



Comparison of ^{68}Ga -PSMA PET/CT and ^{18}F -PSMA PET/CT of a Patient with Prostate Cancer Recurrence on Urinary Bladder Wall

Mesane Duvarında Prostat Kanseri Nüksü Tespit Edilen Hastanın ^{68}Ga -PSMA PET/BT ve ^{18}F -PSMA PET/BT Görüntülerinin Karşılaştırılması

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Abstract

Prostate cancer is one of the most prevalent cancers in the world. After radical prostatectomy, prostate-specific antigen (PSA) levels are usually used as a marker of recurrence for prostate cancer. In the case of increased PSA levels, ^{68}Ga -prostate-specific membrane antigen (PSMA) or ^{18}F -PSMA, a new alternative, can be performed for the detection of recurrent disease. We report a case of a 49-year-old male patient with increasing PSA levels who was previously operated 8 years ago. Although no obvious pathological uptake was detected in ^{68}Ga -PSMA positron emission tomography/computed tomography (PET/CT), ^{18}F -PSMA PET/CT revealed a lesion with pathological uptake on the urinary bladder wall.

Keywords: Cancer, prostate, positron emission tomography, ^{68}Ga -PSMA, ^{18}F -PSMA

Öz

Prostat kanseri dünyada en sık görülen kanserlerden biridir. Radikal prostatektomi operasyonu sonrasında prostat-spesifik antijen (PSA) düzeyleri genellikle prostat kanseri rekürrens için tümör belirteci olarak kullanılmaktadır. Yüksek PSA düzeylerinde ise ^{68}Ga - prostat-spesifik membran antijeni (PSMA) pozitron emisyon tomografi/bilgisayarlı tomografi (PET/BT) veya daha yeni bir alternatifi olan ^{18}F -PSMA PET/BT rekürrensin tespitinde kullanılabilir. Artan PSA düzeyleri tespit edilen ve 8 yıl önce opere edilmiş olan 49 yaşında prostat kanseri tanılı bir hastayı sunduk. Her ne kadar ^{68}Ga -PSMA PET/BT’de belirgin bir patolojik aktivite tutulumu izlenmese de, ^{18}F -PSMA PET/BT görüntülemesi sonucunda mesane duvarında patolojik tutulum gösteren lezyon tespit edildi.

Anahtar kelimeler: Kanser, prostat, pozitron emisyon tomografisi, ^{68}Ga -PSMA, ^{18}F -PSMA

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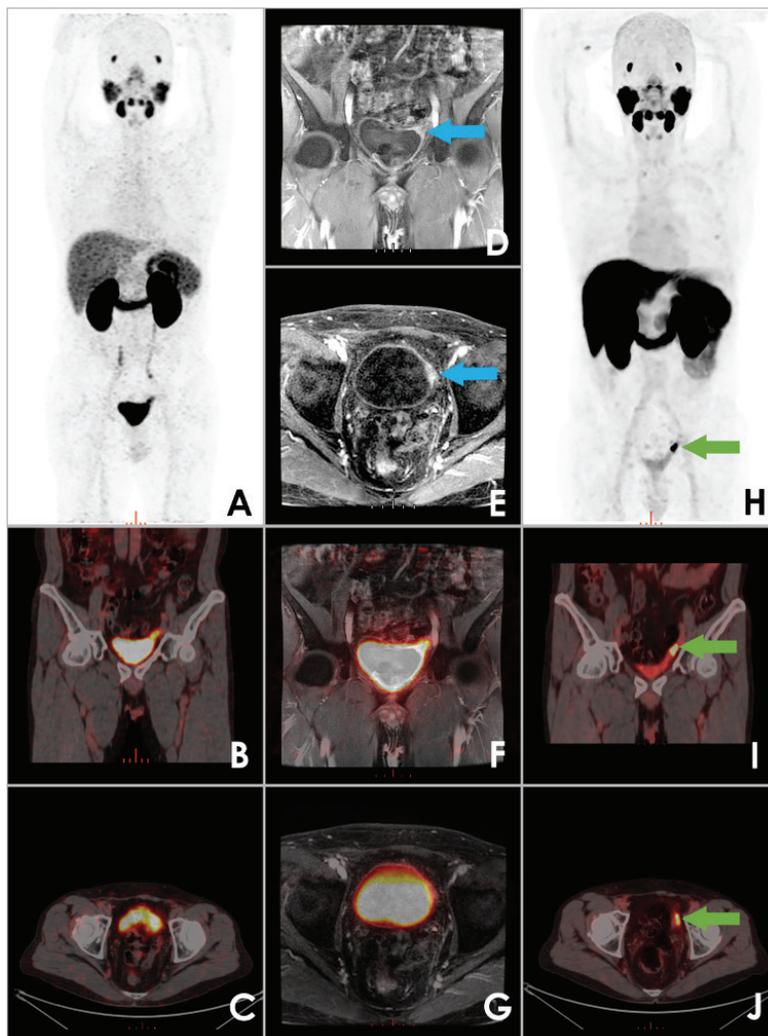


Figure 1. A 49-year-old man with a history of radical prostatectomy for prostate adenocarcinoma was referred for ^{68}Ga -prostate-specific membrane antigen (PSMA) positron emission tomography/computed tomography (PET/CT) because of increased levels of PSA as high as 0.52 ng/mL. There was no discernible pathological uptake on ^{68}Ga -PSMA PET/CT maximum intensity projection (MIP) (A), coronal (B), and axial (C) projections. After completing ^{68}Ga -PSMA whole-body PET/CT, pelvic PET/magnetic resonance imaging (MRI) with intravenous MRI contrast agent was performed to detect any local recurrence in the pelvis. In coronal (D) and axial (E) T1-weighted post-contrast MRI sequences, a lesion with contrast enhancement (blue arrows) was spotted on the left superior wall of the urinary bladder. However, in coronal (F) and axial (G) PET/MRI fusion images, no discernible uptake from radioactive urine could be detected. Three days later, the patient underwent a whole-body ^{18}F -PSMA PET/CT scan. Pathological uptake of ^{18}F -PSMA in the previously reported location in MRI scans has been observed (green arrows) in MIP (H), coronal (I), and axial (J) projections. In ^{18}F -PSMA PET/CT scans, there was a significant difference between activities detected in lesion and radioactive urine, unlike ^{68}Ga -PSMA PET scans. Prostate cancer is one of the most prevalent cancers in men worldwide (1). PSMA is a transmembrane protein that is highly expressed in prostate cancer cells (2). Its expression is increased in cases of more aggressive and dedifferentiated tumors (3). With the utilization of ^{68}Ga or ^{18}F labeled PSMA ligands, prostate cancer lesions can be imaged with positron emission tomography (4,5). Although ^{18}F -PSMA-1007 and ^{68}Ga -PSMA-11 are both PSMA ligands that can be used for imaging prostate cancer, there are some differences in their biodistribution and excretion mechanisms. Urinary extraction of ^{18}F -PSMA-1007 is minimal (5), unlike ^{68}Ga -PSMA-11, which can be an advantage in detecting local recurrences due to close proximity of the prostate gland and urinary bladder.

Ethics

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

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: N.Ö.K., G.S., M.A., Ç.S., Design: N.Ö.K., G.S., M.A., Ç.S., Analysis or Interpretation: B.D., Ç.S., Literature Search: B.D., G.S., Ç.S., Writing: B.D., Ç.S.

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