Case Report

Primary Malignant Melanoma of the Lung: Case Report and Literature Review

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Abstract

Primary malignant melanoma of the lung (PMML) is an extremely rare tumour with only sporadic case reports. We report the occurrence of PMML in a 58-year-old female. Although extremely rare, it must be considered in the differential diagnosis of bronchogenic carcinoma and a detailed systemic examination must be done to rule out any primary skin or eye involvement. **[Indian J Chest Dis Allied Sci 2015;57:181-184]**

Key words: Malignant melanoma, Fiberoptic bronchoscopy, Lobectomy.

Introduction

Melanoma is a highly malignant tumour predominantly involving skin and eyes. Involvement of the respiratory tract is usually metastatic and primary tumours of the lung are extremely rare. Till date, about 32 cases of primary malignant melanoma of the lung (PMML) have been reported worldwide.[1-6] A detailed systemic evaluation is essential to rule out any extra-pulmonary origin of the neoplasm before labelling it as PMML. Here, we report the case of an elderly housewife who presented with a lung mass and was diagnosed to have PMML.

Case Report

A 58-year-old female, from West Bengal, presented with chief complaints of low grade intermittent fever, left-sided pleuritic chest pain, dry cough and loss of appetite for four months. There was no evening rise in temperature. Cough was dry, persistent with no history of diurnal and postural variation. There was no history of haemoptysis. She gave a history of weight loss and anorexia. Patient was a housewife with history of cooking in poorly ventilated surroundings and exposure to biomass fuel smoke for the last 30 years. She was not known to have diabetes mellitus, hypertension; there was no past history of receiving treatment for tuberculosis.

At presentation, the patient had a body mass index (BMI) of 19.2 kg/m^2. On general physical examination, there was no pallor, icterus, cyanosis, digital clubbing or peripheral lymphadenopathy. Patient was febrile (oral temperature 38 °C), heart rate 114/min, blood pressure 116/80 mm of Hg, respiratory rate 22/min. On respiratory system examination, there was a localised bulge present over the left infra-clavicular region. Movements over the left side were diminished. There was a dull note on percussion over the left infra-clavicular region, reduced intensity of breath sounds on auscultation over the left side. Other systems examination was within normal limits. Laboratory investigations revealed normal haemogram, renal and liver function tests. Chest radiograph (Figure 1) revealed a homogeneous opacity in the left middle and lower zone; the left costophrenic and cardiophrenic angles were obscured. There was absence of air-bronchogram with central mediastinum with absence of Ellis's curve.

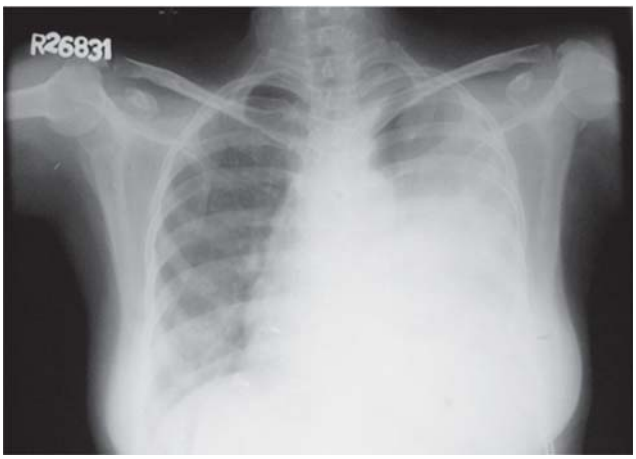

Figure 1. Chest radiograph (postero-anterior view) showing a homogeneous opacity in the left middle and lower zone. Air-bronchogram is not evident. Left costophrenic and cardiophrenic angles are obscured.

Computed tomography of the chest (Figures 2 and 3) revealed a large (8cm x 9cm) heterogeneously enhancing mass lesion in left upper lobe with central non-enhancing necrotic areas. The mass was seen to indent the left main bronchus with minimal left-sided

[Received: September 26, 2013; accepted after revision: October 1, 2014]

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pleural effusion. There was no evidence of rib or chest wall erosion. There were no satellite nodules nor mediastinal involvement.

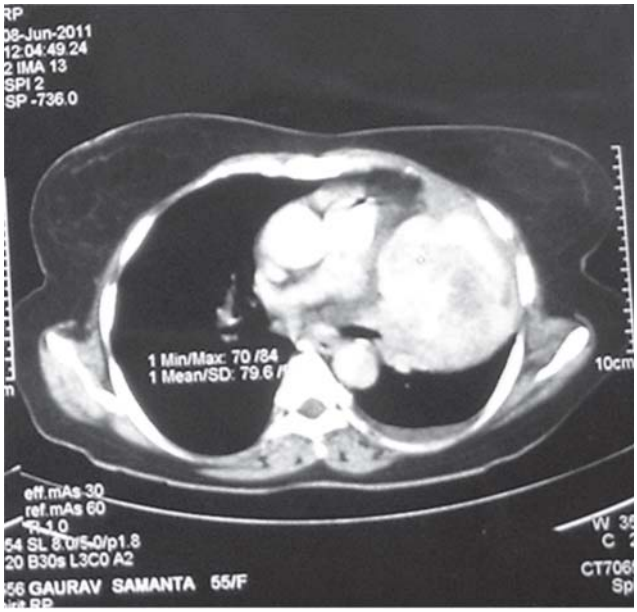

Figure 2. Computed tomography of chest (mediastinal window) showing a large (8cm x 9cm) heterogeneously enhancing mass lesion in the left upper lobe with central non-enhancing necrotic areas and minimal left sided pleural effusion.

