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Case Report Open Access

Elevation of PSA Levels 9 Months after Radical Prostatectomy – A Rare Case of Testicular Metastasis, Secondary to Prostatic Adenocarcinoma

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Abstract

Prostatic adenocarcinoma (PCa) is one of the major contributors to malignancy in men worldwide and second leading cause of cancer death after lung cancer. PCa is an aggressive disease and shows a strong predilection to metastasize into the bones and pelvic lymphatic nodes. In contrast, the metastatic spreads into testicles are rare, accounting up to 4% of all prostate cancer (PCa) cases. Here we present a case from our practice of unilateral testicular metastasis, developed secondary to prostatic carcinoma and diagnosed 6 months after radical prostatectomy. A 69-year-old man presented to our outpatient department for regular follow-up 9 months after radical prostatectomy. The final pathological diagnosis demonstrated pT2b N0M0, Gleason 4+3. His preoperative PSA was 11.2 ng/ml. Preoperative imaging (CT and bone scan) was negative for distant metastases. Nine months later, he presented in our outpatient clinic with left painless testicular swelling. The metastatic work-up, including CT, was negative. However, his serum PSA levels reached 2.09 ng/ml compared with postoperative values 0.04 ng/ml. Testicular ultrasound demonstrated heterogeneous mass in left testicular parenchyma. The postoperative elevation of PSA with ultrasonographic findings suggested that it might be a metastasis, originating from the primary PCa. The left inguinal orchiectomy confirmed our primary preliminary diagnosis. We present a rare case of left testicular metastasis from prostatic adenocarcinoma nine months after radical prostatectomy.

Keywords: Prostate cancer; Prostatectomy; Testicular metastasis; PSA

Abbreviations: PCa: Prostate Cancer; PSA: Prostate Specific Antigen; CT: Computed Tomography Scan

Introduction

Prostate adenocarcinoma most commonly metastases in bone, lymph nodes, lungs, liver, pleura, and adrenal glands. However, its spread into testicles is a very rare condition. In addition, metastasized in testicles PCa can be detected as an incidental finding on autopsy studies up to 2.5% [1-3]. Testicular pain and swelling, along with the elevation of serum PSA but normal levels of α-fetoprotein and human choriongonadotropin, combined with the ultrasonographic findings in testicular parenchyma, necessitate surgical exploration and the histopathological analysis will confirm the diagnosis.

Here we report the case of patient with PCa metastasized in the left testis, diagnosed 9 months after radical prostatectomy and lymphadenectomy, due to significant elevation of serum PSA and evidence of a left-sided palpable mass in the scrotum. The pathology of performed left orchiectomy confirmed metastasis from prostate adenocarcinoma. After one year, patient has no signs of biochemical and clinical recurrence and is free-of disease.

Case Presentation

A 69-year-old man presented to our outpatient department for a regular follow-up after radical prostatectomy and pelvic lymphadenectomy for prostate cancer, performed in another institution 9 months ago. Although preoperative PSA was 11.2 ng/ml, the preoperative metastatic evaluation, that included computed tomography scan (CT) of the abdomen and pelvis was negative. Bone scan imaging did not show any presence of skeletal metastases. Histopathological examination revealed adenocarcinoma of the prostate with a Gleason score of 8 (4+3), pT2b N0M0. In addition, the surgical margins and six pelvic lymph nodes were free of metastases.

However, two months later the patient noticed a progressive increase in size of his left testicle, accompanied with tenderness and discomfort. In addition, his serum PSA level increased gradually from 0.04 ng/ml to 4.09 ng/ml for a period of 7 months. At examination, the patient presented with left testicular swelling and serum PSA levels increased to 6.06 ng/ml. CT of the abdomen and pelvis did not revealed any evidence for recurrence or distant metastases. The chest X-ray was also normal. However, the ultrasonography of the scrotum showed left intratesticular heterogenous mass (Figure 1). Laboratory results for alpha-fetoprotein, human chorionic gonadotropin and lactate hydrogenase were negative. The renal and liver functions, along with the complete blood count were in normal ranges. A left inguinal orchiectomy was performed. Macroscopic examination of the resected testis revealed a solid yellowish-white tumor of 30 × 15 × 20.1 cm. The spermatic cord was nonspecific. Histopathological analysis showed

that the left testis was infiltrated by prostatic adenocarcinoma with a Gleason score of 8 (4+3). Microscopically, a diffuse tumor infiltration was found, with features of prostatic adenocarcinoma and cribriform glandular fusion, Gleason pattern 4. The stroma demonstrated desmoplastic changes without significant inflammation (Figures 2A-2D). Additional immunohistochemical examination revealed that tumor cells were diffusely positive for PSA and P504s (Figures 3A and 3B). These findings confirmed the prostatic origin of the tumor and the patient was diagnosed with left testicular metastasis of PCa.

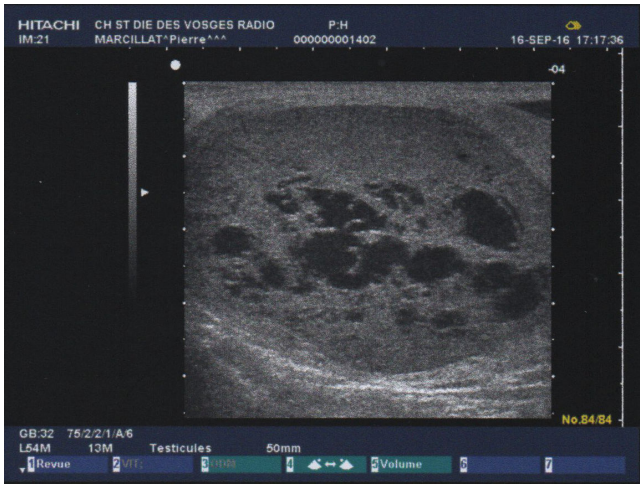

Figure 1: Ultrasonography of the tumor mass in the left testis.

