	
	2	38 (17.1)	3 (12.5)	
	3	15 (6.8)	4 (16.7)	
	4	2 (9)	0 (0)	
	5	1 (0.5)	0 (0)	
Lenght of stay, mean (SD), days		5.75 (3.2)	5.83 (2.9)	0.539
Lenght of surgery, mean (SD), minutes		181.6 (57.4)	191.6 (48.0)	0.296

P-110

PATIENT-SPECIFIC SIMULATION FOR TRACHEOBRONCHIAL RECONSTRUCTION PROCEDURES USING THREE-DIMENSIONAL OPERABLE MODELS BASED ON COMPUTED TOMOGRAPHY: A PROOF-OF-CONCEPT STUDY

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OBJECTIVES
Surgical simulation may be beneficial for the conduct of airway reconstruction which is relatively rare, complex, and high-risk. Operable airway models from preoperative computed tomography (CT) were developed to assist patient-specific simulation for tracheobronchial reconstruction.

METHODS
This retrospective study included three patients with non-small cell lung cancers who underwent sleeve lobectomies: right upper sleeve lobectomy (Case 1: 76-year-old male), right middle and lower sleeve lobectomy (Case 2: 60-year-old female), and left lower and lingular segment extended sleeve lobectomy (Case 3: 59-year-old male). The invasive lesion in the central airway was annotated in each preoperative enhanced CT (Fig.1A). The invasive lesion, cartilage, and the other connective tissues were separately recognized (Fig.1B), and data were converted for three-dimensional (3D) printing (Fig.1C). Two urethan materials mimicking the rigidity and elasticity of the cartilage and remaining tissue (including the invasive lesion) were used. The invasive lesion was highlighted with blue color. Each model was operated on and evaluated by the actual surgeon of each surgery.

RESULTS
Three models including invasive lesion were successfully created (Fig.1D). Three board-certified thoracic surgeons rated each model based on how closely it reproduced the exposure and tissue texture of the airway during each actual surgery (Likert scale: 1 = poor to 5 = excellent). The median (range) scores were acceptable: anatomical reproducibility, 5 (4-5); disease reproducibility, 4 (4-5); surgical exposure, 4 (3-5); rigidity, 3 (2-4); elasticity, 4 (3-5); resistance to needles, 3 (2-4); and resistance to tying, 3 (3-4). The time from data extraction to receive of model was 31 (including trial-and-error process) / 17 / 17 days in Case 1/2/3, respectively.

CONCLUSIONS
3D airway models representing precise airway anatomy, including invasive lesions, were successfully created based on preoperative CT. Actual procedures were reproduced on the models demonstrating promise in prospective patient-specific simulation for tracheobronchial reconstruction.
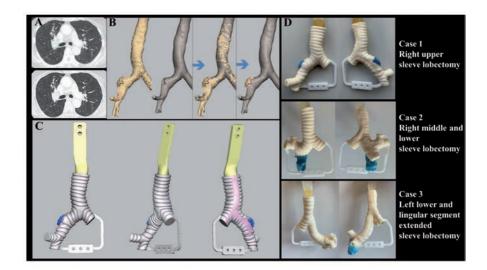
Disclosure: No significant relationships.

P-111

**INDUCTION CHEMOTHERAPY IN LOCALLY ADVANCED NON SMALL CELL LUNG CANCER (NSCLC) UNDERGOING RADICAL SURGERY.
A COMPREHENSIVE ANALYSIS OF PRE- AND POST-OPERATIVE PROGNOSTIC FACTORS**

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OBJECTIVES
Lung cancer is the leading cause of cancer related mortality worldwide with 1.8 million deaths per year. Adenocarcinoma of the lung is the most commonly diagnosed histological subtype of non-small cell lung cancer (NSCLC). The aim of the study is to evaluate the predictive factors of response to induction chemotherapy in patients with locally advanced NSCLC who subsequently underwent surgical radical resection.

METHODS
Eligible patients came from 3 different centers with a diagnosis of NSCLC and undergoing induction therapy, with postsurgical pathological stage IB, II, or IIIA. Complete resection of the primary NSCLC was mandatory. Administration of standard preoperative induction chemotherapy was decided by tumor board oncologist. Patient's data were retrospectively evaluated, in particular lymph node downstaging after induction chemotherapy, response according to RECIST criteria and pathological response. 5-year Overall-survival (OS) and Disease Free survival (DFS) were evaluated.

RESULTS
We considered 82 patients, mean age 65.5 (±8.6), with complete surgical resection
The FU was of 45.6 (±9.2) months, with an overall survival at 5 years of 58% (95% CI, 47.7 to 71.8). Patients who presented a pathological tumor regression over 50% had an OS of 70.7% (95% CI, 53 to 88.5), meanwhile patients without pathological tumor regression had an OS of 39.1 % (CI 95%, 27.8 to 48.7; p= 0.05). Moreover, patients with downstaging of mediastinal lymphnodes (OS 68% vs 41%, p = 0.03) and patients under the age of 66 had a significantly better OS (100% vs 37% at 5 years, p = 0.005).

CONCLUSIONS
Our study confirms the validity of induction chemotherapy followed by radical surgery in patients with locally advanced NSCLC. Multidisciplinary evaluation plays a key role in the selection of patients receiving induction chemotherapy. In multivariate analysis, pathologic response to chemotherapy, age and N2 downstaging were significant prognostic factors.

Disclosure: No significant relationships.
Keywords: Induction Chemotherapy, Locally Advanced NSCLC.

Posters
Abstract 026-146

P-112

NOVEL SURGICAL TECHNIQUE FOR MINIMAL INVASIVE RIBFIXATION USING NITINOL FIXATION PLATES AND VATS

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OBJECTIVES
Operative fixation is becoming a more accepted strategy in the management of multiple single ribfractures and flailchest. Surgical stabilization of ribfractures (SSRF) is being performed increasingly and preferred method is screw-plate fixation. A disadvantage of screw plate fixation is often the need for large open exposures to stabilize fractures. Best operative exposure and strategy as well as implant technology is still being developed and debated. We present a series of patient with multiple ribfractures or flailchest operated minimally invasive using a new combination of surgical techniques.

METHODS
A total of 62 patients that underwent ribfixation using screwless NiTinol osteosynthesis and VATS between January 2019 until December 2021, were included. Data was collected retrospectively on demographics, data of operation and admission and 90 days follow-up.

RESULTS
Data of 62 patients was included, 20 patients (34%) with multiple single ribfractures and 41 patients (66%) with flailchest. A total of 15 patients (23%) were female, median age was 61 years (IQR 50-72). Multiple intra-thoracic injuries were treated by VATS: hematomas in 54 patients (87%), diaphragm ruptures in 3 patients (4%), 4 patients (7%) suffered lung parenchymal injuries. During admission 9 patients (14%) developed a pneumonia, wound infection occurred in 2 patients (3%), no plate failure was seen.

CONCLUSIONS
NiTinol ribfixation combined with VATS is a novel treatment strategy in thoracic wall injuries. Starting with VATS enables us to asses and treat intra-thoracic injuries and precisely localize ribfractures. By VATS we can identify key-fractures to the chest wall stability without stabilizing every fracture. Use of screwless NitiNol-osteosynthesis facilitates smaller incisions and muscle sparing dissection contributing to further minimizing surgical trauma. We think that combining the surgical techniques improves outcome by reducing surgical burden as well as early recognition and treatment of possible other injuries.
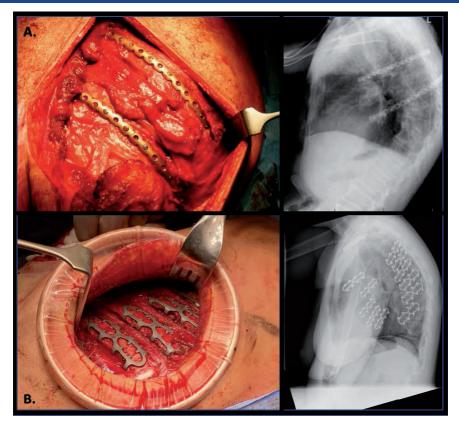
Disclosure: No significant relationships.
Keywords: Ribfixation, Chest Wall, Nitinol, VATS.

P-113

THE IMPACT OF CORONAVIRUS-19 DISEASE PANDEMIC ON SURGICAL VOLUME OF A HIGH VOLUME THORACIC SURGERY UNIT AND OUTCOME

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OBJECTIVES
Between March and June 2020, COVID-19 crisis broke out in Italy, with emergency state declared. We analysed the impact of the pandemic on the number of elective accesses for lung cancer to our Unit.

METHODS
We retrospectively collected and analysed data of patients selected for surgery for lung tumour in our thoracic surgery division from January 2019 to October 2021.
The patients were shared in 3 groups; "pre covid period"(PCP), form January 2019 to February 2020, "acute covid period"(ACP), from March to June 2020, "chronic covid period"(CCP), from July 2020 to October 2021. We analysed number of patients per period, clinical characteristics, stage, and compared the 3 periods.
Differences among these groups were tested using T-student and Chi-squared test.

RESULTS
We included 595 patients:261 patients during PCP, 29 patients during ACP,304 patients during CCP, with 40 considered unfit for surgery.
Upstaging (p-stage higher compared to c-stage) did not present significant differences:43(20%) patients during PCP,5(19%) during ACP and 28(12,5%) during CCP (p=0.926 for PCP Vs ACP and p=0.337 for ACP vs CCP).
There was a significant difference considering patients mean age among the 3 periods: 66.75±14.7years in PCP, 55.93±27.15years in ACP and 67.92±11.2years in CCP(p<0.001).
In 2019, 2020 and 2021 we had a mean of 59.75±21.65, 36.75±9.65 and 58±8.04 patients operated per trimester for lung tumour respectively, with a significant difference comparing 2020 with 2019 and 2021 surgical volume(p=0.047).

CONCLUSIONS
Coronavirus pandemic led to a decrease in 2020 in the volume of elective surgery for lung tumour, with a significant improvement in 2021. The age difference shows that youngest patients were operated during ACP.
The growth in the operative volume in 2021 is the expression of our effort to overcome the reduction of medical assistance experienced during the hardest pandemic months.

Disclosure: No significant relationships.
Keywords: Lung Cancer, Covid-19, Surgery, Pandemic, Upstage.
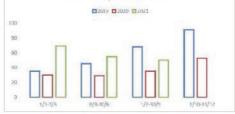
Patients characteristics		Patients characteristics	
Sex (n(%))		**Kind of resection (n(%))**	
Female	270 (45.4)	Lobectomy/Bilobectomy	337 (60.7)
Male	325 (54.6)	Pneumonectomy	6 (1.1)
		Wedge resection	158 (28.5)
Age (average ± sd)		Segmentectomy	54 (9.7)
Pre covid (1/1/2019-7/3/2020)	66.75±14.7		
Acute covid (8/3/2020-30/6/2020)	55.93±27.15	**Upstaging (n (%))**	
Chronic covid (1/7/2020-30/9/2021)	67.92±11.2	Pre covid period	43 (20)
		Acute covid period	5 (19)
cT (n(%)) (509 suspected primitive lung cancer)		Chronic covid period	28 (12.5)
T1	363 (71.3)		
T2	93 (18.3)	**pT (n(%))**	
T3	36 (7.1)	1	314 (65)
T4	17 (3.3)	2	116 (24)
		3	37 (7.6)
cN (n(%))		4	16 (3.4)
N0	452 (88.8)		
N1	28 (5.5)	**pN (n(%))**	
N2	29 (5.6)	0	414 (86)
		1	30 (6.2)
cM (n(%))		2	39 (7.8)
0	506 (99.4)		
1	3 (0.6)	**pM (n(%))**	
		0	481 (99.9)
cStage (n(%))		1	2 (0.1)
I	363 (71.3)		
II	81 (16)	**Histology (n(%))**	
IIIA	38 (6.4)	Adenocarcinoma	345 (62.2)
IIIb	24 (6)	Squamous cell	84 (15.1)
IV	3 (0.6)	Other primitive malignancy	54 (9.7)
		Benign lesion	24 (4.3)
pStage (n(%)) (483 confirmed primitive lung cancer)		Metastasis	48 (8.7)
I	339 (70.2)		
II	87 (18.1)	**Patient number per trimester (average ± sd)**	
IIIA	45 (9.3)	2019	59.75±21.65
IIIb	10 (2.1)	2020	36.75±9.65
IV	2 (0.3)	2021	58±80.04

Patients per trimester

P-114

IS THE USE OF DIRECT ORAL ANTICOAGULANT SAFE FOR PATIENTS AFTER NON-CARDIAC THORACIC SURGERY?

