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From Rare Histology to Precision Treatment: ALK-Rearranged Mucinous Adenocarcinoma of the Lung

Dr Saira Khwaja[I] (Resident Doctor – SHO), **Dr Masood Khalil**[I] (Respiratory Consultant), **Dr Nadia Sayeed**[I] (Respiratory Consultant), **Dr Abbie Pugh**[II] (Consultant Cellular Pathologist)

[I]Walsall Manor Hospital, United Kingdom; [II]New Cross Hospital, Wolverhampton, United Kingdom

BACKGROUND AND AIMS

Lung cancer remains the leading cause of cancer-related mortality worldwide, with lung adenocarcinoma representing one of the most common histological subtypes. Mucinous adenocarcinoma, previously termed mucinous bronchioloalveolar carcinoma, is a rare subtype of lung adenocarcinoma.[1,2,3] This case highlights the importance of comprehensive molecular profiling in identifying actionable genetic alterations and enabling personalised treatment in advanced mucinous adenocarcinoma.

METHOD

A 55-year-old woman presented with shortness of breath on exertion and had a performance status of 0. Her background history included palpitations. A chest X-ray demonstrated widespread reticulonodular opacities. CT of the thorax, abdomen and pelvis revealed a right lower-lobe mass with associated collapse and hepatic cysts. Bronchoscopy demonstrated obstruction at the entrance of the right lower lobe (Figure 1). Biopsies and bronchial washings from the mass confirmed mucinous adenocarcinoma (Figures 2 and 3). MRI of the brain demonstrated multiple metastatic deposits, with the largest lesion located in the right temporal lobe. Molecular and immunohistochemical analyses were subsequently performed.

RESULTS

PD-L1 immunohistochemistry using the 22C3 assay showed low-positive expression, with a tumour proportion score of 20–30%. Molecular testing identified an ALK gene rearrangement, providing an actionable target for tyrosine kinase inhibitor therapy. No other clinically actionable genetic variants were detected apart from common polymorphisms. Following multidisciplinary team discussion, the intracranial disease was considered too extensive for stereotactic radiosurgery, while the right temporal lesion was considered high risk for neurosurgical intervention. The patient was therefore commenced on Brigatinib and Levetiracetam. She demonstrated a good clinical response and remains under regular follow-up.

CONCLUSIONS

This case demonstrates the clinical value of molecular profiling in advanced mucinous adenocarcinoma. Identification of an ALK rearrangement enabled targeted therapy with Brigatinib, providing an opportunity for precision treatment in a rare and metastatic lung cancer subtype.[4] Comprehensive pathological and molecular assessment is therefore essential for identifying actionable alterations and guiding personalised therapeutic decisions. This case also highlights the evolving role of molecular genetics in transforming diagnosis into targeted treatment strategies.

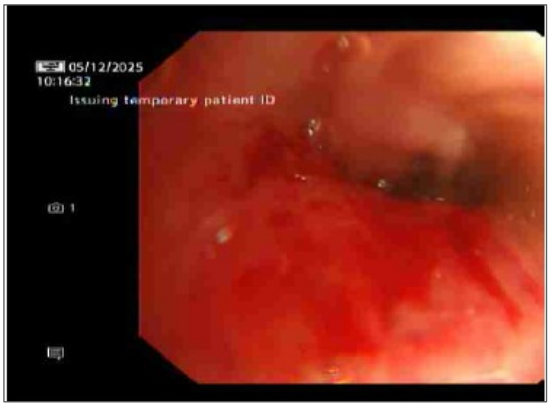


Figure 1: Endoscopic image, showing a mass obstructing the right lower lobe.

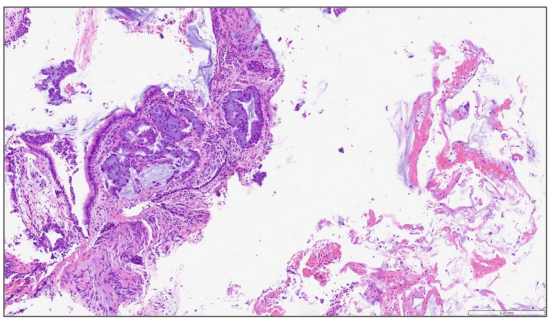


Figure 2: H&E, medium power x10 magnification, showing adenocarcinoma lung histology with background benign respiratory epithelium.

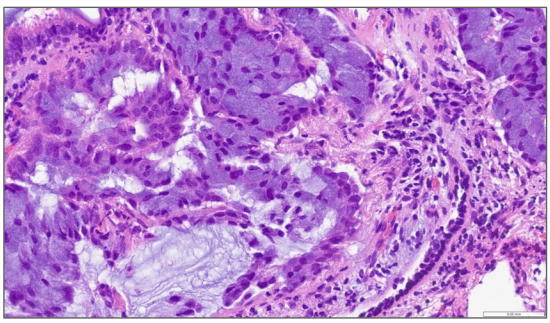


Figure 3: H&E, medium power x40 magnification, showing adenocarcinoma lung histology.

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