ERS Congress 2024: highlights from the Thoracic Oncology Assembly

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Thoracic malignancies pose significant pressure on healthcare systems, with lung cancer being the leading cause of cancer-related mortality worldwide. At the 2024 European Respiratory Society (ERS) Congress in Vienna, Austria, global experts in thoracic oncology presented best practices and the latest advancements in the diagnosis and management of thoracic malignancies. Advances in endoscopic techniques, such as electromagnetic navigation and robotic bronchoscopy, have enhanced the diagnosis of peripheral pulmonary lesions, improving precision and reducing complications. Additionally, next-generation sequencing (NGS) has revolutionised the molecular diagnosis of nonsmall cell lung cancer (NSCLC), facilitating rapid identification of genomic alterations. Challenges in managing resectable stage III NSCLC remain, as many patients relapse despite surgery and perioperative therapies. Furthermore, the lung cancer screening symposium highlighted the importance of tailored lung cancer screening guidelines across Europe, emphasising quality standards and centralised expertise to address variability in practices. Finally, the evolving landscape of pleural mesothelioma (PM) treatment underscores the need for improved stratification and the exploration of novel therapeutic approaches, including the potential of epigenetic modifiers. This article highlights the key takeaways from these presentations.

Lung cancer diagnostics and treatment challenges

Modern endoscopic techniques for peripheral pulmonary lesions

With the global expansion of lung cancer screening, peripheral pulmonary lesions are frequently detected as incidental findings [1]. Recent advances in endoscopic technologies have significantly enhanced the diagnosis and management of these lesions, which are often difficult to access using traditional methods [2]. Innovative bronchoscopy techniques, such as electromagnetic navigation bronchoscopy and robotic bronchoscopy, have revolutionised the approach to these lesions, offering greater precision [3]. According to the recent VERITAS trial that compares electromagnetic navigational bronchoscopy biopsy with computed tomography (CT)-guided transthoracic biopsy of indeterminate lung nodules, navigational bronchoscopy demonstrated a similar diagnostic yield to CT scan-guided transthoracic needle biopsy, but

with fewer complications. The combination of advanced imaging techniques like cone-beam CT with diagnostic bronchoscopy provides real-time three-dimensional guidance and significantly improves the diagnostic outcomes by preventing the operator from missing the target [4]. Moving further, robotic bronchoscopy offers enhanced stability and control, enabling more accurate navigation to peripheral lung regions.

Lung cancer screening

Lung cancer screening is a rapidly evolving field aimed at significantly reducing lung cancer-related mortality, as supported by published data [5, 6]. Many countries are in the process of implementing and planning lung cancer screening programmes aiming to address their diverse needs [7]. Lung cancer screening implementation is anticipated to change the diagnostic and treatment landscape in lung cancer [8].

In Europe, lung cancer screening is in different phases of implementation in different countries. Croatia, Poland and the Czech Republic have established national programmes, while many others are still piloting or evaluating screening. The ERS is a key stakeholder in impactful pan-European projects aimed at streamlining lung cancer screening pathways and improving clinical outcomes. The SOLACE project, funded by the European Union and led by the ERS and the European Society of Radiology (ESR), was presented at the 2024 ERS Congress. It aims to strengthen the implementation of lung cancer screening policies across European countries by providing guidelines and toolkits to national stakeholders (*i.e.* healthcare providers and local authorities). Set to run until 2026, it focuses on reaching high-risk populations, including women and individuals with pre-existing lung conditions, while addressing health disparities. SOLACE also aims to develop tailored screening protocols to accommodate diverse healthcare systems, ensuring effective adoption across various resource levels.

Despite these efforts, challenges remain in the widespread adoption of lung cancer screening. During the ERS Congress lung cancer screening symposium, gaps in screening practices across Europe were highlighted, underscoring the need for tailored guidelines to ensure effective implementation, particularly for high-risk groups such as women and individuals with pre-existing lung conditions. It was emphasised that while low-dose CT screening is backed by strong evidence, maintaining quality and consistency across different healthcare systems remains a challenge. Establishing uniform quality standards for low-dose CT scans is crucial for enabling radiologists to accurately identify benign and malignant nodules. The lung cancer screening symposium panel stressed the need for centralised expertise and strict protocols to minimise overdiagnosis and false positives. Building on previous thoracic oncology guidelines that revealed variability in lung cancer services and registration across Europe [9, 10], this session also highlighted the importance of centralised management protocols for addressing incidental findings from lung cancer screening. Evidence on this topic is summarised in the recently published comprehensive guidance on incidental findings [11], advocating for an evidence-based approach to reporting and managing incidental findings in lung cancer screening programmes.

Molecular diagnosis in NSCLC

Emerging biomarkers and advances in NGS have revolutionised the care of NSCLC patients. Comprehensive molecular profiling is essential to uncover potential treatment options from early to advanced stages of the disease [12]. NGS reflex testing ensures the rapid identification of relevant genomic alteration mutations at diagnosis, making it preferable to multiple single-gene assays as it preserves tissue samples [13]. Re-biopsy and NGS performance at disease progression should also be considered, to identify acquired resistance mechanisms and inform decisions on further management [14]. While tissue biopsy remains the gold standard for identifying actionable genomic alterations, liquid biopsy can serve as an alternative for NGS when tissue is unavailable [15].

