Case Report

Primary Pleuro-Pulmonary Synovial Sarcoma

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ABSTRACT

Primary pleuro-pulmonary synovial sarcoma (PPSS) is a rare tumour and poses a diagnostic challenge particularly when unusual histological features are present. We report a case of a 30-year-old immunocompromised human immunodeficiency virus (HIV) sero-positive male who was referred to us with complaints of cough, breathlessness and left-sided chest pain for the past two months. The PPSS can be confirmed on tru-cut biopsy. **[Indian J Chest Dis Allied Sci 2010;52:169-172]**

Key words: Pleuro-pulmonary synovial sarcoma, Tru-cut biopsy, Immunohistochemical staining.

INTRODUCTION

Pleuro-pulmonary synovial sarcoma (PPSS) is a rare tumour and comprises only 0.5% of primary lung malignancies.[1] It can arise from the chest wall, lung parenchyma, pleura, heart or the mediastinum. It is a misnomer as synovial sarcoma that accounts for approximately 8% of all soft tissue sarcomas is not derived from the synovium, but from immature mesenchymal elements.[2] Radiologically, it presents as a mass or a pleural effusion. This tumour needs to be differentiated from spindle cell tumours and other sarcomatous neoplasms that have a similar morphological picture with the help of immuno-histochemical staining. This report describes a case of primary pleuro-pulmonary synovial sarcoma in a HIV sero-positive patient.

CASE REPORT

A 30-year-old immunocompromised, HIV sero-positive married male, presented with complaints of cough with occasional expectoration, breathlessness, fever and left-sided chest pain for the past two months. He gave a history of removal of two litres of blood-stained fluid from the left side of his chest in a private hospital and was subsequently started on antituberculosis treatment that he took for one month.

On clinical examination, there was a bulge in the left hemithorax with reduced movements. On auscultation, the breath sounds were decreased on the left side. Chest radiograph (postero-anterior view) showed the presence of an opaque left hemithorax (Figure 1). A diagnostic pleural aspiration was performed. The fluid was brownish in colour and turbid in consistency. A coagulum was absent. Analysis revealed proteins 6.2gm%, total nucleated cells 325/mm^3, polymorphs 60% and lymphocytes 40 percent. Pleural fluid cytology was negative for malignant cells. High resolution computed tomography revealed a left-sided mass (8cm x 9cm) showing a few necrotic areas with pleural effusion and partial collapse of the left lung (Figure 2).

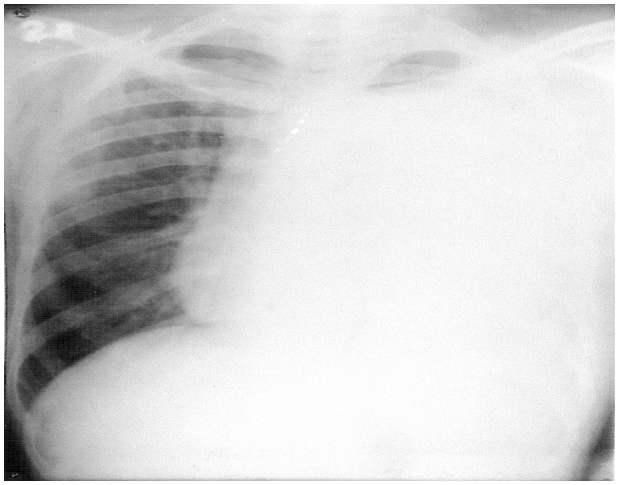

Figure 1. Chest radiograph (postero-anterior view) showing presence of left side opaque hemithorax.

Tissue obtained by a tru-cut biopsy showed neoplastic spindle cell proliferation arranged in interlacing bundles and fascicles mixed with few hypocellular areas. These were separated by slit like vascular spaces. The spindle cells showed mild nuclear atypia and mitotic activity (<10 mitoses per 10 high power fields). No areas of haemorrhage or necrosis were seen. The tumour cells did not show

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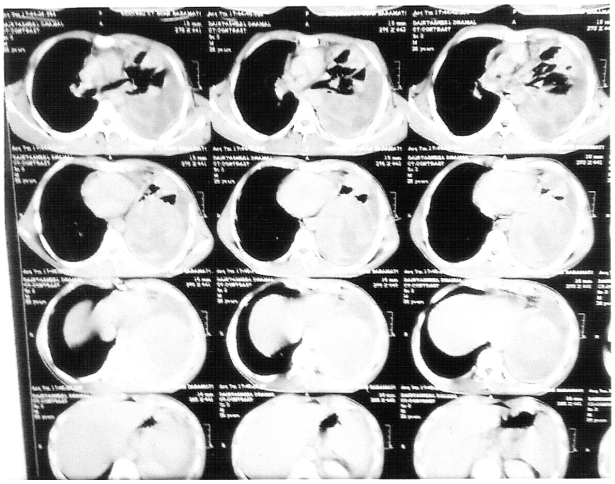

Figure 2. HRCT thorax showing left-sided mass (8cm x 9cm) with few necrotic areas, pleural effusion and partially collapsed left lung.

glandular pattern or epithelioid features (Figure 3). These features were suggestive of monophasic PPSS.

