

“Bilateral Hot Forearm Sign”: Ingeminating the Pattern of Physiological Uptake of ¹⁸F-Fludeoxyglucose

Abstract

Exertion and exercise increase glucose metabolism within the skeletal muscles causing increased fludeoxyglucose (FDG) uptake on ¹⁸F-FDG positron emission tomography/computed tomography (PET/CT). Here, we present findings of ¹⁸F-FDG PET/CT in a patient with acute viral hepatitis A-induced liver failure with multiple foci of pyoderma and incessant itching resulting in increased FDG uptake in the muscles of the bilateral forearm, producing the “bilateral hot forearm sign.”

Keywords: ¹⁸F-Fludeoxyglucose positron emission tomography/computed tomography, bilateral hot forearm sign, exertion, skeletal muscles

**Srinivas Ananth Kumar,
Bhagwant Rai Mittal,
Tanigassalam Sindhu,
Rajender Kumar**

Department of Nuclear Medicine, Postgraduate Institute of Medical Education and Research, Chandigarh, India

Classically, the “hot forearm sign” has been described in the literature when technetium-99m methylene diphosphonate has been injected intra-arterially

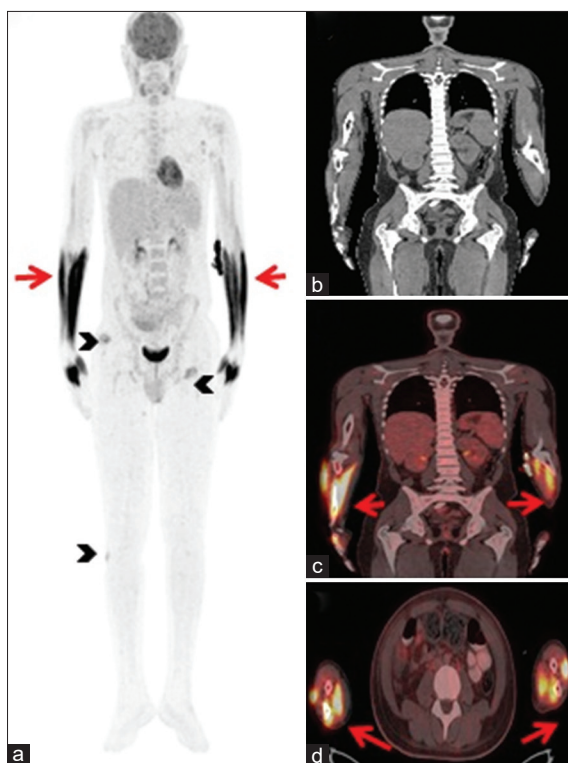


Figure 1: A 21-year-old male complained of fever and yellowish discoloration of sclera and skin for the last 10 days. He was diagnosed with acute viral hepatitis A with acute liver failure. He developed multiple foci of pyoderma in the right gluteal, left inguinal, and right knee with resultant itching. He underwent ¹⁸F-fludeoxyglucose (FDG) positron emission tomography/computed tomography (PET/CT) to look for the extent and localization of infective foci. Maximum intensity projection image (a) showed increased tracer uptake in the infective foci in the right gluteal, left inguinal region, and right upper leg region (black arrowheads) with additional intense tracer uptake in the bilateral forearms (red arrows). Coronal CT and fused PET/CT images (b and c) and axial fused PET/CT (d) of ¹⁸F-FDG PET/CT shows increased FDG uptake in the bilateral forearm muscles consistent with the history of itching mimicking the “hot forearm sign”

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Kumar SA, Mittal BR, Sindhu T, Kumar R. “Bilateral hot forearm sign”: Ingeminating the pattern of physiological uptake of ¹⁸F-fludeoxyglucose. Indian J Nucl Med 2024;39:61-2.

Address for correspondence:
Dr. Rajender Kumar,
Department of Nuclear Medicine, Post Graduate Institute of Medical Education and Research, Chandigarh - 160 012, India.
E-mail: drrajender2010@gmail.com

Received: 20-12-2023
Accepted: 21-12-2023
Published: 27-03-2024

Access this article online

Website: www.ijnm.in

DOI: 10.4103/ijnm.ijnm_145_23

Quick Response Code:



inadvertently at the antecubital fossa or wrist leading to prolonged retention of the radiotracer causing prominent delineation of the arteries.^[1,2] Similarly, the “hot forearm sign” has been documented following intra-arterial administration of other radiopharmaceuticals such as ¹⁸F-FDG.^[3-6] Uptake of FDG in the skeletal muscles following exertion/exercise is a pitfall observed with ¹⁸F-FDG PET/CT,^[7,8] a well-known fact among the nuclear medicine fraternity. This normally observed variant/phenomenon is attributed to increased glucose metabolism in the skeletal muscles following exertion resulting in increased uptake of FDG [Figure 1]. Exertion-like scratching secondary to itching in this patient with pyoderma and deranged liver function tests can also cause increased FDG uptake (consistent with scratch marks), resulting in an uptake similar to the traditional “hot forearm sign” described following intra-arterial injection of the radiopharmaceutical. It reiterates the importance of the clinical history of the patient and the basic knowledge of physiological distribution and pitfalls reported with ¹⁸F-FDG PET to avoid false interpretation of the scan by the nuclear medicine physician.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Andrews GA, Theocheung JL, Andrews E, Tyler KR. Unintentional intra-arterial injection of a bone-imaging agent. *Clin Nucl Med* 1980;5:499-501.
2. Shih WJ, Wienzbinski B, Ryo UY. Abnormally increased uptake in the palm and the thumb as the result of a bone imaging agent injection into the radial artery. *Clin Nucl Med* 2000;25:539-40.
3. Zhu Z, Doss M, Tan H, Feigenberg S, Yu JQ. Inadvertent intraarterial injection of ¹⁸F-FDG: A case report and literature review of hot forearm and hot hand signs. *J Nucl Med Technol* 2011;39:249-51.
4. Kumar K. Abnormally increased uptake of 18F-FDG in the forearm and hand following intra-arterial injection – Hot forearm and hot hand signs. *Br J Radiol* 2009;82:995-9.
5. Miyashita K, Takahashi N, Oka T, Asakawa S, Lee J, Shizukuishi K, *et al.* SUV correction for injection errors in FDG-PET examination. *Ann Nucl Med* 2007;21:607-13.
6. Bybel B, Kwok P, Neumann DR. Arterial injection artifact on F-18 FDG positron emission tomographic scan. *Clin Nucl Med* 2003;28:350.
7. Karunanithi S, Soundararajan R, Sharma P, Naswa N, Bal C, Kumar R. Spectrum of physiologic and pathologic skeletal muscle (18)F-FDG uptake on PET/CT. *AJR Am J Roentgenol* 2015;205:W141-9.
8. Shreve PD, Anzai Y, Wahl RL. Pitfalls in oncologic diagnosis with FDG PET imaging: Physiologic and benign variants. *Radiographics* 1999;19:61-77.