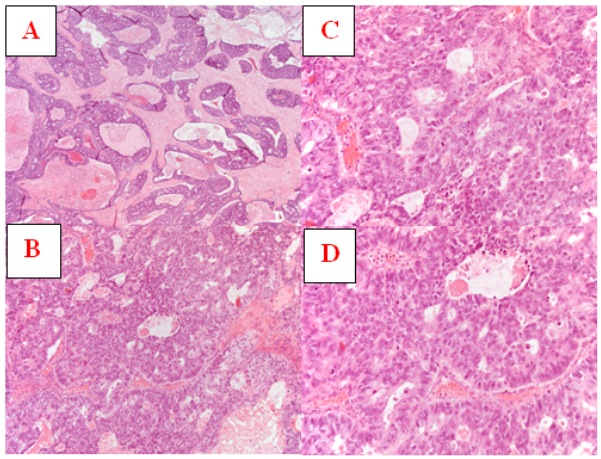

Figure 2: Histology shows diffuse tumor infiltration with features of prostatic adenocarcinoma with cribriform glandular fusion, Gleason pattern 4. The stroma is desmoplastic, without significant inflammation, no residual testicular tissue represented here. (A-H&E × 40, B-H&E × 100, C-H&E × 200, D-H&E × 400).

After the operation, the patient regularly attends follow-up examinations. His last serum PSA level was 0.5 ng/ml, CT scan and ultrasonography of the right testis showed no recurrence or metastatic involvement. The patient is asymptomatic and disease-free and continues his follow-up of serum PSA.

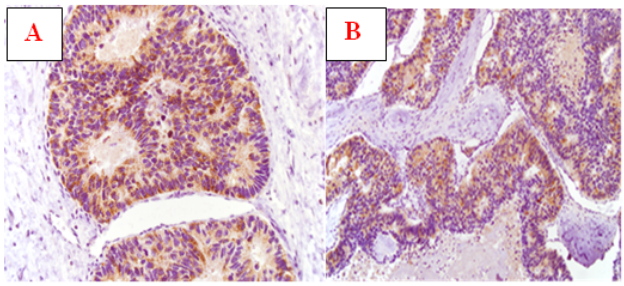

Figure 3: Immunohistochemical staining shows strong positivity for PSA (A) and P504s (B), confirming the prostatic origin of the tumor.

Discussion

Prostatic adenocarcinoma has an overwhelming predilection to involve the bone (84%), followed by distant lymph nodes (10.6%), liver (10.2%), and lungs (9.1%) [4]. However, the involvement of testicles is a rare condition [5]. Semans first reported in 1938 the case of testicular metastasis, secondary to prostatic carcinoma [6]. Despite the anatomical proximity of the prostate to testis, testicular involvement is uncommon [7] and to date, around 200 cases have been reported [8]. Epididymal involvement is also rare, if not exceptional [9]. Several authors have suggested that metastatic prostatic carcinoma in the testicles is a sign of advanced disease, however, to date its prognostic significance is still unknown [10]. According to the world literature, the incidence of prostatic metastases in testicles is in up to 4% and 2.5% of autopsy studies [11]. In addition, Johansson and Lannes reported that 4% of testicular metastases, incidentally found during orchiectomies for castration of advanced prostate cancer [12-16]. In a large study of Bubendorf and al, from a studied cohort of 1589 patients with PCa, the most frequent metastases were found in the bone (90%), followed by lung (46%), and liver (25%) [17]. On the contrary, metastases in the testes comprised only 0.5% [17]. The mechanism of testicular involvement during the PCa dissemination most probably includes retrograde venous or arterial embolism, lymphatic extension and endocanalicular spread [17,18]. In addition, the involvement of urethra by the prostatic tumor mass increases the risk of testicular metastases [4]. In our case, the plausible mechanism is the haematogenous route *via* arterial embolism.

Usually, the clinical manifestation includes painful or painless testicular swelling, followed by elevated levels of PSA, and eventually history of prostatic cancer. However, the tumor markers, specific for testicular neoplasms like α-fetoprotein and human horiongonadotropin, are negative. Radiological tests, such as ultrasonography or CT are non-specific for this cancer and the only method for the precise diagnostics remains the surgical exploration, followed by histopathological examination, where the histological features of testicular metastasis are similar to these of primary PCa [18]. Interestingly, the unilateral involvement is more common than bilateral [19]. Clinical findings of testicular involvement from prostatic adenocarcinoma are inconsistent and only histopathological analysis can precisely diagnose the underlying malignant disease.

Conclusion

This case highlights the natural behaviour of prostatic carcinoma and the need for careful follow-up of patients with prostate cancer. Besides the typical sites of metastasis, every urologist should keep in mind the possibility of involvement of more rare sites, such as testicles. Therefore, the rising PSA in patients after radical prostatectomy that is accompanied with testicular swelling necessitates performing of detailed metastatic work-up, including testicles. This is important for the timely recognition of an isolated, locally curable metastatic disease, which every urologist must keep in mind before the initiation of treatment for biochemical recurrence of PCa.

Acknowledgement

We dedicate this paper in memoriam to our colleague, friend and teacher Prof. Alexander Hinev, suddenly deceased in November 2017.

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