Cytological Profile of a Case of Malignant Mesothelioma of Pleura with Supraclavicular Lymph Node Metastasis

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Abstract

Malignant mesothelioma of pleura is a locally aggressive rare neoplasm of mesothelial cells, which produces distant metastasis in advanced stages of its course. It is exceptional for patients to present with metastasis prior to the detection of primary tumor in the pleura. Here, we report a case of malignant mesothelioma of pleura in a 65-year-old quarry worker where the initial diagnosis was offered by fine needle aspiration of an enlarged supraclavicular lymph node. Subsequent pleural fine needle aspiration cytology (FNAC), tumor biopsy, and immunohistochemical analysis confirmed the diagnosis.

Keywords: Fine needle aspiration (FNA), lymph node, malignant mesothelioma, quarry worker

Introduction

Advanced cases of pleural malignant mesothelioma may metastasize to intrathoracic lymph nodes, however, distant metastasis and extrathoracic lymph node involvement are very rare. In patients with a prior history of malignant mesothelioma, fine needle aspiration (FNA) is a simple procedure for the detection of metastatic disease.

Case History

A 50-year-old male was admitted for evaluation of right-sided chest pain and dyspnoea without fever of 1-year duration. He was a quarry worker for 25 years and a beedi smoker for 30 years. Physical examination revealed diminished movements and expansion of right hemithorax, stony dull note, and absent breath sounds in right infra-axillary and infrascapular regions, along with a hard right supraclavicular lymph node of size 3 × 2 cm. His hematological and biochemical investigations were within normal limits. Sputum smear was negative for acid fast bacilli and malignant cells. His chest X-ray showed right pleural effusion and collapse of the right lung. With these findings, clinician made a provisional diagnosis of bronchogenic carcinoma with malignant pleural effusion and extrathoracic lymph node metastasis and the patient was sent to the cytology lab for FNA of the right supraclavicular lymph node.

Two FNAs were performed from the right supraclavicular lymph node using 21-gauge needle attached to a 10-ml syringe, and the aspirated material was smeared on glass slides, alcohol-fixed or air-dried, and stained with the Papanicolaou and May–Grunwald–Giemsa technique.

FNA of the lymph node showed sheets and singly-scattered medium-sized polygonal cells with well-defined cell borders, prominent cell separation, moderate amount of dense cytoplasm, and central round nucleus with finely granular chromatin, some having intranuclear inclusions [Figure 1a and b]. Thus, we diagnosed the presence of malignant cells in the supraclavicular lymph node consistent with metastasis, and suggested the possibility of metastasis from malignant mesothelioma of pleura or adenocarcinoma of the lung.

Subsequently, computed tomography (CT) of his thorax was done which revealed moderate pleural effusion, right parietal pleural thickening with nodularity, intrabronchial bulging of the lesion, collapse of the right lung, multiple nodules and calcification in both lungs, and multiple calcified...
bilateral hilar and mediastinal lymph nodes. Radiological differential diagnoses were sequelae of empyema, silicosis, and malignancy.

FNA from pleural nodule showed cells with similar cytological features, as seen in the lymph node. Thus, a diagnosis of malignant mesothelioma of pleura with supraclavicular lymph node metastasis was suggested. However, we recommended biopsy and immunohistochemistry of the tumor to rule out the possibility of adenocarcinoma of lung.

Later, a transbronchial biopsy was taken from the tumor for histopathological examination, which showed a neoplasm with multiple areas of calcification. Neoplasm was composed of sheets of polygonal and round cells with dense eosinophilic cytoplasm and round hyperchromatic central nucleus [Figure 1c and d]. These cells were negative for mucicarmine. Immunohistochemistry was done in tissue sections. Nuclear and cytoplasmic positivity for calretinin and membrane positivity for epithelial membrane antigen confirmed the diagnosis of malignant mesothelioma of pleura.

**Discussion**

Malignant mesothelioma is a fatal neoplasm involving the visceral and parietal surfaces of body cavities. With regard to site, pleura accounted for 41.3% of all mesothelioma deaths, far outnumbering the peritoneum and pericardium, which accounted for 4.5% and 0.3% of the deaths, respectively.[2]

The average prevalence of mesothelioma following a heavy exposure to asbestos is 2–3%. In a study among 272 cases of malignant mesothelioma, exposure to asbestos was documented in 87% of cases.[3] The latency period for mesothelioma after initial exposure to asbestos is typically longer than 30 years.[2] Several studies done among quarry workers showed that chronic exposure to silica may increase the risk of respiratory morbidity, and cigarette smokers are at a higher risk.[4] Associations between malignant mesothelioma and exposure to dust or chemicals have also been reported.

Typically, patients present with chest pain and pleural effusion. Tumor grows as multiple ill-defined nodules in diffusely thickened pleura. In malignant mesothelioma, majority of the local or distant hematogenous metastatic foci are incidental autopsy findings. Review studies documented that axillary lymph node metastasis is exceptionally rare even in cases with chest wall involvement.[5,6] It is exceptional for patients to present with peripheral lymphadenopathy prior to the detection of the primary tumor.[7] Till date according to the literature, 14 cases of malignant mesotheliomas involving pleura, pericardium, and peritoneum have been diagnosed initially by extrathoracic lymph node study prior to the detection of primary tumor. Of these, 14 cases, malignant mesothelioma of pleura constitutes 6 cases, of which only 2 cases were diagnosed by aspiration cytology of the lymph node.[8-10]

Sometimes clinical, gross, and microscopic appearance of adenocarcinoma of the lung may resemble epithelial malignant mesothelioma, the commonest histological type. Mesothelioma cells are negative for mucicarmine and positive for immunohistochemical markers such as epithelial membrane antigen, calretinin, and WT1, which have diagnostic importance.

FNA from solid form of epithelial malignant mesothelioma shows pavement-like sheets of epithelial cells with well-defined cell borders, spongiotic separation, angulations, and dense cytoplasm.[7]

**Conclusion**

In conclusion, it is exceptional for malignant mesothelioma to present with extrathoracic lymph node metastasis prior to the detection of the primary tumor in the pleura. Diagnosis of metastasis in lymph node by FNA is a challenge unless there is a previously established diagnosis of mesothelioma. Obtaining material for cell block preparation, cytochemistry, or immunohistochemistry is mandatory to confirm the diagnosis.

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**Conflicts of interest**

There are no conflicts of interest.

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