



Schwannoma: A rare cause of false-positive 68Ga-PSMA PET/CT uptake in the evaluation of metastatic prostate cancer

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ABSTRACT

PSMA expression occurs in epithelial cells in both normal and hyperplastic prostates. In adenocarcinoma, it is present in greater intensity, especially in the more aggressive ones. This made it possible to develop diagnostic tools with greater specificity for detecting prostate cancer metastases like the 68Ga-PSMA PET/CT. Several benign neoplasms with increased marker uptake have been described in the literature. Such false-positives are usually associated with soft tissue injuries, abnormal vascular proliferation, neurogenic injuries, thymomas and adenomas. In the present work we present a case report that exemplifies the above.

1. Introduction

In recent years 68Ga-PSMA PET/CT has emerged as an increasingly common imaging method to aid in the treatment of patients with prostate cancer. However, it is noteworthy that even with good sensitivity and specificity, there are situations in which we come across false positive results. In the present work we present a case report that exemplifies the above.

2. Case presentation

A 71-year-old patient with a history of hypertension and diabetes mellitus, referred for evaluation of prostate cancer diagnosed on biopsy. Pre-biopsy examinations revealed a PSA of 6.7 ng/mL and magnetic resonance imaging (MRI) of the pelvis with a prostate weighing 47 grams, an 19.2 mm index lesion on the left anterior transition zone. The biopsy result confirmed prostate adenocarcinoma, ISUP 3, in all collected cores. Applying Briganti's 2012 nomogram¹ there was a 25% probability of lymph node metastasis.

As the patient was classified as an unfavorable intermediate risk by D'Amico's criteria, he was chosen to undergo 68Ga-PSMA PET/CT. In addition to the lesion in the left prostatic lobe (SUV Max 20.6) there was a slight overexpression of PSMA (SUV Max 2.60) corresponding to a

lymph node with minimally increased dimensions, located in the region of the obturator/internal iliac vessels on the left, measuring 12 × 11mm (Fig. 1).

The patient underwent robot-assisted radical prostatectomy with extended pelvic lymphadenectomy. During left pelvic lymph node dissection, in correspondence with the suspected site of metastasis by 68Ga-PSMA PET/CT, an obturator nerve schwannoma was found. (Fig. 2). As they usually have a benign behavior, it was not resected.

Pathology confirmed prostate adenocarcinoma, ISUP 3, without metastases in any of the 31 lymph nodes obtained in the specimen (Fig. 3). Postoperative control PSA was 0.02 ng/mL.

3. Discussion

68Ga-PSMA PET/CT has 99% specificity for prostate cells, however it is not a unique marker of the gland and can be found in many other tissues. Intense uptake can be seen in lacrimal, parotid and submandibular glands, liver, spleen, small bowel, kidneys, and bladder. In moderate to light intensity in stellate, celiac, hypogastric and presacral sympathetic ganglia, among other structures. There is, however, no validated uptake threshold to differentiate adenocarcinoma of the prostate from non-prostatic lesions.²

Several benign neoplasms with increased marker uptake were prior

; MRI, Magnetic Resonance Imaging; ISUP, International Society of Urological Pathology; PSMA, Prostate-specific membrane antigen; SUV, Standardized Uptake Values.

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to the literature. Such false-positives are usually associated with soft tissue injuries, abnormal vascular proliferation, neurogenic injuries, thymomas and adenomas.²

Sites of neurogenic origin include schwannomas, benign neoplasms originating from the sheath of peripheral nerves, which can affect intracranial structures, spine, spinal roots, trunk and limbs. On tomography, they appear as well-circumscribed nodules of low to intermediate attenuation with displacement of neighboring structures without invasion. An important feature is the proximity to the nerves.³

The illustrated case report reveals a common situation in the daily life of urologists: a patient diagnosed with prostate cancer at increased risk for metastases. Traditionally, bone scintigraphy, MRI and computed tomography (CT) are the recommended first-line exams for tracking these metastases, but 68Ga-PSMA PET/CT is increasingly being used for this purpose. Despite being an exam with excellent sensitivity and specificity rates, it still has limitations for small metastases. Leyhannurah et al.⁴ in their initial experience pointed out metastases to lymph nodes smaller than 4 mm as the greatest challenge when using preoperative 68Ga-PSMA PET/CT. Leeuwen et al.⁵ also obtained similar results for lymph nodes smaller than 3 mm and concluded that extended pelvic lymphadenectomy remains the gold standard for lymph node

staging.

4. Conclusion

The 68Ga-PSMA PET/CT is a reality within the exams available in the investigation of prostate cancer. Due to its limitation for diagnosing lymph node metastases smaller than 4 mm, pelvic lymphadenectomy remains the gold standard for diagnosis.

On the other hand, situations such as described in which false-positive results occur, may compromise the therapeutic decision and lead to overtreatment.

Declaration of competing interest

None.

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Appendix A. Figures

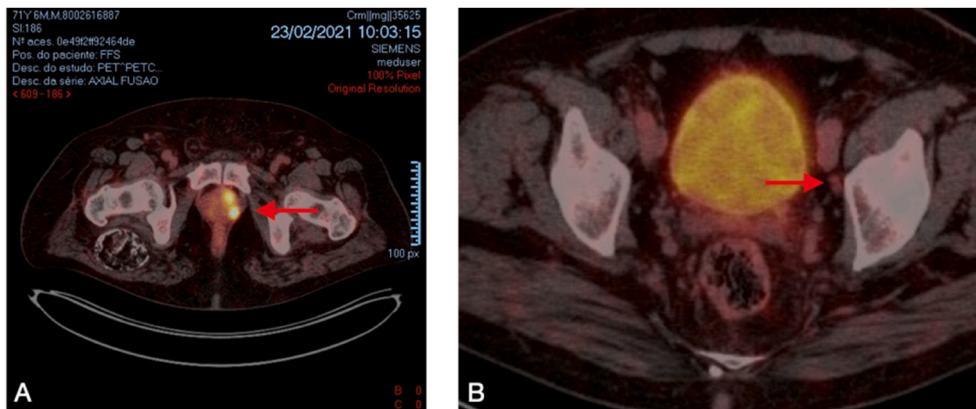


Fig. 1. A, PSMA overexpression in the left prostatic lobe (SUV Max 20.6) in correspondence with biopsy revealing prostate adenocarcinoma; B, Lesser expression (SUV Max 2.60) in the region of the obturator/internal iliac chain on the left.



Fig. 2. Intraoperative finding of left obturator nerve schwannoma.



Fig. 3. Surgical specimen showing prostate with seminal vesicles and extended pelvic lymphadenectomy (surrounding).

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