



Evidence of Subclavian Vein Thrombosis on First-Pass ^{18}F FDG PET in a Patient with Relapsing Upper Mediastinum Lymphoma

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Abstract

Baseline ^{18}F -FDG PET was performed in a 74-year-old patient with relapsing upper mediastinum lymphoma. Left subclavian thrombosis was suspected on prior contrast-enhanced CT. Dynamic PET imaging was achieved during 3 min after IV injection of ^{18}F -FDG to the left arm in order to further assess left subclavian vein permeability. The 20-s dynamic frame at 1 min after injection confirmed the absence of flow in the left subclavian vein and evidenced the derivation of ^{18}F -FDG through left axillary, then superficial, then right internal mammary collaterals to the superior vena cava, hence confirming the subclavian thrombosis.

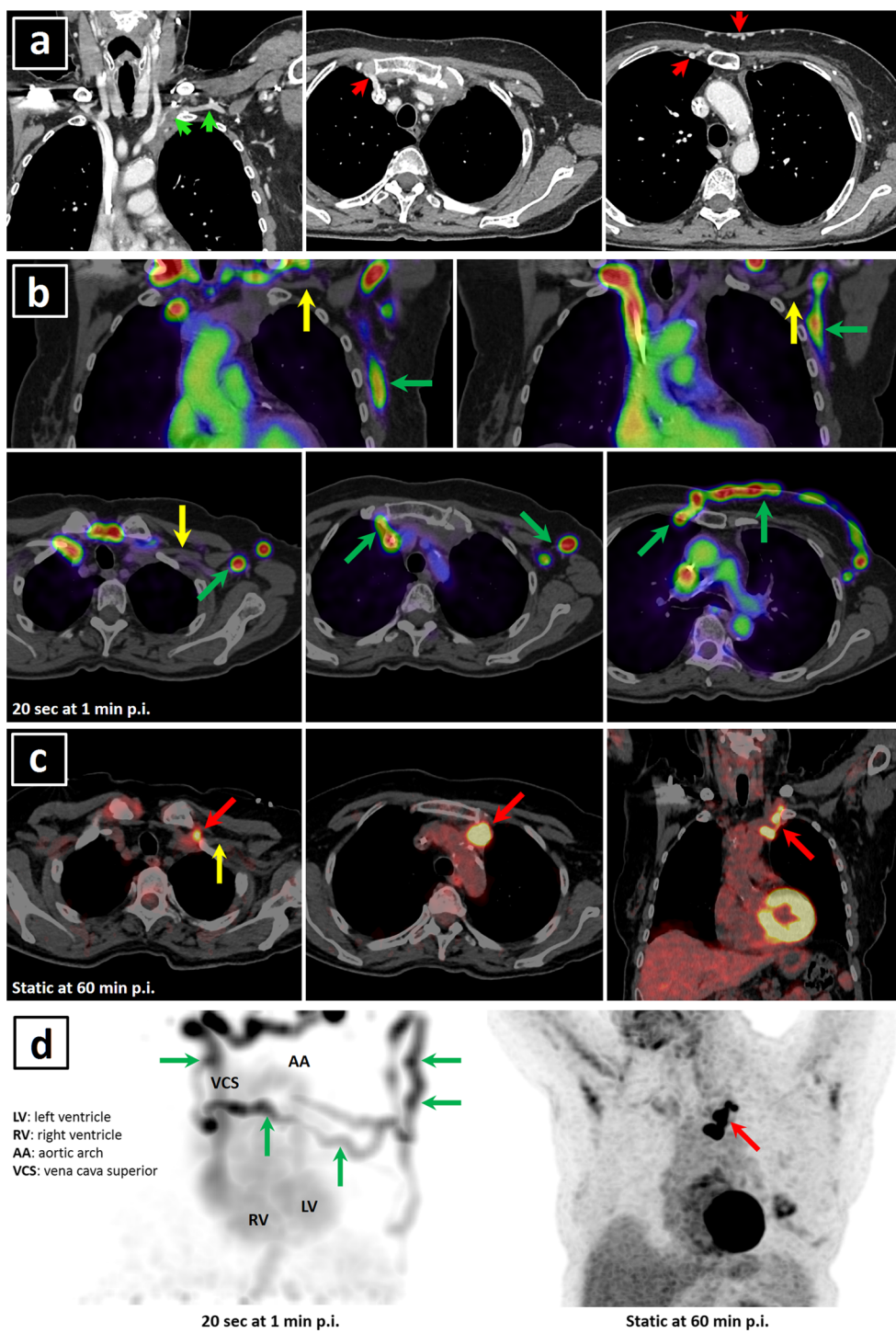
Keywords FDG PET · First-pass · Deep vein thrombosis · Lymphoma

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◀ **Fig. 1** Baseline ^{18}F -FDG PET was performed in a 74-year-old woman with suspected relapse of diffuse large B cell lymphoma of the upper mediastinum. Prior contrast-enhanced CT (**a**) showed upper left mediastinum adenomegalies compressing the left brachiocephalic vein with anterior thoracic collaterality (red arrowheads) and possible left subclavian thrombosis (green arrowheads). First-pass ^{18}F -FDG PET-CT was performed during 3 min after IV injection to the left arm of 178 MBq in order to assess left subclavian vein permeability. The 20-s dynamic frame at 1 min after injection (**b**) confirmed the absence of flow in the left subclavian vein (yellow arrows) and evidenced the derivation of ^{18}F -FDG through left axillary, then superficial, then right internal mammary collaterals to the superior vena cava (green arrows). Static acquisition at 60 min post-injection (**c**) showed hypermetabolic foci centred on upper left mediastinum lymph nodes (red arrows) and no significant tracer activity in the left subclavian vein (yellow arrow). Left anterior oblique maximum intensity projection images (**d**) at first-pass (left, green arrows show venous collateral deviation of the tracer) and equilibrium (right, red arrow points the hypermetabolic lymph nodes) are provided as a synthetic view. Venous thromboembolism is frequent in hematological malignancies, particularly in aggressive lymphomas with an incidence of about 10% [1], and is associated with substantial morbidity and mortality. Standard diagnosis relies on ultrasonography, or contrast-enhanced CT in case of abdominopelvic involvement [2, 3]. Alternative diagnostic explorations relying on metabolic imaging have been proposed, including radionuclide venography using macroaggregated albumin, labeled platelets scintigraphy, and fibrin or plasmin targeting peptide imaging [4, 5]. Recent preliminary studies have reported on the potential value of ^{18}F -FDG PET in the diagnostic evaluation of acute deep vein thrombosis [6, 7]. However, other research has highlighted the critical lack of sensitivity and specificity of both visual assessment and SUV measurements in routine clinical setting [8, 9]. Dynamic ^{18}F -FDG PET imaging during tracer first-pass allows direct visualization of functional vasculature and assessment of venous permeability. It may offer additional diagnostic information in hematological patients with clinically or radiologically suspected deep vein thrombosis, without any modification in injected dose or protocol duration

Compliance with Ethical Standards

Conflict of Interest Fayçal Ben Bouallègue, Fabien Vauchot, and Denis Mariano-Goulart declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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