Eur J Nucl Med Mol Imaging (2017) 44:1099–1100
DOI 10.1007/s00259-017-3657-9

IMAGE OF THE MONTH

^{213}Bi-PSMA-617 targeted alpha-radionuclide therapy in metastatic castration-resistant prostate cancer

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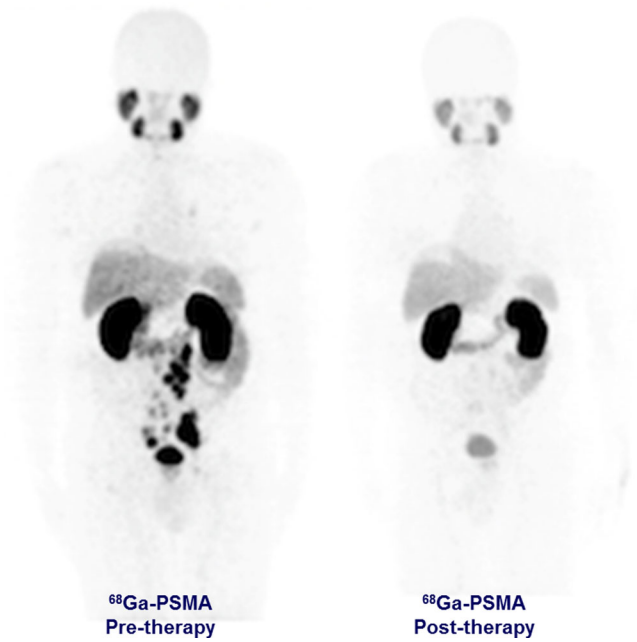
Received: 16 January 2017 / Accepted: 14 February 2017 / Published online: 2 March 2017

Prostate-specific membrane antigen radioligand therapy (PSMA-RLT) with ^{177}Lu-PSMA holds great promise as a safe treatment option in patients with metastasized castration-resistant prostate cancer (mCRPC) with appropriate selection [1]. This approach, together with ^{68}Ga-PSMA PET/CT, is an excellent example of theranostic nuclear medicine [2]. However, more structured data have recently shown that despite a marked response to PSMA-RLT, some patients are refractory to ^{177}Lu-radioligand therapy [2, 3]. Fortunately recent studies have demonstrated that targeted α-radiation therapy with ^{225}Ac-PSMA can significantly benefit mCRPC patients [4]. Similarly, ^{213}Bi-DOTATOC may be able to break the radioresistance to β-emitters while simultaneously reducing haematological toxicity in patients with diffuse red marrow infiltration by neuroendocrine tumour [5].

We present the first-in-human treatment concept with ^{213}Bi-PSMA-617 in a patient with mCRPC that was progressive under conventional therapy. The patient was treated with two cycles of ^{213}Bi-PSMA-617 with a cumulative activity of 592 MBq. Restaging with ^{68}Ga-PSMA PET/CT after 11 months showed a remarkable molecular imaging response. This patient also demonstrated a biochemical response (decrease in PSA level from 237 μg/L to 43 μg/L).



This case supports the need further exploration on the use and supply of targeted α-radiation therapy.

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