Case Report

Carcinoma prostate with intradural metastasis: A case report and review of the literature on a rare entity with dismal prognosis

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ABSTRACT

Prostate carcinoma is the second most common cancer in men. While bone metastasis is more common in carcinoma prostate, dural metastasis is an uncommon diagnosis. Nowadays, men with castration-resistant prostate cancer (CRPC) have shown increase survival with the introduction of better chemotherapy regimens. Here, we present the case of a heavily pre-treated CRPC patient of age 69-year-old who developed metastasis to dura mater. The patient presented with complaints of increased urinary frequency and urgency with bilateral inguinal lymphadenopathy. The ultrasonography-guided biopsy showed acinar adenocarcinoma of the prostate with a Gleason score of 4 + 4 = 8 and TNM staging of T1N3M1b. He was treated initially with hormonal therapy. Subsequently, he developed castration resistance and was advised docetaxel-based chemotherapy. However, on follow-up, the patient developed dural metastasis. Metastases to dura mater should be considered as a differential diagnosis in advanced CRPC with neurological symptoms.

Key words: Castration resistance prostate carcinoma, Dural metastasis, Prostate carcinoma, Survival

Prostate cancer is the second most diagnosed cancer and the fifth leading cause of cancer death in males worldwide [1]. A recent report from the National Cancer Registry Programme, India, states the crude rate of carcinoma prostate being 5.7% [2]. Prostate cancer typically metastasizes to the axial skeleton, pelvic, retroperitoneal lymph nodes, lungs, liver, and less frequently to the central nervous system [3]. Only 0.04% of carcinoma prostate cases metastasize to dura mater [4]. Hence, dural metastasis considers as a differential diagnosis in metastatic carcinoma prostate with neurological symptoms.

CASE REPORT

A 69-year-old male with unremarkable medical and surgical history presented with increased urinary frequency and urgency for 4 months. General physical examination was unremarkable except for the presence of bilateral inguinal lymph node lymphadenopathy. On digital rectal examination, a hard, non-tender, nodular prostate was palpable of approximately a volume of 60 cc. The initial prostate-specific antigen (PSA) level was 1540 ng/ml.

Transrectal ultrasound-guided biopsy and histopathological examination of the specimen showed acinar adenocarcinoma of the prostate. The Gleason score was 4 + 4 =8 (Fig. 1) and the TNM staging was T1N3M1b due to the involvement of para-aortic (Fig. 2a) and pelvic lymph node along with skeletal metastasis (Fig. 2b).

The patient was advised for bilateral orchidectomy with hormonal therapy and bisphosphonate. On subsequent follow-up, the patient was found to be castration resistant due to a progressive rise in serum PSA and increase size in the pelvic lymph node. The patient was advised for chemotherapy with docetaxel and prednisolone. Following the completion of chemotherapy, he was on follow-up.

After 8 months, he presented with complaints of severe headaches and projectile vomiting. Brain magnetic resonance imaging (MRI) showed an enhancing dural lesion in the left posterior parietal region (Fig. 3). PSA was elevated (2250 ng/ml). On contrast-enhanced computed tomography (CECT) imaging, no evidence of pulmonary and hepatic metastasis was found. The patient was subsequently started on palliative whole-brain irradiation and steroids. After completion of the palliative radiation, the patient was on tablet abiraterone 1000 mg once daily and after 3 months succumbed to the metastatic disease.

DISCUSSION

The most common site of metastasis in carcinoma prostate is bone and pelvic lymph node [5]. Dural metastases are more

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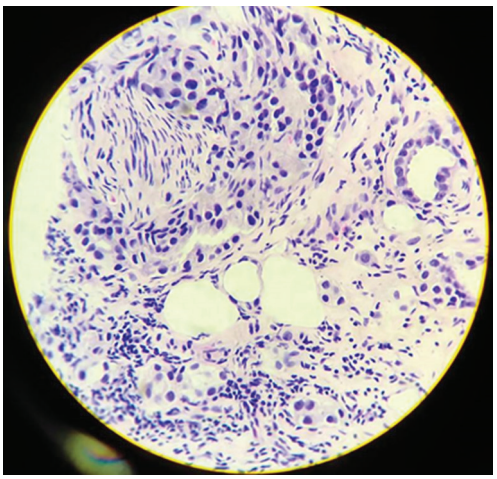

Figure 1: High-power view showing tumor cells arranged in the acinar pattern lined by a single layer of epithelium. Tumor cells have prominent nucleoli

