Who classification of tumours of soft tissue and Online PDF

WHO classification of tumours of soft tissue and is an essential framework used by pathologists and clinicians worldwide to systematically categorize soft tissue tumors based on their histological features, biological behavior, and molecular characteristics. This classification provides a standardized approach to diagnosis, prognosis, and treatment planning, ensuring consistency across medical practices and facilitating research efforts. Soft tissue tumors encompass a diverse group of neoplasms arising from mesenchymal tissues such as fat, muscle, fibrous tissue, blood vessels, and peripheral nerves, making their classification complex and multifaceted.

Introduction to Soft Tissue Tumours

Soft tissue tumors are a heterogeneous group of neoplasms originating from mesenchymal tissues. Although many are benign, some can be malignant, i.e., sarcomas. The diversity in tissue origin, morphological features, and genetic profiles necessitates a comprehensive classification system. The World Health Organization (WHO) has developed a detailed classification that is regularly updated to incorporate advances in molecular pathology and histopathology.

Overview of the WHO Classification of Soft Tissue Tumours

The WHO classification organizes soft tissue tumors into various categories based on their presumed line of differentiation or tissue of origin. This approach helps clinicians and pathologists predict tumor behavior, guide management, and identify targets for therapy.

Key Features of the WHO Classification

- Histological appearance
- Immunohistochemical profile
- Genetic and molecular alterations
- Clinical behavior (benign, intermediate, malignant)

The latest edition of the WHO classification (most recent as of 2020) lists over 50 distinct entities, reflecting ongoing progress in tumor biology.

Major Categories of Soft Tissue Tumours in WHO Classification

The classification broadly divides soft tissue tumors into several major groups based on tissue differentiation:

1. Lipomatous Tumours (Adipocytic Tumors)

Lipomatous tumors are the most common soft tissue neoplasms and include benign and malignant forms.

- **Lipoma**: The most common benign soft tissue tumor, composed of mature adipocytes.
- **Liposarcoma**: Malignant counterpart, with several subtypes (e.g., well-differentiated, myxoid, pleomorphic).
- **Other variants**: such as spindle cell lipoma and angiolipoma.

2. Fibroblastic and Myofibroblastic Tumours

These tumors arise from fibroblasts and myofibroblasts and include benign, intermediate, and malignant types.

- **Benign fibrous tumors**: nodular fasciitis, desmoid fibromatosis.
- **Malignant fibrous tumors**: fibrosarcoma, myxofibrosarcoma.

3. Skeletal Muscle Tumours

Originating from striated muscle tissue, these tumors include:

- **Rhabdomyoma**: benign, rare tumor of striated muscle.
- **Rhabdomyosarcoma**: malignant, common in children, with subtypes such as embryonal and alveolar.

4. Vascular Tumours

Tumors arising from blood vessels include both benign and malignant types.

- **Hemangioma**: benign vascular tumor.
- **Kaposi sarcoma**: a vascular tumor associated with HHV-8 infection, often malignant.
- **Angiosarcoma**: highly malignant vascular tumor.

5. Nerve Sheath Tumours

These tumors originate from Schwann cells or perineurial cells.

- **Schwannoma**: benign, encapsulated nerve sheath tumor.
- **Neurofibroma**: benign tumor associated with neurofibromatosis.
- **Malignant peripheral nerve sheath tumor (MPNST)**: malignant counterpart, often linked with neurofibromatosis type 1.

6. Clear Cell and Other Specific Tumours

A variety of rare tumors with distinct histology:

- **Synovial sarcoma**: a malignant tumor resembling synovial tissue.
- **Clear cell sarcoma**: malignant tumor with melanocytic differentiation.
- **Alveolar soft part sarcoma**: characterized by specific chromosomal translocation.

Molecular and Genetic Aspects in WHO Classification

Advances in molecular pathology have significantly influenced the classification of soft tissue tumors. Specific genetic alterations are now recognized as diagnostic markers and therapeutic targets.

