Dural Metastases in Advanced Prostate Cancer: A Case Report and Review of the Literature

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Key Words

Prostatic neoplasm • Metastasis • Dura mater

Abstract

Dural metastases from advanced prostate cancer are considered an uncommon diagnosis. However, autopsy studies show a high association between advanced prostate cancer and metastases to the meninges. Because the overall survival of advanced prostate cancer patients is expected to improve with the advent of new therapies, the incidence of clinically relevant dural metastases from prostate cancer will likely increase. We present a case of a heavily pre-treated castration-resistant prostate cancer patient who developed metastases to the dura mater. This entity should be considered in the differential diagnosis of any patient with advanced castration-resistant prostate cancer and neurological symptoms. Clinicians should also be aware of the poor prognosis and survival rates associated with the condition.

Case Report

A 47-year-old male with an unremarkable medical history, presented with increased urinary frequency and a prostate specific antigen (PSA) level of 162 ng/ml. Further studies confirmed the diagnosis of adenocarcinoma of the prostate, Gleason Score 8, stage cT2N1M1 due to pelvic lymph node and bony metastases. The patient was then started on complete androgen blockade with goserelin and bicalutamide. In May 2008 the disease was considered castration resistant and chemotherapy with docetaxel and prednisone was initiated along with 3-weekly bisphosphonates. The patient required second line treatment with mitoxantrone and prednisone that added limited clinical and PSA benefit. In August 2009 the PSA was 1,210 ng/ml and the patient had diffuse bone pain. On radiologic evaluation bony, lymph node, and liver metastases were observed. After 3 cycles of weekly paclitaxel the patient presented in clinic with signs of left peripheral facial nerve palsy; neurology consultation confirmed the clinical suspicion and a brain MRI revealed the presence of dural metastases invading the course of the left 7th cranial nerve (fig. 1). The patient was then started on steroids and sent to the radiation oncology department for palliative treatment. Unfortunately, he died shortly after completing the radiation treatment.

Discussion

Dural metastasis from metastatic prostate cancer was noted in only 28 of 6,282 patients (0.04%) in a single-institution study [1]. However, upon autopsy, dural metastasis can be found in up to 19.5% of all prostate cancers cases [2]. With recent trials for various new drugs

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Fig. 1. T1 weighted image after contrast media administration (gadolinium). **a** Axial scan that shows diffuse dural enhancement (star) and osseous lesions in the calvarium with left occipital dural metastases and left frontal dural lesion (*). **b** Axial scan showing cerebellum pontine angles. Small metastases within the left internal auditory canal (arrow).

showing improved overall survival for castration-resistant prostate cancer [3], it is likely that more of these previously clinically insignificant cases of dural metastases will become relevant. Thus, an understanding of the proper diagnosis and treatment of dural metastases will become more important in the treatment of advanced prostate cancer.

The most likely form of prostate cancer metastases spread to the dura is hematogenous through the caval system or retrograde seeding by the valveless Batson venous system [2]. The spectrum of symptomatic presentations is wide including increased intracranial pressure, headaches, seizures, cranial nerve palsy, and deteriorating mental state and level of consciousness [4].

A suspicious non-contrast-enhanced CT accompanying the above symptoms warrants contrast-enhanced CT scans or MRI. The former has the advantage of detecting bone involvement while the latter provides better contrast resolution and is considered the superior means of detection of dural metastases and delineation of soft tissue involvement [5]. The most frequent finding is a thickening of the dura mater with intense contrast enhancement. A nodular pattern is also possible [4]. Dural metastases may also induce a classic subdural hematoma [5]. Differential diagnoses should include meningioma, and lymphoma [4].

No standard of treatment has been clearly defined for the management of dural metastases. High dose dexamethasone

methasone can produce symptomatic relief even in the absence of cerebral edema [6] and evacuation of symptomatic subdural hematoma should be considered. Surgical resection is rarely performed and is only reserved for single metastatic lesions causing severe symptoms [7]. Stereotactic radiosurgery either alone or in combination with whole brain radiotherapy seems to be a safe and effective treatment option [8]. In spite of various treatment options, the outcome of patients with advanced cancer and dural metastasis is poor with an estimated median survival of 3 to 4 months [9].

In conclusion, metastases to the dura mater should be considered in the differential diagnosis of any patient with advanced castration-resistant prostate cancer and neurological symptoms. This entity will probably become more frequent as overall survival of advanced prostate cancer patients improves. A prompt diagnosis should lead to an appropriate treatment. In addition, clinicians should note the poor prognosis and survival rate associated with the condition.

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