

Malignant Mesothelioma

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ETIOLOGY

- **Most common etiology of pleural tumours** : Metastasis from lung ,breast, ovarian carcinomas
- Primary tumours of the pleura are rare **except after exposure to asbestos.**
- After exposure, there may be a **latent period of up to 50 years** before development of the tumour.
- Patients usually present with **chest pain and breathlessness** and there is commonly a pleural effusion.

Pleural tumours

- A) Solitary fibrous tumour
- B) Malignant Mesothelioma - A Malignant neoplasm of mesothelial differentiation that arises from mesothelial lining cells of the pleura

Malignant Mesothelioma

- **80% to 90% of individuals with this cancer** have a history of exposure to asbestos.
- Those who **work directly with asbestos** (shipyard workers, miners, insulators) are at greatest risk.
- Malignant mesotheliomas have appeared in individuals whose only exposure was living near an **asbestos factory** or being a relative of an asbestos worker.
- Mesotheliomas are **highly malignant tumours** that spread to adjacent structures like the pericardium and lung and death usually occur 10 months after diagnosis, although metastases are rare.

Gross-thick, firm, white pleural tumor that ensheathes this bisected lung



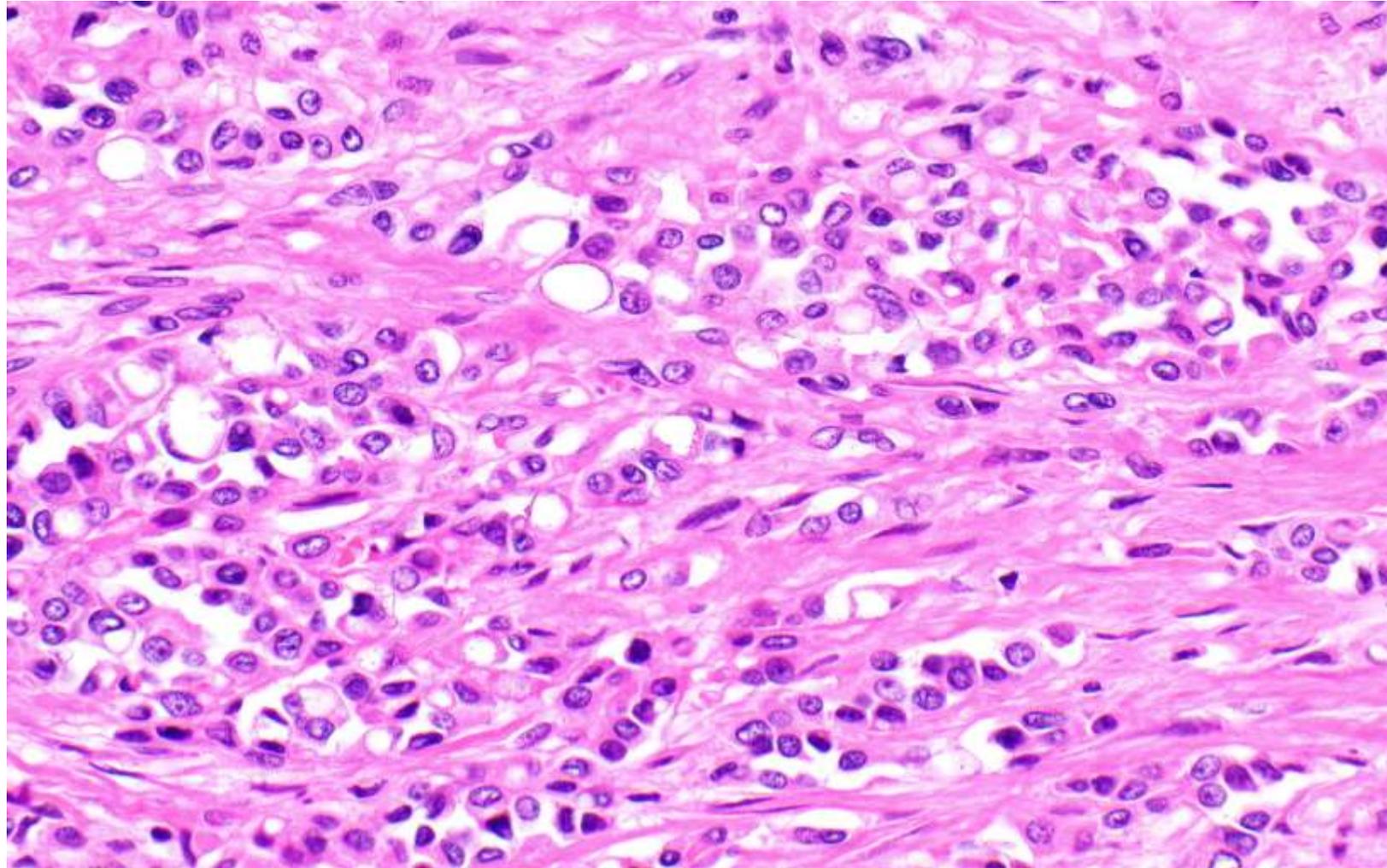
Location based classification

- A) **Thoracic(Pleural) mesothelioma**
- B) Peritoneal mesothelioma
- C) Pericardial mesothelioma

