IMAGING CORNER

Physiologic PSMA Uptake in an Intraprostatic Ganglion: A Rare PET/CT Finding

Ayesha Zubair[1], Nadia Nazir[2], Aamna Hassan[3]
[1,3]Department of Nuclear Medicine & [2]Department of Radiology, Shaukat Khanum Memorial Cancer Hospital and Research Center, Lahore.
Correspondence: Aamna Hassan. e-mail: aamnah@skm.org.pk
ORCID ID. 0000-0003-0026-0729

Abstract

Prostate-specific membrane antigen (PSMA) PET-CT is routinely used in the imaging of prostate carcinoma for initial staging, evaluation of biochemical recurrence, and planning of Lutetium-based radionuclide therapy. In addition to uptake in primary and metastatic prostate cancer, PSMA tracer activity is commonly observed in sympathetic chain ganglia, most frequently along the coeliac axis. We present an unusual imaging finding of PSMA avidity localized to intraprostatic ganglia, highlighting a potential diagnostic pitfall.

Keywords: PSMA PET-CT, autonomic ganglion, intraprostatic.

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Case Report

A 62-year-old male with biopsy-proven adenocarcinoma of the prostate (Gleason score 7 [3+4]/10) and a baseline serum prostate-specific antigen (PSA) level of 4.2 ng/mL was referred for staging with Ga68 PSMA PET-CT. Multi-parametric MRI of the prostate demonstrated a heterogeneous signal intensity lesion in the superior aspect of the left peripheral zone. Subsequent PSMA PET-CT revealed two symmetrically increased foci of PSMA uptake in the postero-inferior aspect of the prostate gland. Corresponding CT images showed no underlying morphological abnormality. After an extensive review of

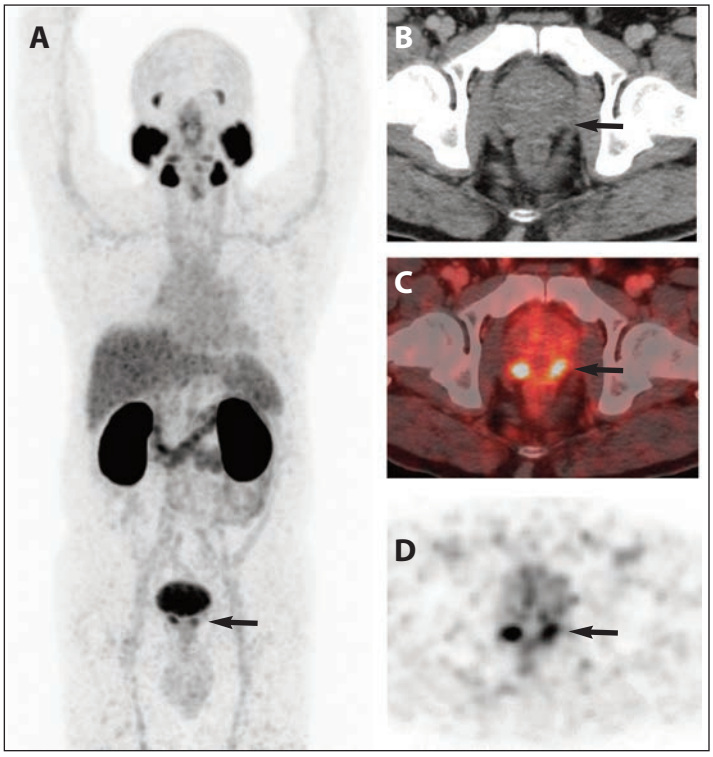

Figure: MIP image A shows two foci of increased PSMA uptake in prostate gland bilaterally as marked by blue arrow. There is no underlying morphologic correlate on CT scan (Image B). Fused image and PET-only image demonstrates bifocal uptake in prostate (Image C, D).

the literature and correlation with typical anatomical location, these findings were interpreted as uptake within intraprostatic ganglia.

PSMA PET-CT has become an integral imaging modality in the evaluation of prostate carcinoma. One of its major indications includes assessment of the primary prostate lesion to predict malignant potential and guide targeted biopsy of the most suspicious area.[1] Although PSMA is highly expressed in prostate cancer cells, increased tracer uptake may also be observed in several benign conditions and non-prostatic malignancies. Among the most encountered benign causes of PSMA uptake are autonomic ganglia.[2] Physiologically, autonomic ganglia are typically located in the cervical, coeliac, and sacral regions.[3] Intraprostatic ganglia are an infrequent site of PSMA uptake.[4] These ganglia are usually situated bilaterally along the postero-inferior surface of the prostate gland. Their PSMA avidity can closely mimic malignant lesions, thereby posing a diagnostic challenge.[5] This case emphasizes the importance of recognizing intraprostatic ganglia as a potential source of false-positive PSMA uptake to avoid misinterpretation and ensure accurate diagnosis

References

1. Evangelista L, Muraglia L, Guglielmo P, Zanca R, Vallone C, Jandric J, Aricò D, Buffi N, Lughezzani G. Primary Score as a Predictive Marker in Intermediate-Risk Prostate Cancer: Insights from PSMA PET/CT Imaging. Nucl Med Mol Imaging. 2025;59:255-260
2. Mamlins E, Schmitt D, Beu M, Mattes-György K, Henke JM, Antke C, et.al. PSMA-1007 Uptake in Ganglia of the Sympathetic Trunk and Its Intra-individual Reproducibility. Mol Imaging Biol. 2023;25:554-559.
3. Osman MM, Iravani A, Hofman MS, Hicks RJ. Intra-patient comparison of physiologic 68Ga-PSMA-11 and 18F-DCFPyL PET/CT uptake in ganglia in prostate cancer patients: a pictorial essay. Cancer Imaging. 2021;21:35.
4. Yörükoglu K, Tuna B, Kirkali Z. Ganglion cells in the human prostate. Prostate Cancer Prostatic Dis. 2000;3:34-36.
5. Rischpler C, Beck TI, Okamoto S, Schlitter AM, Knorr K, Schwaiger M, et.al. 68Ga-PSMA-HBED-CC Uptake in Cervical, Celiac, and Sacral Ganglia as an Important Pitfall in Prostate Cancer PET Imaging. J Nucl Med. 2018;59:1406-1411.