

A Rare Case of Isolated Testicular Metastasis from Prostate Cancer Imitating a Primary Testicular Cancer: Case Report and Review of the Literature

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Abstract

Prostate cancer is among the most common cancers in males worldwide. Those diagnosed may undergo a variety of treatments ranging from radiation to surgery to chemotherapy and hormonal therapy. Although clinicians often encounter metastases in bones and lymph nodes, there are instances where the spread occurs to more unconventional sites. Here, we document a peculiar scenario involving a 76-year-old individual who had undergone prior treatment for prostate adenocarcinoma. This patient manifested symptomatic metastases specifically in the right testis and a lymph node, without evident widespread disease that might initially suggest a primary testicular tumor. This case report underscores the importance of contemplating the potential for metastatic disease in the differential diagnosis when assessing patients with a history of prostate cancer and a newly discovered mass. This consideration should persist until a whole evaluation of the tissue is conducted.

Keywords: Prostate cancer • Testicular metastasis • Radiotherapy

Introduction

Prostate cancer ranks among the most prevalent cancers affecting males globally, contributing to approximately 1,600,000 cases and 366,000 deaths annually [1]. Patients identified with prostate cancer may present with a variety of obstructive and bothersome symptoms in the lower urinary tract, in addition to experiencing hematuria and weight loss. In advanced stages, metastasis is common, often involving sites such as bones, lymph nodes, lungs, and liver. However, occurrences of metastasis to the testicles and epididymis are exceedingly rare, with reported incidence rates ranging from 0.18% to 0.5% [2]. Among adult malignancies, the notable tumors that metastasize to the testes include those arising from the prostate, lungs, gastrointestinal tract, melanomas, and kidneys, of these tumors, prostate adenocarcinoma constitutes the preeminent neoplasm that metastasizes to the testes in adults [3]. Although typically unilateral, instances of bilateral testicular metastases have been documented [4]. Discoveries of testicular metastases typically arise incidentally during postmortem examinations or orchidectomy procedures, often conducted as part of hormonal therapy or for various clinical reasons [5]. The earliest documentation of metastatic carcinoma involving the

testes dates back to 1938 in the United States, and globally, fewer than 200 cases had been reported [6]. This case represents the first reported instances of metastatic carcinoma involving the testes in Morocco. A PubMed database search of existing English literature regarding Testicular Metastasis from prostate cancer revealed few well-described cases. In this context, we present the case of an elderly man who exhibited unilateral metastases affecting the testicle, epididymis, and spermatic cords, all originating from prostatic adenocarcinoma.

Case Presentation

A 76-year-old male was diagnosed with prostate cancer in 2017, he has an obstructive and irritative lower urinary tract symptoms, PSA level was 24 ng/mL, multiparametric prostate MRI showed a nodule in the right peripheral zone responsible for capsular rupture (T3a), without lymph node involvement (N0), a transurethral resection of the prostate revealed a Gleason score of 9 (5+4) adenocarcinoma of the prostate. The preoperative metastatic evaluation at that time, including a bone scan and computerized tomography of the thorax the abdomen and pelvis, was negative (M0). After discussion in a

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Received: 16 January, 2024, Manuscript No. JOMP-24-125103; **Editor assigned:** 19 January, 2024, PreQC No. JOMP-24-125103 (PQ); **Reviewed:** 05 February, 2024, QC No. JOMP-24-125103; **Revised:** 18 April, 2025, Manuscript No. JOMP-24-125103 (R); **Published:** 25 April, 2025, DOI: 10.37421/2576-3857.2025.10.295

multidisciplinary consultation meeting our patient benefited from radiotherapy with intensity modulation type Volumetric Modulated Arc Therapy (VMAT) at a dose of 74Gy on the prostate and 46 Gy on the pelvis concomitantly with three years of LHRH analogues (aLHRH).

One year after the end of triptorelin in December 2020, our patient presented for consultation with a PSA of 5.8 ng/ml, the 18F-Choline Positron Emission Tomography/Computed Tomography (PET/CT) showed a local recurrence at the apex without other metastatic location. Six months later, the patient presents with a big right purse, a testicular ultrasound showed a mass of 19 mm at the lower pole of the right testicle (Figure 1).



Figure 1. Testicular ultrasound showed a mass of 19 mm at the lower pole of the right testicle.

Laboratory results for α -fetoprotein, Human Chorionic Gonadotropin (β hCG), and Lactate Dehydrogenase (LDH) were negative, in front of this clinical presentation right orchidectomy was offered to our patient who refused it. Two years later in early 2023 and following the increase in the size of the right testicular nodule, a new assessment requested with a testicular MRI which revealed a right testicular mass of 7 cm which surrounds the epididymis and the spermatic cord (Figure 2), the patient benefited from a right orchidectomy in another hospital center and whose anatomopathological study showed ret testis Adenocarcinoma (ADK), upon that, for adequate restaging of his disease a new assessment requested made from a prostate MRI which showed prostatic recurrence and a choline PET-CT which demonstrated the appearance of hypermetabolic pelvic and lumbo-aortic lymph node foci associated with prostatic hypermetabolism (Figure 3), with a PSA level of 21 ng/ml, tumor markers (alpha fetoprotein beta HCG and LDH) were always normal, faced with this atypical clinical picture, a re-reading of the anatomopathological blocks in our hospital objectively an immunohistochemical profile of a testicular location of a prostatic ADK (PSA, racemase, and CK7 antibodies positive, and anti CK20, EMA, WT1, INHIBIN, CD30, PLAP, SALL4 antibodies negative) (Figure 4). Following a multidisciplinary tumor board meeting, consensus was to proceed with chemical castration in combination with abiraterone acetate. the evolution was marked by the drop in the PSA level to 7 ng/ml and the patient remained in good control to this day.