Key Molecular Features

- Chromosomal translocations, such as t(X;18) in synovial sarcoma.
- Gene amplifications, like MDM2 amplification in atypical lipomatous tumors.
- Mutations, such as in the NF1 gene in neurofibromas and MPNSTs.
- Unique fusion genes that help distinguish tumor subtypes.

Incorporating molecular data enhances diagnostic accuracy, especially in tumors with ambiguous morphology.

Benign vs. Intermediate vs. Malignant Tumours

Understanding tumor behavior is crucial for prognosis and management.

Benign Tumors

- Do not invade adjacent tissues or metastasize.
- Examples: lipoma, schwannoma, hemangioma.

Intermediate (Locally Aggressive) Tumors

- May invade local structures but rarely metastasize.
- Examples: desmoid fibromatosis, nodular fasciitis.

Malignant Tumors (Sarcomas)

- Capable of invasion, metastasis, and recurrence.
- Examples: liposarcoma, rhabdomyosarcoma, angiosarcoma.

Diagnostic Approach to Soft Tissue Tumours

Accurate diagnosis relies on a combination of clinical, radiological, histopathological, and molecular assessments.

Clinical Evaluation

- Patient history and physical examination.
- Tumor size, location, growth rate, and symptoms.

Imaging Studies

- MRI: preferred modality for soft tissue characterization.
- CT scans: useful for detecting calcifications and metastases.

Histopathology

- Core biopsy or excisional biopsy.
- Morphological assessment and immunohistochemistry.

Molecular Diagnostics

- FISH, PCR, and next-generation sequencing for genetic alterations.

Importance of WHO Classification in Clinical Practice

The WHO classification aids clinicians and pathologists in:

- Providing standardized diagnoses.
- Predicting tumor behavior and prognosis.
- Guiding treatment strategies, including surgery, radiation, and targeted therapy.
- Facilitating research and clinical trials.

Conclusion

The **WHO classification of tumours of soft tissue and** serves as a vital tool for understanding the wide spectrum of mesenchymal neoplasms. Its integration of histological, immunohistochemical, and molecular features allows for precise diagnosis and personalized management. As research advances, this classification continues to evolve, reflecting new insights into tumor biology, ultimately improving patient outcomes through better diagnostic accuracy and targeted therapies.

Keywords: WHO classification, soft tissue tumours, mesenchymal neoplasms, sarcomas, benign tumours, malignant tumours, tumor diagnosis, molecular pathology

Who Classification of Tumours of Soft Tissue and Its Significance in Modern Oncology

Introduction

Who classification of tumours of soft tissue and represents a cornerstone in the field of pathology and oncology, serving as a vital framework for diagnosing, studying, and managing a diverse group of tumors that originate from connective tissues. Given the wide variability in tumor behavior?from benign lesions that rarely pose a threat to aggressive malignancies with high metastatic potential?accurate classification is essential for guiding treatment strategies and estimating prognosis. This article explores the origins, structure, and clinical implications of the WHO classification of soft tissue tumors, providing a comprehensive yet accessible overview for healthcare professionals, researchers, and students alike.

The Significance of WHO Classification in Soft Tissue Tumors

The World Health Organization (WHO) classification system provides a standardized, internationally recognized nomenclature and categorization for tumours of soft tissue. Since its inception, the WHO classification has evolved through multiple editions, integrating the latest scientific discoveries,

molecular data, and clinical insights. Its primary goal is to:

- Facilitate precise diagnosis
- Enable consistent communication among clinicians and researchers
- Guide treatment planning
- Assist in prognostication
- Promote research and development of targeted therapies

Understanding this classification system is crucial because soft tissue tumors encompass more than 50 different entities, each with unique histological and molecular features.

Origins and Development of the WHO Classification

Historical Perspective

The classification of soft tissue tumors has historically been based on histological appearance?cell shape, arrangement, and tissue architecture. However, as molecular biology advanced, it became evident that many tumors previously grouped together displayed distinct genetic alterations. This led to the integration of molecular diagnostics into tumor classification.

The Role of the WHO

The WHO's International Agency for Research on Cancer (IARC) and the World Health Organization's Classification of Tumours series have periodically updated the categorization of soft tissue neoplasms to reflect contemporary scientific understanding. The latest editions incorporate immunohistochemistry, cytogenetics, and molecular genetic findings, making the classification more precise and clinically relevant.