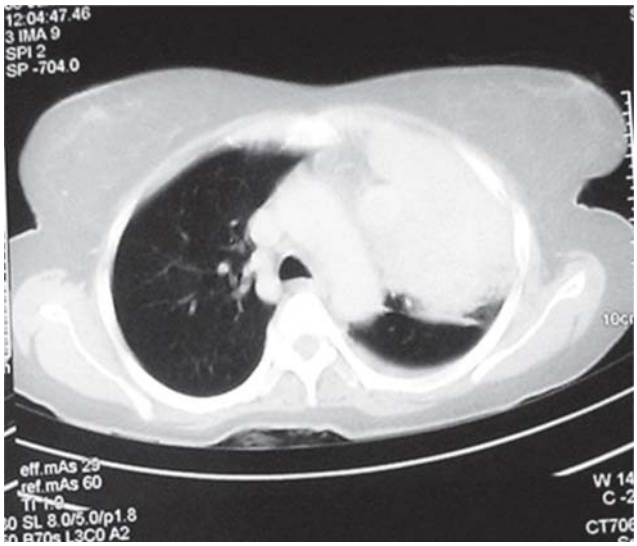

Figure 3. Computed tomography of chest (lung window) showing a mass lesion in the left upper lobe with the absence of air bronchogram and normal contralateral lung.

CT-guided tru-cut needle biopsy revealed malignant tumour with large atypical nuclei, melanin pigment in cytoplasm; immunohistochemistry using human melanoma black-45 stain (HMB-45) was positive (Figure 4). A diagnosis of malignant melanoma was made. Fibreoptic bronchoscopy revealed dense, black pigmentation over left upper lobe bronchial mucosa (Figure 5). Endobronchial lung biopsy was done which revealed invasion of bronchial epithelium by melanoma cells and large atypical nuclei suggestive of malignant melanoma (Figure 6).

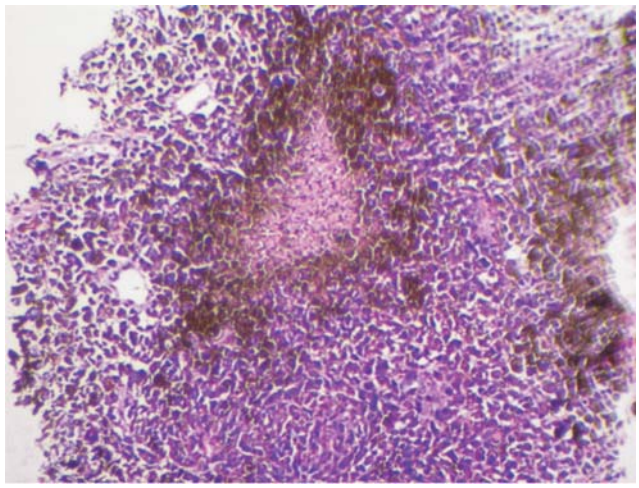

Figure 4. Photomicrograph of tru-cut needle biopsy from the mass lesion showing malignant tumour with large atypical nuclei, melanin pigment in cytoplasm and positive HMB-45 stain (Haematoxylin and Eosin; immunohistochemistry with HMB- 45 × 450).

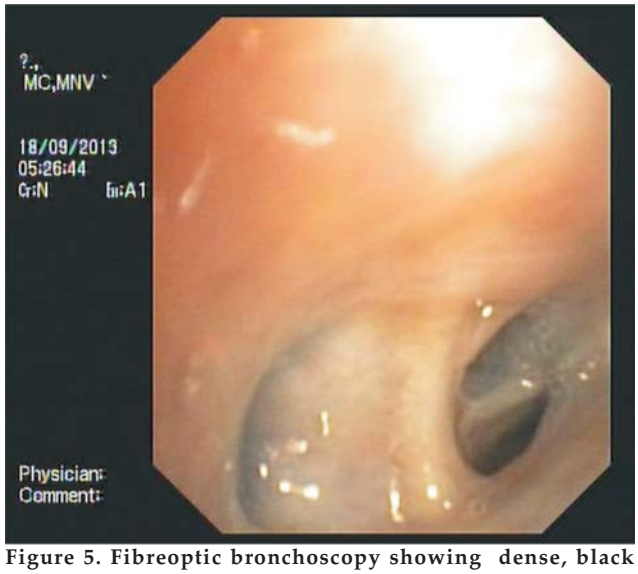

Figure 5. Fibreoptic bronchoscopy showing dense, black pigmentation over the left upper lobe bronchial mucosa.

