Pleural Malignant Mesothelioma - Autopsy Case Report

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Abstract: Introduction: Pleural Mesothelioma is a rare fatal neoplasm mainly related to asbestos exposure originating from lining cells (mesothelium) of pleural and peritoneal cavities, pericardium, and tunica vaginalis. The exact prevalence is unknown but it is estimated that mesothelioma represent less than 1% of all cancer. It may occur over a wide range of age, but most commonly observed in adults over the age of 50 years. Latency from the time of initial asbestos exposure, clinical features of chest pain and dyspnea, and radiological findings of pleural effusion or pleural thickening are the characteristic features. Among two types of mesothelioma, diffuse form is more common than localized mesothelioma.

The Case: We presented an autopsy case of 70 year old man who had complaints of chest pain and dyspnea. His USG report showed Rt. Pleural effusion. No CT scan or pleural fluid examination was performed. Patient was admitted in hospital and died after 2 days of admission. Autopsy was done and histopathology of pleural nodules shows tubulopapillary pattern lined by cells having bland cyto-morphology. Autopsy (removed) IHC markers are applied such as Cytokeratin & Calretinin to differentiate it from lung adenocarcinoma or metastatic adenocarcinoma. PAS stain was also performed. Cells of growth are positive for both Cytokeratin (AE1/ AE3) & Calretinin that are in favour of mesothelioma. PAS stain was found negative that helps to rule out metastatic adenocarcinoma and TTF as a negative marker to differentiate from lung adenocarcinoma. Autopsy was done and (removed) Histopathology (removed) Histological findings along with IHC markers & special stain are in favour of diagnosis of Mesothelioma - Epitheloid variant.

Conclusion: The diagnosis of mesothelioma continues to rely on a multimodal approach that incorporates clinical features, gross and microscopic features, immunohistochemistry, and electron microscopy for arriving at a definitive diagnosis.

Keywords: Pleural mesothelioma, pleural tumour, hydrothorax.

Introduction: Malignant mesothelioma is a rare tumour of pleura. The majority of pleural mesothelioma are related to asbestos exposure. The tumor usually develop many years after exposure (> 20 years). Other etiological agents such as radiation, minerals such as silica and beryllium and synthetic fibers may be associated with mesothelioma development. The mean age at presentation is 60 years. Rarely malignant mesothelioma occurs in patients younger than 20 years. Most cases occur in patients between 40 to 60 years age groups. The ratio of men to women is 5:1. The average interval between onset of symptoms & death is 18 month. There is multimodal approach for the diagnosis of mesothelioma required such as history of asbestos exposure, clinical signs and symptoms, radiographic findings, histopathological features, IHC findings and ultrastructural studies. Treatment of mesothelioma includes chemotherapy, radiotherapy & surgical resections. Recovery has been rarely reported and only in cases of a very early diagnosis, subjected to adjuvant treatment.

Case Report: A man, 70 year old admitted to the department of orthopedics for thigh injury and he had fracture femur. His operation for fracture was done. During admission, patient had also complaints of cough, chest pain and dyspnoea. USG chest was performed, in USG findings, ther was Rt. Sided hydrothorax. Fluid was sent for only culture & sensitivity, in this report, klebsiella strain was found. Sputum examination was AFB negative. Patient died on the next day of operation. Autopsy of patient was done.

Gross: Both lungs are sent in pieces, weight of each lung piece was 450 gms. Both lungs are congested, oedematous & heavy on gross examination. One of the lung piece was found firm in consistency. Pleural surface shows multiple white nodules measuring 0.5 - 0.8 cm in size. Sections were taken from white nodular areas as well as from both lung pieces.

Microscopy: Sections from nodular areas show tubulopapillary growth pattern. Both tubules and
papillae are lined by round to polygonal tumour cells with abundant eosinophilic cytoplasm & bland nuclei that are devoid of mitotic activity. At many places, microglandular pattern is also seen. Both lungs show congestion & oedema. Few glandular areas showing cytological atypia in the form of high N:C ratio and nuclear hyperchromasia. No invasion by growth of pleural surface in both lungs was seen.

**IHC:** IHC markers are applied such as Cytokeratin & Calretinin to differentiate it from lung adenocarcinoma or metastatic adenocarcinoma. PAS stain was also performed. Cells of growth are positive for both Cytokeratin (AE1/ AE3) & Calretinin. Tumour cells are negative for CEA. PAS stain was found negative. Histological findings along with IHC markers & special stain are in favour of diagnosis of Mesothelioma - Epitheloidvariant.

**Discussion:**
The diagnosis of Mesothelioma depends on a constellation of a history of asbestos exposure, clinical signs & symptoms, radiological findings, histopathological features and immunohistochemical studies. There is often insidious onset of chest pain & shortness of breath.
Radiological findings provide important information to the pathologist regarding gross distribution of tumor. Both clinically & histologically Mesothelioma & adenocarcinoma can mimic, so multimodal approach is necessary. Microscopically, there are three subtypes of mesothelioma- epitheloid, sarcomatoid & mixed. 70% of mesothelioma will be predominantly epitheloid, 25% biphasic & 5% sarcomatoid. Sarcomatoid variant is associated with aggressive biological behavior. The intraluminal secretion of mesothelioma is negative with DPAS (PAS stain following predigesion with diastase ) but positive for Alcian blue. Immunohistochemistry is the most widely used technique for establishing diagnosis of mesothelioma. Current recommendations for immunostaining of mesothelioma including a panel of at least two positive & two negative markers. The best "negative" markers are CEA , MOC31 , Ber-EP4, & The best "positive " markers are Cytokeratin 5/6 and calretinine. In our case growth is positive for cytokeratin 5/6, calretinin (both nuclear & cytoplasmic positivity) and negative for CEA. The nuclear antigen TTF -1 may be used to identify lung adenocarcinoma.

There is no definitive pathological criteria in differential diagnosis of benign and malignant localized mesothelioma. However overexpression of P53 is present in malignant mesothelioma.

The presence of an intraparenchymal lung nodule in addition to a pleural nodule may more strongly suggest a lung adenocarcinoma that has metastasized to the pleura than it does a malignant mesothelioma.

Conclusion:
Chest X ray show a large unilateral pleural effusion & may show a large unilateral pleural effusion or a localized pleural based mass. CT of the thorax & MRI provide information regarding invasion to local areas & metastasis. CT also provide presence of pleural plaques or calcification as evidence of prior asbestos exposure. F-fluorodeoxyglucose positron tomography shows promise as a tool for differentiating benign from malignant disease, as well as being an adjunct for staging. The diagnosis of mesothelioma continues to rely on a multimodal approach that incorporates clinical features, gross and microscopic features, immunohistochemistry, and electron microscopy for arriving at a definitive diagnosis.

References:


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