Detection of a Right Carotid Focus of ¹⁸F-FDG Predicted an Ischemic Stroke

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Abstract: A 60-year-old woman was referred into our department for staging of an endometrial carcinoma. In addition to peritoneal and nodes metastases, ¹⁸F-FDG PET/CT showed a calcified plaque of the right carotid with focal uptake. One month later, the patient presented left hemiparesis, suggesting a right hemisphere stroke. MRI confirmed frontal infarction in the anterior cerebral artery territory. ¹⁸F-FDG is suggested to be a valuable tool to detect vessel wall inflammation; detection of focal arterial uptake on PET/CT suggests unstable plaque and requires urgent patient's management to prevent vascular events in a population already weakened by both disease and therapy.

Key Words: stroke, unstable plaque, atherosclerosis, PET, FDG

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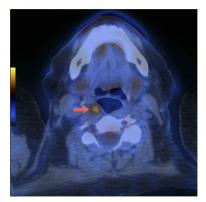


FIGURE 1. A 60-year-old female patient was referred into our department for endometrial carcinoma staging. In addition to peritoneal and nodes metastases, ¹⁸F-FDG PET/CT showed focal uptake in the right carotid (arrow). The SUV_{max} was 3.7.

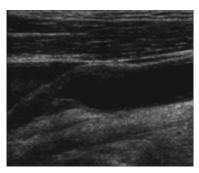


FIGURE 3. A complete occlusion of the right carotid by an atherosclerotic plaque was found on the Doppler examination performed 2 weeks later. The patient was referred for surgery, but in the meantime, she presented neurological symptoms, such as abnormal movements and hemiparesis of the left lower limb, suggesting a right hemisphere stroke. MRI showed a frontal infarction in the anterior cerebral artery territory, and surgery was refuted.



FIGURE 2. The image showed a calcified plaque just below the arterial wall uptake (arrow), and several risk factors, such as smoking, hypertension, and hypercholesterolemia, were found on patient's medical records. FDG is avidly trapped into the vessel wall macrophages¹ and is suggested to be a valuable tool to detect vessel wall inflammation. Inflammatory activity within the arterial atherosclerotic plaques is predictive of sudden vascular events linked to unstable plaques.² Given that FDG PET/CT is mainly performed in cancer staging and that current protocols for cancer staging and for identification of unstable plaque recommend the same delay of 1 hour between injection and images acquisition,³ detection of unstable plaques during cancer staging exists. Cancer patients are at high risk of vascular events,⁴ and FDG PET/CT is now known to identify cancer patients at risk of future vascular events when it shows uptakes in vessels wall,^{5,6} but arterial wall FDG uptake in an asymptomatic population is low and usually confined to 1 type of vessel,⁷ which is harder to detect. Delay between detection of unstable plaques by FDG and vascular event can be short,⁸ even if it cannot be predicted. The FDG focus was reported as suggestive for an active atherosclerotic plaque, and a Doppler examination of supra-aortic vessels was advised.

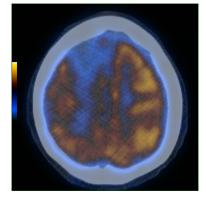


FIGURE 4. Another PET/CT performed after the vascular event confirmed right frontal lobe infarction and persistence of the right carotid focus. The patient conserved left hemiparesis. It is crucial to remind that detection of unstable plaques on PET/CT requires urgent patient's management to prevent life-threatening vascular events in a population already weakened by both disease and therapy. In case of occurrence, vascular events diminish life quality and therapeutic possibilities.