Structure of the WHO Classification System

The WHO classification of soft tissue tumors is organized into several categories based on tissue origin and morphological features. These include:

- Tumors of adipocytic origin
- Fibroblastic and myofibroblastic tumors
- Pericytic (perivascular) tumors
- Tumors of smooth muscle
- Tumors of skeletal muscle
- Vascular tumors

- Nerve sheath tumors
- Germ cell tumors
- Unclassified or miscellaneous tumors

Each category contains specific tumor types with detailed criteria regarding histology, immunohistochemistry, and molecular genetics.

Major Categories and Notable Tumors

- Adipocytic Tumors

- Lipomas: Benign tumors composed of mature fat cells; most common soft tissue tumors.
- Liposarcomas: Malignant counterparts with various subtypes:
- Well-differentiated
- Dedifferentiated
- Myxoid
- Pleomorphic

- Fibroblastic and Myofibroblastic Tumors

- Fibromas: Benign, fibrous tissue tumors.
- Desmoid tumors: Locally aggressive fibrous neoplasms with a tendency to recur.
- Fibrosarcomas: Malignant tumors with spindle-shaped cells showing herringbone pattern.

- Pericytic Tumors

- Glomus tumors: Usually benign, arising from perivascular smooth muscle cells.
- Myopericytomas: Similar to glomus tumors but with different growth patterns.

- Smooth Muscle Tumors

- Leiomyomas: Benign tumors of smooth muscle, often in the uterus.
- Leiomyosarcomas: Malignant smooth muscle tumors with aggressive behavior.

- Skeletal Muscle Tumors

- Rhabdomyomas: Rare benign tumors.
- Rhabdomyosarcomas: Malignant tumors common in children, subdivided into embryonal, alveolar, and pleomorphic types.

- Vascular Tumors

- Hemangiomas: Common benign vascular tumors.
- Angiosarcomas: Malignant tumors arising from blood vessels.

- Nerve Sheath Tumors

- Schwannomas: Benign tumors of Schwann cells.
- Neurofibromas: Benign, often associated with neurofibromatosis.
- Malignant peripheral nerve sheath tumors (MPNSTs): Malignant counterparts with aggressive clinical course.

Molecular and Genetic Insights in Tumor Classification

The integration of molecular genetics has revolutionized the classification and understanding of soft tissue tumors. For example:

- Synovial sarcoma: Characterized by specific translocation t(X;18)(p11;q11) resulting in SS18-SSX fusion gene.
- Ewing sarcoma: Defined by EWSR1-FLI1 fusion.
- Alveolar rhabdomyosarcoma: Associated with PAX3-FOXO1 or PAX7-FOXO1 fusions.
- Gastrointestinal stromal tumors (GIST): Often harbor KIT or PDGFRA mutations.

These genetic markers not only aid in diagnosis but also serve as targets for novel therapies, exemplified by tyrosine kinase inhibitors in GIST management.

Diagnostic Approach and Role of WHO Classification

Accurate diagnosis of soft tissue tumors involves a multidisciplinary approach:

- Histopathology: Morphological assessment using hematoxylin and eosin staining.
- Immunohistochemistry (IHC): Identifies specific protein markers (e.g., S100 for nerve sheath tumors, desmin for muscle tumors).
- Molecular diagnostics: Detects characteristic genetic alterations.

The WHO classification provides the framework to interpret these diagnostic modalities coherently, ensuring that each tumor is correctly identified and classified.

Clinical Implications of the WHO Classification

The classification impacts clinical decision-making in several ways:

- Treatment planning: Benign tumors may require simple excision, while malignant tumors may need wide resection, chemotherapy, or radiotherapy.
- Prognostication: Certain tumor types have predictable clinical courses; for example, liposarcomas tend to recur if not completely excised.
- Research and drug development: Molecular insights have led to targeted therapies tailored to specific tumor subtypes.

Additionally, the classification guides the development of clinical trials, ensuring that patients are stratified accurately for emerging treatments.