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OBJECTIVES
We investigated the safety and efficacy of postoperative use of direct oral anticoagulants (DOAC) compared with warfarin in patients who underwent non-cardiac thoracic surgery.

METHODS
A retrospective study was done in 434 patients who were prescribed anticoagulants in a single center. They were divided into two groups depending on the type of anticoagulant: warfarin (W group) and DOAC (D group). Thromboembolic events within 30 days after operation were evaluated in both groups.

RESULTS
Three (1.2%) out of 247 in D group, and one (0.5%) out of 187 in W group had thrombotic events. Four (1.6%) in D group and four (2.1%) in W group encountered bleeding events. Among eight cases with bleeding, five had the event after resumption of anticoagulant agent: four in D group, and one in W group. As for bleeding events in D group, all patients had HAS-BLED 3 or more point and the events occurred within five days after resumption. No abnormal status of coagulation were observed at the time of bleeding. Diagnosis of bleeding was made with the nature of thoracic drainage in three and symptom of syncope in one.

CONCLUSIONS
DOAC is effective in thoracic surgery to prevent thromboembolic events, though the incidence of major bleeding was observed. Caution should be taken for resumption of DOAC, especially for patients with HAS-BLED 3 or more points.

Disclosure: No significant relationships.
Keywords: Thoracic Surgery, Direct Oral Anticoagulants.

P-115

CURRENT PRACTICE OF ROBOTIC THORACIC SURGERY WITHIN EUROPEAN SOCIETY OF THORACIC SURGEONS (ESTS) ACROSS THE GLOBE IN 2022. RESULTS OF AN OPEN SURVEY

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OBJECTIVES
To determine the current practice on robotic-assisted thoracic surgery (RATS) within ESTS in 2022

METHODS
A survey of 17 questions was rolled out within ESTS with 1 surgeon per unit responses acceptable

RESULTS
Total 174 responses obtained-56.07% board-certified thoracic surgeon, 28.32% chief of the unit. Maximum responses were from Italy (20), followed by Germany and Switzerland. 22 % had no robotic system in their institution, 31% had limited access. Only17.44% had full access to robot including proctoring. Da Vinci Xi was commonest system in 55.18% centers. 25% had dual consoles in all robots and 62.8% had none.

RATS simulator was available in 51.18% of these systems.

115 responded to performing anatomical lung resections by open approach;139 by VATS and 62 by RATS. 39% spent time on robotic simulator, 50.98% on robotic wet/dry lab, 46-59% on VATS platform.

52.02% reported robotic surgery being not included in the training curriculum with no plans to introduce in future.36.42% had some plans to introduce, 7.51% already had robotics as part of their curriculum.

51.45% responded of VATS helpful in RATS training due to familiarity with MIS anatomical views and dissection.

71.26% reported that future thoracic surgeons should be proficient in both VATS and RATS whereas 4.02% by RATS only.

52.02% responded of no difference in earlier chest drain removal with VATS/RATS,34.68% found no difference in postoperative pain and 48.55% no difference in hospital stay. However,52.33% reported better lymph node harvest by RATS.
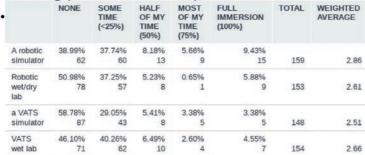
CONCLUSIONS
Survey concluded with 70.69% surgeons recommending to adopt robotics in future. This could be better achieved with introduction of robotics in training curriculum. To note, results indicate no subjective differences in chest drain removal, postoperative pain nor LOS but better lymph node harvest.

Disclosure: No significant relationships.
Keywords: Robotic-Assisted Thoracic Surgery, VATS, Training, Curriculum.

Q12: How many hours did you spend on a training platform already, in total, on:

	NONE	SOME TIME (<25%)	HALF OF MY TIME (50%)	MOST OF MY TIME (75%)	FULL IMMERSION (100%)	TOTAL	WEIGHTED AVERAGE
A robotic simulator	38.99% 62	37.74% 60	8.18% 13	5.66% 9	9.43% 15	159	2.86
Robotic wet/dry lab	50.98% 78	37.25% 57	5.23% 8	0.65% 1	5.88% 9	153	2.61
a VATS simulator	58.78% 87	29.05% 43	5.41% 8	3.38% 5	3.38% 5	148	2.51
VATS wet lab	46.10% 71	40.26% 62	6.49% 10	2.60% 4	4.55% 7	154	2.66

P-116

IS THERE A DIFFERENCE IN LOCAL DISEASE CONTROL BETWEEN A VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) AND THORACOTOMY APPROACH?

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OBJECTIVES
Differences in oncologic outcome between VATS and open thoracotomy have not yet been thoroughly investigated for NSCLC. Most studies suggest a similar outcome, but nodal upstaging as a quality parameter is frequently reported to be higher in thoracotomy patients. If more positive lymph nodes are missed by VATS, pN0 in these patients should result in a higher failure rate of local disease control. In this study we analyze the difference of VATS to open thoracotomy regarding above mentioned parameters.

METHODS
The institutional database was queried. Exclusion criteria were pathologic nodal positive status, metastatic disease, tumour size >4cm, adjuvant/neoadjuvant therapy. 422 patients were included. The VATS cohort included 350 patients, the thoracotomy cohort 72 patients.

RESULTS
A VATS approach in patients with pathologic N0 disease did not show a significantly higher rate for local or lymph node recurrence compared to thoracotomy (12.9% vs. 19.4%; p=0.142). There was no difference in disease-free and overall survival comparing the two groups. Comparing the location of recurrence, thoracotomy patients showed a significantly higher rate of metastatic disease (3.04% vs. 11.54%; p=0.014), most likely due to a longer follow-up time. Other clinical factors did not differ between groups.

CONCLUSIONS
VATS lobectomy does not result in a higher rate of local disease recurrence, suggesting adequate lymph node dissection with this approach. Other factors than the surgical technique might be responsible for nodal upstaging, therefore nodal upstaging should no longer be used as a quality marker for lymph node dissection.

Disclosure: No significant relationships.
Keywords: Lung Cancer, VATS, Local Disease Control, Lymph Node.

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Abstract 026-146

P-117

PLEURAL EMPYEMA: ARE OUTCOMES AFTER OPERATIVE THERAPY DEPENDING ON SURGICAL ACCESS OR POSITIVE MICROBIOLOGICAL RESULTS?

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OBJECTIVES
Pleural empyema can lead to a lethal condition with organized pus, lung restriction and sepsis related organ failure. To constitute differences in outcomes among patients who underwent video-assisted thoracic surgery (VATS) and open thoracotomy (OT), we conducted a single-center study.

METHODS
Data from 126 patients with pleural empyema, who underwent either VATS or thoracotomy (OT) at our institution from 2010 to 2019 were collected retrospectively. The different groups were analyzed towards the endpoints of comorbidity, mortality, length of hospital and ICU stay.

RESULTS
126 patients with pleural effusion undergoing thoracic surgery were eligible for analysis. 109 (86.5%) patients underwent VATS and 17 (13.5%) thoracotomy. 7 Patients (5.6 %) showed an empyema at Stage I, 38 (30.2%) at stage II, 81 (64.2%) at stage III. Patients with positive microbiological results received more frequently two thoracic drainages (OR=3.2), antibiotic therapy (OR=5.9) and postoperative rinsing with antiseptic solution (OR=2.1). The second thoracic drainage remained longer [+3.7 (±1,2) days] among these patients, and they had a longer in hospital stay than patients with negative microbiological results. The mortality was significantly higher (OR=6.9) than in patients with negative cultural results. Wound healing deficit occurred more often in the OT group (OR=6.5 overall; OR=9.5 positive microbiological group). OT patients had a significantly longer ICU stay [16.7 (±5.2) days overall]. Decortication reduced the necessity of rinsing (65% less overall; 90% less among positive microbiological group), the need for reoperation (65% less overall; 81% less among positive microbiological group) and ICU stay.

CONCLUSIONS
Patients with chronic empyema should undergo open thoracotomy with extensive decortication to ensure full lung expansion. VATS significantly decreases risk of postoperative complications such as wound healing deficit and ICU stay. Perioperative microbiological screening should be performed. Preoperative rinsing with Lavasept® could be performed to facilitate decortication.

Disclosure: No significant relationships.
Keywords: Empyema, Parapneumonic Effusion, VATS, Thoracotomy.

P-118

RISK ANALYSIS OF POSTOPERATIVE CEREBRAL INFARCTION AND ASSESSMENT OF THE PREVENTIVE PROCEDURE FOR LUNG CANCER PATIENT UNDERGOING SURGERY

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OBJECTIVES
Postoperative cerebral infarction after lobectomy for primary lung cancer is a relatively rare but serious complication that affects the postoperative course. In this study, we investigated the risk factors for postoperative cerebral infarction and also assessed the efficiency of our devised procedure of dissecting the pulmonary vein last (PV-last procedure) in left upper lobectomy, which aimed to shorten the pulmonary vein stump to prevent cerebral infarction.

METHODS
We retrospectively reviewed patients who underwent a single lobectomy for lung cancer. Postoperative cerebral infarction was defined as onset within 90 days after surgery. We analyzed the risk factors for cerebral infarction and estimated the efficacy of the PV-last procedure, measured the length of the pulmonary vein stump, and analyzed the rate of cerebral infarction and survival times.

RESULTS
We identified five patients with postoperative cerebral infarction out of 1,189 patients. All five patients underwent left-sided lobectomy, specifically, three left upper and two left lower lobectomies. Left side lobectomy, lower FEV1.0%, and body mass index were significant risk factors for postoperative cerebral infarction ($P < 0.05$). The PV-last procedure was performed on 120 out of the 274 patients who underwent left upper lobectomy . The procedure significantly shortened the length of the pulmonary vein stump compared with the non-PV-last procedure ($P < 0.01$) (Figure 1A), and had some preventive effect on cerebral infarction (odds ratio 0.14; $P = 0.19$); there were one and two patients with cerebral infarction in the PV-last and non-PV-last procedures, respectively. There was no significant difference in survival between the two groups ($P = 0.23$). (Figure 1B).

CONCLUSIONS
Left side lobectomy, low body mass index, and FEV1.0% were significant risk factors for postoperative cerebral infarction. Although in a limited case series, the PV-last procedure might potentially demonstrate some efficacy in preventing postoperative cerebral infarction.
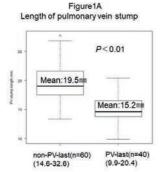
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Figure1A
Length of pulmonary vein stump
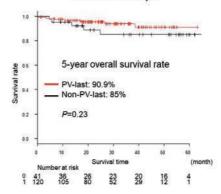
Figure1B
Overall survival analysis

P-119

A MULTI-YEAR, SINGLE SURGEON EXPERIENCE WITH ROBOT-ASSISTED THORACOSCOPIC SURGERY: COMPARING OUTCOMES BETWEEN EVOLVING SURGICAL SYSTEMS

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OBJECTIVES
Surgical departments are increasingly adopting the new da Vinci Xi system however, there remains paucity of data in thoracic surgery demonstrating its advantages compared to the da Vinci Si. Our aim was to compare surgical outcomes and evaluate each system's potential for training.

METHODS
We retrospectively analysed the clinical data of 283 patients with clinical diagnosis of lung cancer who underwent anatomical resections with the da Vinci Si (33.92%) or Xi (66.08%) surgical systems, between September 2018 to October 2021, under a single expert surgeon across two tertiary centres. Levene's test was performed for equality of variances and two-tailed t test was used to analyse outcomes; rejection of the null hypothesis at the level of 5% has been adopted.

RESULTS
Patients who underwent anatomical resections with the da Vinci Si system had better pre-op functional status, compared to the Xi (FEV1 91.89% Vs 82.65%; $p<.001$, DLCO 78.64% Vs 71.90%; $p=.025$). However, procedures performed with the da Vinci Xi system were technically more challenging than the Si, for the expert surgeon as well as trainees (Table 1), with a mean complexity score (calculated considering adhesions, redo, completion, sub-lobar resections) of 1.51 Vs 1.17; $p<.001$. Peri-operative blood loss was higher in cases performed with the Si system (250.66mL Vs 129.74mL; $p=.015$). Even though the length of post-operative stay was comparable between the two groups (5.49d Vs 6.51d; $p=.369$), patients operated with the Si suffered more complications (mean score 1.68 Vs 1.22; $p=.004$) and pain (mean score 1.17 Vs 0.63; $p<.001$), following their procedures.