For further characterisation, immunohistochemical staining (IHC) (Figures 4,5,6) was performed. The panel of monoclonal antibodies (DAKO, Germany) comprising of cytokeratin 5/6 and 7, vimentin, calretinin, CD-34, Bcl-2 protein, SMA and S-100 protein was used. Positive (known tissues with the reaction) and negative (no antibody added) controls were used in appropriate concentrations while performing the IHC stains. The tumour cells expressed cytokertin, vimentin and Bcl-2 protein strongly and uniformly and EMA focally. These cells were immunonegative for calretinin, CD-34, SMA and S-100 protein, thus, ruling out sarcomatous mesothelioma, solitary fibrous tumour, leimyosarcoma and neurogenic sarcoma, respectively.

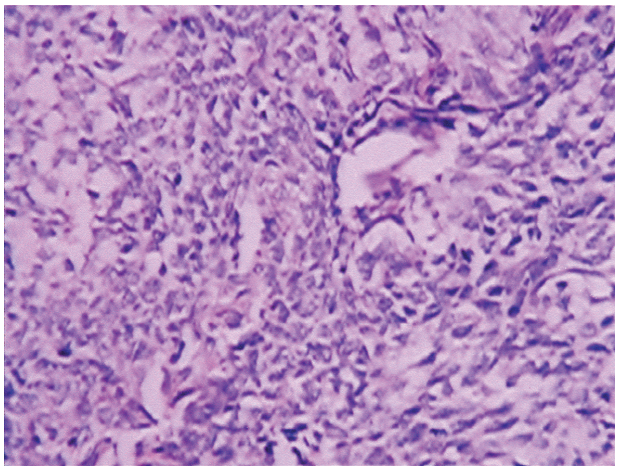

Figure 3. Biopsy showing neoplastic spindle cell proliferation arranged in interlacing bundles and fascicles mixed with few hypocellular areas. These were separated by slit like vascular spaces. Spindle cells showed mild nuclear atypia and mitotic activity (Haematoxylin and Eosin stain × 400).

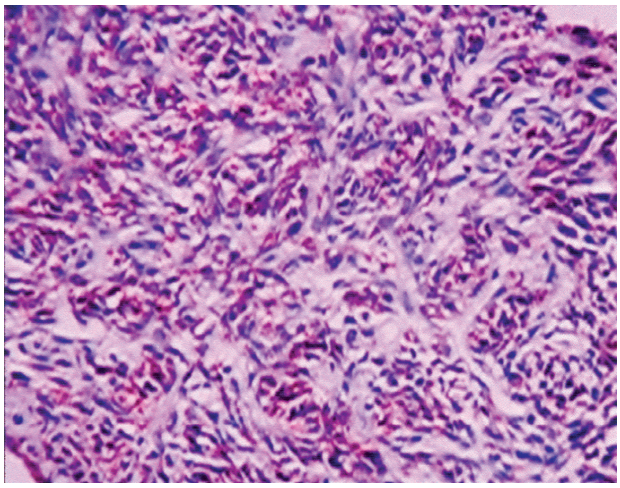

Figure 4. Tumour cells showing strong positivity for cytokeratin staining (IHC × 400).

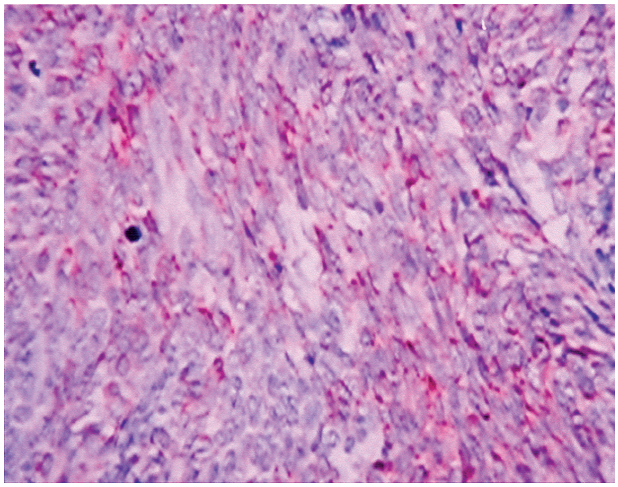

Figure 5. Tumour cells showing strong positivity for Bcl-2 protein (IHC × 400).

