

Fluoro deoxyglucose positron emission tomography-computerized tomography in primary staging and response assessment of a rare case of primary pleural synovial sarcoma

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ABSTRACT Primary pleural sarcomas constitute < 1% of all primary lung cancers. Synovial sarcomas of the pleura are extremely rare. They may be mistaken for malignant mesothelioma or other spindle cell tumors, but the confirmation is by histology and immunohistochemistry. Synovial sarcomas are aggressive with a high incidence of recurrence. In this case report, we present the 18-fluoride-fluoro deoxyglucose (FDG) positron emission tomography-computerized tomography (PET-CT) findings of patient with primary pleural synovial cell sarcoma. The pretreatment and postchemotherapy FDG PET-CT scans are presented. The role of FDG PET-CT in initial staging and response assessment in this interesting case of pleural synovial sarcoma is presented.

Keywords: Fluoro deoxyglucose positron emission tomography, pleura, response assessment, synovial cell sarcoma

INTRODUCTION

Synovial cell sarcoma is a mesenchymal tumor presenting predominantly in the lower extremities. They are extremely rare tumors of the chest occurring commonly in adolescents and young adults. The tumor usually carries poor prognosis. We present a case of histologically proven primary pleural synovial sarcoma where 18-fluoride-fluoro deoxyglucose (18F-FDG) positron emission tomography-computerized tomography (PET-CT) played an important role in the initial staging and subsequent response assessment.

CASE REPORT

A 40-year-old male who presented with unilateral chest pain and breathing difficulty was evaluated and was found to have

large right pleural soft tissue masses. Biopsy from the pleural mass was suggestive of synovial cell sarcoma of the pleura. He was referred for a whole-body 18F-FDG PET-CT scan for initial staging from medical oncology department. Whole-body 18F-FDG PET-contrast enhanced CT scan [Figure 1] showed an intensely FDG avid soft tissue mass in the right thoracic cavity with chest wall infiltration. Intensely FDG avid paracardiac soft tissue masses were also noted. There was a focal FDG uptake in the lateral end of left clavicle, without obvious morphological changes on CT, which was equivocal for metastases. The disease was nonresectable at diagnosis and hence patient was taken up for chemotherapy (ifosfamide + adriamycin).

The patient underwent five cycles of chemotherapy and was referred for a follow-up 18F-FDG PET-CT scan for assessing the response. Follow-up 18F-FDG PET-CT [Figure 2] showed significant reduction in the size and metabolic activity in the pleural lesions. However, residual pleural masses were still present. There was resolution of the FDG uptake in the left clavicle. The findings indicated favorable, but incomplete response to therapy. The patient was referred for further chemotherapy and palliative radiation on the basis of the follow-up PET scan findings. The patient had clinically stable disease and is still on close clinical follow-up at the time of writing this manuscript.

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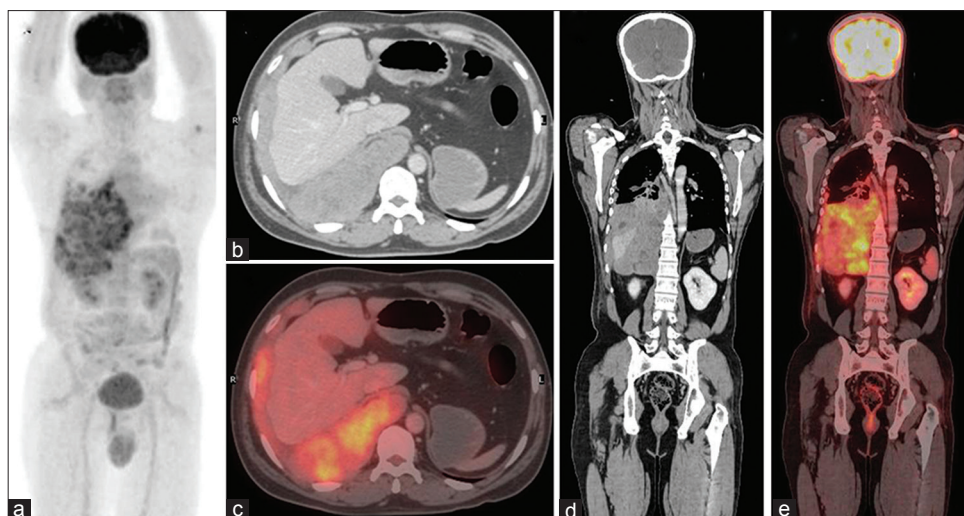