CONCLUSIONS
Our experience demonstrates improved outcomes in thoracic surgery with the da Vinci Xi when compared to the Si. The da Vinci Xi offers technological advancements which allow more technically complex operations to be safely performed, without compromising training opportunities for those surgeons who are still on their learning curve.

Disclosure: No significant relationships.
Keywords: Thoracic Surgery, Robotic-Assisted Thoracoscopic Surgery, Da Vinci, Si, Xi.

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Table 1. Comparative outcomes between da Vinci Si and Xi surgical systems, from a single surgeon's experience in practice and with training.

Parameter	da Vinci	Primary Operator: Trainer			Primary Operator: Trainee			Primary Operator: All		
		N	Mean	Significance (2-tailed)	N	Mean	Significance (2-tailed)	N	Mean	Significance (2-tailed)
Pre-operative										
FEV1 (% pred)	Si Xi	60 112	90.13 81.57	**.003**	19 72	98.84 84.33	**.007**	82 184	91.89 82.65	**<.001**
DLCO (% pred)	Si Xi	37 106	76.51 70.60	.109	14 71	82.79 73.83	.108	53 177	78.64 71.90	**.025**
Peri-operative										
Operation time (mins)	Si Xi	60 112	223.47 218.15	.669	22 73	227.45 202.26	.089	86 185	223.74 211.88	.205
Fissure difficulty*(score)	Si Xi	61 110	2.64 2.35	.068	21 71	2.24 2.10	.526	87 181	2.53 2.25	**.028**
Blood loss (ml)	Si Xi	48 83	256.35 165.66	.073	5 70	196.00 87.14	.444	53 153	250.66 129.74	**.015**
Overall complexity† (score)	Si Xi	68 114	1.19 1.54	**<.001**	23 73	1.11 1.47	.001	96 187	1.17 1.51	**<.001**
Post-operative										
Complications‡(score)	Si Xi	29 44	1.69 1.20	**.002**	5 25	1.60 1.36	.534	34 69	1.68 1.22	**.004**
Length of stay (days)	Si Xi	64 114	6.16 6.12	.977	18 73	3.56 7.12	.219	84 187	5.49 6.51	.369
Pain severity§ (score)	Si Xi	22 114	1.14 0.63	**<.001**	2 73	1.50 0.62	.163	24 187	1.17 0.63	**<.001**

*Fissure difficulty	Score
Complete with entirely separate lobes.	1
Complete visceral cleft but parenchymal fusion at the base of the fissure.	2
Visceral cleft evident for part of the fissure.	3
Complete fusion of the lobe with no evident fissure line.	4

†Overall complexity	Score
Anatomical resection – Lobectomy.	1
Anatomical resection – Segmentectomy.	2
Extensive adhesiolysis.	+ 0.5
Redo +/- Completion procedure.	+ 1.5
Bilobectomy, Bronchoplasty / bronchial sleeve.	+ 2

‡Number of complications	Score
No complications.	0
Surgical (Bleeding, Haemo-/Chylothorax, Persistent leak, Surgical emphysema, Further procedure).	+1 for each
Lung related (Chest infection, Pulmonary embolism, Respiratory failure, Respiratory arrest).	+1 for each
Heart related (Atrial fibrillation, Pericardial effusion, Pulmonary oedema).	+1 for each
Other (Acute Kidney Injury, Ileus).	+1 for each

§Pain severity	Score
No significant or restricting pain reported following the procedure and on follow-up.	0
Significant pain reported on POD 2.	+1
Significant pain reported on POD 4.	+1
Persisting pain reported on routine post-op follow-up.	+1
Neuropathic pain requiring medication at any time after the procedure.	+1

P-120

THYMIC EPITHELIAL TUMORS WITH PLEURAL IMPLANTS: THE ROLE OF SURGERY

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OBJECTIVES
Pleural metastases of thymic epithelial tumours are diagnosed in 5-7% of patients at initial staging and in 10% of patients during follow-up after radical surgery. A cornerstone of treatment is a partial pleurectomy providing radical resection of all viable tumour deposits. We conducted a study to determine the role of surgery in treating patients with thymic epithelial tumours and pleural seeding.

METHODS
Twenty-one patients with resectable thymic epithelial tumour (thymoma – 13, thymic cancer – 8) and pleural implants (initial stage IVa– 11; isolated pleural metastases as tumour progression after radical surgery – 10) underwent surgery in our clinic in a 10-year period from 2010. Partial pleurectomy was performed in all patients along with the diaphragm and lung resection when necessary. Intraoperative photodynamic therapy was performed on 4 and intrapleural hyperthermic chemotherapy on 4 patients.

RESULTS
R0 resection was achieved in 12 (57,2%) patients. Postoperative complications were detected in 6 (28,6%) patients, mortality equalled 7,5%. Overall 1-, 3- and 5-year survival was 78% (95% CI 61-95), 49% (95% CI 23-75), 41% (95% CI 15-67) respectively. The median overall survival was 29 months (95% CI 0-60,6). Recurrence was diagnosed in 10 (47,6%) patients. Recurrence-free 1-year survival equalled 60% (95% CI 30-90). Independent negative predictors for overall survival were: thymic cancer, incomplete resection (HR: 5; 95% CI 1,08-23,9; p = 0,03) (fig. 1), postoperative complications (HR: 4,8; 95% CI 1,13-20,43; p = 0,03), and local recurrence (HR: 0,172; 95% CI 0,03-0,8; p = 0,026).

CONCLUSIONS
Surgery is the method of choice in the treatment strategy for patients with pleural metastases of thymic epithelial tumours at stage IVa or pleural progression after radical surgery. Thymic cancer histology and incomplete resection are unfavourable prognostic factors. Partial pleurectomy is the most frequent type of surgery performed with radical intent, significantly influencing the prognosis.
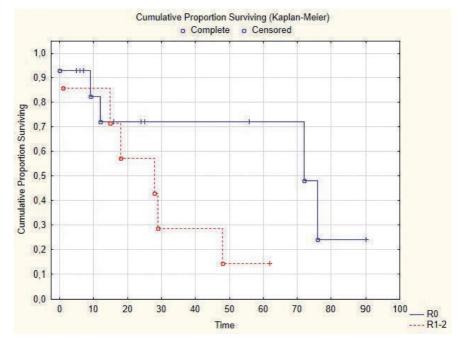
Disclosure: No significant relationships.
Keywords: Thymoma, Thymoma Recurrence, Pleural Seeds, Thymoma Metastasis.

P-121

CAN SIDE OF SURGERY AND TYPE OF SURGICAL APPROACH AFFECT MIDTERM SURVIVAL IN ANATOMICAL LUNG RESECTION?

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OBJECTIVES
Right sided procedure is a recognized risk factor in pneumonectomy. It is debatable if surgery side matters in other lung resections with different surgical modalities (VATS vs open). The aim of this study was to identify variables affecting midterm survival in the context of resection side and type of surgical approach.

METHODS
Clinical data were reviewed retrospectively in 195 patients undergoing anatomical lung resection for primary lung malignancy between Jan 2020 and Aug 2021. Robotic assisted resections were not involved. Midterm survival was assessed using Kaplan-Meier analysis and Cox proportional hazards regression.
Several variables were analysed with surgery side and type of surgical technique used as covariates. The same analysis was performed for the group with pneumonectomy excluded.

RESULTS
There was no early mortality. VATS rate was 79.5% in the main cohort and 81.2% in the cohort without pneumonectomy. Kaplan-Meier analysis in the main group showed a significantly longer mean survival time in VATS resections compared to open resections (695.9 vs 611.8, p=0.001) and left sided resections compared to right sided resections (701.2 vs 662.2, p=0.05). After excluding pneumonectomy mean survival time was still significantly longer in VATS resections (695.9 vs 613.7, p=0.005) but for different resection sides the significance was lost (700.1 vs 666.1, p=0.07). In Cox regression only size of tumour invasive component [p=0.0001, Exp(b) 1.04 (CI: 1.02 - 1.07)] and incomplete resection [p=0.05, Exp(b) 7.31 (CI: 1.35 – 39.5)] were retained in the model as significant variables.

CONCLUSIONS
VATS remains a golden standard in anatomical lung resections, affecting positively also midterm prognosis. Open technique is still valuable in more complex procedures. Right sided resections present with lower survival probability, but surgery side is of limited importance in predicting midterm outcome. Completeness of resection and size of tumour invasive component are the strongest predictors of midterm survival.
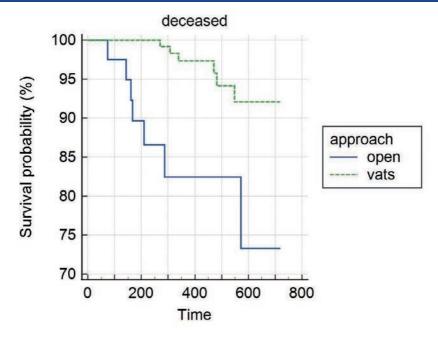
Disclosure: No significant relationships.
Keywords: Anatomical Lung Resection, Survival Analysis.

P-122

ELECTIVE BAR REMOVAL FOLLOWING THE NUSS PROCEDURE: A SINGLE CENTRE EXPERIENCE

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OBJECTIVES
The minimally invasive Nuss procedure is the standard treatment for pectus excavatum. This involves the insertion of a pre-sternal metal bar through which the deformity is corrected instantaneously. In general, the bar is removed after a period of three years. Bar removal may result in potentially life-threatening complications, and a recent systematic review recommends in-situ straightening of the bar before removal to minimise the risk of complications. This method is deviant from the one used in our centre where the bar is not straightened but carefully removed along the thoracic curvature. This study reports our single-centre experience with emphasis on perioperative complications after bar removal.

METHODS
A single-centre retrospective observational cohort study was conducted. Consecutive patients undergoing Nuss bar removal between 2011 and 2020 were eligible for inclusion. The primary outcome was the occurrence of perioperative complications. Secondary outcomes included operation duration, blood loss, and length of postoperative hospital stay.

RESULTS
A total of 320 patients were included in this study. Of these, 279 (87.2%) were male with a median age of 20 years (interquartile range 19 - 24). Perioperative complications occurred in a total of 4 patients (1.25%) following Nuss bar removal. Two patients (0.63%) experienced major complications, and no deaths were recorded. The median operation duration was 30 minutes (interquartile range 20 - 40). Median intraoperative blood loss was 5ml (interquartile range 5 - 15). Patients were discharged after a median postoperative stay of one day (interquartile range 1 - 1).

CONCLUSIONS
Nuss bar removal without prior in-situ straightening of the bar is associated with a low complication rate of 1%.

Disclosure: No significant relationships.
Keywords: Nuss Bar Removal; Pectus Excavatum.

P-123

PATTERNS AND TRENDS IN AIRWAY SURGERY: A SURVEY FROM THE BRAZILIAN SOCIETY OF THORACIC SURGERY

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[4]*Brazilian Society of Thoracic Surgery, São Paulo, Brazil*

OBJECTIVES

The Brazilian Society of Thoracic Surgeons conducted an on-line survey to determine how adult and pediatric airway surgery is performed, and to understand the distribution of the individuals along the country.

METHODS

Active members received electronic information about the survey and were invited to complete an on-line questionnaire from January to April 2020. The survey encompassed 4 topics in the assessment of tracheal diseases: (1) Surgeon`s Demography; (2) Institutional profile, (3) Education and training, (4) Preoperative and post operative. Analyses were limited to those involved with tracheal diseases.

RESULTS

Eighty-nine percent of the surgeons perform tracheal surgery and declared a median of 5 tracheal resection procedures per year(IQR 3-12). Interaction with other specialties occurs in 37.3% of cases. Surgeons were asked to identify which tracheal resection procedures they could perform (Figure 1). Access to technology and devices is highly variable across the country (p=0.001) (Table 1). Forty-four percent of the institutions have an active thoracic surgery residency program. Resident training in airway surgery consists in lectures in 97% of the cases. Training in animals(15.2%), cadavers(12,1%) and simulators(6,1%) are rare. The median number of tracheal resection procedures performed to achieve proficiency is deemed to be 20 (IQR: 10-30). Pre-operatory evaluation is done mainly with flexible bronchoscopy (97.8%) and/or CT scan of the airways (90,6%). Swallowing (20.1%) and voice (14.4%) disorders are rarely evaluated. Eighty nine percent of the surgeons consider bronchoscopy to be the best exam to determine the type of operation to be performed, followed by CT scan (38.8%) and CT-3D reconstruction (37.4%).