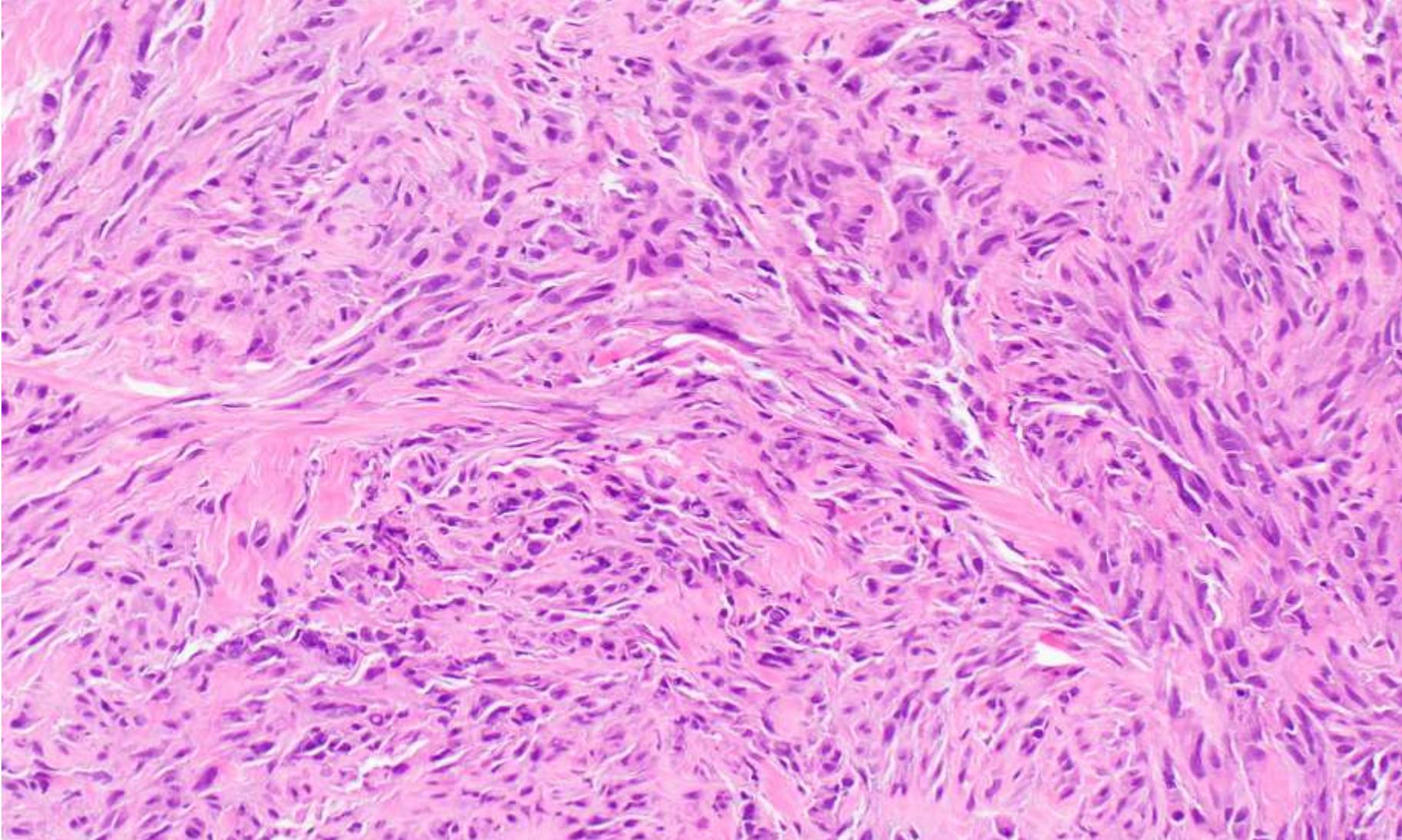
Histologic types of Malignant Mesothelioma

- (1) epithelioid- in which cuboidal cells with small papillary buds line tubular and microcystic spaces (this is the most common pattern and also the one most likely to be confused with a pulmonary adenocarcinoma)
- (2) sarcomatous- in which spindled, occasionally fibroblastic-appearing cells grow in sheets
- (3) biphasic- having both sarcomatous and epithelial areas.

