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ABSTRACTS

Bronchology 1. – Case reports in Hungarian language

B1

Ultrahang-vezérelt transzbronchiális kriobiopszia: új, hatékony módszer a ritka mediasztinális daganatok diagnosztikájában

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Háttér: Az endobronchiális ultrahang-vezérelt transbronchiális tűaspiráció (EBUS-TBNA) a mediasztinális és hiláris léziók diagnosztizálásának gold standardja. Bizonyos esetekben azonban, például limfoproliferatív betegségek vagy benignus elváltozások esetén a szövettani diagnózishoz, illetve a molekuláris patológiai vizsgálatokhoz nagyobb, ép mintára van szükség. Az EBUS-kriobiopszia egy új és hatékony módszer, mely irodalmi adatok alapján növeli a diagnosztikai hozamot jóindulatú rendellenességek, lymphomák, és ritka daganatok esetén, kedvező biztonsági profil mellett.
Esettanulmány: A 68 éves férfit légszomj miatt vizsgáltuk. A mellkas CT-vizsgálat nagy kiterjedésű felső mediasztinális térfoglaló folyamatot mutatott. Bronchoszkópia során a légcső és mindkét főhörgő jelentős szűkülete látszott, külső kompresszió miatt. Az endobronchiális ultrahang nagy mediasztinális térfoglalást mutatott, amely a légcsőtől ventrálisan terjedt, a bifurkációs karinától kezdődően a 4R és 4L régiókat érintve. Az EBUS-TBNA során nyert minta citológiai vizsgálata nem vezetett szövettani diagnózishoz. Egy thorakoszkópos mintavétel betegünk esetében technikailag nehéz lett volna egy korábbi pneumothorax kapcsán elvégzett pleurodesis miatt, ezért EBUS-kriobiopszia elvégzése mellett döntöttünk. A mintavétel során 1,1 cm átmérőjű szövetmintát nyertünk, amelyet szövettani vizsgálata paragangliomát igazolt.
A paragangliómák a mellékvesén kívüli szimpatikus idegrendszer kromaffin sejtjeiből származó neuroendokrin neoplazmák. Előfordulásuk a mediasztinumban rendkívül ritka, az összes paraganglióma körülbelül 1–2%-át, a mediastinális tumorok kevesebb mint 0,3%-át képviseli. A klinikai tüneteket elsősorban a tumor méretével kapcsolatos szekréciós aktivitás és a térfoglaló hatás határozza meg, mindazonáltal az esetek akár 50%-át véletlenül, radiológiai vizsgálat során azonosítják.
Következtetés: A mediastinum és a hilus elváltozásainak kriobiopsziája javítja a diagnosztikai eredményességet az EBUS-TBNA-hoz képest, miközben kedvező biztonsági profilját megőrzi.
Kulcsszavak: EBUS-vezérelt transbronchiális kriobiopszia, ritka mediastinális daganatok, paraganglioma.

B2

A rosszindulatúság árnyékában - a szövettané a végső szó

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Háttér: A kétoldali, csúcsi pulmonalis infiltratumok differenciáldiagnosztikája komplex feladat, a háttérben benignus és malignus megbetegedés is állhat. Különösen fiatal betegeknél fertőző betegségek, granulomatosus, interstitialis kórképek és malignus betegségek egyaránt mérlegelendők. A fenti betegségek radiológiai és klinikai átfedése

diagnosztikai bizonytalanságot eredményezhet. A szövettani vizsgálat perdöntő lehet a végleges diagnózis felállításában.
Esetismertetés: Egy fiatal, téglagyárban dolgozó férfi kétoldali tüdőcsúcsi parenchymás eltérések miatt került kivizsgálásra. A képalkotó vizsgálatok alapján malignitás erős gyanúja merült fel, ugyanakkor a szimmetrikus érintettség és a kétoldali mediastinalis nyirokcsomó-megnagyobbodás sarcoidosis gyanúját is felvetette. A csúcsi lokalizáció és az infiltrátumok morfológiája miatt infekciós eredet, köztük tuberkulózis sem volt kizárható. A bronchoscopia és az első CT vezérelt biopsziás mintavétel nem vezetett egyértelmű eredményhez. A csúcsi eltérés ismételt CT-vezérelt szövettani mintavétele, majd a mediastinalis nyirokcsomókból történt EBUS általi mintavétel azonban idegen anyag lerakódására utaló szöveti képet, polarizált fényben kettős törést mutató porszerű, részben kristályszerű szemcsék lerakódását igazolta. A végső szövettani diagnózis alapján silicosis volt igazolható, mely a beteg anamnéziséből ismert, hosszan fennálló téglapor-expozíció következményének bizonyult.
Diszkusszió: Az eset rámutat arra, hogy a tüdőrák, a sarcoidosis, a tuberkulózis és a silicosis radiológiai és klinikai jellemzői jelentős átfedést mutathatnak. A kétoldali csúcsi elváltozások, valamint a nyirokcsomó-megnagyobbodás malignus folyamatot, szisztémás granulomatosus betegséget és fertőzést egyaránt imitálhatnak. A beteg anamnézisének, expozícióinak ismerete kiemelten fontos a pontos diagnózis felállításához.
Következtetés: A silicosis ismert rizikófaktora mind a tüdőráknak, mind a tuberkulózisnak, továbbá sarcoidosisra emlékeztető granulomatosus reakciókat is előidézhet, ami tovább nehezíti a differenciáldiagnosztikát. A foglalkozási expozíció anamnézisének pontos feltárása segítheti a helyes diagnózist. A célzott szövettani vizsgálat nélkülözhetetlen a pontos etiológia meghatározásában, és döntő jelentőségű a megfelelő betegút és terápiás stratégia kialakításában.

B3
EBUS vizsgálattal igazolt mediastinalis bronchogén ciszta
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A 62 éves férfi anamnéziséből évtizedek óta fennálló, ismeretlen eredetű, visszatérő urticariás tünetek emelhetők ki, belgyógyászati betegségről nem tud. A panaszmentes férfinél szűrővizsgálatként végzett gasztroszkópia során külső kompresszió által okozott nyelőcső szűkületet találtak, mely a lument felére szűkítette. Emiatt készült mellkas CT a subcarinalis régióban 25 x 36 mm-es lágyképletet mutatott, melyet elsősorban nyirokcsomó conglomeratumnak véleményeztek. A terime miatt a nyelőcső 34 mm hosszú szakaszon komprimált volt. Pericardialis, mellkasi folyadékgyülem, illetve a hilusokban és a mediastinumban kóros nyirokcsomó nem ábrázolódott, a tüdőparenchymában kóros eltérés nem látszott.
Kivizsgálás céljából utalták osztályunkra. Laborleteiben jelentős eltérés nem mutatkozott. Légzésfunkciós vizsgálata fiziológiás értékeket mutatott. Hasi UH vizsgálat során prosztata megnagyobbodást írtak le.
EBUS bronchoszkópia során mintát vettünk a 7-es nyirokcsomó régióból, mely során sűrű, nyúlós, áttetsző, zöldes színű váladékot nyertünk. Az elváltozás a látott citológiai kép alapján leginkább tömlőtartalomnak felelt meg, atípiát nem láttak.
Onkoteam bemutatást követően a képlet sebészi úton eltávolításra került, a műtéti szövettan megerősítette a bronchogén ciszta diagnózisát.
Keywords: bronchogén ciszta, mediastinalis térfoglalás

B4
Ritka betegség egy gyakori tünet hátterében
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A 75 éves idős férfibeteget az OMSZ szállította a Váci Kórház Sürgősségi Osztályáról, ahol súlyos stridoros légzés, COPD akut exacerbáció miatt vizsgálták. Az SBO-n gégészeti

konzílium trachea dyskinesist véleményezett, a hangrés eltérés nélküli volt. Érkezését követően rövid időn belül globális légzési elégtelenség alakult ki, urgens légútbiztosítás miatt ITO Részlegünkre helyeztük. Fizikális vizsgálat során szembetűnő volt a beteg sötétszürke bőre, a nyak mozgásai beszűkültek voltak, hólyagkatéteren sötétvörös vizelet ürült. Hörgőtükrös vizsgálat során a bifurcatios carina felett a trachea alsó szakaszát körkörösen idegenszövet szűkítette, ebbe mélyen beágyazódva és a jobb felső lebeny bemenetében fekete „idegentesteket" észleltünk. A szövettani vizsgálat a malignitás kizárása mellett granulációs szövetet véleményezett. A beteget rövid időn belül keringési elégtelenség miatt elveszítettük, a sectio során több szervi lokalizációban, a mellkasfali csontokban, a trachea valamennyi porcában, a szív papillaris izmaiban, a billentyűkön, az aorta falában kiterjedt sötét pigmentáció volt látható. A tracheában talált fekete „idegentestek" szövettani vizsgálata folyamatban van.
Következtetés:
A fizikális vizsgálat, a sectio során észleltek differenciáldiagnosztikai kérdést vetnek fel, azonban az állás során megfeketedő vizelet és a több szervi lokalizációban észlelt fekete pigmentáció inkább generalizált anyagcserebetegség, alcaptonuria irányába tereli a gyanúnkat. Teljesen véletlen, hogy egy gyakori pulmonológiai tünet, a stridor hátterében akár egy igen ritka anyagcserebetegség is állhat, amely betegünk esetében 75 évig rejtve volt.