Challenges and Future Directions

Despite advances, challenges persist:

- Rare tumor types: Limited data hinder consensus on management.
- Tumor heterogeneity: Variability within tumor types complicates diagnosis.
- Emerging molecular data: Continuous discoveries necessitate regular updates to the classification.

Future directions include:

- Incorporating more comprehensive genomic profiling.
- Developing personalized medicine approaches.
- Enhancing collaborative databases for rare tumors.

The ongoing evolution of the WHO classification aims to enhance diagnostic precision and improve

patient outcomes.

Conclusion

The WHO classification of tumours of soft tissue stands as a vital framework that underpins modern pathology and oncology. It synthesizes histological, immunohistochemical, and molecular data to provide a nuanced understanding of these diverse tumors. As scientific knowledge expands, this classification continues to evolve, fostering improved diagnostics, targeted therapies, and ultimately, better patient care. For clinicians, pathologists, and researchers, mastery of this classification system is essential in navigating the complex landscape of soft tissue neoplasms and advancing the frontiers of cancer treatment.

WHO CLASSIFICATION OF TUMOURS OF THE LUNG PLEURA

WHO classification of tumours of the lung pleura

The World Health Organization (WHO) classification of tumours of the lung and pleura provides a comprehensive framework for diagnosing, categorizing, and understanding the diverse neoplasms that originate in these regions. This classification is pivotal for clinicians, pathologists, and researchers because it standardizes terminology, facilitates accurate diagnosis, guides treatment strategies, and aids in prognostication. This article delves into the detailed WHO classification of lung and pleural tumours, exploring the various tumour types, their histopathological features, clinical relevance, and updates from the latest WHO editions.

Overview of WHO Classification of Lung and Pleural Tumours

The WHO classification system for lung and pleural tumours was first established to address the heterogeneity of neoplasms arising within these thoracic structures. It is periodically updated to incorporate advances in pathology, molecular biology, and clinical insights. The latest WHO classification categorizes tumours into benign, borderline, and malignant entities, based on histological features, behaviour, and molecular characteristics.

The classification encompasses tumours originating from:

- Lung parenchyma (primarily epithelial tumours)
- Pleura (mesothelial tumours)
- Other rare tumours of the lung and pleura

Understanding these categories is essential for accurate diagnosis and appropriate management.

Classification of Tumours of the Lung

Lung tumours are predominantly epithelial in origin, with non-small cell lung carcinomas (NSCLCs) being the most common, followed by small cell lung carcinomas (SCLCs). The WHO classification emphasizes histological subtypes, molecular alterations, and clinical implications.

Benign Lung Tumours

Benign lung tumours are rare and usually asymptomatic. They are often discovered incidentally during imaging studies. Main benign tumours include:

- Bronchial adenomas (now termed neuroendocrine tumors of low malignant potential)
- Hamartomas
- Leiomyomas
- Hemangiomas

Malignant Lung Tumours

Malignant tumours are classified primarily based on histological features into non-small cell lung carcinomas and small cell lung carcinomas.

Non-Small Cell Lung Carcinomas (NSCLCs)

This group includes the most prevalent lung cancers and is subdivided into:

- adenocarcinoma
- squamous cell carcinoma
- large cell carcinoma

Adenocarcinoma: The most common type, especially among non-smokers. It originates from glandular epithelium and often occurs peripherally.

Squamous cell carcinoma: Typically arises centrally within the bronchi and is strongly associated with smoking.

Large cell carcinoma: A diagnosis of exclusion characterized by undifferentiated malignant cells without glandular or squamous differentiation.

Small Cell Lung Carcinoma (SCLC)

SCLC accounts for approximately 15% of lung cancers. It is characterized by small, round to oval cells with neuroendocrine features, high mitotic rate, and aggressive behavior. It often presents with extensive disease at diagnosis and responds initially to chemotherapy and radiotherapy.

Other Rare Lung Tumours

The WHO also recognizes rare tumours such as carcinoid tumours, sarcomatoid carcinomas, and lymphomas involving the lung.