Figure 1: Whole-body 18-fluoride-fluoro deoxyglucose (18F-FDG) positron emission tomography-computerized tomography (PET-contrast enhanced CT) scan (a) maximum intensity projection, (b) axial CT, (c) fused PET-CT, (d) coronal CT and (e) coronal fused PET-CT performed as per standard protocol showed an intensely FDG avid soft tissue mass in the right thoracic cavity with chest wall infiltration. Intensely FDG avid paracardiac soft tissue masses were also noted. There was a focal FDG uptake in the lateral end of left clavicle which was equivocal for metastases

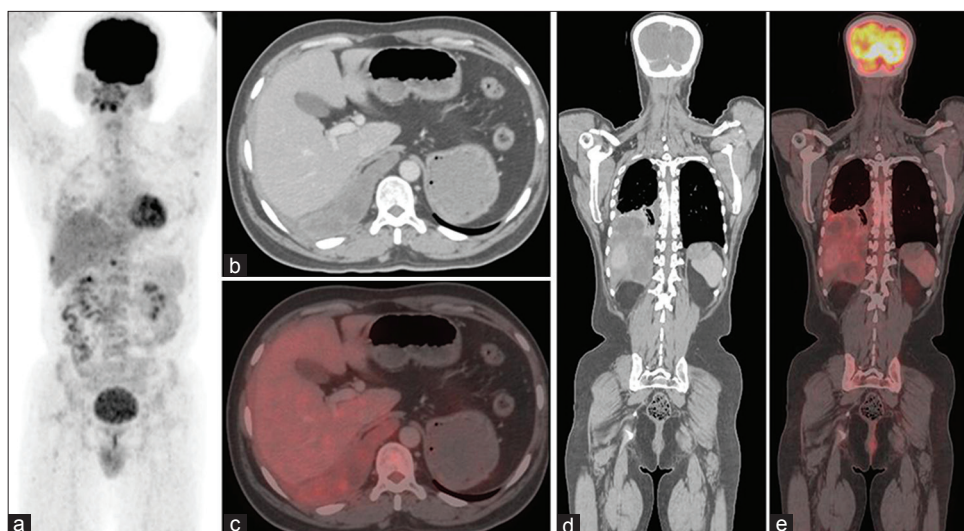


Figure 2: Follow-up 18-fluoride-fluoro deoxyglucose (18F-FDG) positron emission tomography-computerized tomography (PET-CT) (a) maximum intensity projection, (b) axial CT, (c) fused PET-CT, (d) coronal CT and (e) coronal fused PET-CT showed significant reduction in the size and metabolic activity in the pleural lesion. However, residual pleural mass was still present. There was resolution of the uptake in the left clavicle. The findings indicated favorable but incomplete response to therapy

DISCUSSION

Synovial sarcomas are rare tumors of the chest and represent <0.5% of the lung.^[1] Synovial sarcoma occurs predominantly in the extremities, where it tends to arise in the vicinity of large joints, especially the knee region.^[2] Furthermore, this tumor has been described in numerous locations unrelated to joint structures, including chest,^[3,4] fallopian tubes,^[5] and testis.^[6] Based on these findings, it is currently thought that the origin of this tumor is unrelated to normal synovial tissues and thus synovial sarcoma is placed among the miscellaneous soft tissue tumors.^[7]

Pleuro-pulmonary synovial cell sarcomas usually present as large pleural based soft tissue masses. The other differential

diagnoses are carcinosarcomas, malignant fibrous histiocytomas, adenocarcinomas and malignant mesotheliomas. Malignant fibrous histiocytoma and synovial cell sarcomas are the most common variants of pulmonary sarcomas. Based on immunohistochemistry, synovial cell sarcomas are positive for cytokeratin, epithelial membrane antigen, B-cell lymphoma 2 and vimentin. Primary mediastinal synovial cell sarcomas are extremely rare and the role of FDG PET-CT has been previously described.^[8]

Complete surgical resection remains the best option for cure. However, complete resection was not feasible in the index case because of the extent of the lesion, chest wall infiltration and also the suspicious bone metastases to the clavicle. Ifosfamide and adriamycin based chemotherapy has been used in treating advanced soft tissue sarcomas with up to 60% of the patients

showing favorable response. The combination was used in our index patient with favorable, but incomplete response. Radiotherapy is advocated in patients who have margin positivity postsurgery.

Role of FDG PET-CT in the evaluation of synovial sarcomas have been previously described.^[9-11] However, its role in the response evaluation is limited. To the best of our knowledge, this is the first report on the use of FDG PET-CT in response evaluation of primary pleural synovial sarcoma. We would like to emphasize the fact the 18F-FDG PET-CT played a significant role in the initial evaluation and response assessment in our patient. 18F-FDG PET-CT could potentially play an important role in all patients with synovial cell sarcoma, which needs to be evaluated further.

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