Proffered Papers

E01

Diagnostic Value of Pleuroscopy in Pleural Diseases – Experience from Semmelweis University

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Background:
Medical thoracoscopy (pleuroscopy) is a minimally invasive technique that enables direct visualization of the pleura, targeted biopsy, and therapeutic interventions such as talc pleurodesis. We aimed to evaluate the diagnostic yield, safety, and clinical utility of pleuroscopy based on institutional experience.
Methods:
We performed a retrospective analysis of pleuroscopies carried out at the Department of Pulmonology, Semmelweis University. Data on diagnostic outcomes, histological results, patient demographics, and complications were collected.
Results:
Altogether, 49 pleuroscopies were analyzed, of which 3 were incomplete due to adhesions. The pooled cohort comprised 24 women and 25 men, with a mean age of 63.5 years. Pleural abnormalities were visualized in all evaluable cases, and biopsies were obtained in nearly all patients. Histological analysis revealed 22 malignant pleural diseases, while 22 cases were benign. In 3 patients, malignancy was missed by pleuroscopy but confirmed by subsequent investigations (false negatives). Two patients were diagnosed with extrapulmonary tuberculosis.
Adverse events were infrequent: 1 pneumothorax and 1 empyema occurred, in both cases chest tube insertion and conservative treatment resolved the complication. Most procedures were performed under local anesthesia with midazolam ± nalbuphin sedation.
Pooled diagnostic performance for malignant pleural disease was: sensitivity 88%, specificity 100%.
Conclusions:
Our findings confirm that pleuroscopy is a safe, reliable, and highly accurate diagnostic tool in pleural diseases and also offers therapeutic options. Pleuroscopy should be considered an integral part of the diagnostic and therapeutic approach to pleural disorders, particularly in suspected malignancy.
Keywords: pleuroscopy, pleural disease, pleural effusion

E02

Ex Vivo Lung Perfusion: Methodological Insights and Drug Distribution studies in Resected Human Cancerous LUNGS

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OBJECTIVE: Ex-Vivo Lung Perfusion (EVLP) represents a dynamic and advancing methodology, serving both as an organ assessment tool for lung transplantation and a translational research technique for the comprehensive study of pulmonary physiology. Our aim was to establish a pioneering EVLP model for cancerous human lobes, to assess the viability of conducting drug delivery studies within this experimental framework.

METHODS: We enrolled patients diagnosed with lung cancer who were scheduled to undergo conventional thoracic surgical procedures either by thoracotomy or video-assisted thoracoscopy. In our EVLP model, cancerous human lobes or lungs after resection underwent perfusion with an acellular solution under normothermic conditions. Perfusion and ventilation parameters were adjusted to normal levels. Blood gas analysis was done intermittently to ensure physiological conditions. Sunitinib was infused at concentrations ranging 10-1000 times the normal anticipated plasma levels. After termination of the experiment, lung samples were obtained from both tumorous and non-tumorous regions. Serial cryosections were stained with hematoxylin-eosin and immunolabeled with relevant fluorescent antibodies. In order to quantify drug distribution, matrix-assisted laser desorption ionization-mass spectrometry imaging (MALDI) was utilized. The assessment of drug signals was conducted utilizing a workflow established by our research team.

RESULTS: The median duration of the experiments was 159 minutes, while the median perfusion time for sunitinib was 112 minutes. There were no significant differences in baseline physiological parameters in lung specimens obtained by pneumonectomy and lobectomy. The experiment did not alter the relevant immunohistochemical profiles of the tumorous and non-tumorous samples. The mean intensity of sunitinib exhibited a statistically significant elevation in lung tissue as compared to the tumorous area across all three tested concentrations. We observed a progressive increase in signal intensity over time in lung samples collected intermittently from both the upper and lower lobes.

CONCLUSIONS: The application of the EVLP technique on cancerous lobes is a viable and unique option that presents a prospective tool for future pharmacological investigations. In our first experiments, drug delivery was less efficient to tumorous regions of the lung, most likely due to the lack of bronchial circulation. These finding underlines why alternative drug delivery pathways, such as inhalation, should be sought.

E03

Identifying Novel Prognostic Markers in Small Cell Lung Cancer Through Comprehensive In-silico Analysis

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Background: Small cell lung cancer (SCLC) is among the most aggressive malignancies, characterized by rapid disease progression.

Objectives: We aimed to identify and validate robust prognostic markers in SCLC by analyzing publicly available transcriptomic datasets and conducting subsequent immunohistochemistry (IHC) analyses.

Methods: Three previously published SCLC tissue transcriptomic datasets, accompanied by overall survival (OS) data, were accessed. Cox regression analysis was conducted to identify genes with potential prognostic significance. The most promising markers across the three cohorts were identified based on their alignment with corresponding protein expression data and insights from our comprehensive literature search. To validate our in-silico findings, we performed IHC analyses on a cohort of 50 surgically resected SCLC specimens.

Results: Our comprehensive bioinformatic analysis revealed 25 genes with potential prognostic significance in SCLC. Protein expression data supported the survival association for 1 unfavorable and 11 favorable markers ($p<0.15$). Following our in-depth selection process, PFN2, CTSB, PTPN6, and SLC35C1 emerged as the most promising markers for further validation. The IHC analysis revealed that high PFN2 expression in tumor cells was associated with worse OS ($p=0.14$), supporting its role as an unfavorable prognostic marker. In contrast, higher expression of CTSB ($p=0.3$) and PTPN6 ($p=0.17$) in immune cells was correlated with improved OS, suggesting these proteins may reflect immune competence within the tumor microenvironment. No significant association was found for SLC35C1.

Conclusion: Analyzing publicly available gene and protein expression datasets facilitates the identification of novel prognostic markers applicable to the diverse SCLC population, paving the way toward more personalized management of SCLC patients.

E04

Small Cell Lung Cancer as a Second Primary Cancer: A Comprehensive Analysis

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Background: Small cell lung cancer (SCLC) is characterized by rapid growth, high metastatic capacity, and extremely poor survival outcomes. Despite the known increase in the incidence of second primary cancers, the existing literature provides only a very limited insight into the characteristics and survival of patients with SCLC as their second primary cancer, underscoring the need for comprehensive evaluation.

Objectives: In this study, we aim to address the literature gap by exploring the characteristics and prognostic factors of SCLC patients who were previously treated for another malignant disease.

Methods: A multifaceted methodology was used to combine evidence from an in-depth assessment of patient data originating from our institution, a population-level analysis using the SEER registry, and a systematic analysis of existing literature (PubMed, Medline via Ovid, Scopus).

Results: The distribution of genders among SCLC as the first vs. second primary cancer was significantly different, with a larger proportion of females in the second primary group. Patients with second primary SCLC tend to be significantly older than those with first primary SCLC. The smoking distribution between first and second primary SCLC patients is not significantly different. The most common previous malignancy for second primary SCLC patients was breast cancer, followed by head and neck tumors, gastrointestinal cancers, and genitourinary malignancies. The stage distribution was also significantly different in

both analyses, with a larger proportion of limited-stage patients in the second primary group. When stratified by disease stage, Kaplan–Meier analysis showed that patients with second primary SCLC had significantly worse survival than those with first primary SCLC. The type of previous malignancy was moderately associated with survival; however, neither the type of systemic treatment received for the previous malignancy nor the time elapsed since the previous malignancy does not seem to have a significant effect on survival.
Conclusion: This study contributes to the understanding of this unique subset of SCLC cases, underscores the complexity of this rare clinical scenario while also raises questions about the potential impact of previous anti-cancer treatments and shared risk factors.