CONCLUSIONS

Brazilian surgeons refer that airway resection and reconstruction is part of their practice, but the total number of procedures per surgeon per year is low. Access to high-end technology and equipment is heterogenous. There is impending need to restructure the training offered to residents in most academic institutions.
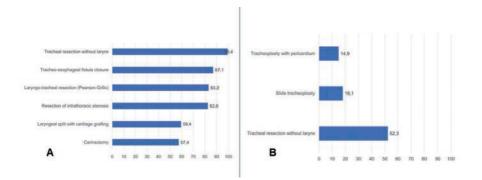
Disclosure: No significant relationships.
Keywords: Airway Surgery, Tracheal Stenosis, Trachea, Survey, Surgical Education.

Adult Flexible Bronchoscopy	98%
High-resolution CT scan	95.3%
Adult Laryngeal Mask (various sizes)	94.7%
Adult Rigid Bronchoscope	84.7%
Pediatric Rigid Bronchoscope	66%
Pediatric Flexible Bronchoscope	66%
Videolaryngoscope	58%
Cardiopulmonary bypass	53.3%
High-frequency jet ventilation	36%
ECMO*	27.3%

P-124

UNIPORTAL SUBXIPHOID VIDEO-ASSISTED THORACOSCOPIC (SVAT) APPROACH IN PULMONARY LOBECTOMY - A UNITED KINGDOM EXPERIENCE

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OBJECTIVES
Uniportal subxiphoid video-assisted thoracoscopic (SVAT) lobectomy is a novel approach aimed to reduce post-operative pain and enhance recovery. Evidence on SVAT remains scattered, particularly in Europe and Americas. We aim to share our experience as a single large-volume centre in the United Kingdom.

METHODS
Retrospective analysis of a prospectively collected database identified sixty-two patients undergoing SVAT lobectomy from August 2018 to December 2021. Data on patient characteristics and perioperative outcomes are presented as mean ± standard deviation. The surgical technique was previously described by Aresu et al.

RESULTS
Fifty-seven (92%) patients underwent SVAT lobectomy for suspected non-small-cell lung carcinoma, one (2%) for pulmonary oligometastases and four (6%) for benign disease. Mean age was 68.9±12.2, BMI of 24.6±4.11, FEV1/FVC of 58.60±23.17% and predicted TLCO 71.48±32.1%. Six (10%) SVAT lobectomies were performed via non-intubated approach with operating times of 203±66.1 minutes. In comparison, the mean operating times for intubated SVAT lobectomy was 201±59.7 minutes. Three (4.8%) patients required conversion to intercostal VATS due to suboptimal visualisation and two (3.2%) converted to thoracotomy for pulmonary artery injury. Two (3.2%) re-operations within 30 days occurred for right middle lobe torsion and hemothorax evacuation respectively.

Post-operatively, the duration of chest drain use was 5.35±7.4 days. The number of lymph node stations explored was 3.4±1.3 and 57 (98%) cases achieved R0 resection. Preliminary data in our institution demonstrates that patients had a shorter length of stay in SVAT lobectomy than intercostal VAT lobectomy within the same study period (5±6.4 vs 6±14.3 days, p=0.04). Two (3%) SVAT lobectomy patients reported chronic pain 12 weeks post-surgery. The overall 30 day, 1-year and 3-year post-operative mortality was 0%, 10%, and 13%, respectively.

CONCLUSIONS
Our experience demonstrates that SVAT lobectomy is feasible and safe. Longer follow up is ongoing prior to a wider adoption of this technique.

Disclosure: No significant relationships.
Keywords: Subxiphoid, Uniportal, Minimally Invasive Thoracic Surgery, Enhance Recover After Surgery (ERAS), Non-Intubated.

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P-125

MALIGNANT PLEURAL MESOTHELIOMA. BENEFIT OF SURGERY WITH A MULTIMODAL THERAPY

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OBJECTIVES
Malignant pleural mesothelioma (MPM) is a highly aggressive tumor with poor prognosis. The benefit of surgical treatment with a multimodal therapy continues being in discussion. The objective of our study was to evaluate the potential benefits of surgery.

METHODS
The study consisted in a retrospective and descriptive study comparing two periods of time. The period previous to initiate our surgical program for pleural mesothelioma (from 2000 to 2010 - control group, chemotherapy treatment) and after we started to offer surgical treatment with a multimodal therapy (from January 2011 to December 2021 - experimental group). Patients with epithelioid histology, non-mediastinal lymph nodes involvement (negative mediastinoscopy), non-peritoneal affection (negative laparoscopy), and suitable to be resected were included in the study.
The IBM SPSS® statistical software was used for survival analysis through the Kaplan-Meyer method.

RESULTS
A total of 102 patients (25 female and 77 male) with a mean age of 70.06 ± 9.95 years, were diagnosed of malignant pleural mesothelioma during the period of study. The histological type Epithelioid was found in 80 cases. 30 patients met the selection criteria, 12 in the control group and 18 in the experimental group. No difference were observed in the descriptive characteristics between groups. The surgical procedure consisted of 12 extended pleurectomy/decortication (EPD) (66.6%) and 6 extrapleural pneumonectomy (EP) (33.3%). The mean survival for those undergoing surgery was 22.7 ± 3.7 months, compared to 11.8 ± 4.2 months in the control group (P=0.04) (figure 1). Regarding the surgical technique, the EPD presented a mean survival rate of 26.7 ± 4.7 months compared to 13 ± 2.8 months of the EP (P=0.02).

CONCLUSIONS
The results of our study show a clear benefit of surgery with a multimodality therapy in the group of selected patients with malignant pleural mesothelioma. The EPD seems to offer a better survival rate than EP.
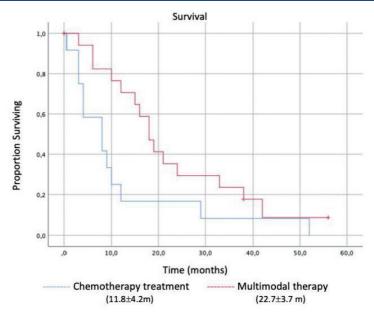
Disclosure: No significant relationships.
Keywords: Malignant Pleural Mesothelioma, Surgery, Multimodal Therapy.

P-126

"ONE-STOP-SHOP" DIAGNOSIS AND STAGE-ADAPTED SURGICAL THERAPY FOR SMALL NODULES OF EARLY STAGE LUNG CANCER IN A HYBRID OPERATING ROOM

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OBJECTIVES
Emergent lung cancer screening programs increased detection of small pulmonary nodules. Anatomical resection in case of early-stage lung cancer with only one intervention becomes increasingly desirable. Current literature lacks procedure data about both diagnosis and subsequent indicated resection. After starting our hybrid operating room program, we reviewed the efficacy of detection, diagnosis and therapy in one step.

METHODS
Undiagnosed pulmonary nodules suspicious of lung cancer, which were not detectable by conventional video-assisted thoracoscopic surgery (VATS) due to localization and size, were scheduled for a hybrid procedure consisting of a cone-beam CT-guided hookwire insertion and C-arm assisted thoracoscopic wedge resection for frozen section. All procedures were analyzed for perioperative outcomes including success rate of image-guided nodule resection and rate of concomitant correct anatomical resection.

RESULTS
Between July 2020 and July 2021, 23 patients with 25 nodules underwent image-guided VATS (iVATS) in the hybrid room. Twenty-two nodules were successfully marked by hookwire, three nodules were detected by ultrasound in one case and palpation in two cases. In 16 patients (70%) wedge resection with frozen section showed malignancy. Five patients with previous history of operated lung cancer received only a diagnostic wedge, as frozen section could not differentiate between primary or metastatic lung cancer. Eleven patients (48%) had early-stage primary lung cancer (8 adenocarcinoma, one typical carcinoid, one small-cell lung cancer and one squamous-cell lung cancer). Ten of them (91%) received a synchronous completion anatomical resection (seven lobectomies, three segmentectomies). In one patient, malignancy was only confirmed in final histology.

CONCLUSIONS
One-stop-shop diagnosis and treatment by iVATS with frozen section and concomitant completion anatomical resection in a hybrid operating room for otherwise non-well approachable early stage lung cancer is patient-convenient for the increasingly detected small pulmonary nodules.

Disclosure: No significant relationships.
Keywords: IVATS, Hybrid Operating Room, Pulmonary Nodules, Early Stage Lung Cancer, Ground Glass Opacity GGO.

P-127

THIRTY AND NINTY-DAY READMISSION AFTER SURGERY FOR LUNG CANCER IN THE ELDERLY PATIENTS: ANALYSIS OF RISK FACTORS

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OBJECTIVES
Unscheduled readmission following surgery has become an increasingly important measure of surgical care delivery and quality. Furthermore, it has been associated to significantly shorter overall survival time for cancer patients.The aim of this research was to assess predictors of unscheduled readmission within 30- and 90-days after discharge in patients undergoing radical intent surgery for NSCLC.

METHODS
We included all patients undergoing surgery with radical intent between 2012 and 2020 for NSCLC. Patients were divided into two groups, < and ≥ 75 years. The data were analyzed and compared using Kruskal-Wallis and Fisher's tests, with Kaplan-Mayer survival analysis.

RESULTS
A total of 443 patients met the inclusion criteria, with a mean age of 71.6 years. Lung lobectomy was the procedure more frequently performed (84.9%). The 30- and 90-days readmission rates were 7.4% and 11.5%, respectively; the mean time to readmission was 13.33 and 27.80 days. Causes of readmissions were infections (25%), respiratory failure (11.5%) and heart failure (15.6%). A worse respiratory function, the grade of complications according to Ottawa scale and age were factors associated with a greater risk of readmission. Overall one year survival was significantly reduced for readmitted patients (58.5%).

CONCLUSIONS
The results obtained show the existence of possible predictive parameters of an unplanned readmission 30- and 90-days after discharge. Furthermore, patients undergoing readmission showed a significantly reduced 1-year survival.

Disclosure: No significant relationships.
Keywords: Lung, Cancer, Elderly, Readmission, Risk Factors.

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Abstract 026-146

P-128

SURGERY FOR OLIGOPROGRESSIVE METASTATIC RENAL CELL CANCER CAN PROVIDE LONG-TERM DISEASE CONTROL

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OBJECTIVES
Novel systemic therapies have drastically improved response rates and overall survival in metastatic renal cell cancer. However, complete remission is rarely achieved and often progression in only few lesions is observed. Here, we analyse the role of surgery for oligoprogressive disease in metastasized renal cell cancer.

METHODS
All patients who underwent surgery at our institution between 2007 and 2021 for thoracic oligoprogressive or oligometastatic lesions after systemic treatment for metastasized renal cell cancer were included in this study. Histopathological data, treatment modalities and therapies, treatment duration and disease trajectory, particularly intervals of remission and stable disease and overall survival were assessed.

RESULTS
Ten patients with metastasized clear-cell renal cell cancer were included in this study. All patients had undergone systemic therapy prior to presentation for surgery of thoracic metastasis. Systemic therapy consisted of tyrosine kinase inhibitors, mTOR-inhibitors and immunotherapy. Median interval between nephrectomy and oligoprogression was 64 months (range 16-164). In four patients, complete remission could be achieved through resection of the oligoprogressive lesions. Three of these patients had no progression at last follow up (median 15 months, range 10-29), one patient progressed after 5 months. Five patients had stable disease after surgery for a median of 5 months (range 2-29), before three of them progressed. One patient showed immediate disease progression. Median progression-free survival after surgery was 10 months (range 0-29). Median overall survival after surgery was 24 months (range 2-72).

CONCLUSIONS
In selected cases, surgery can lead to sustained disease control in patients with oligoprogressive or oligometastatic metastasized renal cell cancer after systemic treatment. Moreover, with effective local treatment, the initially applied systemic therapies can be continued and thus save treatment options for the future course of disease. Reliable molecular markers are needed for identification of patients who will benefit from radical local treatment.