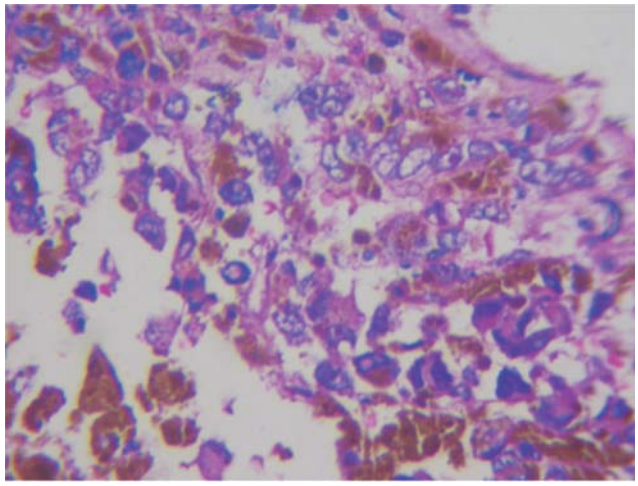

Figure 6. Endobronchial lung biopsy on histopathology reveals invasion of bronchial epithelium by melanoma cells and large atypical nuclei suggestive of malignant melanoma (Haematoxylin and Eosin × 450).

Bronchoalveolar lavage taken from left upper lobe anterior segment revealed no acid-fast bacilli and was negative for malignant cells. A detailed examination of skin and eyes did not reveal any evidence of primary melanoma. Positron-emission tomography CT (PET-CT) ruled out involvement of any other body site other than the lung. A final diagnosis of primary malignant melanoma of lung (PMML) was made. The patient was offered surgical resection. However, the patient refused surgery. She was prescribed oral tramadol for pain control and syrup linctus codeine for cough suppression as a part of palliative therapy. She was lost to follow-up after two months.

Discussion

Melanoma is a malignant tumour, arising from the pigment producing cells (melanosomes) of the deeper layers of the skin or the eye and is the leading cause of death attributable to skin lesions. However, it has also been identified at other sites, such as the oral cavity, oesophagus, liver and vagina.[7-10] The PMML is an extremely rare form of lung cancer with an incidence of 0.01% amongst all lung neoplasms.[11,12] The clinical features are indistinguishable from other forms of lung cancer. In one report[13] (n=19), common clinical features were cough, haemoptysis, post-obstructive pneumonia, lobar collapse or atelectasis; endobronchial involvement was frequently observed. Final diagnosis of PMML is made based on a combination of clinical, radiological and pathological findings. Certain diagnostic criteria have been proposed[14,15] in order to avoid over-diagnosis: (i) junctional changes like 'dropping off' or 'nesting' of melanoma cells just beneath the bronchial epithelium; (ii) invasion of the bronchial epithelium by melanoma cells; (iii) malignant melanoma associated with these epithelial changes; (iv) solitary lung tumour; (v) no history of a cutaneous, mucous membrane or ocular melanoma; and (vi) absence of any other detectable tumour at the time of diagnosis. These criteria ensure the correct diagnosis of PMML. The patient reported here also fulfilled the afore-mentioned criteria.[14,15]

Several pathological mechanisms have been proposed for the occurrence of malignant melanoma in the lung. One such hypothesis is the migration of benign melanocytes during embryogenesis. This is supported by the presence of malignant melanoma in oesophagus and larynx, which share a common embryonic origin with the lung.[16] Another proposed mechanism is the spontaneous regression of previous skin lesions which later on present as lung melanoma.[13] A third theory states that melanoma cells may be derived from pleuripotent stem cells.[14]

Treatment options include surgical resection of the lung lesion with an adequate tumour free margin which offers the best results. Lobectomy or pneumonectomy with adequate lymph node dissection is the modality of choice.[6] Lymph node involvement at the time of diagnosis does not predict long-term survival and the standard TNM staging has not been validated for PMML due to limited number of reported cases. Role of neoadjuvant or adjuvant chemotherapy or radiotherapy in management of PMML is not well established. Recently, chemotherapeutic agents such as dacarbazine, post-operative adjuvant immunotherapy with interleukin-2 (IL-2), interferon-alpha, immunostimulant thymosin-alpha-1 alone or in combination have been tried as treatment for PMML.[6,17,18] Further studies are required to establish a definitive role of these treatment modalities. Post-operative radiation therapy is used for locally or regionally advanced skin melanoma or for unresectable distant metastasis. It may reduce the rate of local recurrence but has not shown to prolong survival.[19]

Overall long-term prognosis remains poor and a survival of 10 and 11 years has been achieved only in two cases till date following lobectomy and pneumonectomy, respectively.[11] Early diagnosis, aggressive surgical resection with a curative intent and close follow-up for prompt detection of metastatic dissemination is essential for achieving a prolonged progression free survival period.

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