E05

Expectations and quality of life of lung cancer patients during the care process

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Introduction
Lung cancer affects an increasing number of people worldwide. Mortality and incidence rates are traditional public health indicators, but these indicators are difficult to interpret at the individual level. The experiences of those affected in the care system and during the patient journey can provide important feedback.
Methods:
A quantitative questionnaire-based cross-sectional study examining patients' self-reported clinical data and their experiences during the patient journey, in two selected institutions (in total, n=122). The qualitative method focuses on feedback on personal experiences (focus groups n=7).
Results:
The patients average age was 66.8 years, and their general health was good according to their self-reporting. In terms of stage: 51% of the patients were in stage I-II, 20% in stage III. and 29% in stage IV.
Over 90% were unaware of biomarker positivity, although it was at the base of subsequent treatments.
Half of the patients were identified through screening, 10% were included in the LDCT program.
In terms of transparency in the patient journey, public information on early symptom recognition, improving the relationship between primary care physicians and patients, and more in-depth education about lung cancer were considered useful by 85%. Reducing waiting times was considered important by 60%, and clear information about diagnostic processes was considered particularly important by 77%.
In their suggestions, 91% of patients identified the accessibility of the medical team and 86% of professionals' communication skills as areas for improvement. In total, 89% found the communication reassuring.
Conclusion:
Patients will trust clinical decisions when they are provided with sufficient information and understanding during treatment so that their overall quality of life is satisfactory regardless of the outcome of treatment. Clear communication with patients during the whole proccess promotes the better quality of life and sence of security.
Patients experience difficulties in accessing primary care and early information at the beginning of their journey, and the time to diagnosis seems long, which is partly a justified observation.
The feedback on the work of the care team and the information received and the quality of care is satisfactory. However, the quantity and quality of communication is not entirely reassuring. This may be due to the known capacity and staff shortage, which means that the team is overloaded.
Keywords: Quality of Life, Patient experinced data, communication

E06

Potential Role of the Microbiome in the Efficacy of PD-1/PD-L1 Inhibitor Therapy in NSCLC

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Introduction: In recent years, the role of the gut–lung axis and the microbiome has gained increasing attention. Microbial diversity, drug exposures (antibiotics, proton pump inhibitors – PPIs), and metabolic pathways may influence immune responses and the efficacy of immunotherapy. This is presumed to occur partly through alterations in microbial metabolites and immune cell interactions (balance of Treg–$CD8^+$ T cells, tumor microenvironment).

Objective: To provide an overview of the role of the gut microbiota in non-small cell lung cancer (NSCLC), based on both literature data and our cohort study, with a focus on pathomechanisms, modulation strategies, and translational significance.

Methods: In our prospective cohort study (n = 65), we performed metagenomic analysis of fecal samples from NSCLC patients treated with PD-1 inhibitors, assessing species-level taxonomy and functional metabolic pathways. We added a cohort (n = 55) to our study using metagenomic analysis to validate our findings. The potential role of microbiota modulation was summarized based on available literature.

Results: Reduced microbial diversity, as well as exposure to antibiotics and PPIs, was consistently associated with poorer immune checkpoint inhibitor (ICI) efficacy. In our cohort study, short progression-free survival (PFS) was associated with increased abundance of Firmicutes and Actinobacteria, as well as a higher Firmicutes/Bacteroides ratio, whereas Euryarchaeota was linked to low PD-L1 expression. We found Long PFS-associated taxa, including Alistipes shahii, A. finegoldii, and Barnesiella viscericola, while short PFS was associated with Streptococcus species and Bifidobacterium breve. Using Random Forest analysis, taxonomic profiles predicted PFS (AUC = 0.74), while metabolic pathways predicted PD-L1 expression (AUC = 0.87). Our findings in the discovery cohort were confirmed using the validation cohort.

Conclusion: The composition and functional features of the gut microbiome represent promising biomarkers for predicting the efficacy of ICI treatment in NSCLC. Based on literature data, microbiota modulation (through dietary interventions, probiotics, fecal microbiota transplantation, and next-generation microbial consortia) may offer additional opportunities to improve immunotherapy outcomes.

Keywords: Microbiome, NSCLC, Immunotherapy

E07

Brain Metastases in NSCLC: Real-World Survival Outcomes with Updated Analysis of Extracranial Disease

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Background:

We previously reported real-world outcomes of non-small cell lung cancer (NSCLC) patients with brain metastases (BM), highlighting factors influencing survival. That analysis did not include extracranial disease (ED) status. Here, we present updated data incorporating ED.

Methods:

We retrospectively analyzed NSCLC patients diagnosed with BMs from January 1, 2018, to December 31, 2022, at a single academic center in Serbia. Inclusion required histologically confirmed NSCLC, radiologically verified BM, and complete clinical data. Overall survival (OS) was defined as the time from BM verification to death or last follow-up. Survival analyses were performed using Kaplan–Meier curves and Cox regression, including ED status.

Results:

Among 267 patients, the median OS was 5.0 months (95% CI: 3.981–6.019). Factors associated with better OS in univariate analysis included age <65 years, female gender, single BM,

asymptomatic BM, ECOG PS 0–1, BM verification at diagnosis, and combined systemic and local treatments. Combined treatments yielded the greatest survival benefit (median OS: 9.0 months), while best supportive care and local-only treatments yielded 2.0 months. Immunotherapy and targeted therapy were associated with the highest OS (13.0 months), outperforming chemotherapy alone (7.0 months). Multivariate analysis confirmed younger age, single BM, early BM verification, and combined treatment as independent predictors of improved survival.
Extracranial metastases were present in 60.7% of patients. Median OS was 3.0 months for patients with ED versus 6.0 months for those without. Cox regression showed a non-significant association with survival.
Conclusions:
In this real-world cohort of NSCLC patients with BMs, extracranial metastases did not significantly affect survival. These findings expand on our previous report, confirming that outcomes are primarily driven by intracranial disease burden, patient characteristics, and treatment modality, while reporting extracranial status provides a more complete characterization of the population.
Keywords: Lung cancer, Non-small-cell lung cancer, Brain Metastases

E08

Lung cancer screening - the female perspective

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Lung cancer screening has been gaining momentum since the data from the NLST and NELSON study has been published.
It is now a well established fact, that low dose lung cancer screening (LDCT-LCS) significantly lowers mortality in well chosen risk groups.
However most of these trials focused mainly on male smokers, despite the fact that in several countries, including Hungary lung cancer is now the leading cause of cancer deaths in the female population.
Since the start of randomised prospective lung cancer screening programs in Hungary (HUNCHEST in 2013-2019, HUNCHEST-II in 2019-2022, and HUNCHEST 3 still ongoing) a high percantage of the screened population were women. We will present the demographics, smoking habits and screening results specific to female screenees, to show why screening of women is important.
Keywords: lung cancer, screening, women

E09

Early-Stage Resectable Non-Small Cell Lung Cancer in Hungary

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This study provides a comprehensive analysis of early-stage resectable non-small cell lung cancer (NSCLC) in Hungary, investigating incidence rates, demographic trends, treatment patterns and survival outcomes. We used data from the National Health Insurance Fund (NHIF) spanning 2013–2022, and we analyzed 6,571 patients with available NSCLC histology and no metastasis, who underwent curative surgery within six months of diagnosis, and evaluated epidemiological trends and the use of neoadjuvant and adjuvant therapies. For the efficacy analysis, we narrowed the patient cohort to 5,494 patients diagnosed and treated between 2013 and 2019 with at least three-year follow-up data. Key endpoints included overall survival (OS) and disease-free survival (DFS), inferred via time to first subsequent therapy (TFST).

Our results revealed a gradual decline in early-stage resectable NSCLC diagnoses, with a significant drop in 2020, likely linked to COVID-19 restrictions. Older age groups (66–75 years) represented a growing proportion of cases, reflecting shifting demographic trends. Among patients with EGFR mutations receiving EGFR tyrosine kinase inhibitor (EGFR-TKI) therapy, OS significantly improved compared to those not receiving EGFR-TKI therapy, who are assumed to have wild-type EGFR status (HR = 0.58 (95% CI: 0.47–0.72), p < 0.0001).
These findings underscore the importance of early detection, comprehensive biomarker testing and targeted therapies in improving outcomes for resectable NSCLC patients. Future studies with extended follow-up and integration of broader clinical data, including staging and patient comorbidities, are warranted to optimize therapeutic strategies.

E10

Evolving Real-World Survival in Late-Stage NSCLC Across the Pre-Immunotherapy, COVID, and Post-COVID Eras: A Nationwide Analysis (2011–2024)

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Background:
The therapeutic landscape of advanced non-small cell lung cancer (NSCLC) has undergone major shifts over the past decade, driven by the introduction of immune checkpoint inhibitors (IO), the impact of the COVID-19 pandemic, and evolving national reimbursement frameworks. We aimed to assess real-world survival trends among late-stage NSCLC patients treated with systemic anticancer therapy (SACT) between 2011 and 2024 in Hungary.
Methods:
This nationwide, retrospective cohort study utilized the Hungarian National Health Insurance Fund database, capturing all adults (≥20 years) newly diagnosed with lung cancer (ICD-10: C34) and receiving SACT without lung surgery within 180 days of diagnosis. Overall survival was evaluated at fixed time points (3, 6, 12, 24, and 36 months) and stratified by five key periods: pre-immunotherapy (2011–2016), early IO adoption (2017–2018), broad first-line IO access (2019), COVID-19 pandemic (2020–2021), and post-COVID recovery (2022–2024).
Results:
Survival improved gradually during the pre-IO years and accelerated following the introduction of IO therapy. Despite transient declines during the pandemic—reflecting diagnostic and treatment disruptions—survival rebounded in 2022. However, recent data indicate that gains achieved during the early IO era have plateaued, suggesting ongoing system-level and therapeutic challenges.
Conclusions:
This 14-year nationwide analysis reveals significant improvements in survival among Hungarian patients with late-stage NSCLC treated with SACT, followed by transient setbacks during COVID-19 and modest stabilization thereafter. Continuous monitoring of real-world outcomes is crucial to sustain progress achieved with modern therapies in the post-pandemic era.