Disclosure: No significant relationships.
Keywords: Oligoprogression, Metastasized Renal Cell Cancer.

P-129

ARE LOBE-SPECIFIC OR SYSTEMATIC LYMPH NODE DISSECTION/ SAMPLING COMPARABLE IN TERMS OF THE PROGNOSIS AND SURVIVAL CONDITION FOR EARLY-STAGE LUNG ADENOCARCINOMA WITH CONSOLIDATION TUMOR RATIO MORE THAN 0.5?

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OBJECTIVES
Operation is the most effective treatment for early-stage lung cancer. This study will propose a personalized plan for lymph node dissection in early-stage lung adenocarcinoma to reduce the risk of surgery and improve the quality of life after surgery.

METHODS
This study retrospectively analyzed the patients who underwent lobectomy and lymph node dissection in the Department of Thoracic Surgery, Zhongshan Hospital, Fudan University from June 2011 to January 2016. Clinical stage I lung adenocarcinoma patients with solid component ratio (CTR) between 0.5 and 1 were included. Patients were divided into systematic (SLND) and lobe-specific (L-LND) lymph node dissection groups. The days of hospitalization, the presence or absence of complications (cough, vomiting, infection, atrial fibrillation, etc.), the recurrence-free survival rate and the overall survival rate were calculated to evaluate the postoperative quality and operation risk of the patients.

RESULTS
A total of 210 patients (138 L-LND and 72 SLND) were included. There were 2 lymph node metastases in the SLND group and no lymph node metastases in the L-LND group (p = 0.049). There were more male patients in the L-LND group (p = 0.048), No differences were shown in age, tumor site, size, solid component, degree of tumor invasion and stage. For postoperative complications, the proportion of patients with severe postoperative cough and the length of hospital stay in the L-LND group decreased. The 5-year OS of the entire cohort was 98.1%, 98.6% in L-LND, compared with 97.2% in SLND; RFS was 94.8%, 95.7% in L-LND, compared with 93.0% in SLND.

CONCLUSIONS
For cIA lung adenocarcinoma, according to the imaging features on the Thin-slice CT within 1 month before the operation, if the main lesion was less than 3cm and CTR over 0.5. L-LND is as effective as SLND, and for the minimally invasive purpose, the former is even better.

Disclosure: No significant relationships.
Keywords: Early-Stage Lung Adenocarcinoma (CTR > 0.5); Lobe-Specific Lymph Node Dissection (L-LND); Systematic Lymph Node Dissection (SLND); Survival Status; Prognosis.

Table 1 Patient and surgical characteristics of the Patients in Each Group.

		SLNS 138	SLND 72		
Gender					p = 0.048*
	Male	49	35.5%	1622.2%	
	Female	89	64.5%	5677.8%	
Age					p = 0.919
	≤60	63	45.7%	3548.6%	
	61-70	53	38.4%	2636.1%	
	>70	22	15.9%	1115.3%	
Tumor Location					p = 0.914
	Left Lung	48	34.8%	2636.1%	
	Right Lung	87	63.0%	4562.5%	
	Both Lungs	3	2.2%	1 1.4%	
Tumor Size (mm)					p = 0.996
	6-10	15	10.9%	811.1%	
	11-20	76	55.1%	3852.8%	
	21-30	38	27.5%	2027.8%	
	>30	9	6.5%	6 8.3%	
Size of Solid Components (mm)					p = 0.639
	4-10	61	44.2%	3345.8%	
	11-20	68	49.3%	3244.4%	
	21-30	9	6.5%	7 9.7%	
Pleural Invasion					p = 0.983
	Yes	27	19.6%	1419.4%	
	No	111	80.4%	5880.6%	
cT-stage					p = 0.566
	T1a	53	38.4%	3143.1%	
	T1b	68	49.3%	3244.4%	
	T1c	9	6.5%	7 9.7%	
	T1mi	8	5.8%	2 2.8%	
Surgical Method					p = 0.990
	Lobectomy	97	70.3%	5069.4%	
	Segmentectomy	22	15.9%	1216.7%	
	Wedge Resection	19	13.8%	1013.9%	
Postoperative pathology					p = 0.632
	Adenocarcinoma	122	88.4%	6286.1%	
	MIA, AIS	16	11.6%	1013.9%	
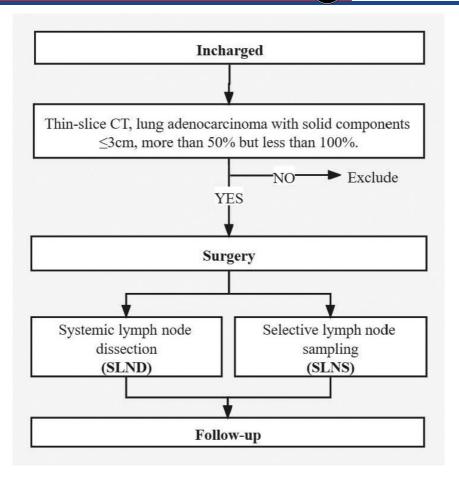
		SLNS 138		SLND 72		
Lymph Node Metastasis						p = 0.049*
	Yes	0	0.0%	2 2.8%		
	No	138	100.0%	70 97.2%		
Length of Hospital Stay (day)						p = 0.942
	<7	51	37.0%	25 34.7%		
	7-14	79	57.2%	43 59.7%		
	>14	8	5.8%	4 5.6%		
Length of Postoperative Hospital Stay (day)						p = 0.927
	<4	47	34.1%	26 36.1%		
	4-6	71	51.4%	35 48.6%		
	>6	20	14.5%	11 15.3%		
Intraoperative Blood Loss (mm)						p = 0.624
	≤50	71	51.4%	42 58.3%		
	50-100	57	41.3%	26 36.1%		
	>100	10	7.2%	4 5.6%		
Blood Transfusion						NA
	Yes	0	0.0%	1 1.4%		
	No	138	100.0%	71 98.6%		
Severe Postoperative Cough						p = 0.220
	Yes	2	1.4%	3 4.2%		
	No	136	98.6%	69 95.8%		
Postoperative Complications						p = 0.309
	Yes	18	13.0%	6 8.3%		
	No	120	87.0%	66 91.7%		
Recurrence						p = 0.423
	Yes	6	4.3%	5 6.9%		
	No	132	95.7%	67 93.1%		

Posters
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P-130

IS IT FEASIBLE TO PERFORM ANATOMICAL LUNG RESECTION FOR LUNG CANCER AND HEART SURGERY CONCURRENTLY

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OBJECTIVES
The aim of this study is to compare the effects of bypass surgery on anatomical lung resections for non small cell lung cancer according to the timing of bypass surgery, in regards of operation time, length of hospital and intensive care unit (ICU) stay, air leakage, lung adhesions, conversion to open surgery rates and complications.

METHODS
Twenty-one patients who underwent anatomical lung resection in our clinic and underwent bypass surgery before or concurrent with lung resection were included in this study. Length of operation, pulmonary adhesions, conversion to open surgery, length of hospital and ICU stay, air leakage time, blood transfusions, complications and operative mortality of the patients were measured and compared.

RESULTS
While 13 patients had bypass surgery before lung resection (prior bypass, PB), 8 patients underwent bypass surgery concurrent with lung resection (concurrent bypass, CB). There wasn't any statistical significance between two groups in terms of length of hospital stay, pulmonary adhesions, blood transfusions, complication rates and operative mortality. But the difference of length of operation and length of ICU stay were statistically significant, as both these parameters were higher in CB group (Table). The air leakage time was significantly lower in CB group (p=0.008). Whilst the pulmonary adhesions, conversion to open surgery and complication rates were notably lower in CB group, rates of blood transfusions were lower on PB group (Table) and these parameters were statistically insignificant (p>0.05). Operative mortality rates were similar in two groups.

CONCLUSIONS
In patients who are planned lung resection for non small cell lung cancer, whose cardiac surgery indication is detected in preoperative examinations or who will be needing to use medication after stent indication, instead of waiting after bypass surgery, we recommend performing bypass surgery and then lung resection surgery concurrently.

Disclosure: No significant relationships.
Keywords: LUNG CANCER, Bypass Surgery, Videothoracoscopy.

	PB	CB	p
n	13	8	-
Length of operation (mins)	174,62	356,63	0,018
Length of ICU stay (days)	1,00	1,63	0,006
Air leakage time (days)	3,62	0	0,008
Pulmonary adhesions	6	1	>0,05
Conversion to open surgery	4	2	>0,05
Complications	7	2	>0,05
Blood transfusions	3	2	>0,05
Operative mortality	1	0	>0,05

B: Prior bypass group

CB: Concurrent bypass group

P-131

VENO-VENOUS EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO) SUPPORT IN AIRWAY SURGERY FOR PATIENTS' LIMITED PULMONARY RESERVE OR COMPLEX TRACHEOBRONCHIAL RESECTION AND RECONSTRUCTION

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OBJECTIVES
The indications to use extracorporeal life support (ECLS) in main airway surgery are not well established. This study evaluated the riks and benefits of using veno-venous (v-v ECMO) in selected cases of main airway surgery.

METHODS
We retrospectively analyzed the data of 9 patients who underwent main airway surgery under v-v ECMO support in our department between 2013 and 2021.

RESULTS
All 9 patients (7 males and 3 females, median age 52 years, range 19-85 years) underwent main airway surgery under peripheral VV-ECMO, achieved either through femoro-femoral (n=5) or femoral-jugular (n=4) cannulation.

Indications for ECMO were previous pulmonary resection (n=1), complex carinal resection and reconstruction (n=4) and extensive distal traumatic tracheal/carinal injuries (n=4).

Surgical procedures included carinal resection and reconstruction with complete pulmonary parenchimal preservation (n=3), right upper sleeve lobectomy and hemi-carinal resection (n=1), sleeve resection of the left main bronchus after previous right lower bilobectomy (n=1), tracheal/carinal repair for traumatic laceration (n=4). Apart from 4 post-traumatic lesions, the underlying pathology was squamous cell carcinoma in 3 patients and chondrosarcoma and IgG4-related disease in 1 case, respectively.

The mean time on v-v ECMO was 188.2 +/- 67.4 min and the mean operative time was 212.4 +/-55.0 min. In 3 cases of complex carinal resection and reconstruction, high-flow (between 3 and 4 L/min) ECMO achieved by femoro-jugular cannulation allowed for apnoea for almost 3 hours, avoiding cross-field ventilation. In 4 patients ECMO was weaned in ICU over a median of 96 hours (range 3 hours-10 days). No peri-operative death occurred. There was no complication related to the use of ECMO.

The median hospital stay was 9 days (range, 7-51 days).

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CONCLUSIONS

In our experience of extensive main airway surgery, v-v ECMO provided sufficient partial and even complete respiratory support with very good safety profile and represents the gold standard when ECLS is needed.

Disclosure: No significant relationships.
Keywords: ECMO; Tracheo-Bronchial Resection; Airway Surgery.

P-132

SPONTANEOUS INTERCOSTAL RUPTURES - FIRST RESULTS OF A MESH-FREE RECONSTRUCTION TECHNIQUE

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OBJECTIVES
Spontaneous intercostal rupture with protruding lung tissue is a rather infrequent clinical event, initially often misdiagnosed as muscular distorsion or contusion. In literature the disease is found in case reports or few small series.. The typical onset of symptoms is immediately after a coughing or sneezing attack with peracute pain followed by a local swelling and instability. Treatment of choice is surgery aiming at a stable reconstruction of the torn intercostal-abdominal segment. After a small serie with relapsing hernias after surgical stabilization we have developed a new type of reconstruction with no relapses up to now.

METHODS
Prospective analysis of a serie of surgical stabilized spontaneous intercostal ruptures in a centre of thoracic surgery.

RESULTS
From 2006 until 2021 we saw 21 patients with spontaneous intercostal rupture. Surgery was offered to 16. In the first 3 cases we chose a repair with pericostal polypropylene or polyester threads, all 3 men had a relapse. Reoperation showed refractures of ribs and ruptures of the threads. patient nr.4 -13 were stabilized with braided polyester tapes in pericostal figure of eight position. A tear of the cartilage arc with incipient or complete disruption of the abdominal wall was found in 9 of 11 cases requiring a synchronous mesh reconstruction. the posterior border of the rupture is found persistently at the dorsolateral segment of the rib, combined with a fracture which may be the initial event.
6 patients had a concomitant rupture of the abutting diaphragm.
Follow up (median duration 18 mths) showed no relapses in patients with polyester tape reconstruction.

