

A case of ^{68}Ga -PSMA PET early dynamic image revealing occult recurrent lesion in the posterior wall of the urinary bladder

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Abstract

A 79-year-old man with prostate cancer was treated with prostatectomy. He presented with a rising prostate specific antigen (PSA) level of 6.00 ng/mL. Gallium-68-prostate-specific membrane antigen positron emission tomography/computed tomography (^{68}Ga -PSMA PET/CT) showed avid PSMA uptake in the posterior wall of the urinary bladder on the early stage (60s postinjection; 5min postinjection; 10min postinjection). However, this lesion was difficult to distinguish because of adjacent physiological urine activity on routine imaging, delayed PET/CT and PET/magnetic resonance (MR) imaging. Our case indicates early dynamic scan is conducive to increasing the rate of detected lesions, especially for the existence of adjacent physiological urine activity disturbance lesions.

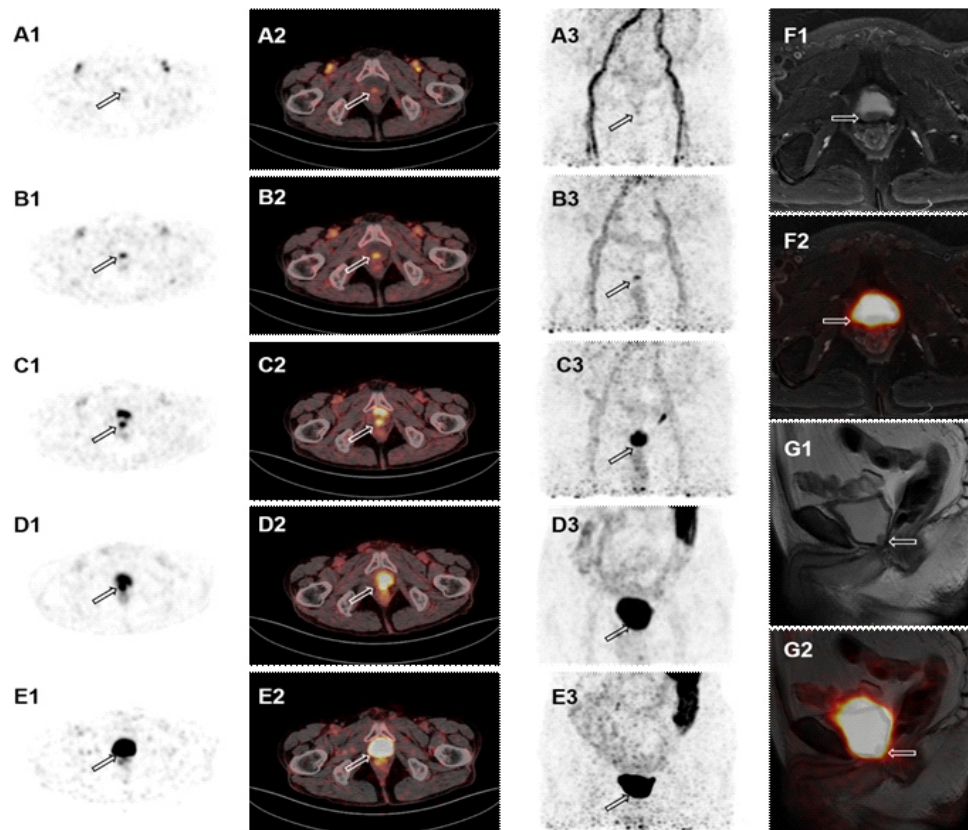


Figure 1. A 79-year-old man with prostate cancer was treated with prostatectomy. He presented with a rising PSA level of 6.00ng/mL. Thus, ^{68}Ga -PSMA-11 PET/CT was performed for possible recurrence lesions. Due to early PET imaging increases the detection rate of local recurrence for patients with patients with biochemical recurrence, dynamic imaging (immediately postinjection, 10 frames, 60s each), routine PET/CT scans (60min postinjection) and delayed image (3h postinjection) were performed. The dynamic imaging at the early stage (A1-A3, 60s postinjection; B1-B3, 5min postinjection; C1-C3, 10min postinjection) showed avid PSMA uptake in the posterior wall of the urinary bladder. As time goes on, this lesion was difficult to distinguish because of adjacent physiological urine activity on routine imaging (D1-D3) and delayed imaging (E1-E3). For the sake of further evaluation, PSMA PET/MR was performed. Pelvic MRI (F1; G1) showed a soft tissue nodule in the posterior wall of the urinary bladder on the T2WI image. This lesion had iso-intensity (relative to muscle). Similarly, fusion image also can not differentiate uptake degree for urine activity interference (F2, G2). According to the joint EANM and SNMMI procedure guidelines, routine ^{68}Ga -PSMA-11 PET/CT scans are recommended to be acquired 1h after injection [1]. It is reported that ^{68}Ga -PSMA-11 PET/CT has no advantage in detecting local lesions in close anatomical relation to the bladder [2]. Increased lesion detection rate in close proximity to the ureter or the bladder has been reported with delayed imaging up to 3-4 hours post injection [3]. Our case indicates early dynamic scan is conducive to increasing the rate of detected lesions, especially for the existence of adjacent physiological urine activity disturbance lesions [4].

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Liu Xiao MD, Haitao Wang MD, Yuhao Li MD

Department of Nuclear Medicine, West China Hospital of Sichuan University, No. 37. Guoxue Alley, 610041 Chengdu, Sichuan province, P.R. China

Liu Xiao and Haitao Wang contributed equally to this work and should be considered co-first authors.

Corresponding author: Yuhao Li, MD. Department of Nuclear Medicine, West China Hospital of Sichuan University, No. 37. Guoxue Alley, 610041 Chengdu, Sichuan province, P.R. China. E-mail: tsflyh@126.com.