E11

Do we need different approach in lung cancer management in octogenarian patients?

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Background:
Lung cancer (LC) is one of the leading cancers regarding incidence and prevalence in the elderly. With increasing life expectancy more octogenarians (referred to as the oldest old) are in need of LC diagnosis and treatment. Multimorbidity and frailty significantly increases with age and might influences LC outcomes, needing more data on this special population.

Aims:
The objective of this study was to analyse patient characteristics and treatment options in octogenarian patients.
Methods:
We retrospectively analysed all newly diagnosed LC patients presented the first time on our Multidisciplinary oncoteam (MDT) between January 2020-December 2021 and January-June 2025. Patients were divided being <80 or ≥ 80 years of age at the presentation. Descriptive patient characteristics were compared.
Results:
Out of 1195 patients 100 (8.4%), 55% female were octogenarians, with significant increase in the proportion from 6% to 12% regarding the years 2020 and 2025. Patients of this age groups were significantly less often smokers (16.3 vs.47.1%; p<0.001), while chronic obstructive lung disease was similarly present in both groups. Significantly less octogenarians had PS0-1 (63 vs. 83%; p<0.001), as well as lung cancer subtypes did significantly differ, as there was a high proportion of not verified LC cases in this age group (37.2 vs 22.5%; p<0.01). Most cases were stage IV LC in both groups, however even more pronounced in the octogenarian group (86.8 vs. 72.8%; p=0.03). Therapeutic approach was also significantly different as mainly best supportive care (40.0 vs. 14.3%) was offered, followed by chemotherapy (26.7 vs. 48.0%), target (11.7 vs. 7.3%) and immune checkpoint inhibitor monotherapy (6.7 vs. 3.8%).
Conclusion:
Octogenarians are representing an increasing proportion of LC patients, exceeding 10% of the newly diagnosed patients in a real word setting. Most patients had no histological verification due to advanced disease, possibly comorbidities and worse PS limiting invasive approaches and significantly influencing therapeutic possibilities. Looking at LC treatment outcomes this special population needs further research to account for confounders and best options to help these patients in the fight against LC
Keywords: Lung cancer, PS, elderly, diagnosis, treatment

E12

Pembrolizumab versus Pembrolizumab plus Chemotherapy in Non-small Cell Lung Cancer with High PD-L1 Expression – Multicenter Real-world Evidence Study

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Background: Patients with non-small cell lung cancer (NSCLC) with PD-L1 expression ≥ 50% can be treated with immunotherapy alone or with a combination of immunotherapy and chemotherapy. One of these options is treatment with pembrolizumab (P) with/without chemotherapy (CHT). Meta-analyses from randomized trials suggest a beneficial effect on response rate (RR) or progression free survival (PFS) when using the combination treatment P + CHT compared to P alone, but not on improving overall survival (OS). However, data from real-world clinical practice are insufficient especially in European patients. Regional differences, e.g. in the representation of KRAS mutations between Asian and European patients, could theoretically influence potential differences between P + CHT and P.

Therefore, the aim of this study was to compare P + CHT versus P alone in real clinical practice in patients from Central Europe.
Methods: Retrospective data from 8 comprehensive oncology centres in Central Europe were used. All patients with PD-L1 expression ≥ 50% with stage IV NSCLC treated with pembrolizumab in daily practice to June 2024 were included and their data statistically analysed.
Results: In the whole group 793 patients was included in the study – 706 treated with P and 87 with P+ CHT. In this unadjusted sample, we observed significantly higher RR (p <0.0001) and OS (p = 0.044) for the P + CHT group vs. P. For significant differences in both groups, where performance status in particular played a role in survival in the Cox model, we subsequently performed patient matching 2 (P+CHT):1 (P) from the whole group of patients. After this patient matching, we continued to observe a significant difference in RR (p = 0.005), but no longer in OS (p = 0.103). The PFS was not significantly different in both cases (p= 0.174 for unadjusted patients resp. p = 0.342 for matching groups).
Conclusions: P+CHT leads to a significantly higher RR compared to P and can therefore be considered in patients with a more certain treatment response goal (e.g., bulky symptomatic tumor), however, this advantage does not translate into PFS and OS benefit.
Keywords: Immuntherapy, PD-L1, pembrolizumab, NSCLC

E13
Beyond clinical trials: Real world experience in first line NSCLC
Zsolt Pápai-Székely
President of Hungarian Respiratory Society
Affiliations: The presentation reflects the standpoint of Dr. Zsolt Pápai-Székely. The analysis was prepared by RxTarget at the request of Roche (Hungary) Kft. The presentation was made possible with the support of Roche (Hungary) Kft.
Background: The approval of immunotherapy (IO) for the treatment of late-stage non-small cell lung cancer (NSCLC) opened new perspectives in improving survival outcomes. While randomized controlled trials (RCTs) represent the gold standard for evaluating new therapies, real-world data (RWD) is increasingly complementing the evidence generated by RCTs. This study aimed to assess survival outcomes, specifically progression-free survival (PFS) and overall survival (OS), alongside a description of the treatment sample size and patient flow of patients with advanced 1L NSCLC receiving atezolizumab or pembrolizumab (either as monotherapy or as in combination with chemotherapy) using real-world data derived from the Hungarian National Health Insurance Fund database.
Methods: The analysis was prepared utilizing data derived from the Hungarian National Health Insurance Fund database. The results for progression-free survival (PFS) and overall survival (OS) were examined separately during the periods corresponding to the national reimbursement for the respective active ingredients. The observational period for pembrolizumab (monotherapy/combination) was from January 2021 to May 2023, while for atezolizumab (monotherapy/combination) it was from June 2023 to December 2024. Progression was defined by the initiation of 2nd line therapy or death. Overall survival was measured until death from any cause.
Results: Patients initiating 1L atezolizumab monotherapy showed a median PFS of 8 months. For those starting 1L atezolizumab combination therapy, the median PFS was 13 months. The median OS for patients beginning 1L atezolizumab monotherapy was 15 months. For patients on 1L atezolizumab combination therapy, the median OS was 17 months. Patients initiating 1L pembrolizumab monotherapy demonstrated a median PFS of 8 months. For those starting 1L pembrolizumab combination therapy, the median PFS was 12 months. The median OS for patients beginning 1L pembrolizumab monotherapy was 13 months. For patients on 1L pembrolizumab combination therapy, the median OS was 18 months.
Conclusion: In the absence of dedicated comparative trials, performance of drugs in a real-world setting, assessed through RWD analyses, provides essential insights for clinical practice and decision support. Acknowledging the inherent limitations of this real-world analysis, similar survival outcomes were observed for atezolizumab and pembrolizumab within the Hungarian healthcare setting. A key factor in the selection of immunotherapies

remains making a decision tailored to the patients' clinical characteristics and general condition.

Posters

P01

Combining Radiation Therapy and Endovascular Stenting Improves Survival in Lung Cancer Patients with Superior Vena Cava Syndrome

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Background

Radiation therapy and endovascular stenting are treatment options for lung cancer patients with superior vena cava syndrome (SVCS). This medical emergency occurs when a growing tumor compresses the SVC, leading to compromised circulation and edema in the upper body. Thoracic radiotherapy and/or endovascular stenting can alleviate symptoms such as dyspnea, face and neck swelling, and improve the patient's quality of life.

Methods

A prospective study was conducted in Institute for pulmonary diseases of Vojvodina, which included 170 patients who presented with SVCS, and received radiation treatment of tumor and mediastinum with or without undergoing SVC endovascular stenting. In September 2019. first endovascular stent was applied in our institution. Our study included patients treated from January 2021. to January 2024. and had diagnosis of lung cancer before or after SVCS occurred. If stenting was possible, after reducing of symptoms, they received radiation therapy to the thorax (tumor and mediastinum). Patients who could not undergo stenting were referred only to radiation therapy.

Results

From total of 170 patients majority were male (62.7%), in stage III (55.0%), small cell carcinoma was the most frequent type (33.5%). More than half of patients were able to previously undergo stenting (55.4%). One hundred and forty-four (85.2%) patients were able to receive radiation therapy in planned dose. Half of the patients in the study received systemic therapy before or after onset of SVCS symptoms. In three-year follow up total of 16 (9.5%) patients were alive. However, overall survival was significantly better in the group of patients who had both stenting and radiation therapy compared to group who only had radiation therapy (8.0 vs 5.2 months; p=0.029).