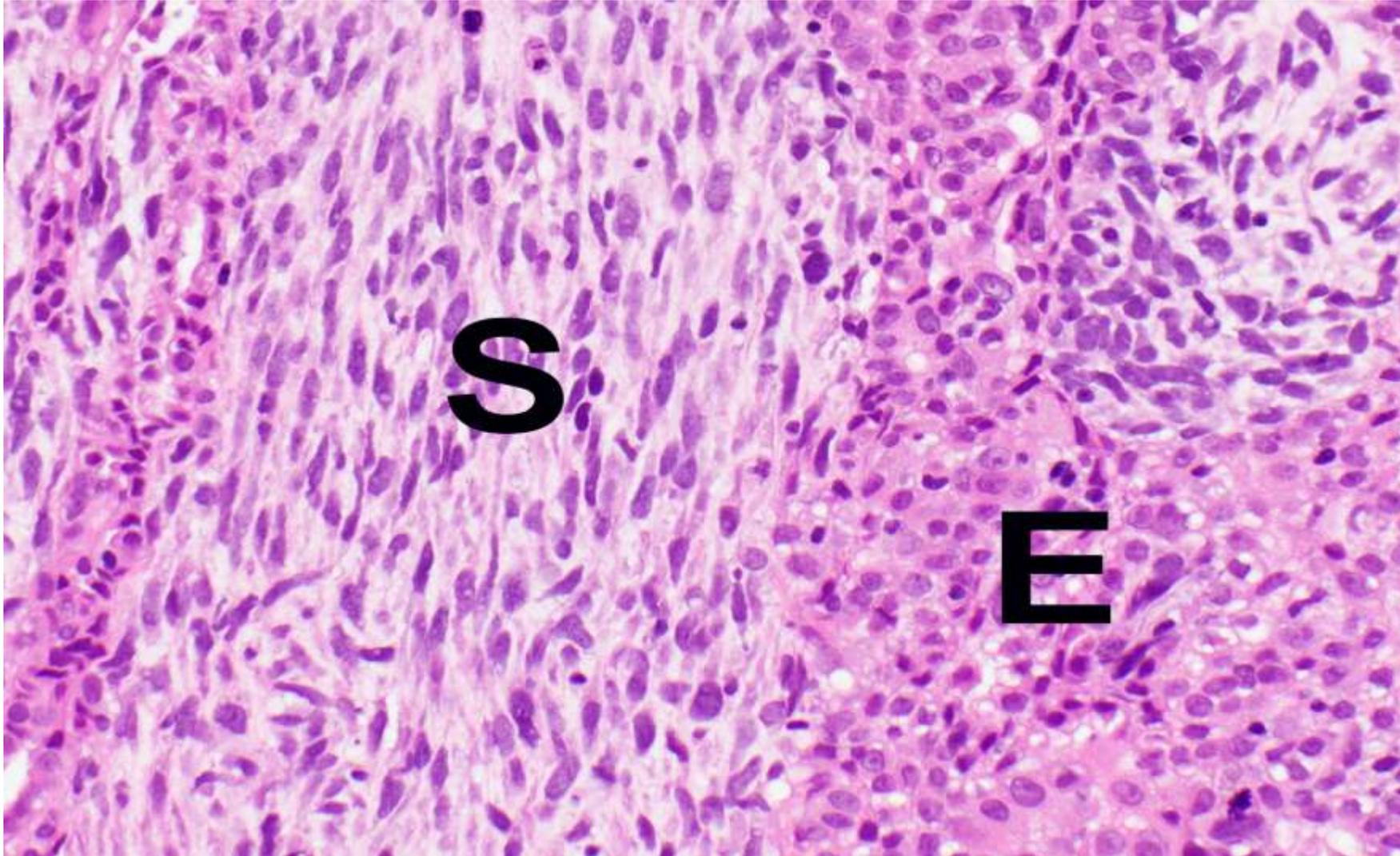
EPITHELIOD TYPE-Large polygonal cells are characterized by a fair amount of cytoplasm and round to oval nuclei with open chromatin, some with conspicuous nucleoli.



SARCOMATOUS TYPE-Spindle cells grow in a haphazard pattern.



BIPHASIC TYPE-



Pathogenesis

Once inhaled, asbestos fibers remain in the body for life



asbestos fibers gather near the mesothelial cell layer



generation of reactive oxygen species, thus DNA damage + mutations



multiple driver mutations which cluster in pathways involved in DNA repair, cell cycle control, and growth factor signaling

- Most commonly mutated gene in sporadic mesothelioma= **BAP1**

Clinical features

- Shortness of breath
- Chest wall pain, pleurisy
- Cough
- Weight loss
- Recurrent unilateral pleural effusion(might be hemorrhagic)

Diagnosis

- Pleural thickening or recurrent pleural effusion on chest Xray followed up with contrast enhanced chest CT scan
- Thoracentesis acquiring pleural fluid for cytology
- With BAP1 and MTAP immunostaining and FISH for homozygous deletion of CDKN2A, diagnosis of malignant pleural mesothelioma possible on at least a subset of fluids)
- Pleural biopsy (e.g., video assisted thoracoscopic surgery [preferred], CT guided core biopsy, open biopsy)

- Routine blood work
- Serology for mesothelin and fibulin-3 - screening markers for malignant pleural mesothelioma

Complications from lesion

- Dyspnoea.
- Chest pain.
- Dysphagia.
- compression of nerves and spinal cord leading to pain.

Complications from surgery

- Pulmonary Edema
- Pulmonary Embolus
- Bronchial Air Leaks
- Mediastinal Shift

Complications from chemotherapy

- Hair loss
- Nausea and vomiting
- Fatigue
- Respiratory Infections
- Myelosuppression that causes anemia, low platelets or low white blood cell count