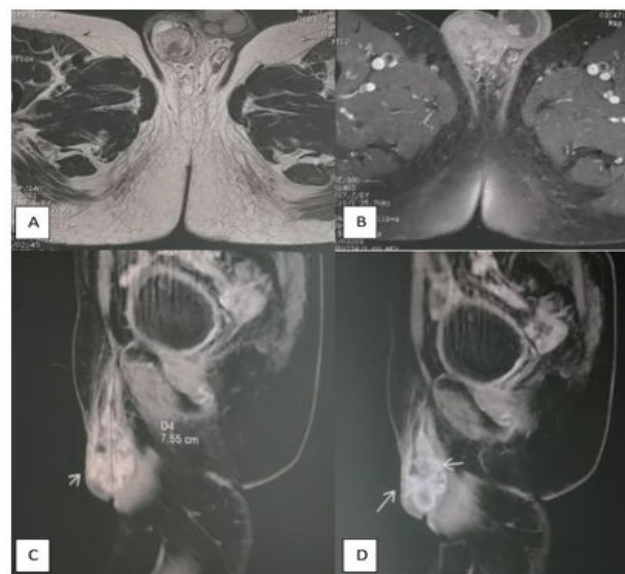


Figure 2. Testicular MRI which revealed a right testicular mass of 7 cm which surrounds the epididymis and the spermatic cord A) Axial section in T2 sequence, B) Axial image in T1 sequence after gadolinium injection, C and D) Sagittal image in T1 sequence after gadolinium injection.

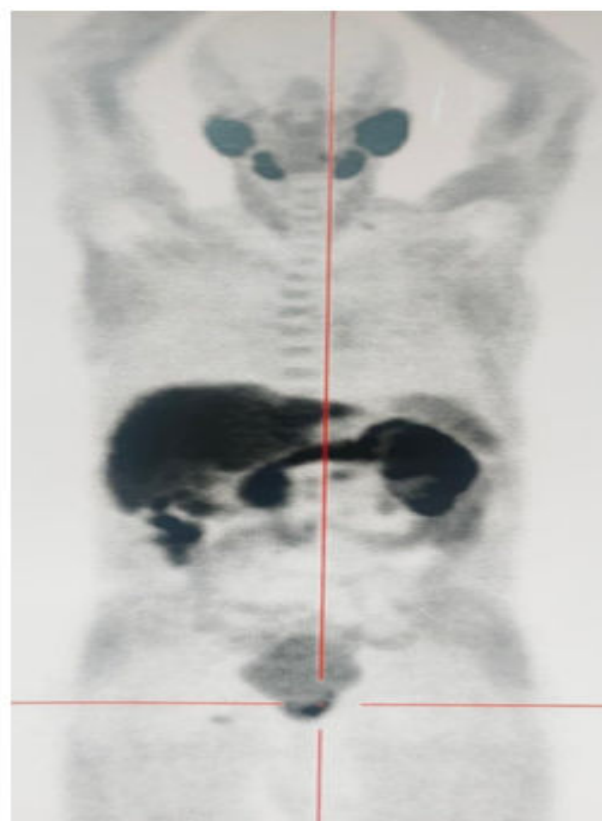


Figure 3. Choline PET-CT which demonstrated the appearance of hypermetabolic pelvic and lumbo-aortic lymph node foci associated with prostatic hypermetabolism.

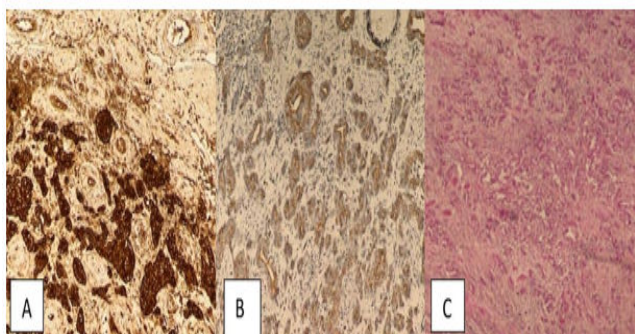


Figure 4. A) Intense and diffuse expression of PSA (x100); B) Granular cytoplasmic expression of racemase (x40); C) Testicular localization of a tumor proliferation of adenocarcinomatous appearance (HE medium magnification).

