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INTERESTING IMAGE

Hypermetabolism of Skeletal Muscles Following Sexual Activity: A Normal Variation

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Abstract A 46-year-old man with early gastric cancer at the gastric antrum underwent an F-18 fluorodeoxyglucose (FDG) positron emission tomography (PET)-computer tomography (CT) scan for staging. No definite abnormal FDG uptake of the stomach was shown. Incidentally, variable FDG uptake at the bilateral serratus muscles, abdominal muscles and muscles of both thighs (Fig. 1) was observed. He had no significant past medical history except recently diagnosed stomach cancer. On personal interview, he described having had sexual activity the night before the F-18 FDG PET/CT scan, although he was aware of needing to avoid physical activity before a PET scan. The F-18 FDG PET/CT scan was done at 2:00 p.m. Therefore, the hypermetabolism of individual skeletal muscles following sexual activity lasted over 12 h. This case illustrates the hypermetabolism of skeletal muscles following sexual activity as a normal variation.

Keywords Positron emission tomography/computed tomography (PET/CT) · Fluorodeoxyglucose (FDG) · Skeletal muscle · Sexual activity · Physiological FDG uptake

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It is well known that hypermetabolism of some individual muscles and in brown adipose tissues can be seen as a physiological and benign variant in several specific and non-specific circumstances [1, 2]. Furthermore, several reports have described the hypermetabolism of the various skeletal muscle groups exercised before and after F-18 FDG administration [3–5]. In this case, the skeletal muscles, used during sexual activity, showed an increased F-18 FDG accumulation. The individual muscle's function can be illustrated, showing that the serratus muscles are related to the movement of the scapulas, and the rectus abdominis muscles are related to action of the vertebral column. Furthermore, the pectineus, iliacus and adductor muscles are responsible for movement of the thigh. There are many different types of sexual intercourse, and F-18 FDG uptake by the muscle groups is variable according to the type. It is not known why the FDG uptake of skeletal muscles tended to the left side of this right-handed man in this case. We could not ask him what sexual postion he had used because of privacy issues. The hypermetabolism of the skeletal muscles could be a problem in oncologic studies because of false-positive results. Abdel-Dayem et al. [3] recommended a protocol for F-18 FDG PET of malignant tumors to reduce the physiological accumulation in the skeletal muscles. In addition, physiological uptake of F-18 FDG in the skeletal muscles could be a useful tool for understanding the function of individual muscle groups. From this point of view, the F-18 FDG PET scan could provide a new atlas of the human anatomy.

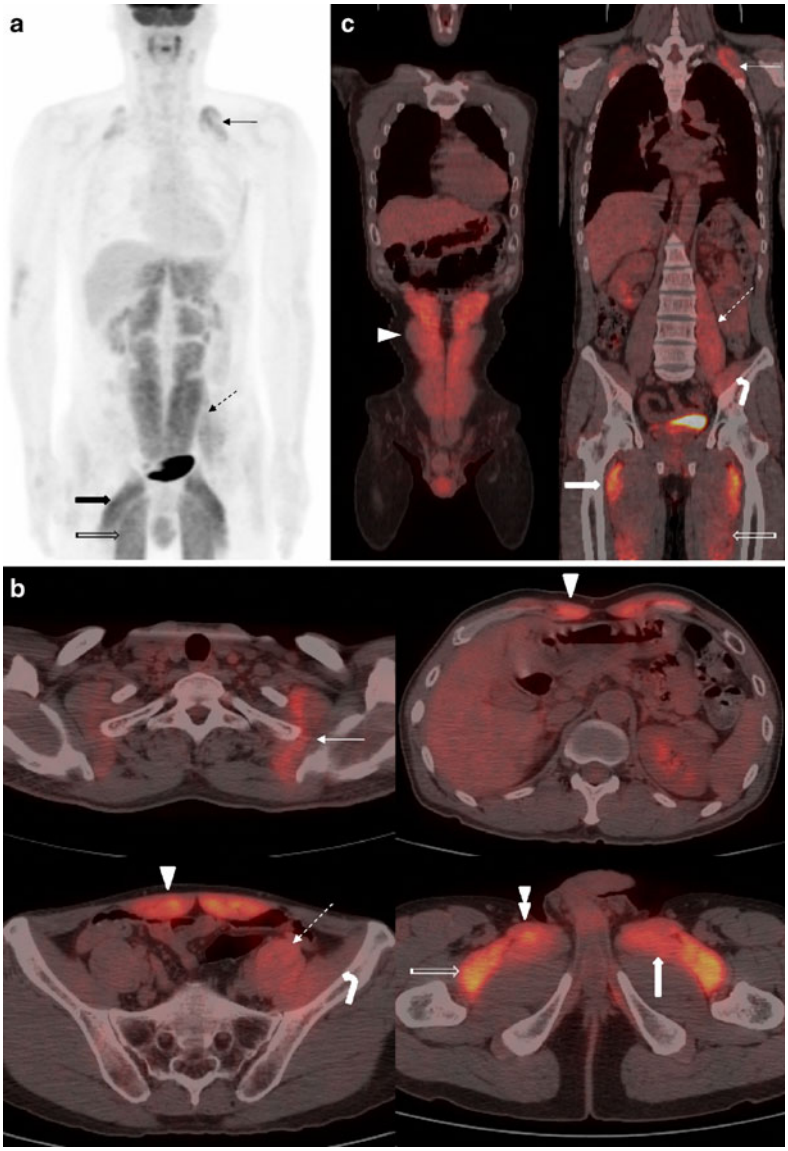

Fig. 1 A 46-year-old man with early gastric cancer at the gastric antrum underwent a F-18 fluorodeoxyglucose (FDG) PET/CT scan for staging. The patient had been fasting for over 6 h, and his blood sugar level was within normal limits at the time of injection. After intravenous injection of 431 MBq F-18 FDG, the patient rested in the supine position for 1 h on a bed. The F-18 FDG PET/CT was acquired 60 min after the injection. The PET/CT scan was done at 2:00 p.m. He had had sexual activity the night before the F-18 FDG PET/CT scan. The MIP image of the F-18 FDG PET (**a**) shows diffuse and moderate hypermetabolism of the bilateral serratus muscles, bilateral rectus abdominis muscles, left psoas muscle and bilateral adductor muscles. The PET-CT fusion image of the transverse plane (**b**) and the coronal plane (**c**) shows diffuse increased uptake of F-18 FDG at bilateral serratus muscles (straight arrows, →, 4.5 and 3.0), bilateral rectus abdominis muscles (arrowheads, ▶, 5.5), left psoas muscle (dotted arrow, ⇢, 4.0), left iliacus muscle (curved arrow, ⤻, 3.3), bilateral pectineus muscles (double arrow heads, ⏩, 6.0), bilateral adductor brevis muscles (open arrow, ⇨, 5.3) and bilateral adductor longus (solid arrow, ➡, 6.8). The maximum standardized uptake value (SUV) of the individual muscles is in parentheses

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