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OPINION ARTICLE

Non-Small Cell Lung Cancer in Histopathology

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Description

Although histology has historically served as the basis for treatment choices for patients with lung cancer, the complexity and variability of histological classification has had little impact on the standard of care in oncology. Due to the identification of genetic abnormalities and the outcomes of clinical trials for novel and targeted medicines, this has drastically changed during the past several years. These findings have led to the development of a new classification system for Non-Small Cell Lung Cancer (NSCLC), based on the presence of potential drivers and targetable genomic changes. A new paradigm and approaches to the pathological diagnosis of NSCLC have been made possible by the speed with which the landscape of mutation and genomic changes is being identified. International consortia have put out new lung adenocarcinoma classifications, recommendations for molecular testing in lung cancer, and specific advice on how to perform lung cancer pathology in this situation.

NSCLC histologic classification

Malignant epithelial lung cancers are classified by the World Health Organization (WHO) as having eight major subtypes in 2004. These subtypes include squamous cell carcinoma, small cell carcinoma, adenocarcinoma, large cell carcinoma, adenosquamous carcinoma, Sarcomatoid carcinoma, carcinoid tumour, and salivary gland tumours. Small Cell Lung Carcinoma (SCLC) and Non-Small Cell Lung Cancer (NSCLC) are the two main subtypes into which the majority of tumours are classified for treatment purposes.

Classification of Adenocarcinoma

There were several problems with the 2004 WHO classification that led to the new IASLC/ATS/ERS classification system for lung cancer being proposed. Despite the fact that it is well known that lung adenocarcinomas frequently contain a heterogeneous mixture of histological growth patterns, the fact that >80% of adenocarcinomas are categorised as "mixed type" ignored potentially important information that could be associated with the various histological patterns. As an illustration, it's been reported.

New classification used in small biopsy samples

For the first time, recommendations on how to report NSCLC diagnoses in small biopsy and cytology specimens were also included in the IASLC/ATS/ERS report. It is advised that the term "large cell carcinoma" not be used for diagnosis in small biopsy or cytology specimens and should only be restricted to resection specimens, and that "the term NSCLC-NOS should be used as little as possible and be applied only when a more specific diagnosis is not possible by morphology and/or special stains."

Adenocarcinoma of the lung (genomic pathology)

Unprecedented opportunities to analyse the genetic and genomic changes underlying the heterogeneity and complexity of clinical behaviour of lung cancers have been made possible by the rapid advancements in sequencing technologies. The discovery of mutations in the Epidermal Growth Factor Receptor's (EGFR) Tyrosine Kinase (TK) domain and the proof that their presence identifies lung adenocarcinoma patients who are susceptible to small-molecule EGFR kinase inhibitors.

Small cell lung cancer genomic pathology

Due to the infrequent surgical treatment of these tumours, there is not enough tissue available for high-throughput genetic research of SCLC. Using array comparative genomic hybridization, bronchial carcinoids, and SCLC tumour and cell line. They demonstrated that the karyotypes of SCLC tumours and cell lines were significantly abnormal when compared to carcinoid. High copy number gains were also discovered in SCLC.

NSCLC molecular testing: A multidisciplinary and evidence-based guideline for molecular testing is required because predictive biomarkers are increasingly important in the use of targeted therapies to treat lung cancer patients.

The idea and approach for treating lung cancer more specifically by using the detection of particular driver genetic aberrations as predictive biomarkers to choose therapies for individual patients have been revolutionised by the discovery of EGFR mutations. Although only EGFR mutation and ALK gene rearrangement are currently acknowledged as the markers that require testing, rapid discoveries of additional driver have been made based on the availability of therapies that have been shown to be effective for tumours with these aberrations.

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