Conclusions

The study's results suggest that timely and effective intervention aimed at treating malignant cause of this syndrome can relieve significant suffering and improve patient's quality of life. Endovascular stenting followed by radiation can prolong overall survival in lung cancer patients with SVCS. These findings highlight the importance of a multidisciplinary approach to managing SVCS in lung cancer patients.

Keywords: lung cancer, treatment, radiation therapy, stenting

P02

Characteristics of advanced lung cancer patients receiving first-line best supportive care: a single-center real-world Hungarian database-analysis

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Background: Treatment decisions for advanced lung cancer patients involve balancing potential benefits of active oncological therapy against patient fitness and disease burden. Understanding the characteristics of patients unsuitable for active treatment provides insights into clinical decision-making patterns and potential healthcare challenges. We analyzed the population receiving first-line best supportive care (BSC) at our institution to identify key determinants.

Methods: We retrospectively analyzed all patients with newly diagnosed advanced lung cancer first presented to our multidisciplinary oncology team between June 2020-December 2021 and January-July 2025, comparing those recommended for BSC versus active treatment.
Results: Of 618 patients with available first-line treatment decisions, 104 (16.8%) were recommended first-line BSC. Patients receiving BSC were significantly older (median 73 vs. 67 years, p<0.001), had markedly worse performance status (89% with ECOG 3-4 vs. minimal in active treatment group, p<0.001), and more frequently presented with metastatic disease (95.4% vs. 81%, p=0.002). Pathological confirmation was unobtainable in over 70% of BSC patients due to severe comorbidities and low performance status. Comparing COVID-era upfront BSC patients (2020-2021, n=67) to recent BSC patients (2025, n=35), we observed that age and performance status remained similar; however, in 2025, patients showed significantly higher rates of COPD comorbidity (85% vs. 46%, p=0.004), pathologically non-verifiable disease (92.1% vs. 64.2%, p<0.001), and multiple metastases (85.7% vs. 17.9%, p<0.001).
Conclusions: Patients receiving first-line BSC are characterized by advanced age, poor performance status, and extensive metastatic disease. The increasing proportion of patients with unconfirmed diagnoses and multiple metastases in recent year suggest diagnostic challenges due to poor performance or the presence of severe comorbidities, supported by the significantly higher COPD prevalence in recent BSC patients. Our findings highlight the importance of optimizing supportive care pathways and exploring interventions to identify patients earlier in their disease trajectory when active treatment options may be feasible.
Keywords: best supportive care, advanced disease, Hungary

P03

Our Experience with Linear EBUS-TBNA in Everyday Bronchological Practice

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Introduction
EBUS-TBNA has become a first-line method in the diagnostic work-up of mediastinal and hilar lymph nodes. In January 2024, our department introduced its first linear EBUS system.
Objective
To summarize our first-year experience with EBUS-TBNA, focusing on technical performance, clinical utility, and diagnostic yield, while supplementing our findings with data on the adequacy of rapid on-site cytological evaluation (ROSE).
Methods
Procedures were performed under general anesthesia following rigid bronchoscopic intubation, using a 21G EBUS-TBNA needle. Sampling was done sequentially from higher- to lower-stage lymph node regions. ROSE using Diff-Quik-stained smears guided further sampling. Patients were included if CT or PET-CT demonstrated enlarged or FDG-avid lymph nodes.
Results
During the first year, 25 patients (14 male, 11 female) underwent EBUS-TBNA. The median number of abnormal regions per patient was 2, with sampling usually performed from 1–3 regions.
Adequate sample rate: 92%
Diagnostic distribution: 36% reactive lymph nodes, 32% malignancy, 20% sarcoidosis, 4% sarcoid-like immune-related reaction, 8% non-representative samples
Most cell block specimens were suitable for molecular pathological testing
In two cases, the EBUS-TBNA results significantly influenced therapeutic decisions (down-staging enabling lobectomy; exclusion of suspected immunotherapy progression)
Related study (ROSE)
In a parallel study involving 64 patients (23 with EBUS-TBNA, 41 with cTBNA), ROSE was performed by a laboratory specialist. Compared with the pathologist's assessment, 100% of EBUS-TBNA samples were adequate, while conventional TBNA achieved 78% adequacy (p=0.021). Agreement between ROSE and the pathologist regarding adequacy was 90.6%

(κ=0.70; AC1=0.87), with sensitivity 89% and specificity 100%. For final diagnostic categories, moderate agreement was found (κ=0.54).
Conclusions
The implementation of EBUS-TBNA at our clinic significantly improved diagnostic efficiency, often replacing mediastinoscopy. The technique provides a safe, rapid, and high-quality sample suitable for molecular analysis. Adequacy studies further demonstrated the superior quality of EBUS-TBNA samples and confirmed that ROSE can be reliably performed by laboratory specialists. While the procedure requires experience and is associated with a learning curve, it becomes routine for trained bronchologists and represents substantial value in everyday clinical practice.
Keywords: EBUS TBNA, Rapid on-site evaluation, Mediastinal lymph node diagnostics

P04

Real-world comparison of first-line platinum-based chemotherapy and chemo-immunotherapy in metastatic non-small cell lung cancer

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Background:
Metastatic non-small cell lung cancer (NSCLC) is one of the most malignant neoplastic diseases. Therapeutic options in target-negative NSCLC include chemotherapy (CHT) and chemo-immunotherapy (CH-IM); however real-world data are scarce about the effect of these therapies.
Aims:
The objective of this study was to evaluate and compare the impact of chemotherapy and chemo-immunotherapy on progression-free survival (PFS) in NSCLC patients.
Methods:
We retrospectively analysed all newly diagnosed advanced NSCLC patients presented the first time on our Multidisciplinary oncology team (MDT) between January 2020-December 2021 and January-June 2025. Patients with stage IV squamous-cell carcinoma or adenocarcinoma were included if ECOG status was 0-1, and if first line treatment of CHT or CH-IM was chosen (N=130; CHT: N=59; CH-IM: N=71)). Patients who had been lost to follow-up; refused therapy; treated with best supportive care, targeted or mono-immunotherapy; had concomitant or previous malignant diseases; or previously underwent surgical procedure due to lung cancer were excluded from the analysis. PFS was estimated using Kaplan–Meier curves and compared by log-rank test and Cox proportional hazards regression. To control for potential confounding we conducted a multivariable Cox proportional hazards regression model including the following co-variables: age, sex, smoking history, comorbidity of chronic obstructive pulmonary disease (COPD), ECOG status and lung-cancer histology type. P value < 0.05 was defined as statistically significant.
Results:
There was no significant difference between CHT and CH-IM treated groups regarding sex distribution, ECOG status; history of COPD and histology type (adeno/squamous cell rate); however in the CHT group patients were older (68.8±6.7 vs 65.5±8.8, p=0.02) and active smoking was more common (59% vs 32%, p=0.005). Significantly better PFS outcome was associated with CH-IM (HR=0.288; CI= 0.17 - 0.48; p<0.001), which was found to be significant based on the multivariable analysis including confounders (aHR=0.288; CI= 0.16 - 0.50; p<0.001).
Conclusion:
In this real-world retrospective cohort of metastatic NSCLC patients with ECOG 0-1 status, first-line chemo-immunotherapy demonstrated a significant PFS advantage over platinum-based chemotherapy, even after controlling for potential confounders. These findings suggest that combined chemo-immunotherapy has beneficial effect on PFS, prolonging time until progression.
Keywords: NSCLC, chemo-immunotherapy, progression-free survival

P05

RADIOMIC PREDICTORS OF EX VIVO LUNG PERFUSION FEASIBILITY IN TUMOR-BEARING LUNGS

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Background:

Ex vivo lung perfusion (EVLP) provides a unique platform for translational research by maintaining lung tissue under near-physiological conditions. Resected lobes or lungs containing tumors can be placed into an EVLP circuit for physiological and pharmacological investigations. However, there is limited guidance on identifying which cases represent optimal candidates for such experiments. Therefore, our objective was to determine which radiological features on preoperative CT scans might predict the physiological feasibility of a resected lobe or lung for EVLP.

Methods:

Radiomics analysis was performed on 10 patients preoperative PET/CT examinations' unenhanced CT scans. The lung cancers were manually segmented, then 107 radiomics features (RF) were extracted. After correlation filtering, the remaining 24 RFs were correlated with the slope of time-curves of lactate, pH, glucose, and potassium levels. The time curves were assessed by linear regression, and Spearman's correlation was used for correlation analysis.