Perioperative regimens in resectable NSCLC

Surgery is the cornerstone of treatment for early-stage lung cancer; however, over 60% of patients with resectable stage III disease experience relapse and there are multiple treatment approaches [16]. Several clinical trials are currently assessing the efficacy of immunotherapy as adjuvant, neoadjuvant or perioperative treatment, along with targeted therapies. Despite improvements in resectability rates and major pathological responses with perioperative immunotherapy, challenges have arisen in thoracic surgery due to extensive fibrosis resulting from immune-mediated inflammation.

It remains difficult to predict which patients will be cured by surgery alone, who will benefit from perioperative additional systemic treatment, and who will relapse post-surgery, even with additional therapies. An algorithm for perioperative regimens summarising recent evidence is illustrated in figure 1 [17].

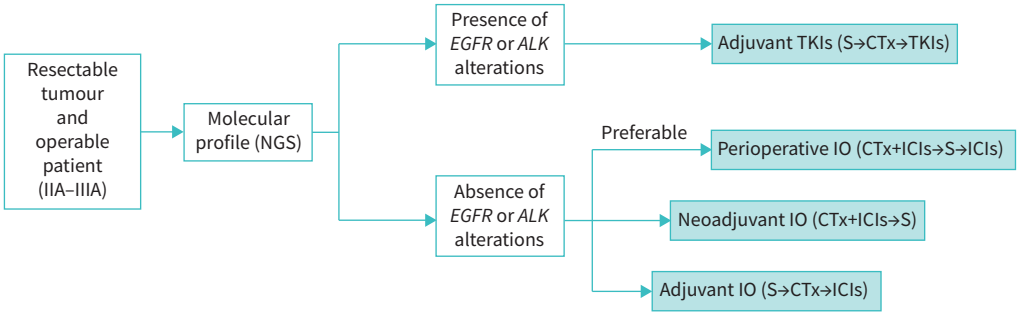

FIGURE 1 Algorithm for perioperative regimens according to the recent evidence, for nonsmall cell lung cancer stage IIA–IIIA. NGS: next-generation sequencing; EGFR: epidermal growth factor receptor; ALK: anaplastic lymphoma kinase; TKIs: tyrosine kinase inhibitors; S: surgery; CTx: platinum doublet chemotherapy; IO: immunotherapy; ICIs: immune checkpoint inhibitors.

Evolution of mesothelioma therapy informed by modern phenotyping and stratification

The clinical trial landscape for PM is becoming increasingly diverse as our understanding of PM biology grows. Treatment is currently guided by subtype and stage; however, the heterogeneous nature of the disease necessitates a more nuanced stratification [18, 19]. Following the publication of the MARS 2 trial [20], the concept of "resectability" has been challenged, with multiple randomised trials reporting no benefit from surgery in PM, leading to a lack of consensus on the standard of care for early-stage disease.

Histological subtyping is highly prognostic, with non-epithelioid PM displaying chemoresistance and worst outcomes [18, 21, 22]. Biphasic disease is arbitrarily defined by a >10% sarcomatoid element, potentially leading to misclassification, especially in a voluminous pleural cavity, placing a premium on multi-region sampling. Significant inter-patient and intra-tumour heterogeneity complicates this further, with multi-omic data indicating that current subtyping explains only 6% of PM molecular variances [23]. This points to the need for future molecular stratification and reliable biomarker identification.

The MiST2 study reported improved outcomes using cyclin-dependent kinase (CDK)4/6 inhibition in methylthioadenosine phosphorylase (MTAP)-deficient tumours, demonstrating progress with this approach [24]. Future intervention trials require more refined eligibility criteria, and umbrella studies could help navigate the nuances of treatment stratification, expediting the identification of efficacy signals. This strategy has been adopted by SELECTmeso, a multicentre, multi-arm, phase II platform trial aiming to determine the activity and safety of multiple targeted therapies for the treatment of patients with relapsed PM.

Reliable PM staging is critical as novel therapies emerge. PM typically presents with high tumour burden, yet its rind-shaped growth pattern complicates reliable volumetric assessment [18]. The emergence of artificial intelligence volumetry tools will likely revolutionise our approach, and the recently published ninth edition of the TNM classification system has introduced tumour thickness measurements as a surrogate for true volume [25]. These updates necessitate a thoughtful clinical and academic application of current evidence for systematic anti-cancer therapy based on late-stage cohorts using seventh and eighth edition TNM criteria [21, 22, 25].

Key molecular features of PM include a low mutational burden in a genomic landscape dominated by tumour suppressor loss, which limits opportunities for precision medicine [26]. Recent identification of epigenetic modifiers, including EZH2 (enhancer of zeste homolog 2) inhibition, has unlocked new avenues for therapeutic strategies [27, 28]. PM tumours are highly stromal, comprising a complex tumour microenvironment suggesting key biological drivers may be extrinsic. Accordingly, mesothelial–mesenchymal transition is now considered a core mediator of progression, driving the disease becoming sarcomatoid [29]. PM is often preceded by benign asbestos-associated pleural inflammation, providing a unique opportunity for translational research focused on pre-malignant detection and intervention [30].

Concluding remarks

Thoracic malignancies remained a central theme at the 2024 ERS Congress, and presentations showcased the latest advancements and best practices in the field. The ERS remains a key stakeholder in thoracic oncology and is actively involved in various pan-European projects. In the coming years, we anticipate

continued growth in knowledge aimed at improving overall survival rates and enhancing quality of life. The annual ERS Congress will remain a key platform for sharing new scientific insights and best practices in thoracic oncology, acting as a hub for fostering collaboration and driving initiatives forward.

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