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IMAGE OF THE MONTH

^{68}Ga-PSMA ligand PET versus ^{18}F-NaF PET: evaluation of response to ^{223}Ra therapy in a prostate cancer patient

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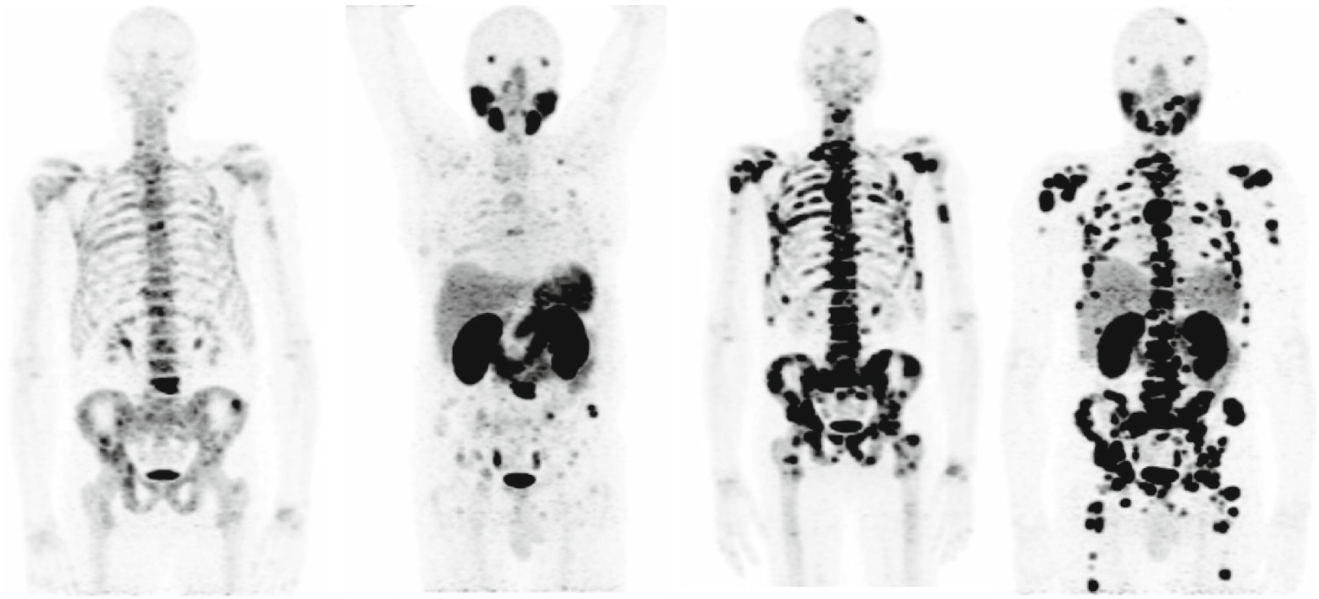
Recent reports suggest that ^{223}Ra prolongs survival in prostate cancer patients [1]. Bone scintigraphy is considered the gold standard in the assessment of osseous metastatic disease in prostate cancer [2]. ^{68}Ga-labelled prostate-specific membrane antigen (PSMA) ligand is a novel, highly specific tracer for the detection of metastatic lesions of prostate cancer [3].

We present the case of a 69-year-old prostate cancer patient with extensive metastases to the bone (adenocarcinoma, Gleason score 8, PSA 1,239 μg/l, at initial diagnosis) who underwent both ^{68}Ga-PSMA PET and ^{18}F-NaF PET for the evaluation of response to therapy with ^{223}Ra. ^{18}F-NaF PET and a ^{68}Ga-PSMA PET performed prior to



Pretherapeutic ^{18}F-NaF PET | Pretherapeutic ^{68}Ga-PSMA PET | Posttherapeutic ^{18}F-NaF PET | Posttherapeutic ^{68}Ga-PSMA PET

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therapy revealed multiple bone metastases that appeared mainly sclerotic on CT. On ^{18}F-NaF PET only some lesions showed a high bone turnover, whereas most of the metastases showed faint tracer uptake. This correlated with the metabolic activity of the PSMA ligand with the highest uptake in a lumbar vertebra and the left pelvis. Apart from bone metastases no other PSMA-positive tumour lesions were found. The patient received six cycles of ^{223}Ra. ^{18}F-NaF PET performed 16 days after the last cycle showed a marked increase in tracer uptake in the known bone metastases. Clear differentiation as to whether this was related to tumour progression or due to a "flare" phenomenon was not possible [4]. ^{68}Ga-PSMA PET demonstrated a massive increase in metabolic activity in disseminated bone metastases and additionally revealed local recurrence and iliac lymph node metastases, consistent with progressive disease. We conclude that ^{68}Ga-PSMA PET may be superior to ^{18}F-NaF PET for the evaluation of therapy response to ^{223}Ra therapy in bone metastases.

Conflicts of interest None.

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