Results:

The range and median CT density values of the tumors exhibited correlation with predicated lactate levels at 60 minutes (rho=-0.93, p=0.003; rho=0.85, p=0.016 respectively) and at 120 minutes (rho=-0.93, p=0.003; rho=0.85, p=0.016 respectively). Significant correlations were also observed for the slopes of lactate (rho=-0.79, p=0.036; rho=0.95, p=0.001 respectively) and glucose time-curves (rho=0.86, p=0.014; rho=-0.90, p=0.006 respectively). Regarding the texture feature parameters, NGTDM-Complexity and GLDM-Dependence Variance showed significant correlations with the slopes of both glucose (rho=0.86, p=0.014; rho=0.96, p=0.000 respectively) and lactate time-curves (rho=-0.89, p=0.007; rho=-0.93, p=0.003 respectively). These texture parameters also correlated with predicated lactate levels at 60 minutes (rho=-0.93, p=0.003; rho=-1.0, p=0.000 respectively) and at 120 minutes (rho=-0.93, p=0.003; rho=-1.0, p=0.000 respectively).

Conclusion:

Our findings suggest that specific imaging characteristics correlate with metabolic changes during ex vivo lung perfusion. These correlations underscore the potential role of advanced radiological parameters in predicting physiological feasibility and guiding case selection for EVLP-based research.

Keywords: ex vivo, lung perfusion, radiomics

P06

Preoperative cardiopulmonary exercise testing for functional assessment of lung resection candidates at the Pulmonology Center of the Reformed Church in Hungary

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Background: Cardiopulmonary exercise testing (CPET) evaluates the integrative response of the cardiopulmonary and systemic oxygen transport systems, providing an estimate of

functional reserve after lung resection. The ERS/ESTS guidelines recommend CPET, with peak VO_2 measurement, in candidates with impaired lung function to stratify perioperative risk.
Aims: To evaluate the application of the ERS/ESTS functional assessment algorithm for lung resection candidates at our center between January 2024 and September 2025. We analyzed FEV_1, diffusing capacity of the lung for carbon monoxide (DLCO), predicted postoperative (ppo) FEV_1, ppo DLCO, and CPET results, and compared these with guideline recommendations.
Results: A total of 241 stage IA–IIIA patients were referred and recommended for curative-intent surgery by oncology team (OT). The baseline DLCO was >80% in 42 cases, 60–80% in 94, and 80% in 156 cases, 50–79% in 75, and 20 in 5 cases, 15–20 in 25, 10–15 in 17, and <10 range in 5 patients with high risk according to the algorithm for assessment of pulmonary reserve before surgery. Among patients who underwent CPET, the Average ppo-DLCO was 36.49% (2.89 $mmol \cdot min^{-1} \cdot kPa^{-1}$). The average ppo-$FEV_1$ was 55.4% (1.33 L), Following the decision of the Multidisciplinary Oncology Team for 32 surgery recommendations, finally 22 patients underwent lobectomy (n=12), pneumonectomy (n=2), segmentectomy (n=1) or diagnostic procedure (n=7). In the remaining cases, surgery was not performed due to staging refinement, PET-CT findings, comorbidities, or withdrawal of consent.
Conclusions: In line with ERS/ESTS guidelines, CPET provided important information for perioperative risk stratification. Our experience confirms that CPET is helpful for patients with FEV_1 or DLCO values 30–80% predicted, thereby reducing the risk of inappropriate resections and supporting informed surgical decision-making.
Keywords: CPET, exercise testing, ergospirometry, lung resection, perioperative risk stratification

P07

Perthoracal sampling procedures and their results used at the Reformed Pulmonary Center of Törökbálint

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Lung cancer is the second most common type of cancer and one of the leading causes of death worldwide in both men and women. New treatment options are becoming more complex, and certain new therapies are limited to specific histological or molecular subtypes, requiring more accurate classification and molecular testing. Obtaining tissue samples of sufficient quantity and quality is essential for establishing a definitive diagnosis and for personalizing the therapy. This is particularly important in the case of peripheral pulmonary nodules that do not have endobronchial spread.
In our work, we processed X-ray, CT, or ultrasound guided perthoracal core biopsies at our institute between November 2022 and August 2025 retrospectively, with a focus on assessing and comparing their diagnostic rate and safety. The indication in all cases was tumor, and the targeted lesions included intrapulmonary and subpleural nodules, cervical lymph nodes, and cutaneous nodules.
Overall, based on our results, all three methods proved to be safe, with ultrasound- and CT-guided biopsies performing exceptionally well in terms of efficiency. The size and location of the lesion can help in the selection of the method, with the goal being to choose the most optimal, patient-centered sampling method.
Keywords: lung cancer, core biopsy, CT scan, ultrasound

P08

Synchronous tumors Lung Adenocarcinoma and Breast Cancer – Case Report

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Introduction: Synchronous tumors are defined as two or more separate primary malignancies diagnosed simultaneously or within six months, where one is not a metastasis of the other. Though rare, they present significant diagnostic and therapeutic challenges, requiring accurate identification, staging, and tailored treatment strategies. Case Report: A 54-year-old woman was diagnosed on 24 September 2022 with invasive ductal carcinoma of the left breast, G2, with axillary lymph node metastases. At initial staging, a pulmonary infiltrative lesion was seen and interpreted as metastatic. She received standard treatment (6 cycles of AC and docetaxel). Follow-up PET/CT on 31 August 2023 revealed a metabolically active mass in the lower lobe of the left lung (30×22.5×30 mm, SUVmax 14.93) and focal axillary uptake. She underwent segmentectomy of the left breast with left axillary dissection on 30 January 2024. Pathology revealed invasive ductal carcinoma, grade 3, ypT2, lymphovascular invasion positive, with 4 out of 13 lymph nodes involved. Despite therapy, PET/CT on 22 February 2024 showed progression of the lung lesion (35×24×32 mm) without significant mediastinal lymphadenopathy. The discordant treatment response—breast tumor regression with lung lesion progression—raised suspicion of a second primary tumor. Bronchoscopic biopsy and immunohistochemistry confirmed adenocarcinoma of the left lower lobe bronchus, negative for GATA3, ER, and PR, but positive for TTF-1, Napsin A, and PD-L1—supporting primary lung cancer. Following functional assessment, the patient underwent video-assisted thoracoscopic left lower lobectomy with mediastinal lymphadenectomy on 26 August 2024. Histopathology confirmed lung adenocarcinoma, staged as T2aN0M0. Discussion: This case illustrates the diagnostic complexity of synchronous malignancies, where the lung cancer was initially misclassified as a metastasis. Differentiation between a second primary tumor and metastatic disease is critical, as it significantly impacts treatment planning and prognosis. Multidisciplinary evaluation and immunohistochemical profiling played a key role in guiding appropriate management. Conclusion: In patients with atypical treatment response, synchronous primary tumors should be considered. Accurate diagnosis through histopathology and immunohistochemistry is essential to distinguish second primary cancers from metastases, enabling proper therapy and improving outcomes.

Keywords: synchronous tumors, breast cancer, lung adenocarcinoma, metastasis, immunohistochemistry.

P09

Real-world comparison of first-line chemoimmunotherapy versus immunotherapy alone in advanced NSCLC patients with high PD-L1 expression

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Background:

In metastatic non-small cell lung cancer (NSCLC) with PD-L1 expression ≥50%, both immune checkpoint inhibitor (ICI) monotherapy and chemoimmunotherapy are accepted first-line options. The optimal strategy in this setting remains debated, particularly in real-world populations.

Methods:

We performed a retrospective cohort analysis of patients in the intervals of January 2020–December 2021 and January 2025–June 2025 including only newly verified adenocarcinoma or squamous-cell carcinoma patients. Eligible stage IV, ECOG status ≤1 patients had results of PD-L1 expression ≥50%, and all the follow-up data were available. First-line chemoimmunotherapy (ChICI; n=43) or ICI monotherapy (ICI; n=26) receiving patients were enrolled, and were matched according to treatment modality, histology (adenocarcinoma and squamous cell carcinoma), ECOG PS (0 or 1) and smoking status. Progression-free survival (PFS) was estimated using Kaplan–Meier curves and compared by log-rank test. Subgroup analyses were performed by age groups (<65 vs. ≥65 years), smoking status, and chronic obstructive pulmonary disease (COPD) as comorbidity.