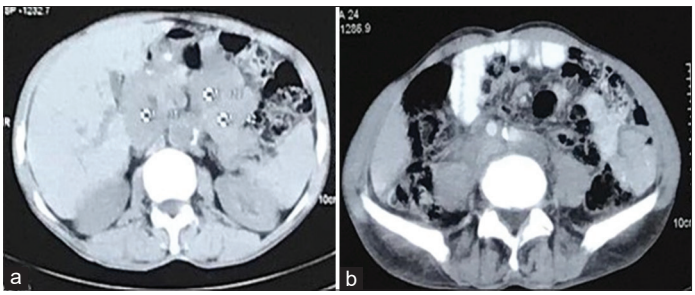

Figure 2: Contrast-enhanced computed tomography scan of the abdomen and pelvis showing (a) para-aortic lymphadenopathy and (b) pelvic lymphadenopathy

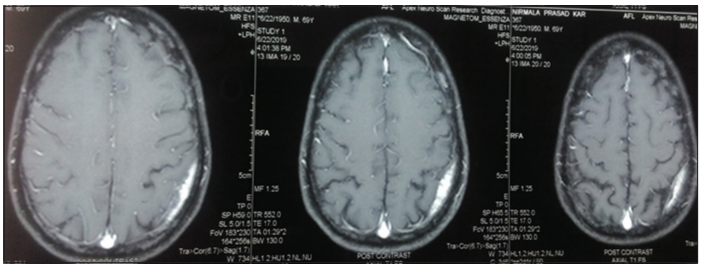

Figure 3: Magnetic resonance imaging brain T1+ contrast sequence showing a dural enhancing lesion in the posterior parietal region

common in solid tumors, that is, breast and lung malignancy but a rare finding in prostate cancer [5,6]. In 2003, Trement-Lukats *et al*. reviewed a series of 16,280 patients with prostate cancer and only nine cases showed dural metastasis [4]. Another single institutional study found that approximately 0.04% of metastatic carcinoma prostate showed dural metastasis [4]. However, on autopsy specimens, dural metastasis was found in 19.5% of all prostate cancer cases [5].

With the advent of newer chemotherapy drugs, the overall survival of castrate-resistant prostate cancer (CRPC) increased [7], leading to improve diagnosis of previously undiagnosed dural metastasis. CRPC is defined by disease progression despite androgen depletion therapy and may present as either a continuous rise in serum PSA levels, the progression of pre-existing disease, and/or the appearance of new metastases [8]. We hypothesize that the improved treatment regimens and resultant increased survival in patients with CRPC may allow for the progression of disease in once rare sites of metastasis, including the cranial dura.

Several mechanisms are proposed for dural metastasis in metastatic carcinoma prostate. Batson's theory suggests the direct retrograde flow of tumor cells to the cranium through the vertebral vein [9]. A multistep or cascade theory suggests that metastases occur first in the bone then move more distally [10]. Our case shows more consistency with multistep theory as there is more extensive bone metastasis before dural metastasis.

Dural metastasis in CRPC shows a spectrum of symptoms, including increase intracranial tension, headache, vomiting, seizure, cranial nerve palsy, and deteriorating mental status and level of consciousness. The neurological symptoms in CRPC arise a high clinical suspicion of dural metastasis and warrant a CECT scan or MRI for early detection. CECT shows the advantages of detecting the involvement of the cranium, while MRI shows better detection of dural metastasis with the finding of thickening hyperintense dura mater [11].

Due to the rarity of cases, no definitive management for dural metastasis was proposed. High-dose dexamethasone can produce symptomatic relief in the absence of cerebral edema [12]. Surgical resection of dural metastasis can be considered in single metastasis with severe symptoms [13]. Stereotactic radiosurgery alone or with whole-brain radiation can consider as the most efficient treatment [14]. Most of the patients received numerous therapies before the onset of distance metastases, including docetaxel-based chemotherapy and hormone therapy. Hence, decisions regarding further treatment should be individualized. Various newer agents such as abiraterone or enzalutamide can be considered as other treatments. However, despite various treatment options, overall survival in CRPC with dural metastasis is inferior, with a median survival of 3–4 months [15].

CONCLUSION

Although a rare entity dural metastasis should be considered as a differential diagnosis in CRPC with the neurological symptom, despite all available treatment, dural metastasis in CRPC has a poor prognosis and overall survival.

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