

## 68-gallium Prostate-Specific Membrane Antigen Positron Emission Tomography/Computed Tomography Detects Rare Testicular Metastasis from Prostate Cancer

### Abstract

Testicular metastases from solid tumors is a rare entity. We describe one such case where a patient on treatment for prostate cancer presented with a right scrotal swelling. For restaging, whole-body 68-gallium prostate-specific membrane antigen positron emission tomography/computed tomography (PET/CT) was performed. Fused PET/CT images demonstrated intense uptake in the testicular lesion. Unique anatomic and functional information provided by hybrid PET/CT helped in reliably establishing the testicular mass as the site of metastases from prostate cancer, which had a major impact on patient management.

**Keywords:** 68-gallium prostate-specific membrane antigen positron emission tomography/computed tomography, prostate cancer, testicular metastasis

### Introduction

With the widespread utilization of 68-gallium prostate-specific membrane antigen positron emission tomography/computed tomography (<sup>68</sup>GaPSMA PET/CT) for prostate cancer imaging, it has become important to confidently identify and diagnose the unusual sites of metastatic lesions which are now being detected with the ever-increasing incidence and which were earlier difficult to diagnose with conventional imaging. The testis represents one such unusual site of metastasis from a solid tumor. High and intermediate-risk prostate cancers typically show high <sup>68</sup>Ga PSMA uptake in the primary and its metastatic lesions. PSMA PET/CT is a highly sensitive and specific imaging modality to detect prostate cancer metastatic lesions.

### Case Report

A 52-year-old male who was a diagnosed case of metastatic hormone-sensitive prostatic carcinoma (nodal and skeletal metastases) and on docetaxel therapy and medical castration with injection leuprolide, now presented with enlarging right scrotal mass. A restaging <sup>68</sup>Ga PSMA PET/CT was advised. Maximum intensity projection image showed focal increased tracer

uptake in the right scrotal region (curved arrow), prostatic region (arrow), and supraclavicular region (block arrow). Axial CT and fused PET/CT images showed increased PSMA expression in the prostate gland [Figure 1a and b; arrows] and right testicular lesion with associated hydrocele formation [Figure 1c-f; curved arrows]. The patient subsequently underwent bilateral scrotal orchidectomy (surgical castration) and metastasis from prostatic carcinoma was confirmed in the right testis on histopathology.

### Discussion

Metastases to the testes are apparent in only ~0.04% of autopsy studies in patients with known malignancy, and most of these are identified incidentally after surgical castration or on autopsy.<sup>[1,2]</sup> In adults, a malignant testicular lesion is much more likely to be a primary rather than a metastatic lesion. Literature suggests that the rarity of testicular metastases may be due to the fact that there is relatively lower temperature in the scrotum, so the malignant cells find it more difficult to proliferate and another theory is that the blood–testes barrier prevents the spread of tumor cells here. Although prostate cancer is the second-most common cancer,

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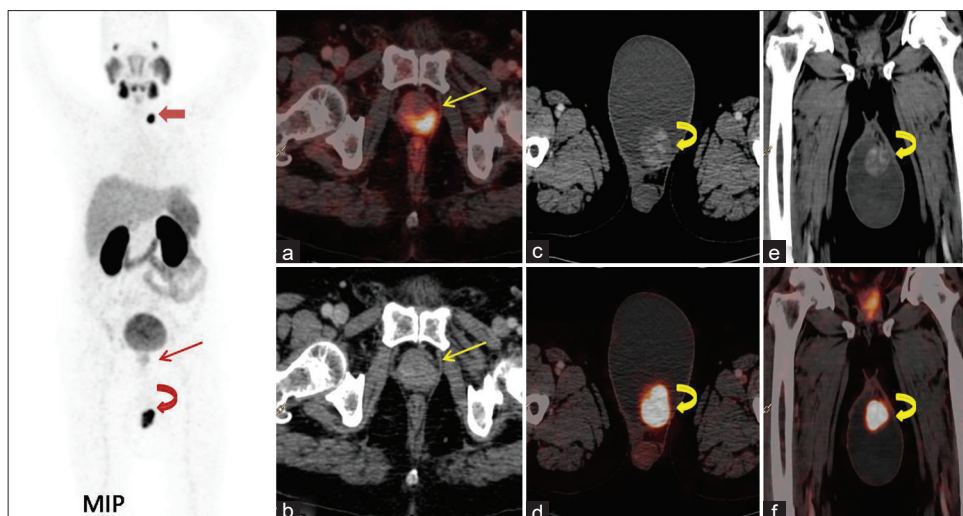
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**Figure 1:** Maximum intensity projection image showing focal increased tracer uptake in the right scrotal region (curved arrow), prostatic region (arrow), and supraclavicular region (block arrow) with normal physiological distribution in the rest of the body. Axial computed tomography and fused positron emission tomography/computed tomography images showing increased prostate-specific membrane antigen expression in the prostate gland (a and b; arrows) and right testicular lesion with associated hydrocele formation (c-f; curved arrows)

metastases to testes are rare and usually are seen in quite advanced stages.<sup>[1]</sup> <sup>68</sup>Ga PSMA PET/CT is highly sensitive and specific and today perhaps the single-most accurate, non-invasive imaging modality for the detection of primary and metastatic prostate cancers. It gives us the ability to diagnose and confidently report such lesions.<sup>[3-5]</sup> Accurate diagnosis of testicular metastases using conventional imaging is always challenging. Histopathological diagnosis remains the backbone of correct diagnosis. This case highlights the importance of <sup>68</sup>Ga PSMA PET/CT in noninvasive detection of prostate cancer metastases to the testis which was not possible with conventional imaging earlier. To the best of our knowledge, there are only a handful of such cases reported in literature.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient (s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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#### Conflicts of interest

There are no conflicts of interest.

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