Classification of Tumours of the Pleura

Pleural tumours primarily originate from mesothelial cells lining the pleura. The WHO classification emphasizes mesothelial tumours, their benign, borderline, and malignant categories.

Benign Pleural Tumours

The most common benign pleural tumour is:

- Localized fibrous tumour of the pleura (also called solitary fibrous tumour)

These are usually asymptomatic, slow-growing, and incidentally found.

Borderline and Intermediate Tumours

This category includes tumours with uncertain malignant potential, though they are less well-defined compared to malignant tumours.

Diffuse Mesothelioma of the Pleura

While classified as malignant, mesotheliomas are a distinct entity with unique pathological features.

Malignant Pleural Tumours

The most significant malignant pleural tumour is:

- Malignant mesothelioma

This tumour arises from mesothelial cells and is strongly associated with asbestos exposure.

WHO Classification of Mesothelial Tumours

Mesothelial tumours are categorized based on histological subtypes, differentiation, and cellular features:

- Epithelioid mesothelioma: The most common form, characterized by epithelial-like cells.

- Sarcomatoid mesothelioma: Composed of spindle-shaped cells resembling sarcomas.

- Biphasic (mixed) mesothelioma: Contains both epithelioid and sarcomatoid components.

Additional features include the grading of cellular atypia, mitotic activity, and invasion patterns, which influence prognosis.

Key Features and Diagnostic Criteria in WHO Classification

The WHO classification emphasizes several diagnostic criteria:

- Histopathological features: Cell morphology, growth patterns, invasion depth.

- Immunohistochemistry: Markers such as calretinin, WT-1, cytokeratin 5/6 for mesothelial origin; TTF-1, Napsin A for adenocarcinomas; p40, p63 for squamous cell carcinomas.

- Molecular features: Genetic alterations, e.g., EGFR mutations in adenocarcinoma, BRAF, KRAS mutations, and PD-L1 expression relevant for targeted therapy.

Importance of WHO Classification in Clinical Practice

The WHO classification guides clinicians by:

- Providing a standardized terminology for diagnosis and communication.

- Informing prognosis; for example, adenocarcinomas generally have better outcomes compared to small cell carcinomas.

- Influencing treatment decisions; targeted therapies depend on molecular subtypes.

- Facilitating research and epidemiological studies through consistent categorization.

Updates in the Latest WHO Classifications

The WHO periodically revises its classification to incorporate advances in pathology and molecular biology. Notable updates include:

- Recognition of new subtypes of lung adenocarcinoma (e.g., lepidic, acinar, papillary).

- Inclusion of molecular markers as diagnostic criteria.

- Clarification of borderline and pre-invasive lesions.

- Better characterization of mesothelial tumours, including epithelioid, sarcomatoid, and biphasic variants.

Conclusion

The WHO classification of tumours of the lung and pleura remains a cornerstone in thoracic pathology, fostering precise diagnosis, guiding treatment, and improving understanding of tumour biology. Its systematic approach to categorizing benign, borderline, and malignant neoplasms based on histological, immunohistochemical, and molecular features ensures consistency across institutions and enhances patient care. Staying updated with WHO revisions is essential for healthcare professionals involved in the management of thoracic tumours, ultimately leading to better outcomes for patients.

Keywords: WHO classification, lung tumours, pleural tumours, mesothelioma, lung carcinoma, benign lung tumours, malignant lung tumours, thoracic pathology, tumour histology, thoracic neoplasms

WHO Classification of Tumours of the Lung Pleura

The World Health Organization (WHO) classification of tumours of the lung and pleura represents a comprehensive framework that guides pathologists, oncologists, and researchers in diagnosing, categorizing, and managing thoracic neoplasms. This classification system, regularly updated to incorporate advances in molecular pathology and histopathology, provides a standardized language that enhances clinical decision-making and facilitates epidemiological studies. In this review, we explore the detailed taxonomy of pleural tumours as outlined by the WHO, emphasizing their histopathological features, molecular characteristics, and clinical implications.

