Case Report

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Pathology Section

Prostatic Adenocarcinoma Presenting Primarily as Orbital Space Occupying Metastatic Lesion: A Rare Case Report

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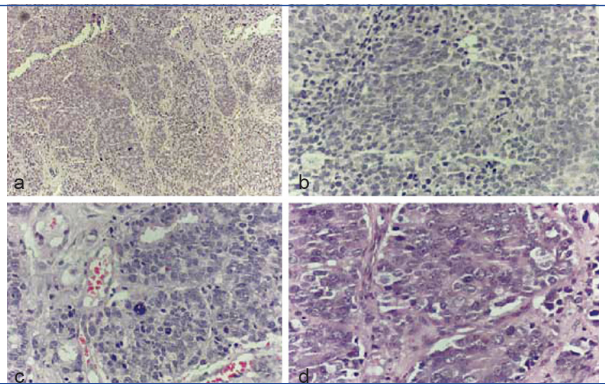
ABSTRACT

Brain metastasis from prostate cancer is very rare, occurring in less than 1% of metastatic cases. Brain metastasis may be misdiagnosed as a primary brain tumour on imaging. We present a case of a 65-year-old male patient, who presented to the Ophthalmology department with left eye swelling, lid oedema and proptosis. Clinically, provisional diagnosis of left orbital cellulitis had been made. MRI of brain showed features of left fronto-temporal space occupying lesion. The lesion was surgically resected. On the basis of histopathological findings, differential diagnosis of lacrimal duct carcinoma, polymorphous adenocarcinoma and metastatic malignancy had been made. Further investigation showed prostate specific antigen level of 105 ng/mL. Immunohistochemistry (IHC) of antibodies (AR, P53, PSA, AMACR, EGFR, E-Cadherin, CD45, HMB45, S100, Her2neu, GFAP, P63, CD117, CK7, CK20, SMA and Vimentin) applied and after interpretation, diagnosis of metastatic prostatic adenocarcinoma was made. This case was not known to have any prostatic pathology before diagnosis of brain metastasis. Although brain metastasis from prostate cancer is rare, it should be considered in patients presenting with such clinical features. Early diagnosis may contribute to improved survival outcomes.

Keywords: Brain metastasis, Brain space occupying lesion, Prostate adenocarcinoma

CASE REPORT

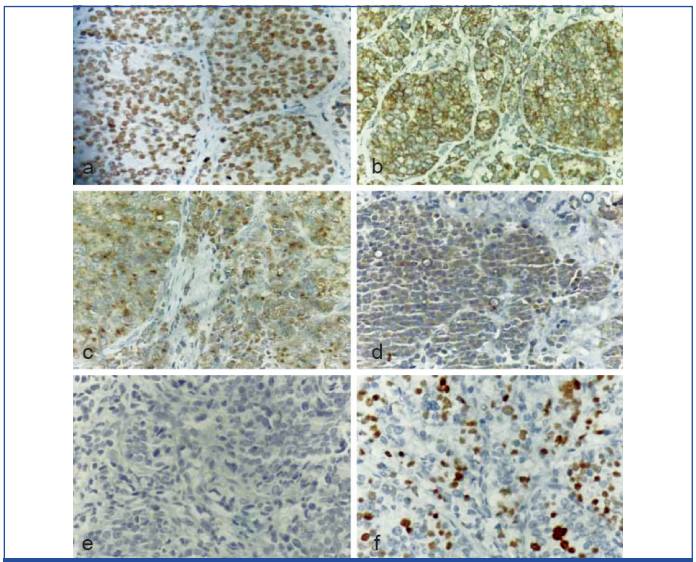
A 65-year-old male presented with the left eye swelling, dull aching pain, and lid oedema since 3 months. Patient had taken local treatment at another facility, and the pain and swelling subsided for sometime; however, patient redeveloped similar clinical symptoms. Based on the clinical presentation, a provisional diagnosis of left orbital cellulitis was made. The ophthalmologist referred the patient to the Department of Neurosurgery and advised a brain MRI, which revealed a left frontotemporal orbital Space-Occupying Lesion (SOL) with a broad differential diagnosis, including abscess, meningioma, glioma, and metastasis. The patient subsequently underwent a left frontotemporal orbitozygomatic craniotomy with left orbitotomy. All routine preoperative investigations were within normal limits. On gross examination, the surgical specimen comprised multiple grey-brown soft tissue fragments measuring an aggregate of 4 × 3 × 3 cm. Microscopically, sections demonstrated a tumor arranged in irregular sheets, lobules, and trabeculae. The tumor cells exhibited round to oval nuclei with irregular chromatin, prominent nucleoli, and ill-defined cytoplasm. Areas of tumor necrosis and clusters of histiocytes were observed focally. Lymphovascular and perivascular invasion were evident. The mitotic count was 3–5 per 10 High-Power Fields (HPF). [Table/Fig-1a-d]



[Table/Fig-1]: Histopathological features- a) H&E staining 100x magnification, tumour cells in sheets, lobules and trabecule; b) H&E 400x, tumor cells showing atypical features; c) H&E 400X, tumor cells showing mitotic figures; d) H&E 400X, tumor cells showing enlarged nuclei, scanty cytoplasm.

