Interesting Image
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Increased ^{18}F-FDG Uptake in the Axillary Lymph Nodes of the Vaccinated Side Associated with COVID-19 Vaccination

COVID-19 Aşılaması ile İlişkili Aşılı Tarafın Aksiller Lenf Nodlarında Artan ^{18}F-FDG Tutulumu

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Abstract

A 50-year-old female patient underwent ^{18}fluorine-fluorodeoxyglucose (^{18}F-FDG) positron emission tomography/computed tomography (PET/CT) following modified radical mastectomy for cancer of the left breast. Ten days before the PET/CT, the coronavirus disease-2019 (COVID-19) vaccine was injected intramuscularly into the right deltoid muscle. Increased ^{18}F-FDG uptake of maximum standardized uptake value (11.0) was observed in the lymph nodes of the right axilla, which had not been observed in the previous PET/CT. The size of the oval-shaped lymph nodes was up to approximately 11×9 mm; however, it was larger than that observed on the previous PET/CT. We contemplate that the increased ^{18}F-FDG uptake was a reactive change in the lymph nodes associated with the COVID-19 vaccine.

Keywords: COVID-19, vaccination, ^{18}F-FDG PET/CT

Öz

Elli yaşında kadın hastaya sol meme kanseri nedeniyle modifiye radikal mastektomi sonrası ^{18}flor-florodeoksiglukoz (^{18}F-FDG) pozitron emisyon tomografisi/bilgisayarlı tomografi (PET/BT) uygulandı. PET/BT'den 10 gün önce, koronavirüs hastalığı-2019 (COVID-19) aşısı sağ deltoid kas içine enjekte edildi. Daha önceki PET/BT'de izlenmeyen, sağ aksilla lenf nodlarında maksimum standardize alım değeri (11,0) ^{18}F-FDG tutulumu artışı gözlendi. Oval şekilli lenf nodlarının boyutu yaklaşık olarak 11x9 mm'ye kadardı; ancak önceki PET/BT'de gözlemlenenden daha büyüktü. Artan ^{18}F-FDG tutulumunun, COVID-19 aşısıyla ilişkili olarak lenf nodlarındaki reaktif bir değişiklik olduğunu düşünüyoruz.

Anahtar kelimeler: COVID-19, aşı, ^{18}F-FDG PET/BT

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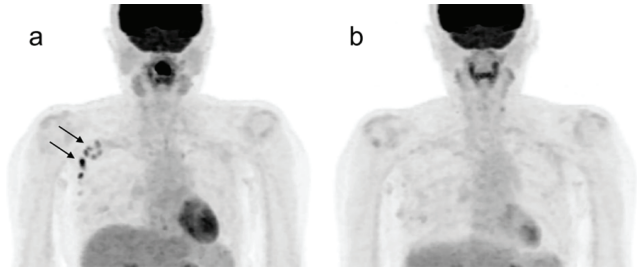

Figure 1. ^{18}Fluorine-fluorodeoxyglucose (^{18}F-FDG) positron emission tomography (PET) maximum intensity projection image of a 50-year-old female patient. ^{18}F-FDG PET/computed tomography (CT) performed 2 years and 10 months after surgery for cancer of the left breast shows several lymph nodes in the right axilla with increased ^{18}F-FDG uptake (arrows) (a). Ten days before the ^{18}F-FDG PET/CT was performed, the patient received the coronavirus disease-2019 (COVID-19) vaccine (Comirnaty, Pfizer-BioNTech), injected intramuscularly into the right deltoid muscle. The reactive change was considered to have been caused by the vaccine. No increased uptake in the axillary lymph nodes was seen on the ^{18}F-FDG PET/CT performed previously (1 year and 10 months after surgery) (b).