CONCLUSIONS
A meshfree reconstruction of spontaneous intercostal ruptures with braided polyester tapes seems to be a reasonable stabilization technique with low morbidity and good results. Synchronous tears of the cartilage arc and the adjoining abdominal wall are often found and require a synchronous reconstruction with a alloplastic mesh.

Disclosure: No significant relationships.
Keywords: Intercostal Rupture, Spontaneous, Surgical Technique.

P-133

VIRTUAL PATIENT CLINICS DELIVER HIGH PATIENT SATISFACTION DURING THE PANDEMIC: A SURVEY

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OBJECTIVES
To assess the level of satisfaction with a novel virtual clinic among patients on post-surgery lung cancer surveillance.

METHODS
This audit was approved by the hospital Audit Committee. The target population were patients who had lung cancer surgery from 2013 to 2020, and had been attending an in-person clinic before the COVID pandemic. They had now converted to a virtual format. A standard question set was used.

RESULTS
Total 110 patients included in our audit, 57% females and 43% males. 43.6% of patients were between the ages of 70 to 79 years. Out of 110 patients, there were 62.8% of patients on surveillance for less than 3 years. 98.9% of patients are satisfied with the follow-up arrangements and 97% of patients mentioned that they understand all information given on phone calls. Also, only 3% of patients preferred to come to the clinic and be seen by the physician, 97% of patient's preferred virtual consultation.

CONCLUSIONS
Virtual clinic for follow-up post-operative patients during the pandemic is efficient with a high satisfaction rate between patients. It would appear that the virtual clinic can be adopted in the future in hospitals where there are similar satisfaction results. However, this will need to be re-evaluated after the COVID pandemic to determine if hospital avoidance preferences impacted the results.

Disclosure: No significant relationships.

P-134

CAN PREOPERATIVE CT SCANNING PREDICT THE NEED FOR AN EXTRACERVICAL APPROACH (STERNOTOMY) IN RETROSTERNAL GOITRES?

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OBJECTIVES
Retrosternal goitres are predominantly benign hyperplastic growths of the thyroid gland. Computed tomography (CT) of the neck and thorax is the routine imaging modality in preoperative planning. Surgical resection is usually indicated in the presence of pressure symptoms and/or malignancy. In a small proportion of cases, a median sternotomy is necessitated. Often times, the procedure is carried out jointly by the otolaryngologist and thoracic surgeon. Operating room resources are reserved in the event a sternotomy is required. We sought out to determine whether preoperative computed tomography can be predictive in determining the need for sternotomy.

METHODS
An eleven-year (2010–21) retrospective review of pre-operative scans of patients who had undergone retrosternal goitre resections from a tertiary Thoracic surgical centre was undertaken.

RESULTS
510 thyroidectomies were performed. 65 referred to Thoracic surgeon for consideration of sternotomy. 21 were excluded in the analysis due to missing preoperative scans. Median age: 66.5yrs. M:F=1: 3.5. 9.25% were malignant. 3.1% of these required a sternotomy. Goitres that required sternotomy had a larger volume (146.1cm3 IQR 39.74-322.4) as compared to those requiring only a cervical incision (52.73cm3 IQR 29.57-82.08). p=0.0789. Extension below the aortic arch, craniocaudal extension below the thoracic inlet, extension into posterior mediastinum, adherence to mediastinal structures, histological thyroiditis were not significant.

CONCLUSIONS
Volumetric analysis was significant in its predictive value. A standardised definition of a retrosternal goitre is needed in future work inorder to improve the external validity of findings. A combination of radiological and surgical factors play a key role in determining the route-of-access and a robust predictive model would need to be reflective of this.

Disclosure: No significant relationships.
Keywords: Retrosternal Goitre, Sternotomy, CT Scan.

P-135

IS TUMOR NECROSIS STILL A POOR PROGNOSTIC FACTOR IN PATIENTS WHO HAVE NOT RECEIVED NEOADJUVANT TREATMENT?

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OBJECTIVES
The aim of this study was to investigate the prognostic effect of tumor necrosis in patients who did not receive neoadjuvant treatment.

METHODS
Two hundred and ten consecutive patients with resected non-small cell lung cancer were enrolled retrospectively in this study from January 2019 to November 2021. Presence of necrosis and pathological factors were compared and survival analyzes were performed.

RESULTS
Tumor necrosis was detected in 73 (34.8%) patients. A significantly higher rate of necrosis was observed in squamous cell cancers than in adenocarcinomas (63.5% vs 21% $p<0.001$). It was observed that the incidence of necrosis was higher in solid-dominant type compared to other types in patients with adenocarcinoma (54.5% p:0.001). More necrosis was detected in patients with lymph node metastasis (N0: 29.9% N1: 58.1% N2: 42.9% $p<0.01$). In addition, tumor diameters of necrosis-positive patients were found to be significantly higher (39.81mm 27.25% vs 18.96mm 12.46% $p<0.001$).

CONCLUSIONS
The fact that tumor necrosis is a poor prognostic factor in studies may be misleading. In our opinion, tumor necrosis is not a cause, but the result of a tumor with a poor prognosis. Although it appeared as a promising independent prognostic factor in studies conducted years ago, we think that these studies were conducted with the 7th TNM and necrosis did not yield what was expected with the 8th TNM, with the introduction of new phased parameters such as tumor size.

Disclosure: No significant relationships.
Keywords: Necrosis, Prognosis, Non-Small Cell Lung Cancer.

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MANAGEMENT OF DEEP STERNAL WOUND INFECTION, A SINGLE CENTER EXPERIENCE

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OBJECTIVES

Sternal wound infection(SWI) is a serious complication after cardiac surgery, although its incidence has significantly decreased due to perioperative optimization. It could be divided in Superficial(SSWI), when it involves skin, and subcutaneous tissue until muscle fascia and Deep(DSWI), which is a life-threatening complication associated with high morbidity and mortality. There are several surgical options in current practice and treatment algorithms may vary among surgeons. Current treatment of sternal wound closure, apart from antibiotics, include surgical debridement, vacuum-assisted closure therapy, flap coverage, and sternal platin. This study aimed to evaluate our experience in the treatment of deep sternal wound infection after cardiac surgery.

METHODS

We performed a retrospective analysis of 42 patients who were referred to our institution for management of DSWI following cardiac surgery from 2015 to 2021. Demographical data, treatment and patient outcomes were collected. Empiric antibiotic therapy has been initiated followed by culture-directed therapy as soon as microorganism was isolated. Patient underwent surgery which included removing sternal wires and necrotic debris and subsequent reconstruction using a bilateral pectoralis muscle plasty. Half of them were treated with vacuum assisted closure(VAC) preoperatively.

RESULTS

In 42/42 of the cases the wound healed completely with excellent functional and aesthetic outcomes alongside with low morbidity and mortality. Two patients(4.8%) died of a myocardial infarction and COVID-19 infection. Intraoperative time ranged between 40 and 130 minutes. One case required 8 weeks treatment using negative pressure postoperatively at home, until complete wound closure to be achieved. External chest support with vest used in 38 patients(90%) postoperatively.

CONCLUSIONS

The bilateral pectoralis muscle plasty is a safe and effective procedure and played an important role in the treatment of Sternal Wound Dehiscence. The preoperative use of VAC is a useful bridge to definite closure. The multidisciplinary approach and individualized treatment are usually required due to the complexity of DSWI.

Disclosure: No significant relationships.
Keywords: Sternal Wound Infection, Treatment, Flap, VAC, Sternal Plating.

P-137

SURGICAL INDICATION AND PRACTICE OF THORACOSCOPIC SEGMENTECTOMY TO AVOID LOCAL RECURRENCE

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OBJECTIVES
We have been trying to reduce local recurrence by identifying inter-segmental veins and simulating resection margins with 3DCT. We examined the short and long-term outcomes of thoracoscopic segmentectomy for our indication and technique.

METHODS
Two hundred ninety-four primary lung cancer cases from September 2004 to December 2018,176 cases (59%) with curative indication and 118 cases (41%) with compromised indication were retrospectively reviewed. The indications were as follows: tumor diameter of 2 cm or less, the invasive diameter of 25% or less, substantial tumor of 1.5 cm or less, and passive indication. Clinical, perioperative, and pathological data were reviewed, and overall survival (OS), cancer-specific survival (CSS), and disease-free survival (RFS) were examined by the Kaplan-Meier method.

RESULTS
Median age 71 years (IQR 63-76), 155 males (52.7%), 159 smokers (54%). Median tumor diameter was 1.5 cm (IQR 1.2-2.0 cm), C/T ratio >0.5, and median C/T ratio was 0.52 (IQR 0-1) in 148 (50.3%) lung nodules. The surgical techniques were simple (S6, left lingual, left upper division) in 61 cases and complex (other than simple cases) in 233 cases. The median operative time was 180 minutes (IQR 147-211), the median blood loss was 50 ml (IQR 3-125), ten patients underwent open conversion, and the median postoperative drainage period was one day
(IQR 1-1).
Postoperative complications occurred in 35 patients (12%), with pulmonary air leakage being the most common complication (21 patients), but there was no perioperative death. OS, CSS, and RFS at a mean follow-up of 1970 days were 97.0%, 100%, and 99.4% for the curative and 69.9%, 96.3%, and 93.3% for the compromised indication, respectively. No local recurrence was observed in patients with curative and 4 cases with compromised indication.

CONCLUSIONS
Our method for thoracoscopic segmentectomy based on our original criteria is acceptable for short and long-term outcomes.
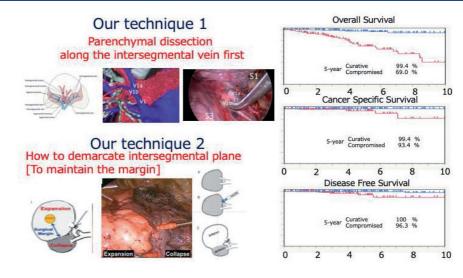
Disclosure: No significant relationships.
Keywords: Thoracoscopic Surgery, Segmentectomy, Early Stage Lung Cancer.

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LUNG VOLUME REDUCTION SURGERY (LVRS) IN THE MANAGEMENT OF SEVERE EMPHYSEMA IN MODERN THORACIC SURGERY: A SINGLE-CENTER RETROSPECTIVE STUDY

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OBJECTIVES
Severe emphysema is a common condition, causing respiratory disability commensurate with its severity. Lung volume reduction surgery (LVRS) in the management of severe emphysema is a safe technique that has shown efficacy in terms of functional improvement but remains an underused technique today. The objective of our study is to evaluate the efficacy on respiratory functional and the safety of LVRS in our centre in a modern surgical environment.

METHODS
All patients operated on between January 2014 and July 2021 was analysed. Pre- and postoperative data were collected retrospectively. The endpoint was the change in dyspnoea (mMRC), quality of life after surgery, changes in functional parameters at rest and during exercise, mortality, and postoperative complications. The observed improvement was compared to a theoretical percentage improvement of 30% by an exact binomial test with a one-sided alpha risk of 2.5%.

RESULTS
Forty-two patients underwent surgery for unilateral LVRS with 93.3% thoracoscopy, 20% of which was robotic assistane. The median FEV1 and RV were 27.5% and 259.5% respectively. The mMRC score was significantly improved in 69% of patients [53%; 82%] (p<0.0002). The mean FEV1 improvement was 215 ml, with a significant improvement in 61.9% of patients [45.6-76.4] (p = 0.00002). Walking distance was not significantly improved. Mortality at 3 months and 1 year was 0% and 2.5%, respectively. Complications were identified in 68.9% of patients, of which 83.9% were grade < 3. Prolonged air leakage was the most common complication (55.6% of patients). Of the 34 patients reachable retrospectively, 82.4% improved their quality of life.

CONCLUSIONS
Our study confirms that currently, emphysema volume reduction surgery is a safe and effective procedure in terms of functional benefit in patients well selected by expert multidisciplinary teams. LVRS deserves to be democratized in a greater number of centers, to be known to a greater number of patients.

Disclosure: No significant relationships.
Keywords: Emphysema, COPD, Emphysema Treatment, Emphysema Volume Reduction Surgery, LVRS.

