Comparison between ^{68}Ga-PSMA PET-CT and ^{99m}Tc-PSMA SPECT-CT in patient with recurrent prostate cancer

Naila Sheikh, Muhammad Numair Younis, Mishal Mumtaz, Arzoo Fatima

Department of Nuclear Medicine and PET CT, Institute of Nuclear Medicine and Oncology Lahore

Background

Prostate specific membrane antigen targeted PET-CT imaging with ^{68}Ga-PSMA ligands is a standard diagnostic investigation in patients with carcinoma of prostate, for detection of primary tumor, initial staging of high risk disease, for metastases as well as upon recurrence. However, PT-CT is not universally available, and most of the patients would not afford it. ^{99m}Tc-PSMA SPECT/CT may be a cost-effective and logistically simple alternative for it.

Case report

We report case of a 79 years old man with prostate adenocarcinoma, diagnosed in 2017 and treated initially with anti-androgen therapy followed by B/L subcapsular orchiectomy in March 2020. On ^{99m}Tc-MDP whole body bone

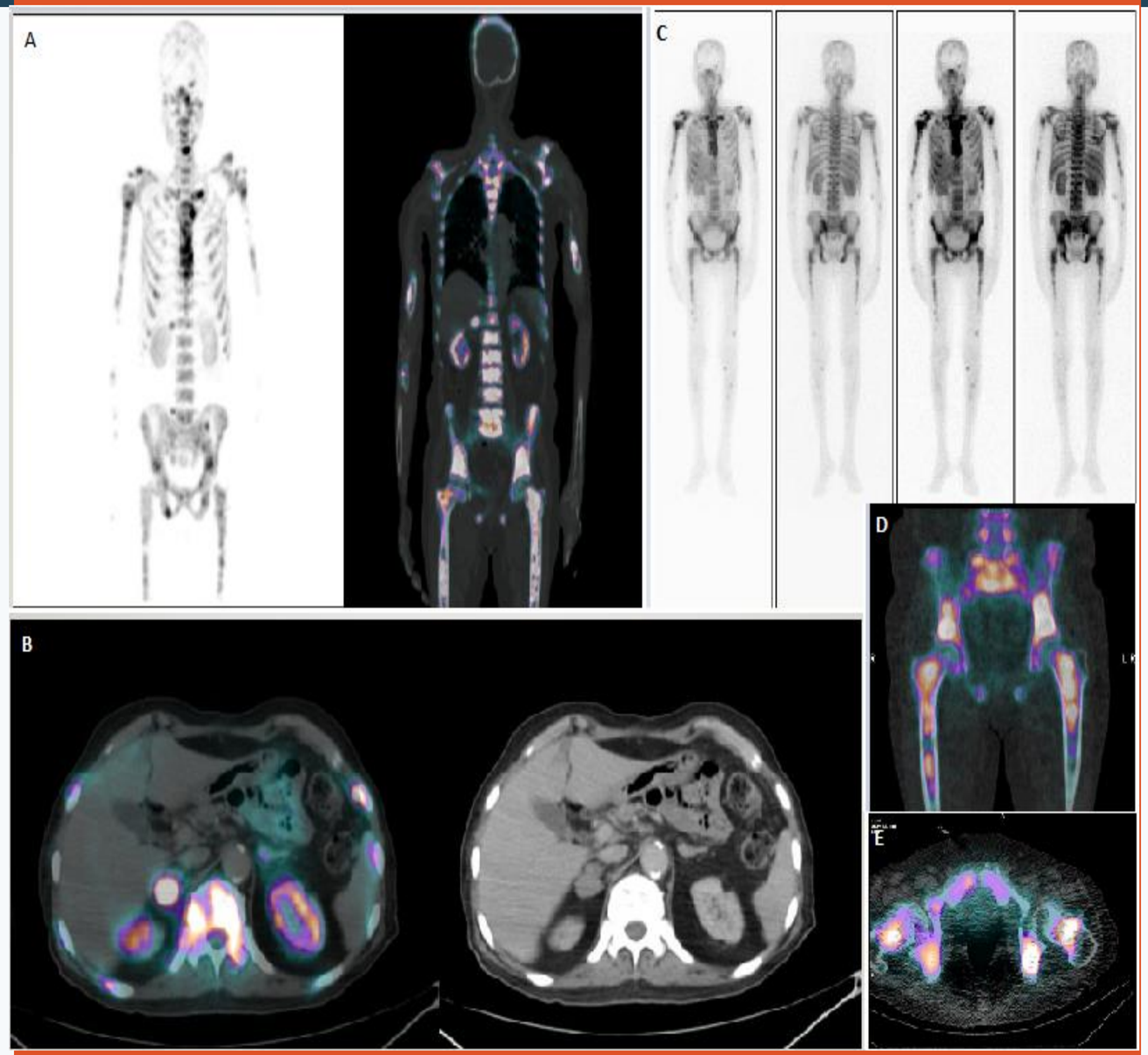

Fig: A. Ga-68 PSMA PET MIP and fused PET-CT coronal images showing extensive skeletal and bone marrow involvement in axial and appendicular skeleton. Fig: B. Axial views showing nodal metastasis in right suprarenal region. Fig: C. Tc-99m PSMA whole body planar images anterior and posterior views, Fig: D. and Fig: E. limited SPECT-CT coronal and axial views showing similar skeletal and bone marrow findings except for the nodal lesion.

Case report (continued)

scan, he was found to have oligometastatic disease with 4 abnormal sites of tracer uptake. On follow up, he was found to have biochemical recurrence with rising PSA levels of 50 ng/ml. On further imaging with ^{68}Ga-PSMA PET-CT, there was wide spread disease with skeletal and bone marrow involvement and suprarenal soft tissue density lesion, consistent with nodal metastases. Within a week after getting ^{68}Ga-PSMA PET-CT, a ^{99m}Tc-PSMA SPECT-CT was performed, findings of which were correlative with ^{68}Ga-PSMA PET-CT except for the nodal metastatic lesion.

Conclusion

Our finding is consistent with international literature, however nodal lesion was missed on ^{99m}Tc-PSMA SPECT-CT in our case despite of high PSA levels of 50 ng/ml, probably because the nodal lesion was deep seated. This is probably the first case being reported from Pakistan. Further research with a case series or a prospective randomized trial is in plan to establish the role of ^{99m}Tc-PSMA SPECT-CT which is cost effective and more universally available.