Discussion

Metastatic carcinoma involving the testes was initially documented in the United States in 1938 [6], and to date, the global tally stands at fewer than 200 reported cases. Prostate cancer ranks as the most common type of tumor to metastasize to the testes, although instances of lung tumors, melanomas, and colon or kidney tumors doing so are rare [7]. A study of 24,000 autopsy results by Pienkos and Jablowski revealed a testicular metastasis rate of 0.06% [8]. In a cohort of 142 confirmed prostate cancer patients who underwent bilateral orchiectomy, Olapade-Olaopa et al., reported a 1.4% incidence of testicular metastasis [9]. In a separate study involving 1589 prostate cancer patients, Bubendorf et al., found hematogenous metastases in 35% of cases, affecting various organs such as bones (90%), lungs (46%), liver (25%), pleurae (21%), and adrenal glands (13%). However, testicular and epididymal metastases were exceptionally rare, with reported incidences ranging from 0.18% to 0.5% [10]. Johansson and Lannes noted that 4% of testicular metastases are incidentally discovered during orchiectomy for advanced prostate carcinoma [11]. The scarcity of testicular metastases is attributed to the unfavorable conditions for tumor growth created by lower temperatures in the scrotum [12].

Prostate cancer can reach the testis through various pathways, including retrograde venous extension, arterial embolism, lymphatics, or endocanalicular spread [13]. In our case, retrograde invasion couldn't be ruled out due to the invasion of the rete testis spermatic cord and epididymis following a prostatic recurrence.

When a testicular lesion occurs in a patient in the context of an unknown neoplastic, the etiologic diagnosis is unclear; it could be a primary or secondary tumor. Most patients who develop secondary testicular metastases are in their sixth or seventh decades of life especially for those with a history of prostate cancer, in contrast to primary testicular germ cell neoplasms, which primarily affect younger men.

The detection of testicular metastases usually occurs incidentally during postmortem examinations or orchiectomy performed as part of hormonal therapy or other indications [14]. However, some cases, like our patient, present with a palpable lump or nodule. They typically affect one testicle, but approximately 15% occur bilaterally [15].

While the majority of cases involving testicular metastasis in prostate carcinoma are typically advanced, featuring metastases in other body parts and a high Gleason histological score [16], instances of isolated testicular metastasis, as observed in our patient, are exceptionally rare. The initial step in managing this condition is orchiectomy for diagnostic and therapeutic purposes. Diagnosing testicular metastasis from prostate adenocarcinoma can be challenging for pathologists, especially when the lesion is poorly differentiated. This was the case with our patient, where the initial pathological reading indicated adenocarcinoma of the rete testis but was later corrected after reevaluation in our hospital with immunohistochemical analysis. The neoplasia can mimic primary testicular germ tumors or lymphomas. However, a secondary prostatic tumor can be identified based on the patient's prostate cancer history, an antibody PSA positivity, atypical morphology for a germ cell tumor, and negative results from immunolabeling with specific antibodies against alpha-fetoprotein, PLAP, CD117, and CD30.

The prognostic implications of testicular metastasis from prostatic carcinoma have been examined in a few studies. Some suggest it signals a poor prognosis, Lu et al., found that the mean survival period after orchiectomy was 12.8 months in patients with prostate cancer and 7.4 months in those with other forms of cancer, while others report more favorable outcomes, such as a case where a patient with isolated testicular metastasis remained disease-free with undetectable PSA levels for over 5 years after orchiectomy.

Conclusion

This case report underscores the importance of vigilant clinical follow-up for individuals with prostate cancer. In addition to monitoring for local recurrences or metastases in common locations, it is crucial to consider the possibility of rare metastatic sites, such as the testis and para-testicular structures, when there is an elevation in serum PSA levels. Any identification of a testicular mass in a patient with a history of prostate carcinoma should trigger suspicion. To achieve an accurate diagnosis, a comprehensive approach involving a total radical orchiectomy along with histological and immunohistochemically analyses is imperative. His prognosis remains controversial depending on the series.

Competing Interests

We (authors) declare that we have no conflict of interest.

Authors' Contribution

Khalid hadadi and Mouhcine Hommadi contributed equally to the work and should be considered co-first authors, El ktaibi Abderrahim, Maroua Benlemlih, Elamin Marnouch, Abdelhak Maghouss, Amine Bazzine, Noha zagbha, Issam Lalya, Khalid Andaloussi Saghir, Mohammed Elmarjany, Oukabli Mohamed and Hassan Sifat designed and coordinated research and drafted the manuscript. All authors read and approved the final manuscript.

Acknowledgement

All the authors are thankful for providing the necessary facilities for the preparation the manuscript. Special thanks are due to the Faculty of Medicine and Pharmacy of Rabat; the source(s) of funding for all authors.

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How to cite this article: Hadadi, Khalid, Mouhcine Hommadi, Elktaibi Abderrahim, and Oukabli Mohammed, et al. "A Rare Case of Isolated Testicular Metastasis from Prostate Cancer Imitating a Primary Testicular Cancer: Case Report and Review of the Literature." *J Oncol Med Pract* 10 (2025): 295.