

Extensive tumor thrombus in a case of carcinoma lung detected by F18-FDG-PET/CT

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ABSTRACT Tumor thrombus is a rare complication of solid cancers, mainly seen in cases of renal cell carcinoma, wilm's tumor, testicular carcinoma, adrenal cortical carcinoma and hepatocellular carcinoma.^[1] Tumor thrombus in inferior vena cava is a rare complication of primary carcinoma lung. It should be identified so as to rule out venous thromboembolism and avoiding unnecessary anticoagulant therapy. We describe a case where F18-Fluorodeoxyglucose (FDG) positron emission tomography - computed tomography (PET/CT) helped to identify extensive tumor thrombus.

Keywords: Carcinoma lung, FDG (Fluorodeoxyglucose) PET/CT, inferior vena cava, tumor thrombus

INTRODUCTION

Tumor thrombus is an unusual complication of a metastatic tumor deposit. We present a case of carcinoma lung post-surgery and chemo radiation who presented with IVC obstruction diagnosed to be a tumor thrombus on FDG PET/CT.

CASE REPORT

A 56-year-old male patient went under follow-up for moderately differentiated adenocarcinoma of upper lobe of left lung (T1N0M0) since January 2009. He had undergone left upper lobectomy with lymph nodal clearance in January 2009. He had received three cycles of adjuvant chemotherapy with gemcitabine and cisplatin from April to June 2009. Further, chemotherapy was precluded by neutropenia initially and then the patient defaulted.

The patient again reported in October 2010 for complaints of pain in the abdomen and the lower limbs. On examination, dilated superficial abdominal veins with features of IVC obstruction were seen. The patient was started on symptomatic and supportive care. The patient was referred for F18-FDG PET/CT.

Whole body PET/CT imaging was done after intravenous administration of 370MBq (10 mCi) of F18-FDG. The images were acquired after 45 minutes of uptake period.

PET/CT did not reveal any FDG avid lesion at the site of the primary. A large FDG avid left suprarenal mass measuring-10.6AP x 9.9TR x 13.0CC cm was noted [Figure 1] with extension of tracer uptake along dilated left adrenal vein into the inferior vena cava [Figure 2]. The tumor thrombus was extending from the level of 3rd lumbar vertebra in the inferior vena cava up to the level of right atrium [Figure 3]. Left kidney was displaced inferiorly by the suprarenal mass. FDG avid lesions were also noted in segment I, II, IV and VII of the liver [Figure 4].

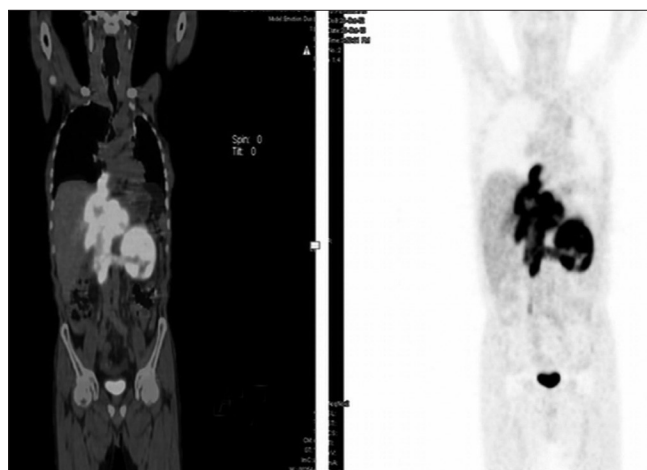


Figure 1: Whole body FDG PET/CT and PET images showing large FDG avid left suprarenal mass, suggesting adrenal metastasis, with a linear tracer uptake along the inferior vena cava. The linear uptake is consistent with tumor thrombus

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Figure 2: Transaxial slices of PET/CT depicting FDG avid left suprarenal mass with FDG avid lesion in dilated left adrenal vein extending to involve the inferior vena cava. The hyper-metabolic foci in left adrenal vein and inferior vena cava, confirm the finding of tumor thrombus

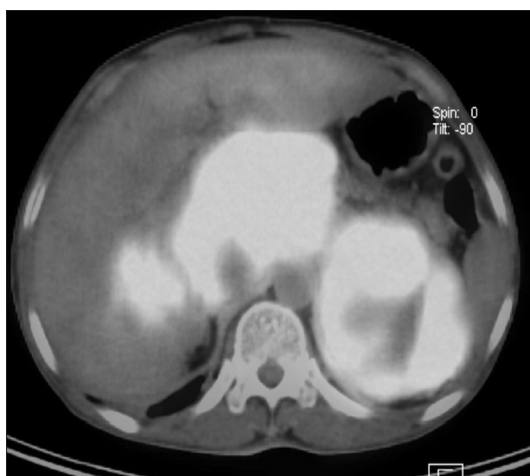


Figure 3: Transaxial slices of PET/CT showing FDG avid lesions in the liver and left suprarenal suggestive of hepatic and adrenal metastasis



Figure 4: Transaxial CECT slices depicting a large left suprarenal mass exhibiting heterogeneous enhancement with extension of tumor thrombus along left adrenal vein into the inferior vena cava. The tumor thrombus is exhibiting streaky enhancement in the arterial phase images. Left kidney is displaced inferiorly. Heterogeneous enhancement of liver is noted, consistent with hepatic metastasis

DISCUSSION

Tumor thrombus is a rare complication of primary carcinoma lung. Also, the involvement of inferior vena cava is only seen in 0.11 % of solid tumors.^[1]

In our case, most probably the adrenal metastasis lead to the formation of tumor thrombus in left adrenal vein which further extended to involve the inferior vena cava. Though there have been case reports describing tumor thrombus in various types of cancer mainly renal,^[2] hepatocellular, thyroid,^[3] colon,^[4] testicular cancers etc, metastatic lesion extending to involve the inferior vena cava with right atrial extension in this way has not been reported yet. Early identification of tumor thrombus with appropriate treatment can increase patient survival and quality of life.

F18-FDG PET/CT has a definite role in identifying tumor thrombus and to differentiate between tumor thrombus and venous thromboembolism, which is also a frequent complication of malignancies. The correct identification leads to proper management of the case. Though there are some pitfalls in the diagnosis, e.g., septic thrombus can also show FDG uptake. Also, the FDG uptake depends on the avidity of the primary tumor and size of the tumor thrombus. If the primary tumor is non FDG avid then the tumor thrombus may also be non-avid. If the size of the tumor thrombus is small then it may be missed on PET/CT scan. PET combined with contrast enhanced CT is likely to be the most accurate diagnostic modality as neovascularisation of tumor thrombus with intraluminal filling defect can be identified in most of the cases in the arterial phase [Figure 4]. It is classically called as the “thread and streak” sign.

Adrenal gland is one of the common sites of metastasis from primary lung cancer. Adrenal metastases are usually unilateral. Bilateral adrenal metastases are seen in 10% of all lung cancer patients.^[5] Identification of adrenal metastasis is important because adrenalectomy or chemotherapy/radiotherapy increases the patient survival.

CONCLUSION

Detection of tumor thrombi during follow-up FDG PET/CT scans of patients with solid tumors and differentiating between bland thrombus versus tumor thrombus in such patients when they present with features of venous thromboembolism is important to guide correct therapy and likely to improve patient prognosis. F18-FDG PET combined with contrast-enhanced computed tomography (CECT) is likely to be a superior modality in this regard.

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