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MCKEOWN ESOPHAGECTOMY WITH UNIPORTAL-VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) APPROACH: 5-YEAR SINGLE-CENTER EXPERIENCE

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OBJECTIVES
The effectiveness of minimally invasive esophagectomy (MIE), with multiportal thoracoscopic or robotic approach, has been widely investigated in the last years, conversely few reports are available about Uniportal video-assisted thoracic surgery (VATS) approach. We present our 5-year experience with Uniportal-VATS McKeown esophagectomy, evaluating surgical and oncological outcomes.

METHODS
From December 2016 to December 2021, the prospectively collected clinical data of 45 patients, who underwent Uniportal-VATS esophagectomy and reconstruction with a stomach conduit, according to McKeown technique, were reviewed and outcomes evaluated. Gastric tubulization was performed totally laparoscopic or through a mini-laparatomic access and cervical anastomosis was made according to Orringer's technique.

RESULTS
The mean age of population was 61.89±9.23 years. Thirty-two (71.1%) patients were males. Twenty-nine (64.4%) underwent neoadjuvant therapy before surgery. The mean operative time of Uniportal-VATS esophagectomy was 90.67±23.50 min. The main histology was squamous cell carcinoma (23 patients, 51.1%) and the median number of thoracic nodes removed was 8. Main pathological stages were II (19 patients, 42.2%) and III (15 patients, 33.3%).
Intra- and post-operative mortality were null. Three patients (6.7%) developed an anastomotic leak (treated conservatively), 1 (2.2%) patient a chylothorax (which required a surgical treatment) and 1 (2.2%) a left vocal cord palsy. The mean level of pain was 2.50±1.90 (VAS-scale) on first postoperative day. Post-operative stay was 9.97±5.71 days (median: 8 days). Thirty-five (77.8%) patients underwent adjuvant therapy.
One- and 3-year overall survival were 100% and 68%, respectively (4 patients died of disease and 1 of other causes). One- and 3-year disease-free survival were 84% and 75%, respectively.

CONCLUSIONS
Uniportal-VATS McKeown esophagectomy seems to be a safe and effective MIE, with satisfactory surgical and short-term oncological outcomes. However further studies with larger population and longer follow-up are claimed.

Disclosure: No significant relationships.

Keywords: Esophageal Cancer, Mckeown, Uniportal-VATS, Minimally Invasive Esophagectomy.

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MAJOR OMENTUM TRANSPOSITION FOR SEVERE THORACIC INFECTIONS

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OBJECTIVES
To describe a series of patients who underwent one-step surgical treatment of severe thoracic infections, using the major omentun transposition

METHODS
Between December 2015 to 2021, 26 patients with mediastinitis, bronchial or tracheal fistula and/or severe pleural space infection underwent omentum transposition and associated thoracic procedures. Prior surgery, patients were treated by antibiotics, chest tubes(empyema, pneumothorax or intra-abscess tubes CT-scan guided), ventilation weaning (FiO2 <40%, no ventilation support during 48h before surgery if possible) and hemodynamic support. The omental flap was used to seal bronchial dehiscence, full-fill pleural space and antibiotic delivery. Four patients underwent previous abdominal surgeries. Omentum was harvested by median laparotomy in all cases. Partial or total thoracoplasty was combined to obliterate the pleural space if sparing parenchyma and omentum were considered insufficient

RESULTS
There were 19 males, median 60 ±13y. Two patients died (stroke, ADRS) at 90 days. ITU and hospital stay were 15,4[3-89] and 31,4 [14-122] respectively. Three patients were in ECMO for several weeks. There were 11 bronchial fistula related to necrotic nosocomial pneumonia, 13 postsurgical stump failure or non-eradicated pleural space infection, 1 tracheal allograft infection and one mediastinitis after spine surgical osteosynthesis . Microbiology culture was positive in eight patients (fungus (2), MRAS(3), Klebsiella(1), pseudomona(2)). Complications occurred in 15 patients (wound infection (5), reoperation(1), difficult weaning (2), Stroke(1), ARDS (1), pneumonia(2)) No flap necrosis was detected;To date only one patient has suffered from omentum and pleural space re-infection(mucormucosis, 4 years after first operation) and total thoracoplasty with partial omentum removal was performed. The follow-up median was 26 (range 4-73) months. Five years survival was 56%[0.41-0.66], significantly better in non NSCLC patients (p<0.05).

CONCLUSIONS
One-step surgery with omentum flap transposition allows excellent management of severe intrathoracic infections. This challenging group of patients can be treated safely, without severe complications and high rate of success.

Disclosure: No significant relationships.
Keywords: Infections, Bronchial Fistula, Omentum.

	Gender Age	Cause	UCI/ Stay	Risk factors	Procedure (omentum +)	Outcome	Follow-up (months) enero 2021
1	F/64	Infection	23/67	Spine Surgery DM Previous abdominal surgery	Bilobectomy	Alive	Alive /18
2	M/54	Surgery	3/16	-	Omentum	Alive	Alive/19
3	M/66	Infection	7/17	Lung cancer	LUL	Alive	Dead / 7
4	M/58	Surgery	8/23	Lung cancer Sd cushing	Thoracoplasty	Dead Ictus	-
5	M/49	Infection	10/7	Kidney transplant Fungus	LUL Pericardio	Alive	Alive/69
6	M/57	Surgery	3/14	RN Chemotherapy	Thoracoplasty	Alive	Dead/26
7	M/66	Surgery	3/17	Hepatic cirrhosis	Omentum	Alive	Dead/56
8	M/54	Infection	15/29	Diabetes	LUL	Alive	Alive/48
9	F/24	Infection	89/122	IgG deficiency	LUL	Alive	Alive/29
10	F/36	Infection	6/22	Chemotherapy	LUL	Alive	Alive/63
11	M/67	Surgery	7/16	RP*	thoracoplasty	Alive	Alive/ 73
12	M/61	Surgery	8/21	RT+CHT** inmunotherapy+	omentum	Alive	Alive / 14
13	M/57	Infection	7/23	COVID-ECMO	RLL	Alive	Alive /12
14	M/67	Surgery	13/32	Lung cancer RT+CHT	RUL	Alive	Alive/23

	Gender Age	Cause	UCI/ Stay	Risk factors	Procedure (omentum +)	Outcome	Follow-up (months) enero 2021
15	M/79	Infection	23/53	Hepatic cancer	RLL	Alive	Alive/14
16	M/63	Surgery	12/22	Lung cancer RT+CHT	Sleeve LUL	Alive	Dead/11
17	F/41	Surgery	7/23	Lung cancer	LLL Thoracoplasty	Alive	Alive/7
18	M/63	Surgery	7/14	Lung cancer	RP(completion) Thoracoplasty	Alive	Alive/16
19	F/39	Infection	42/62	Drug abuser	Bilobectomy	Alive	Alive/4
20	M/50	Infection	28/42	ECMO pn	RLL	Alive	Alive/7
21	M/76	Surgery	4/18	-	Double Sleeve LUL	Alive	Alive/6
22	M/53	Surgery	23/45	Lung cancer RT+CHT	RP + vena cava	Alive	Alive/4
23	M/67	Surgery	32/-	Lung cancer RT+CHT	RLL+ Spine	DEAD	-
24	F/73	Surgery	9/13	Lung cancer	RP	Alive	Alive/32
25	M/80	Infection		BPCO	Empyema	Alive	Alive/4
26	F/45	Surgery	47/62	T. Adenoid-Cystic	Tracheal transplantation	Alive	Alive/5

RP(right pneumonectomy); ** Radiotherapy & Chemotherapy

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SUBXIPHOID UNIPORTAL VATS NON-INTUBATED VERSUS INTUBATED THYMECTOMY: INITIAL ASSESSMENT OF FEASIBILITY AND SAFETY

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OBJECTIVES
Subxiphoid video-assisted-thoracoscopic-surgery (SVATS) has been associated with enhanced recovery and shorter length of hospital stay. This comparative study is aimed to compare the technical feasibility, safety and adequacy of oncological resection in patients undergoing non-intubated SVATS thymectomy and intubated subxiphoid resection.

METHODS
We conducted a retrospective study of 42 patients who underwent SVATS thymectomy from September 2016 until June 2021. 21 carefully-selected patients underwent non-intubated SVATS thymectomy. 42 In total patients were selected for the study and were matched with regards to age,gender,comorbidities,smoking-history, and length of hospital stay.There were no deaths in both groups after a year.Additionally, pain scores were measured post-operatively in 1,3,6 months and in one year.Non-intubated SVATS was performed with spontaneous breathing maintained with air/sevoflurane. Additionally,several nerve blocks were employed to maintain analgesia and diaphragm control.

RESULTS
In Group, 19% of the patients experienced mild pain after 1 month follow-up, compared to 33% in Group2.In Group2, 3 cases were converted to sternotomy, compared to Group1, where only in one case, the incision was extended to a mini sternotomy. Subsequently, 0 admissions to the Intensive Care Unit for Group2 and 1 admission due to AKI for Group1. The median hospital length of stay for both groups was 2 days and 30day survival for both groups was 100%. Histologically proven thymoma tumors were resected in 8 cases(38%) in Group1 compared to 14 in Group2. Complete resection was achieved in all cases in Group1 whereas in Group 2,4 cases were reported with R1 resection margin. (Table1)

CONCLUSIONS
Significant improvements in pain were reported post-operatively, with most of the patients in the non-intubated SVATS group being to their baseline performance status on discharge.Based on our experience of Non intubated SVATS thymectomy is safe and associated with adequate oncological resection.However, larger studies are required to confirm this hypothesis.
Disclosure: No significant relationships.
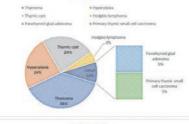
Results		
	SVATS non-intubated (Group 1)	**SVATS intubated (Group 2)**
Length of Hospital Stay (median)	2	2
Conversion to sternotomy	1/21	3/21
ICU admission	1	2
Post-operative complications	28.5%	23.8%
30day survival after surgery	100%	100%
Anaesthetic time (mean)	2 hours 32 min	3 hours 59min
Thymoma Histopathology Report		
	SVATS non-intubated (Group 1)	**SVATS intubated (Group 2)**
Thymoma	8/21	14/21
Tumour max dimension	76mm	46mm
TNM class	Stage 1	Stage1
WHO classification		
AB	4	4
B1	1	1
B2	2	5
A	1	0
B3	0	4
Masaoka Stage	2a	2a
Resection Margin R0	100%	71.4%
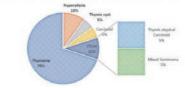
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FEASIBILITY OF VIRTUAL INTERACTIVE CLASSROOM TO TEACH BASIC VIDEO-ASSISTED THORACOSCOPIC SURGERY SKILLS

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OBJECTIVES
This study evaluated the feasibility of a virtual classroom to deliver hands-on training of core Video-Assisted Thoracoscopic Surgery (VATS) skills using an artificial simulator.

METHODS
Trainees were asked to complete the 23-question survey after finishing a VATS skills course consisting of three 2-hour sessions delivered using a virtual classroom.
A pair of trainees from 2-3 different thoracic centers joined each course. Each pair shared a simulator and connected to the virtual session by an endoscopic camera and a panoramic camera. The instructor used a software broadcaster to combine three different cameras (endoscopic, panoramic, and portrait) into a single video feed to provide interactive instructions and guidance.
The surveys of the last six courses were analyzed; out of the total of 16 courses organized.
The primary outcome measure was the response to questions "Would you suggest this Virtual VATS Skills Simulation Course to your colleague?" and "Would you consider participating in a more Advanced Virtual VATS Skills Simulation Course?".

RESULTS
The 21 trainees came from 9 countries; 10 classified themselves as beginners, 2 as novices, 6 as intermediate, and 1 as advanced. Only 4 had already practiced on the same simulator.
All 21 participants responded by Yes to both questions "Would you suggest this Virtual VATS Skills Simulation Course to your colleague?" and "Would you consider participating in a more Advanced Virtual VATS Skills Simulation Course?".
They liked most about the course to improve their basic skills such as instrumentation, exposure and using endo staplers. They also enjoyed the guidance and instructions provided by the instructor. Most responded by "nothing" to the question of what they disliked.

CONCLUSIONS
The virtual interactive classroom is feasible to deliver hands-on surgical skills training bringing significant advantages. Still, traditional face-to-face training has an important role; therefore, hybrid hands-on training events may be the optimal solution.