Introduction

The pleura, a vital serous membrane enveloping the lungs and lining the thoracic cavity, is a site for a diverse array of benign and malignant tumours. Malignant pleural mesothelioma (MPM) is the most notorious primary neoplasm arising from the mesothelial cells, but secondary tumours such as metastases from lung, breast, and other carcinomas also involve the pleura. The WHO classification provides a structured approach to distinguish these entities, primarily focusing on mesothelial neoplasms, fibrous tumours, and other rare variants.

Understanding the WHO classification is essential for accurate diagnosis, prognostication, and therapeutic planning, especially given the heterogeneity of pleural tumours and the evolving landscape of molecular diagnostics.

Primary Tumours of the Pleura

Primary tumours originate from the mesothelial lining or associated stromal components. They are classified based on histopathological features, immunohistochemical profiles, and molecular alterations.

Mesothelial Tumours

Mesothelial neoplasms are the most common primary pleural tumours and encompass benign, borderline, and malignant categories.

Benign Mesothelial Tumours

- Localized Mesothelial Hyperplasia: Reactive proliferation of mesothelial cells often associated with inflammation or trauma.
- Well-Differentiated Papillary Mesothelial Tumour (WDPMT): A rare benign entity characterized by papillary proliferation of mesothelial cells with minimal atypia and no invasion.

Malignant Mesothelial Tumours

- Malignant Mesothelioma (MM): The most significant primary malignant tumour of the pleura, with distinct histological subtypes and molecular features.

Malignant Mesothelioma Subtypes

The WHO recognizes three main histological subtypes, each with differing prognosis and therapeutic responses:

- Epithelioid Mesothelioma
- Sarcomatoid Mesothelioma
- Biphasic (Mixed) Mesothelioma

Epithelioid Mesothelioma:

Most common (~60-70%), characterized by polygonal cells forming tubules, papillae, or solid sheets. Frequently exhibits a prominent fibrous stroma and tends to have a better prognosis.

Sarcomatoid Mesothelioma:

Less common (~10-20%), composed of spindle-shaped cells resembling sarcoma. These tumours are often more aggressive and less responsive to therapy.

Biphasic Mesothelioma:

Contains both epithelioid and sarcomatoid components, with prognosis depending on the proportion of each.

Molecular and Immunohistochemical Features of Mesothelioma

- Key Immunohistochemical Markers:

- Positive: Calretinin, WT1, D2-40 (podoplanin), Cytokeratin 5/6, Mesothelin
- Negative: Carcinoma markers such as TTF-1, CEA, Ber-EP4

- Molecular Alterations:

- Loss of BAP1 expression
- CDKN2A (p16) deletion detectable via FISH
- Rare mutations in BRAF, NRAS

Other Mesothelial Tumours

- Localized Malignant Mesothelioma: Rare, similar to diffuse but confined to localized areas.
- Multicystic Mesothelioma: Generally benign, presenting as multicystic lesions.

Fibrous and Other Tumours of the Pleura

Aside from mesothelial origins, the pleura can host fibrous and miscellaneous tumours.

Solitary Fibrous Tumour (SFT)

- Originates from fibroblastic mesenchymal cells.
- Usually benign but can be malignant.
- Features: Well-circumscribed, spindle cells with high vascularity, "patternless" pattern, and CD34 positivity.
- Malignant SFTs show increased cellularity, atypia, mitoses, necrosis.
- Molecular hallmark: NAB2-STAT6 gene fusion detectable via immunohistochemistry (STAT6 nuclear positivity).

Fibrosarcoma and Other Sarcomas

Rare; includes fibrosarcoma, malignant peripheral nerve sheath tumour, and angiosarcoma. These are generally distinguished through histomorphology and immunoprofile.

Mesenchymal Tumours with Other Differentiations

- Lipomas and Liposarcomas
- Hemangiopericytoma

Secondary Tumours of the Pleura

Metastatic involvement of the pleura is common, especially from lung, breast, and other carcinomas.

Common Metastases

- Lung Carcinomas: Adenocarcinoma, squamous cell carcinoma
- Breast Carcinoma
- Gastrointestinal Tumours
- Lymphomas and Leukemias

Immunohistochemistry and molecular studies help determine the primary site, especially in poorly differentiated tumours.