Results:

ChICI group patients were significantly younger (68.7±7.9vs. 75.2±8.5 years, p=0.02) without differences in sex distribution, or smoking status, presence of COPD, or histology. There was

no significant difference in PFS between the ChICI and ICI groups (14 (95% CI, 12–17) vs. 10 (95% CI, 9–12) months, n.s., HR=1.05). Similarly, subgroup analyses by age, smoking status, and COPD did not reveal any significant differences in PFS between treatment modalities.
Conclusions:
In this real-world retrospective cohort of stage IV NSCLC patients with PD-L1 ≥50%, first-line ChICI did not demonstrate a PFS advantage over ICI monotherapy, including across clinically relevant subgroups. These findings add to the ongoing debate in the literature regarding the optimal frontline strategy in this patient population, however emphasis on possible patient selection bias including more elderly into the ICI treatment should be considered.
Keywords: nsclc, immune checkpoint inhibitor, pfs

P10

Frequency of Driver Mutations in Early- and Late-Stage Non-Small Cell Lung Cancer in Slovenia

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Background:
In Slovenia, reflex and routine NGS testing was introduced in 2022 for all newly diagnosed non-squamous NSCLC, regardless of the disease stage. Due to the country's small population, over 40% of lung cancer cases are diagnosed at a single center. Data on molecular alteration frequencies in early-stage disease remain limited, though increasingly relevant with the adoption of targeted therapies and chemoimmunotherapy in these stages. This study examines frequencies and the distribution of driver mutations across disease stages.
Methods:
Initial NSCLC biopsies collected between January 2022 and December 2024 at University Clinic Golnik were analyzed using the ThermoFisher Oncomine Precision Assay®. We assessed the frequency of actionable oncogenic drivers and their distribution by disease stage: early (I–IIIA) and late (IIIB–IV).
Results:
A total of 898 patients with non-squamous NSCLC were tested for oncogenic alterations over a three-year period, representing 88% of all eligible cases diagnosed at the center. The mean age was 68.3 years, and 52.1% were male. Targetable driver alterations were identified in 63% of cases. Nearly half of the cohort (49.7%, n=446) presented with early-stage disease, most commonly Stage I (n=258, 29%), reflecting the center's expertise in detecting small lesions.
The distribution of alterations was as follows: KRAS mutations 37.3% (E: 39.0% vs L: 35.3%); EGFR mutations 14.8% (E: 13.9% vs L: 15.3%); ALK fusions 3.5% (E: 3.1% vs L: 3.7%); ROS1 fusions 0.7% (E: 0.4% vs L: 0.9%); BRAF V600E 1.8% (E: 1.3% vs L: 2.2%); MET exon 14 skipping 2.4% (E: 3.5% vs L: 1.3%); RET fusions 1.2% (E: 1.5% vs L: 0.9%); NTRK1/2/3 fusions 0.1% (E: 0.2% vs L: 0.0%); and ERBB2 mutations 0.7% (E: 0.4% vs L: 0.9%).
Except for KRAS and MET exon 14 skipping mutations and RET and NRG1 fusions, most alterations were more frequent in late-stage disease; however, numbers were small for the rarer mutations.
Conclusions:
This trial provides insight into biomarker frequencies in one of the largest and most homogeneous NSCLC populations tested with a single assay, notably including early-stage patients who are rarely assessed worldwide. These findings also inform future evaluation of biomarker-driven targeted therapies in early-stage disease.
Keywords: NSCLC, NGS testing, early stage, driver alterations

P11

When Interstitial Lung Disease Mimics or Coexists with Malignancy: A Case of Fibrotic NSIP, Sarcoidosis and Lung Adenocarcinoma

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Background: Interstitial lung disease (ILD) can present with radiological and clinical features that mimic malignant or granulomatous disorders. The diagnostic process is further complicated when multiple pathologies coexist.

Case presentation: We report the case of a 51-year-old never-smoking male with fibrotic nonspecific interstitial pneumonia (NSIP) confirmed by cryobiopsy, receiving antifibrotic therapy with nintedanib. An underlying immunological disease was not confirmed. PET-CT performed for evaluation of a solid pulmonary nodule demonstrated bilateral, moderately FDG-avid mediastino-hilar lymphadenopathy. Endobronchial ultrasound (EBUS) with transbronchial needle aspiration revealed non-necrotizing granulomas consistent with sarcoidosis. Subsequently, a left lower lobe nodule (segment 10) raised suspicion for malignancy on CT-guided biopsy. The patient underwent left lower lobectomy, which histologically confirmed invasive mucinous adenocarcinoma (7.5 cm, pT4N0, invasive but without lymphovascular or pleural invasion). Molecular pathology analysis is ongoing.

Discussion: This case illustrates the diagnostic challenges in ILD patients, where inflammatory, granulomatous, and neoplastic processes may overlap. The coexistence of fibrotic NSIP, biopsy-proven sarcoidosis, and invasive adenocarcinoma highlights the importance of comprehensive multidisciplinary evaluation (ILD team, oncoteam, thoracic surgery).

Conclusion: ILD may mimic malignancy, but since patients with ILD carry an increased risk of lung cancer, malignancy can also develop either concurrently or later in the disease course. Careful integration of clinical, radiological, pathological, and multidisciplinary input is essential for accurate diagnosis and optimal treatment planning.

P12

Presentation of the Thoracic Multidisciplinary Oncology Team and Analysis of Its Operation at the National Korányi Pulmonology Institute

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In Hungary, the diagnosis and treatment of lung cancer and malignant mesothelioma patients mainly function within the framework of the pulmonology network. Multidisciplinary Oncology Teams (MDTs) operate in accordance with strict professional and quality assurance requirements. The composition of MDT experts and adherence to documentation protocols are regulated. In accordance with requirements, both in-person attendance and online participation are allowed, although sessions primarily take place in person.

At our institute, the permanent members of the MDT are the onco-pulmonologist specialist, thoracic surgeon, radiation therapist, diagnostic imaging specialist, pathologist, and MDT coordinator. Oncology notification and follow-up forms are available both in electronic and paper formats, validated by MDT members, and are immediately uploaded to the Electronic Health Service Space. The MDT coordinator organizes patient pathways for those eligible for clinical trials together with the clinical trial coordinator. They also play a role in ordering medications available within the high-value innovative financing environment, requesting special imaging examinations, monitoring patients involved in specialized care, and overseeing administrative tasks. In our institute, the MDT meets twice a week without the presence of patients, analyzing 80–100 cases per week. Annually, 1300–1400 new patient cases are presented to the MDT. We analyze the data of patients presented to the MDT, the

distribution of oncological stages, and the manner of treatments applied. We also address the main characteristics of patient pathways.

P13

Investigation of the effect of metformin treatment on non-small cell lung cancer cell lines with mutations in KRAS and EGFR

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Introduction:
Non-small cell lung cancer (NSCLC) remains a leading cause of cancer mortality globally, with mutations in KRAS and EGFR genes significantly influencing disease progression and therapeutic response. Targeted therapies, particularly EGFR-tyrosine kinase inhibitors (EGFR-TKIs), have improved outcomes in EGFR-mutant NSCLC patients; however, drug resistance frequently develops, limiting long-term efficacy. Metformin, a widely used antidiabetic agent. Metformin has started to be investigated as a potential adjunct in NSCLC treatment. In this study, we investigate the molecular mechanism involved.
Materials and Methods:
This study aims to evaluate the effects of metformin on NSCLC cell lines harboring KRAS and EGFR mutations. Our experiments were performed using the A549 (KRAS mutant) and the PC9 (EGFR mutant) lung carcinoma cell lines. Samples were analysed 24, 48 and 72 hours after treatment. After total RNA collection, cDNA was prepared by reverse transcription. Changes in gene expression were examined by q-RT PCR and TaqMan-ADMETox.
Results:
Among all therapies, 20 mM metformin causes a statistically significant decrease in cell numbers compared to the control after only 24 hours. The results confirm that the effectiveness of metformin treatment depends on concentration but is independent of the driver mutation in the cell line.
Discussion:
In conclusion, metformin exhibits promising anticancer activity in NSCLC cell lines with KRAS and EGFR mutations through multiple molecular mechanisms, warranting further investigation, both molecular and clinical, for combination treatment strategies. Careful consideration of dosing is essential to mitigate potential adverse effects. This study contributes to the growing evidence that metformin may enhance the therapeutic efficacy of existing targeted treatments in NSCLC.
Keywords: NSCLC, metformin

P14

Is chest radiotherapy dose a determinig factor for survival of patients with small cell lung cancer after prophylactic cranial irradiation?