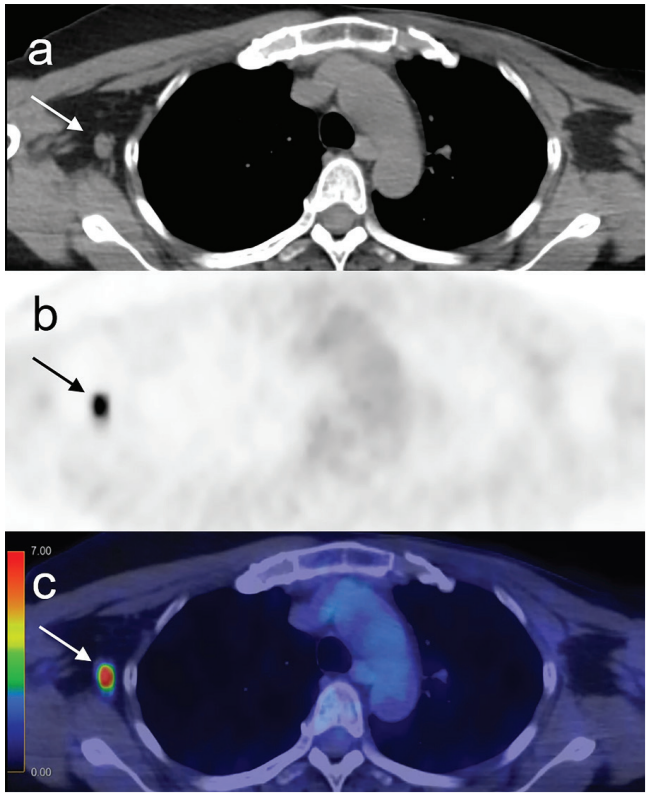

Figure 2. Axial CT (a), ^{18}F-FDG PET (b), ^{18}F-FDG PET/CT fusion image (c) at the axillary level. Lymph nodes with increased ^{18}F-FDG uptake [maximum standardized uptake value (SUV_{max}) 11.0] are seen in the right axilla (arrows). These lymph nodes were oval-shaped, and the hilum was seen in the largest of these lymph nodes. Their size was up to approximately 11×9 mm, which was larger than that observed on the ^{18}F-FDG PET/CT performed a year ago. Some studies have reported that COVID-19 vaccination increases the ^{18}F-FDG uptake in the axillary lymph nodes on the vaccinated side (1,2,3,4,5,6). To date, ^{18}F-FDG uptake in the lymph nodes has been reported to have a SUV_{max} of 4.5 and 9.4 (1,2); however, it was even higher in this case (SUV_{max} 11.0). Similar findings have been reported for influenza vaccinations (7,8). It is necessary to appropriately interpret these findings after injection of the influenza vaccine to avoid confusion with lymph node metastasis or lymphoproliferative diseases, such as malignant lymphoma. The same would also apply to the COVID-19 vaccination. Especially when the vaccine is injected intramuscularly on the ipsilateral side of the cancerous breast, it might be difficult to distinguish the reactive changes due to vaccination from metastasis of the breast cancer in the ^{18}F-FDG PET/CT images. Therefore, patients with breast cancer should be vaccinated in the deltoid muscle contralateral to the cancerous breast. In addition, when interpreting the ^{18}F-FDG PET/CT findings in patients who have received the COVID-19 vaccine, it should be noted that vaccination might cause increased uptake in the axillary lymph nodes on the vaccinated side. It is expected that the chances of interpretation of ^{18}F-FDG PET/CT images of patients who have been vaccinated against COVID-19 will increase rapidly. Hence, it is important to confirm the patient's recent vaccination history, site of vaccination, and the period since vaccination before the examination.

Ethics

Informed Consent: Written informed consent of the patient was obtained.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Y.O., S.I., H.I., Concept: Y.O., S.I., Design: Y.O., S.I., Data Collection or Processing: Y.O., S.I., H.I., Analysis or Interpretation: Y.O., T.S., H.O., M.H., Literature Search: Y.O., S.I., Writing: Y.O.

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