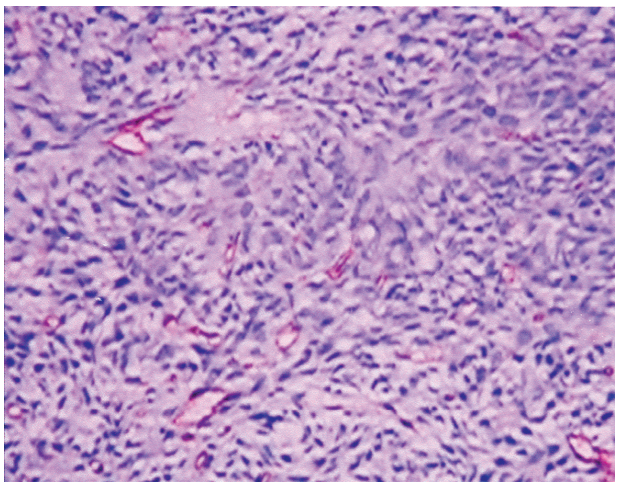

Figure 6. Immunohistochemical staining showing absence of CD-34 stainin (IHC × 400).

An ultrasound of the abdomen showed the presence of mild hepato-splenomegaly and the bone scan was negative for metastatic deposits. Liver function tests were in the normal range and hepatitis B santigen and anti-hepatitis C virus were negative. Hence, the hepato-splenomegaly may have been primarily due to HIV infection.

DISCUSSION

Synovial sarcoma accounts for approximately 8% of all soft tissue sarcomas. Previous results[3-5] indicate that, in contrast to soft tissue synovial sarcoma, the primary pulmonary and mediastinal synovial sarcoma occurs in older patients without any gender bias. The term "pleuro-pulmonary" was first recommended by Essary and colleagues[5] to describe the anatomic subset of primary synovial sarcomas originating from either the lung or the pleura due to inherent difficulties in assigning a precise anatomic origin in most cases. There has been no large series documenting the exact number of repeated pleuro-pumonary synovial sarcoma cases worldwide. Data is available in isolated case reports and small case series.

In a review by Ng *et al*,[6] 57% of the patients were males, the age ranged from 9 years to 69 years, and chest pain followed by dyspnoea and cough were the most frequent complaints. Radiologically, a mass lesion and/or pleural effusion were common as in our case. Ipsilateral pleural effusion was common,[7,8] while mediastinal lymphadenopathy was rare.[7] Histologically, 50% of the tumours were biphasic with both epithelial and spindle cell components. The monophasic subtype (spindle cell variety) was most common, and studies have pointed out that entrapped pneumocytes should not be mistaken for the epithelial component of a biphasic tumour. Pleura-pulmonary synovial sarcomas must be differentiated from other primary pulmonary neoplasms, such as malignant fibrous histiocytoma, malignant mesothelioma (sarcomatous), solitary fibrous tumour of pleura, leiomyosarcoma and neurogenic tumours. Extrathoracic primary tumours should be excluded by physical examination and computed tomography. Histopathology should be supplemented with IHC studies. Immunohistochemically, synovial sarcomas are nearly uniformly positive for cytokeratin, EMA, Bcl-2, and vimentin, and negative for S-100, Desmin, smooth muscle actin, and vascular tumour markers.[1] Zeren *et al*[3] reported that these epithelial markers were diffusely positive in nearly all 25 cases of primary pulmonary sarcomas with features of monophasic synovial sarcoma.

In our case, we ruled out the differential diagnosis by IHC. Use of a panel of antibodies is recommended in order to confirm the diagnosis of PPSS as well as to rule out commonly considered differential diagnosis of spindle cell tumours in this region. Other malignant extra-thoracic lesions were excluded by physical examination and bone scan.[1]

Histopathology and IHC have been supplemented recently by cytogenetic analyses, which can confirm the diagnosis of synovial sarcoma. Cytogenetic studies of synovial sarcomas have revealed the chromosomal translocation t (x; 18) (p11; q11). This translocation fused the *SYT* gene from chromosome 18 to either of two homologous genes at Xp11, *SSX1* or *SSX2.* The prognosis for patients with the *SYT-SSX2* abnormality is better (no deaths in the first five years after surgery in one study group) than the prognosis for patients with the *SYT-SSX1* abnormality.[9]

The prognosis for patients with PPSS is poor, with an overall 5-year survival rate of 50 percent. Factors predicting a worse prognosis for patients with synovial sarcomas include tumour size (>5cm), male gender, older age (>20 years), extensive tumour necrosis, high grade, large number of mitotic figures (>10 per 10 hpf), neurovascular invasion, and, recently, the *SYT-SSX1* variant.[10] Unfortunately we could not perform chromosomal studies on this patient due to financial constraints and because the patient was lost to follow up.

There is no standardised therapy for PPSS and most patients are treated with surgery alone or surgery with adjuvant radiation therapy. Synovial sarcomas are chemosensitive to ifosfamide and doxorubicin, with an overall response rate of approximately 24 percent.[11]

To the best of our knowledge, this is the first reported case of pleuro-pulmonary synovial sarcoma in India in an HIV sero-positive patient. The association of this tumour with HIV sero-positive state is not known. The purpose of presenting this case study is not only to report an uncommon pleuro-pulmonary tumour but also to raise awareness amongst clinicians to keep the differential diagnosis of this tumour in HIV sero-positive patients, though based on a single case, an association between PPSS and HIV infection cannot be established.

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