Rare and Unusual Pleural Tumours

- Mesenchymal chondrosarcoma
- Malignant fibrous histiocytoma
- Synovial sarcoma

These are exceedingly rare but are recognized within the WHO framework based on histopathology and molecular features.

Diagnostic Challenges and Advances

Accurate classification relies on a combination of histopathology, immunohistochemistry, and increasingly, molecular diagnostics.

Role of Molecular Diagnostics

- Detection of BAP1 loss and CDKN2A deletions for mesothelioma
- Identification of NAB2-STAT6 fusion in SFT
- Next-generation sequencing panels for rare entities

Diagnostic Algorithms

- Use of panel immunohistochemistry to differentiate mesothelioma from metastatic carcinoma
- Employing molecular markers for ambiguous cases

Clinical Implications of WHO Classification

The WHO classification informs prognosis and guides management strategies:

- Benign vs. Malignant: Surgery for benign tumours; multimodal therapy for mesothelioma.
- Histological Subtypes: Epithelioid mesotheliomas have better outcomes.
- Molecular Features: Potential targets for novel therapies.

Conclusion

The WHO classification of tumours of the lung and pleura offers a detailed and nuanced taxonomy that reflects advances in our understanding of thoracic neoplasms. It emphasizes the importance of integrating histopathological, immunohistochemical, and molecular data to achieve accurate diagnosis. As research continues to evolve, especially in molecular genetics and targeted therapies, this classification will likely undergo further refinements, ultimately improving patient outcomes through tailored treatment approaches.

Understanding the diverse spectrum of pleural tumours aids clinicians and pathologists in making precise diagnoses, prognostic assessments, and guiding appropriate management. The ongoing evolution of the WHO classification underscores the importance of multidisciplinary collaboration in thoracic oncology.

QuestionAnswer What is the WHO classification of tumors of the lung and pleura? The WHO classification of tumors of the lung and pleura is a standardized system that categorizes benign and malignant tumors based on histological features, genetic profiles, and clinical behavior to guide diagnosis and treatment. How are mesotheliomas classified in the WHO system? In the WHO classification, mesotheliomas are categorized into epithelioid, sarcomatoid, biphasic (mixed), and rare variants, based on their cellular morphology and immunohistochemical profiles. What are the main types of primary lung carcinomas according to WHO? The main types include non-small cell lung carcinomas (adenocarcinoma, squamous cell carcinoma, large cell carcinoma) and small cell lung carcinoma, each with distinct histological and molecular features. How does the WHO classify benign tumors of the lung and pleura? Benign tumors are classified as hamartomas, papillomas, lipomas, and other rare benign neoplasms, characterized by their benign histological appearance and non-invasive behavior. What is the significance of the WHO classification in clinical management? The WHO classification helps in accurate diagnosis, prognosis, and selection of appropriate treatment strategies by providing a standardized framework for tumor categorization. Are genetic features incorporated into the WHO classification of lung and pleural tumors? Yes, the WHO classification increasingly incorporates molecular and genetic markers that aid in subclassification, prognosis, and targeted therapy options. How are metastatic tumors to the lung and pleura classified in the WHO system? Metastatic tumors are classified based on their primary

origin and histological similarity, with common types including metastases from breast, colon, and other cancers, but they are not part of the primary WHO tumor classification. What updates have recent WHO classifications introduced for lung and pleural tumors? Recent updates include enhanced molecular characterization, recognition of new tumor variants, and refined criteria for differentiating benign from malignant lesions to improve diagnostic accuracy. How does the WHO classification address rare tumors of the lung and pleura? The WHO classification provides specific categories for rare tumors such as solitary fibrous tumors, carcinoids, and other uncommon neoplasms, facilitating their recognition and management. Why is the WHO classification important for pathologists and clinicians? It ensures consistent diagnosis, informs prognosis, guides treatment decisions, and fosters research by providing a comprehensive, evidence-based framework for tumor categorization.

Related keywords: lung tumors, pleural tumors, WHO classification, thoracic oncology, mesothelioma, lung cancer types, pleural mesothelioma, malignant pleural effusion, tumor histology, lung neoplasms

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