On the basis of these features, differential diagnosis of lacrimal duct carcinoma, polymorphous adenocarcinoma and metastatic malignancy were considered. On further investigation serum Prostate Specific Antigen (PSA) was found 105 ng/mL incidentally.

For confirmation of the diagnosis, relevant Immunohistochemistry (IHC) markers on thin sections were applied. IHC of Androgen Receptor (AR), P53, Prostate Specific Antigen (PSA), Alpha Methylacyl CoA Racemase (AMACR), Epidermal Growth Factor Receptor (EGFR), P63, Cytokeratin (CK)-7, CK-20, E-Cadherin, Human Melanoma Black (HMB45), S100, Human epidermal growth factor receptor-2 (Her2neu), Glial Fibrillary Acidic Protein (GFAP), Cluster of Differentiation (CD)-117, Smooth Muscle Actin (SMA), Vimentin and CD-45 were applied. On interpretation, tumour cells showed positive immunoreactivity for AR, P53, PSA, AMACR, EGFR, and E-Cadherin. A negative expression of tumour cells for CD45, HMB45, S100, Her2neu, GFAP, P63, CD117, CK7, CK20, SMA and Vimentin was also observed [Table/Fig-2a-f].



[Table/Fig-2]: Immunoreactivity interpretation- a) Micrograph showing positive immunoreactivity for AR; b) Positive for AMACR; c) positive for PSA; d) Negative for CK7; e) Negative for HMB45; f) Positive for P53.

On the basis of above IHC results, diagnosis of metastatic prostatic adenocarcinoma was established. Patient was referred to urology and oncology for further management.

DISCUSSION

Brain metastasis from prostate cancer is rare (0.2-0.63%) and dural based metastasis may mimic meningioma [1,2]. Prostate cancer has a predilection to metastatise to bones and lymph nodes and very rarely to Central Nervous system (CNS) [1]. Most prostate adenocarcinoma cases who acquire CNS metastasis are initially asymptomatic and can be misdiagnosed as abscess, subdural haematoma or meningioma on plain CT scan [2]. Brain metastasis preceding the diagnosis of primary prostate cancer is very rare, though there are few case reports [3]. In this case we diagnosed primary only after brain metastasis.

On evaluation of literature, it was seen that many prostatic adenocarcinomas, which acquired brain metastasis, were initially asymptomatic (as seen in our case too). These lesions are prone to be neglected in medical practice and misdiagnosed as abscess, subdural hematoma or meningioma, on radiological examination [2].

In this case clinical symptoms suggested diagnosis of left eye orbital cellulitis. Radiological investigation (MRI) predicted a primary Brain SOL. On histopathological examination, lacrimal duct carcinoma, and polymorphous adenocarcinoma were the other differential apart from metastatic malignancy.

Polymorphous adenocarcinoma is diffusely positive for CK7, S100, SOX10 etc. Focal expression of GFAP, SMA and MSA can be seen in these cases. But our results excluded this differential. [4] Kubota T et al., stated in their study that lacrimal duct carcinoma typically exhibits Estrogen Receptor (ER) positivity and may demonstrate HER2/neu overexpression [5]. HER2/neu was negative in the present case, while serum PSA levels were extremely high. Moreover, high PSA level significantly increases the possibility of metastasis of prostate cancer [6]. Central Nervous System (CNS) metastasis preceding the diagnosis of primary prostate cancer is extremely rare though there are few case reports [3] Ogunbona OB et al., found in their study, eight cases of brain metastasis, with no prior diagnosis of prostate cancer [7]. Recently, Nhungo CJ et al., also presented a case of advanced prostate cancer with brain metastasis without urinary symptoms. That case had no history of lower urinary tract symptoms, haematuria, or bone pain. Digital rectal examination revealed a soft prostate. Only after performing an abdominopelvic MRI, the primary prostatic lesion was identified and diagnosed as prostate cancer. Only after an abdominal pelvic MRI, the primary lesion of prostate cancer was diagnosed [8]. Ajmal N et al., presented 21 cases of metastatic prostate adenocarcinoma of the brain. They outlined two cases, presenting clinical features of metastasis with no prior history (Clinical diagnosis of glioma had been made). Later MRI confirmed the diagnosis of prostate cancer [9].

In the present case, appropraiate IHC panels for diagnosing metastatic malignancy had been applied. CK7, CK20 were negative, PSA was positive. Other IHC markers eg GFAP, S 100, CD45, HMB45, Her2neu, P63, CD117, SMA, and Vimentin were used to exclude metastasis from other common primaries. Soon after the histopathological diagnosis, prostate MRI (abdominal pelvic MRI) was performed, which showed features of prostate cancer. Patient was referred to higher centre for radiation therapy and androgen deprivation therapy.

CONCLUSION(S)

Diagnosis of this case was challenging to the clinician. First clinical diagnosis was left eye orbital cellulitis. After MRI of brain, diagnosis was brain SOL, and only after histopathological examination and IHC , final diagnosis of metastatic prostate cancer has been made. Metastatic prostate cancer in the brain may often be confused with primary brain tumors such as meningioma and haemangioblastoma. This case was not known to have any prostate malignancy before diagnosis of brain metastasis. So a thorough radiological and histopathological examination is necessary in these types of cases.

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