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Introduction
The prognostic impact of thoracic radiotherapy dose on survival time following prophylactic cranial irradiation (PCI) remains unclear in patients with small cell lung cancer.
Objective
To evaluate whether the dose of thoracic radiotherapy correlates with survival time in patients who received prophylactic cranial irradiation.
Methods
We conducted a retrospective study of 32 small cell lung cancer patients treated between 2021 and 2024 in our Center. Patients were grouped based on received thoracic radiotherapy dose 30 Gy (curative group). We collected data on the time intervals between prophylactic cranial irradiation and time of death, between the completion of chest radiotherapy and planning CT; and from planning CT to completion of PCI.
Results

Among the 32 patients included in the study, 17 were treated with palliative dose of chest radiotherapy and 15 with curative doses. No statistically significant differences were observed between the two groups regarding age, gender or disease stage. The mean survival time from completion of prophylactic cranial irradiation and death was mean 494,35 days in palliative group and mean 497, 73 days in curative group, with no statistically significant difference between groups. The time interval between planning CT and completion of PCI was mean 36,82 days in the palliative group and mean 34.33 days in curative group. The time between completion of chest radiotherapy and completion of PCI was mean 123, 65 days in the palliative group and mean 150,8 days in curative group. Neither of these time intervals showed a statistically significant difference between groups.
Conclusions
Our study did not demonstrate a significant association between the dose of thoracic radiotherapy and post PCI survival with no statistically significant difference between groups. However, this result should be interpreted with caution due to the limited sample size. We can concluded that all patients received treatment appropriate to their clinical status, in accordance with current recommendations and clinical guidelines.
Keywords: small cell lung cancer, prophylactic cranial irradiation (PCI), survival time

P15

NON-OCCUPATIONAL MERCURY AND LEAD EXPOSURE AMONG ADVANCED SQUAMOUS CELL LUNG CANCER PATIENTS IN VOJVODINA

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Smoking is the primary cause of squamous cell lung cancer with indications that non-occupational exposure to metals increase the risk. There is currently no direct evidence in human data establishing a link between mercury exposure and the lung cancer development while it is accepted that exposure to lead increases lung cancer risk.
In this study 62 patients (32 male and 30 female) with advanced stage (III/IV) of squamous cell lung cancer diagnosed at the Institute for Pulmonary Diseases of Vojvodina, Serbia were enrolled. All patients had preserved kidney function (GFR>60 mL/min), and were not occupationally exposed to neither mercury nor lead. Each patient provided a first morning urine sample within 24h of hospitalization. The samples were prepared using microwave digestion and tested for mercury and lead using Inductively Coupled Plasma Mass Spectrometry analysis.
In 69.35% (43/62) urine samples mercury was measured above limit of quantification (LOQ) with average concentration 6.245±2.595 μg/L or 10.52±7.27 μg/g creatinine (Cre). There were no differences in frequency of quantification between genders (68.35% male vs. 70.00% female). Mercury urine concentrations were significantly higher (p=0.001) in women (14.346±7.330 μg/gCre) when compared to men (6.868±5.093 μg/gCre). Lead above LOQ was measure in three samples (two male and one female) with average value 13.630±1.860 μg/L (23.324±19.316 μg/gCre).
Almost two-thirds of patients enrolled in this study had mercury in their urine sample with higher concentrations registered among female participants. Further studies are urgent in order to determine its influence on survival rate among squamous cell lung cancer patients non-occupationally exposed to mercury.
Acknowledgement: This work was supported by Provincial Secretariat for Higher Education and Scientific Research, AP Vojvodina, Republic of Serbia, Grant number 003076431 2024 09418 003 000 000 001.
Keywords: squamous cell lung cancer, mercury, lead, non-occupational

P16

Effect of Inhaled Corticosteroids on Lung Cancer Risk in COPD Patients – retrospective analysis

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Background:

Lung cancer (LC) is a leading cause of death among patients with chronic obstructive pulmonary disease (COPD). Previous studies have suggested that inhaled corticosteroids (ICS) may reduce LC risk, but findings remain inconsistent.

Objective:

To evaluate the impact of ICS use on LC incidence in COPD patients by applying two distinct methodologies (Suissa and Raymakers) to the Hungarian National Health Insurance Fund (NHIF) database.

Methods:

A retrospective cohort study was conducted using NHIF data from 2009 to 2019. Two cohorts were formed based on the inclusion criteria of Suissa (n=96,686) and Raymakers (n=196,560). ICS exposure was modeled as a time-dependent variable to avoid immortal time bias. Cox proportional hazards models adjusted for age and sex were used to assess LC risk.

Results:

ICS use was associated with a significantly reduced risk of LC in both cohorts:

Suissa: HR = 0.77 (95% CI: 0.63–0.94)

Raymakers: HR = 0.61 (95% CI: 0.53–0.70)

Short-term ICS use (≤2 years) and low daily doses (≤500 mcg) showed the strongest protective effect.

Conclusions:

Despite methodological differences in prior studies, our analysis of nearly 200,000 COPD patients confirms a protective association between ICS use and LC risk. These findings support the potential role of ICS in lung cancer prevention, particularly at lower doses and shorter durations.

Keywords: lung cancer, COPD, ICS,

P19

What else? - Diagnostic Challenges in a Patient with Small Cell Lung Cancer

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Small cell lung cancer (SCLC) is one of the most rapidly progressing pulmonary malignancies. Delays in diagnosis or initiation of treatment can substantially increase tumor-related mortality. In our case study, we present the challenging diagnostic process of a 73-year-old male patient who was admitted with signs of superior vena cava syndrome, which was found to be caused by a pulmonary space-occupying lesion. Despite our awareness, we encountered several unexpected clinical and procedural complications, resulting in a prolonged evaluation process. This case illustrates the diagnostic difficulties that clinicians may face even in a well-coordinated clinical setting. Our presentation aims to emphasize the importance of persistence, adaptability, and close collaboration among specialties to ensure effective patient care.

P17

Early Findings from the Hungarian HUNCHEST-SOLACE Pilot Program

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Lung cancer remains a leading cause of cancer-related mortality, with late-stage diagnosis contributing to persistently low survival rates. The Hungarian HUNCHEST-SOLACE pilot program, part of the broader EU SOLACE initiative, aims to improve early detection of lung cancer through low-dose computed tomography (LDCT) screening, particularly among high-risk and underserved populations. The program targets three key groups: women, socioeconomically disadvantaged individuals (including Roma communities and those in remote areas), and patients with pre-existing pulmonary or oncologic conditions. Our study summarizes early findings from a cohort of 4,218 participants screened as of May 31, 2025. The majority were female (63.44%), with a mean age of 61.55 years. Roma ethnicity was reported by 23.49%, and 15.34% were classified as having low socioeconomic status. Smoking prevalence was high, with 62.23% of participants identified as current smokers. COPD was present in 25.29% of the cohort, and 12.70% had a history of prior malignancy. Screening was conducted through a hybrid infrastructure combining fixed centers and mobile units, enabling participation from 494 settlements across Hungary. A total of 174 positive and 795 intermediate radiological findings were identified. Multivariable logistic regression analysis revealed that COPD (OR: 1.73), Roma ethnicity (OR: 1.68), low socioeconomic status (OR: 1.62), and active smoking (OR: 1.54) were significantly associated with higher odds of lung cancer detection. Increasing age was also a significant risk factor, while higher BMI was rather protective. Among 129 active smokers with positive findings, 79.8% had at least one additional major risk factor, and 34.1% had two or more overlapping vulnerabilities. These findings underscore the importance of a targeted screening approach and confirm the added value of addressing social determinants of health in lung cancer prevention strategies. The HUNCHEST-SOLACE pilot program demonstrates that LDCT screening is feasible and effective in reaching high-risk, underserved populations in Hungary. Early identification of individuals with overlapping risk factors can help optimize resource allocation and maximize the impact of national lung cancer screening efforts.
Keywords: SOLACE, Lung cancer screening, LDCT, High-risk populations, Overlapping risk factors, Screening feasibility

P18

Real-world evaluation of first-line chemotherapy and chemo-immunotherapy in advanced -small cell lung cancer patients

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Background:

Advanced-stage small-cell lung cancer (SCLC) has one of the worst prognoses out of all pulmonary oncological diseases. Therapeutic options in Hungary now include chemotherapy (CHT) and, since May of 2022, chemo-immunotherapy (CH-IM). In Hungary, there are no published results yet about the real-world effect of CH-IM on progressive free survival (PFS).

Aims:

The objective of this study was to assess the impact of chemotherapy versus chemo-immunotherapy on PFS in SCLC patients.

Methods:

We retrospectively analyzed patients with SCLC who were first presented to the multidisciplinary oncology team of the Department of Pulmonology, Semmelweis University between January 1, 2020, and April 31, 2024. In our analysis, we included patients with stage IV, ECOG performance status (PS) 0-1 and excluded those with a history or presence of any other malignancy and those participating in clinical trials (N=65). To assess the effect of CH-IM, we created three cohorts. Cohort 1 consisted of patients presented to the multidisciplinary tumor board (MTB), who were recommended CH-IM as first-line therapy (N=28). Cohort 2 included patients presented to the MTB who were recommended CHT as a first-line treatment (N=33). For the comparison of baseline parameters between

Cohort 1 and 2 we used Student's t-tests and chi-square tests. For the analysis of PFS we used Kaplan-Meier estimates and log rank test.
Results:
There was no significant difference between the two cohorts regarding age, sex, presence of obstructive pulmonary disease and smoking history. However a worse average ECOG PS was observed in Cohort 2. Nominally better mean PFS was observed using CH-IM (235±175 days) compared to CHT (176±192 days). This difference of PFS was not found to be statistically significant based on the Kaplan-Meier estimates and the log-rank test (p = 0.123).
Conclusion:
In this real-world retrospective cohort of SCLC patients, first-line chemo-immunotherapy demonstrated a nominal PFS advantage over the historical chemotherapy control cohort of chemotherapy; however the difference was not significant which may be the result of still low patient numbers.
Keywords: SCLC, chemoimmunotherapy, PFS