"A Glowing Clot": FDG PET/CT Identifies Persistent Tumour Thrombus in Metastatic Lung Carcinoma

Sana Munir Gill, Aimen Anis, Mairah Razi
Department of Nuclear Medicine,Shaukat Khanum Memorial Cancer Hospital and Research Center, Lahore.
Correspondence: Aamna Hassan. e-mail: aamnah@skm.org.pk
ORCID ID. 0000-0003-0026-0729

Abstract

Tumour thrombi are a rare but serious complication of malignancy. It involves extension of organised collection of neoplastic cells into adjacent blood vessels, in contrast to a bland thrombus which consists of platelets and fibrin. It occurs more commonly in renal cell or hepatic cell carcinoma. Tumour thrombi are often asymptomatic and incidentally detected on imaging, however, their presence can affect staging, treatment options and prognosis of the patient. We present a rare case of a FDG avid tumour thrombus in left brachiocephalic vein in a patient with previously treated metastatic urothelial carcinoma and a second primary lung carcinoma.

Keywords: Tumour thrombus, Urothelial carcinoma, FDG PET-CT, pulmonary adenocarcinoma

DOI: https://doi.org/10.47391/JPMA.26-07

A 69-year-old patient, previously treated for urothelial carcinoma, was referred for 18F-FDG PET-CT to evaluate a mediastinal mass and adrenal lesions seen on CT. The scan showed increased metabolic activity in these lesions, along with extension of an avid prevascular nodal mass into the left brachiocephalic vein. Avid lesions were also seen in the thoracic vertebrae (Figure). Histopathology of the prevascular mass confirmed metastatic pulmonary adenocarcinoma, a second primary.

The patient received chemotherapy, and a follow-up FDG PET-CT at 2 months showed reduction in size of mediastinal lymph node. However, persistent FDG avidity was seen in the left brachiocephalic vein thrombus and right adrenal gland. Immunotherapy was started, and a scan 9 months later showed resolution in the adrenal gland, but the tumour thrombus

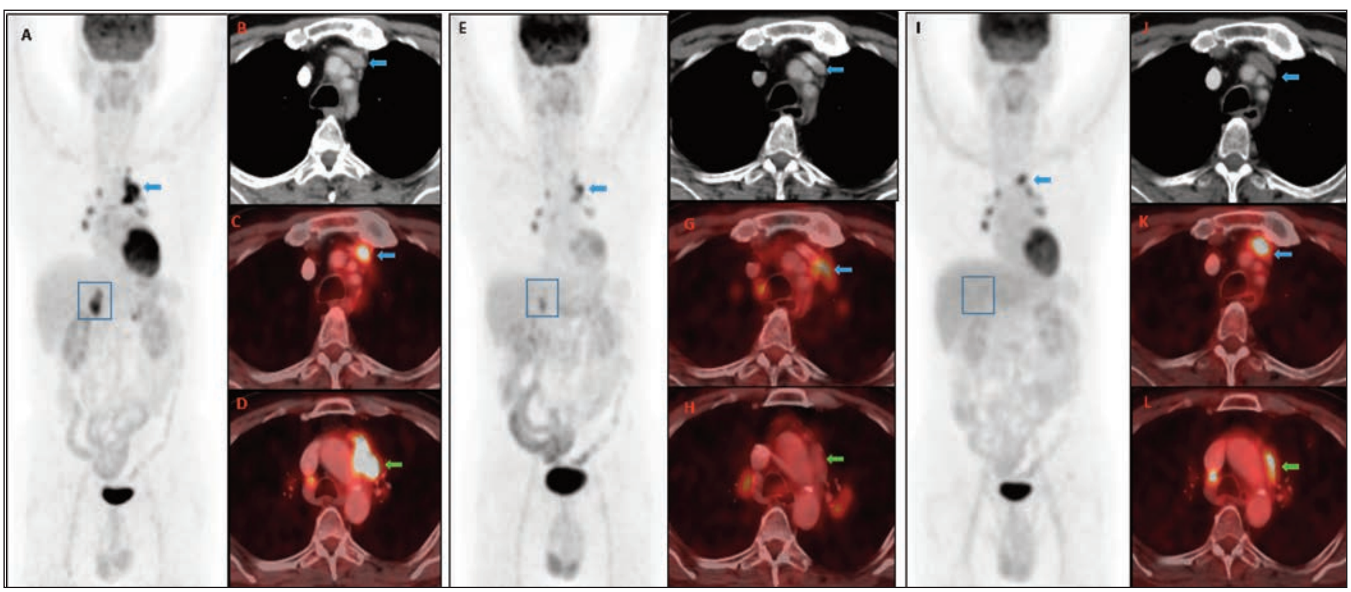

Figure: Serial maximum intensity projection, axial CT only and fused PET/CT axial images showing course of FDG avid left brachiocephalic vein tumour thrombus. Images A-D show avid mediastinal lymphadenopathy; prevascular nodal mass infiltrating into the left brachiocephalic vein resulting in avid tumour thrombus [blue arrows]. Post-chemotherapy scan (2 months) shows decreased extent and avidity of the tumour thrombus [E–G, blue arrows] and faint residual mediastinal nodal uptake [H, green arrow]. 9 months post-immunotherapy, there is increased extent and avidity of the left brachiocephalic vein thrombus [I–K, blue arrows] and new avidity in residual mediastinal nodes [L, green arrow]. Response was noted in the adrenal metastatic lesions on serial imaging [blue box]. No locoregional recurrence in the urinary bladder was noted on any scan.

in the left brachiocephalic vein remained hypermetabolic.

Intravascular tumour thrombus is common in various malignancies such as renal cell, adrenal and hepatic carcinomas. However, its occurrence in left brachiocephalic vein in lung carcinoma patients is rare.[1] It indicates the presence of advanced lung cancer and can have significant diagnostic, prognostic and therapeutic implications. Since these thrombi are inaccessible for biopsy, hybrid molecular imaging is crucial for differentiation from bland thrombi, offering both anatomical and physiological details.[2] Tumour thrombi are diagnosed due to increased FDG avidity on PET and a filling defect on CT.[3] Use of PET-CT is essential in evaluating the course of tumour thrombus highlighting its significance in facilitating appropriate management of cancer related venous thrombus.[4,5]

References

1. Tathireddy H, Rice D, Martens K, Shivakumar S, Shatzel J. Breaking down tumour thrombus: Current strategies for medical management. Thromb Res.2023;230:144-151.
2. Lai P, Bomanji JB, Mahmood S, Nagabhushan N, Syed R, Gacinovic S, et al. Detection of tumour thrombus by 18F-FDG-PET/CT imaging. Eur J Cancer Prev. 2007;16:90-94.
3. Quencer KB, Friedman T, Sheth R, Oklu R. Tumour thrombus: incidence, imaging, prognosis and treatment. Cardiovasc Diagn Ther. 2017;7(Suppl 3):S165-S177.
4. Rohatgi S, Howard SA, Tirumani SH, Ramaiya NH, Krajewski KM. Multimodality Imaging of Tumour Thrombus. Can Assoc Radiol J. 2015;66:121-129.
5. Aurangabadkar HU, Palle L, Ali Z. Tumour thrombosis and patterns of fluorine-18 fluorodeoxyglucose uptake: a pictorial review. Nucl Med Commun. 2013;34:627-637.