Disclosure: No significant relationships.
Keywords: Hands-On Training, Surgical Simulation, Deliberate Practice.
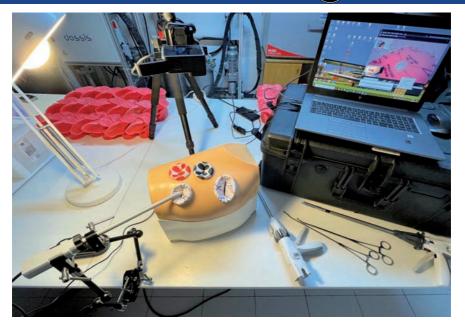
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UNIPORTAL-VIDEO ASSISTED THORACOSCOPIC SURGERY (VATS) COMPLETION LOBECTOMY LONG AFTER WEDGE/SEGMENTECTOMY: EARLY EXPERIENCE

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OBJECTIVES
The aim of the study is to evaluate the effectiveness and outcomes of Uniportal-VATS completion lobectomy long after wedge resection or segmentectomy.

METHODS
Clinical prospectively collected data of 32 patients undergone Uniportal-VATS completion lobectomy, from May 2016 to February 2021, were analyzed.
All patients, already undergone wedge resection or segmentectomy for suspected metastasis, were scheduled for completion lobectomy for pathological diagnosis of primary lung cancer or for local tumor recurrence.

RESULTS
Thirty-three (42%) patients were male and the mean age was 67.2 ± 8.4 years. Thirty-three patients (42%) were active smoker. The mean FEV1% was 29.12 ± 0.32 and the ASA score 2.36 ± 0.49. Previous surgery was: a wedge resection in 24 patients (75%), segmentectomy in 5 (15.6%) and multiple wedge resections in 3 (9.4%). In 26 cases (81.2%) the pathological diagnosis was a primary lung cancer, in the other cases the re-operation was necessary due to recurrence on stapler-line.
The median time for completion lobectomy was 5 weeks after first surgery. The mean time of Uniportal-VATS completion lobectomy was 231.0 ± 76.6 min, with an intraoperative blood-loss of $112 + 52$ ml. No conversion to thoracotomy or further access were necessary. Intra- and post-operative mortality were null. Five patients (15.6%) had minor complications (3 cases of atelectasis, 1 pneumonia and 1 atrial fibrillation). The length of chest tube was $4,3+1,9$ days, with a post-operative stay of $5.0 + 2,3$ days. Post-operative pain lasted $1.56 + 0.98$ days, with a good cosmetic result (valuated $2.9 + 0.3$ points by patients on a 0-3 scale).

CONCLUSIONS
In the hand of expert surgeons, Uniportal-VATS completion lobectomy long after wedge or segmentectomy seems to be safe and feasible with satisfactory intra- and post-operative results.

Disclosure: No significant relationships.
Keywords: Uniportal VATS, Completion Lobectomy, VATS, Segmentectomy.

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Abstract 026-146

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RESULTS OF ROBOT-ASSISTED MINIMALLY INVASIVE ESOPHAGECTOMY IN 111 CONSECUTIVE PATIENTS: AN ASIA COHORT STUDY

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OBJECTIVES
Robot-assisted minimally invasive esophagectomy (RAMIE) is becoming increasingly popular as a treatment for esophageal cancer. The purpose of this study was to use the da Vinci robotic system (Intuitive Surgical, Sunnyvale, CA, USA) to perform 111 consecutive cases of radical esophageal cancer and report the perioperative data of surgery and postoperative complications and short-term oncological outcomes.

METHODS
We retrospectively analyzed 111 patients who underwent RAMIE conducted at Fujian Medical University Union Hospital from August 2016 to January 2021. Each patient's characteristics, clinicopathological stage, postoperative pathological stage, surgery outcome, postoperative recovery, and short-term oncological outcomes were analyzed.

RESULTS
Of the 111 patients who underwent RAMIE, 77 were male and 34 were female, and the mean age was 62.1 ± 8.8 years. Twenty-seven patients (24.3%) received preoperative neoadjuvant therapies. The vast majority of patients (110/111, 99.1%) underwent radical resection, with a mean intraoperative bleeding amount of 99.9 ± 68.4 mL and a mean operative time of 271.9 ± 70.0 min. The mean total number of lymph nodes removed was 40.9 ± 16.7, including 21.8 ± 9.0 thoracic lymph nodes. Fifty-five (49.6%) patients had lymph node metastases. The main postoperative complications included pulmonary infection in 24 cases (21.6%), celiac disease in 3 cases (2.7%), tracheoesophageal fistula in 1 case (0.9%), anastomotic fistula in 3 cases (2.7%), postoperative cardiac arrhythmias in 11 cases (9.9%), VTE in 3 cases (2.7%), and pleural effusion (requiring postoperative tube drainage) in 13 cases (11.7%). The median length of stay was 10.9 ± 6.1 days, and there were no cases of perioperative death.

CONCLUSIONS
Robotic esophageal cancer radical surgery is safe and feasible. The surgeon can be proficient in thoracic robotic surgery and mediastinal lymph node dissection and achieve high levels of perioperative safety and short-term efficacy.

Disclosure: No significant relationships.
Keywords: Robot-Assisted Surgery, Esophageal Cancer, Minimally Invasive Surgery, Complications, Short-Term Outcomes.

Table 1. Demographics and tumor characteristics of the patients(n=110)

	n = 111
Age (y) (Median-range)	(62.1±8.8)(44–85)
gender(n(%))	
Male	77 (53.2)
Female	34 (30.6)
comorbidity (n(%))	
No comorbidity	59(79.3)
Vascular	13 (11.7)
Cardiac	7 (6.3)
Diabetes	10 (9.0)
Pulmonal	23(20.7)
Oncologic	3 (2.7)
Previous thoracic/abdominal operation	15(13.5)
ASA score (n (%))	
1	64 (57.7)
2	42 (37.8)
3	5(4.5)
Clinical stage (TNM 8) (n (%))	
pTisN0M0	8 (7.2)
cT1aN0	4 (3.6)
cT1aN1	1 (0.9)
cT1bN0	10 (9.0)
cT1bN1	7 (6.3)
cT2N0	10 (9.0)
cT2N1	7 (6.3)
cT2N2	2 (1.8)
cT3N0	22 (19.8)
cT3N1	26 (23.4)
cT3N2	10 (9.0)
cT3N3	1(0.9)
cT4aN0	2(1.8)
cT4aN1	2(1.8)
cT4aN2	1(0.9)
Tumor location (n (%))	0(0)
Upper esophageal	10 (9.0)
Middle esophageal	75 (67.6)
Lower esophageal	26 (23.4)

	n = 111
Tumor type (n (%))	
Adenocarcinoma	
Squamous cell carcinoma	
High-grade intraepithelial neoplasiaNeuroendocrine	0 (0)
	102 (91.9)
Neoadjuvant treatment (n (%))	8 (7.2)
No therapy	1 (0.9)
Chemotherapy	84(75.7)
Chemoradiotherapy	8 (7.2)
Immunotherapyand chemotherapy	16 (14.4)
	3 (2.7)

Table 2 Operative details (n = 110)

n = 110	
Operating time (min)(mean – SD)	(271.9±69.7)min
Blood loss (ml)(±SD)	(99.9±68.4)ml
Intraoperative complications	
Conversion thoracic phase	0
Conversion abdominal phase	3
Lymph nodes (number) (median – range)	(40.9±16.7)
Thoracic lymph node (number)	(21.8±9.0)
Positive lymph nodes (number)	55(49.5%)
106recLPositive lymph nodes n(%)	17(15.3%)
106recRPositive lymph nodes n(%)	24(21.6%)
106rec Positive lymph nodes n(%)	7(6.3%)

Table 3 Postoperative data (n = 111)

n = 111	
Complicated procedures (n (%))	39(35.1)
Pulmonary complications (n (%))	33(29.7)
Pneumonia (n (%))	24(21.6)
Pneumothorax (n (%))	2(1.8)
Pleural effusion (n (%))	13(11.7)
ARDS(n(%))	3(2.7)
Cardiac complications (n (%))	11(9.9)
Anastomotic leakage type II (n (%))	3(2.7)
tracheoesophageal fistula (n(%))	1(0.9%)
Chylothorax (n (%))	3(2.7)
Recurrent laryngeal nerve paralysis (n (%))	9(8.1)
VTE(n(%))	3(2.7%)
Wound infection (n (%))	1(0.9)
30-day mortality	0(0)
90-day-mortality	0(0)
Readmission ICU (n (%))	3(2.7)
Hospital stay (days) (medianmean – range)	(10.9±6.1)(6-50)
Readmission in 30 days after discharge (n (%))	2(1.8)

Table 4 Histopathological data
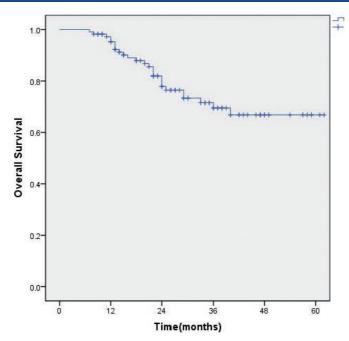
Histological type (n (%))	
R0	110 (99.10)
R1	1 (0.90)
Lymph nodes (number) (median – range)	(40.88±16.7)
Positive lymph nodes (number)	55(49.55%)
Pathological stage (TNM 8) (n (%))	
pTisN0M0	3(2.70)
pT0N0	4(3.60)
pT0N1	1(0.90)
pT0N3	1(0.90)
pT1N0	2(1.80)
pT1aN0	4(3.60)
pT1bN0	14(12.61)
pT1bN1	2(1.80)
pT1bN2	2(1.80)
pT1N1	3(2.70)
pT2N0	9(8.11)
pT2N1	6(5.40)
pT2N2	2(1.80)
pT3N0	17(15.32)
pT3N1	17(15.32)
pT3N2	13(11.71)
pT3N3	6(5.40)
pT4aN0	2(1.80)
pT4aN3	1(0.90)
pT4bN0	1(0.90)
neuroendocrine carcinoma(ypT0N1M0)	1(0.90)
Histological type (n (%))	
Adenocarcinoma	0(0)
Squamous cell carcinoma	105(94.60)
No viable tumor cells	2 (1.80)
neuroendocrine carcinoma	1 (0.90)
High-grade intraepithelial	3 (2.70)

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WITHDRAWN

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COMPLETE RESECTION OF THYMOMA: ANALYSIS OF A SINGLE CENTER RETROSPECTIVE DATABASE

Ahmet Sami Bayram, Eylem Yentürk, Tolga Evrim Sevinç, Hüseyin Melek, Cengiz Gebitekin
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OBJECTIVES
Thymoma which is one of the malignant thymic epithelial tumors constitutes half of the anterior mediastinal masses. The most effective current treatment procedure is complete surgical resection.

METHODS
Patients diagnosed with thymoma after mediastinal surgery in our clinic between 2001-2020 participated in this study. Thymic carcinoma and rare thymoma variants were excluded according to pathology results. Totally 99 patients were examined retrospectively. Age of the patients at the time of thymo-thymectomy, histopathological grading of WHO, tumor size, capsular invasion, type of surgery, presence of myasthenia gravis, adjuvant therapies, Masaoka-Koga staging were documented. Patients' survival and disease-free survival times were calculated as the date to end of December 2020.

RESULTS
According to gender, there were 48 (48%) male and 51 (52%) female patients. The ages of the patients were between 20 and 79, and the average age was 50. It has been observed that the presence of myasthenia gravis has no significant effect on survival and relapse statistically. In the adjuvant therapy, it has been observed that the disease-free survival time of the group that underwent radiotherapy is longer than others who underwent chemotherapy or radiochemothrapy (Image 1). It has been calculated that a one unit decrease in the age of surgery increases the risk of disease-free survival time by 1.143 times. It has been found that the general survival and disease-free survival times of the patients who were in Masaoka clinical stages 1 and 2 are higher than those who were in clinical stages 3 and 4.

CONCLUSIONS
It has been seen that clinical staging and age were important prognostic factors but histopathological grading has no significant effect statistically. According to this, regardless of tumor size and capsular invasion, the significance of complete surgical resection increased more. As a postoperative treatment option, radiotherapy by itself contributes positively to survival and relapse.

Disclosure: No significant relationships.
Keywords: Thymoma, Myasthenia Gravis, Thymo-Thymectomy

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