

Multifocal Skin Fluorodeoxyglucose Uptake in a Patient with a Large Abdominal Mass

Run Yu

امتصاص متعدد البؤر للفلوروديوكسي جلوكوز في جلد مريض
لديه كتلة كبيرة في البطن

ران يو

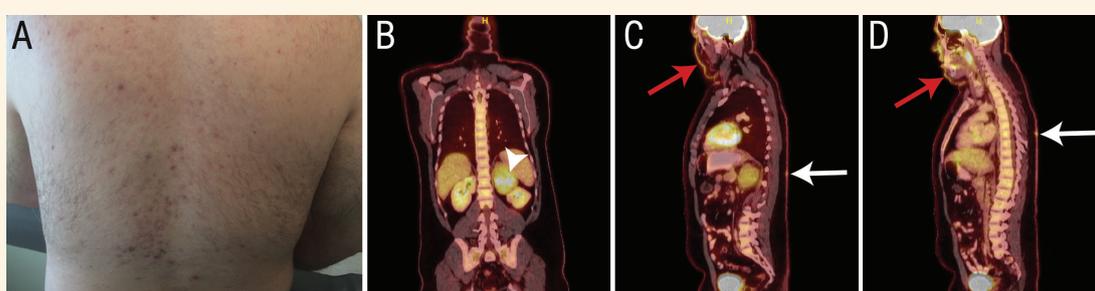


Figure 1: A: Photograph of the back of a 30-year-old male patient with a large abdominal mass showing multiple acne lesions. B–D: Fused fluorodeoxyglucose (FDG) positron emission tomography/computed tomography imaging in the (B) coronal and (C & D) sagittal views showing heterogeneous moderate-to-intense FDG uptake in the abdominal mass (arrowhead) as well as multifocal FDG uptake in the back skin (white arrows) and diffuse FDG uptake in the facial skin (red arrows).

A 30-YEAR-OLD MALE PATIENT PRESENTED TO the emergency room of a community hospital in California, USA, in 2018 with lower abdominal pain. Abdominal computed tomography (CT) revealed a 9-cm mass in the left adrenal gland. Subsequently, the patient became very anxious and stressed and developed chest and abdominal pain, which resulted in more than 10 emergency room visits over the next few months. The pain reportedly subsided once the patient was prescribed benzodiazepine. He was then referred to the Ronald Reagan University of California Los Angeles Medical Center, Los Angeles, California, for management of the mass. At referral, the patient was currently taking esomeprazole and lorazepam. His past medical history included mild hypertension, obesity and kidney stones. Multiple family members had a history of malignancy. A physical examination indicated tachycardia and multiple acne lesions on the back [Figure 1A]. Biochemical tests revealed normal levels of catecholamines, metadrenalines, aldosterone, renin, potassium, dehydroepiandrosterone sulfate and cortisol.

A dedicated adrenal CT scan showed an $8.2 \times 6.9 \times 9.5$ cm mass in the left adrenal gland, with a pre-contrast attenuation of 28 Hounsfield units and delayed enhancement after contrast administration. Fluorodeoxyglucose (FDG)-positron emission tomography (PET)/CT imaging indicated heterogeneous moderate-to-intense FDG uptake in the mass (standard uptake value [SUV]: 6.4) [Figure 1B] as well as multifocal and diffuse FDG uptake in the back (SUV: 1.9–3.9) and facial (SUV: 7.8) skin, respectively [Figures 1C and D]. The patient underwent surgical resection of the mass which was subsequently histologically diagnosed as a benign ganglioneuroma, with a normal left adrenal gland.

Comment

An adrenocortical carcinoma is a serious concern among patients with a large unilateral mass in or near the adrenal glands.¹ Therefore, FDG-PET imaging is required to identify potential local invasion, tumour thrombi and remote metastasis. Multifocal skin FDG uptake in the

absence of visceral or bony metastasis is very unusual because most skin metastases from adrenocortical carcinomas occur after hepatic and pulmonary metastases.¹ Multiple benign skin lesions, including infectious and inflammatory lesions, are often seen incidentally on FDG-PET imaging.²

Acne *vulgaris* is a common skin condition in which the associated lesions are often positive on FDG-PET imaging, leading to suspicion of skin malignancy, such as melanomas.^{2,3} A simple physical examination will easily ensure the correct diagnosis, as in the current case, in which the patient had a few purulent acne lesions on his back corresponding to locations of FDG uptake. However, the diffuse facial skin FDG uptake was intriguing and, to the best of the author's knowledge, has not been reported previously.

Various emotional states such as stress, anger, anxiety and fear increase blood flow to the facial skin.^{4,5} In the present case, the patient was under extreme stress due to the recent diagnosis of a potentially malignant abdominal mass and was very anxious during the FDG-PET procedure. However, upon physical examination, his facial skin appeared completely normal. It is therefore likely that the diffuse facial skin FDG uptake was due to

emotional stress. While it is unknown if emotional stress can cause hyperaemia in the chest and abdominal skin, FDG uptake in these areas was normal. This case illustrates that multifocal skin FDG uptake can be due to benign lesions in patients with suspected malignancies and that diffuse facial skin FDG uptake may be due to emotional stress.

References

1. Else T, Kim AC, Sabolch A, Raymond VM, Kandathil A, Caoili EM, et al. Adrenocortical carcinoma. *Endocr Rev* 2014; 35:282–326. doi: 10.1210/er.2013-1029.
2. Metser U, Tau N. Benign cutaneous and subcutaneous lesions on FDG-PET/CT. *Semin Nucl Med* 2017; 47:352–61. doi: 10.1053/j.semnuclmed.2017.02.007.
3. Pawlik TM, Erasmus JJ, Truong MT, Macapinlac H, Ross MI, Gershenwald JE. Acne vulgaris: False-positive finding on integrated 18F-FDG PET/CT in a patient with melanoma. *AJR Am J Roentgenol* 2006; 187:W117–19. doi: 10.2214/AJR.04.1986.
4. Drummond PD, Quah SH. The effect of expressing anger on cardiovascular reactivity and facial blood flow in Chinese and Caucasians. *Psychophysiology* 2001; 38:190–6. doi: 10.1111/1469-8986.3820190.
5. Engert V, Merla A, Grant JA, Cardone D, Tusche A, Singer T. Exploring the use of thermal infrared imaging in human stress research. *PLoS One* 2014; 9:e90782. doi: 10.1371/journal.pone.0090782.