

Calvarial-orbital Metastasis of Prostate Carcinoma which was Diagnosed with Sixth Cranial Nerve Palsy

Abstract

Sixth nerve palsy is frequently due to infectious orbital lesions, trauma, elevated intracranial pressure, brainstem lesions, and vasculopathies. Here, we describe a rare cause of sixth cranial nerve (CN) palsy secondary to calvarial and orbital metastasis of prostate carcinoma. The diagnosis of the prostate carcinoma with sixth CN palsy is a very rare condition. A 66-year-old male patient presented with complaints of blurred vision, double vision, and inability to move outward in the right eye for 3 weeks. Magnetic resonance imaging revealed a right orbitocalvarial mass and the mass surgically removed completely. Pathologic findings were compatible with prostate adenocarcinoma metastasis. After surgical removal, significant improvement in sixth CN palsy was observed.

Keywords: Calvarial, cranial nerve, metastasis, prostate

Introduction

The incidence of prostate cancer is increasing rapidly across worldwide. The most important step for raising the survival rate in prostate cancer is early diagnosis. For early diagnosis, clinicians need to know better about the metastatic sites and clinical findings of these metastases besides primary signs of prostate cancer.

The most common sites of metastasis of prostate cancer are lymph nodes, bone, lung, and liver, there is a bone metastasis at diagnosis in 15–25% of patients.^[1,2] The pelvis and spine are frequent localizations for bone metastases, but orbital and calvarial spread is extremely rare.^[3] A review of the literature showed that totally 48 patients with metastatic prostate carcinoma to orbita have been reported.^[4] Two-third of these patients were previously known prostate cancer patients while one-third of them have been diagnosed with metastasis signs to the orbita. As we defined in our case, only 2 cases have been diagnosed with sixth cranial nerve (CN) palsy.

Case Report

A 66-year-old male patient was admitted to our department with complaints of blurred vision, double vision, and inability to move outward in the right eye for 3 weeks. He was hospitalized in our clinic upon the

mass had been detected in right orbita, frontal bone, and sphenoid wing on brain magnetic resonance imaging (MRI) and computed tomography (CT) analyses [Figure 1a and b]. We also scanned spinal cord (contrast-enhanced MRI of the cervical, thoracic, and lumbar area) and other intracranial areas including clivus, skull base, brainstem, cerebellum, and cerebrum with contrast-enhanced brain MRI; no pathological abnormalities were determined. Neurological examination was normal except 6th CN palsy in the right eye. There was no any urinary tract symptom. In clinical examination, vital findings, blood glucose, complete blood count, erythrocyte sedimentation rate and liver enzymes were normal, and there was no pathology in the abdomen and thorax CT. A whole-body bone scintigraphy revealed osteoblastic activity to the right orbital and calvarial bones, other bones were normal.

The calvarial-orbital mass was totally excised with orbitozygomatic craniotomy in our clinic [Figure 2a and b]. Complete lateral gaze palsy was rapidly improved in the early period after surgery [Figure 2c]. The patient's postoperative bone window CT showed that the mass was totally removed [Figure 2d]. Surgically excised mass was diagnosed as prostate adenocarcinoma metastasis, so prostate biopsy was performed on the patient and the diagnosis was confirmed. The patient

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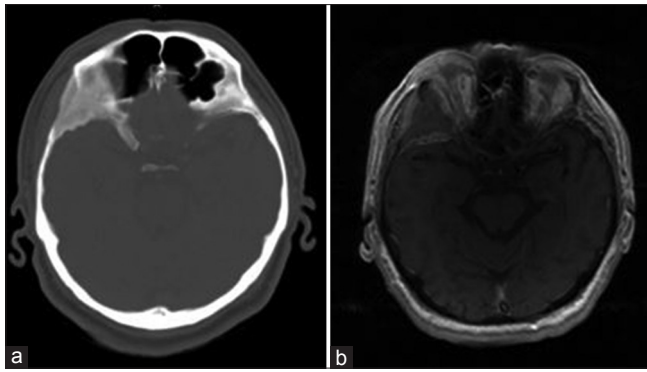


Figure 1: The mass in the right temporal bone, orbita, and sphenoid wings in the patient's bone window computed tomography (a) and the mass lesion which includes peripheral contrast uptake and spreads to lateral rectus in superolateral region of the right orbit in the patient's contrast-enhanced brain magnetic resonance imaging (b)

has been continued to treatment by oncology department; in the 54th month after surgery follow-up, neuroradiological examinations revealed no metastatic tumors in different areas.

Discussion

The most common metastatic sites for prostate cancer are regional lymph nodes (26.2%), bone (19.7%), distant lymph nodes (18.4%), lung (12.8%), and liver (7.8%).^[1] The prostate carcinoma metastasis has been reported in atypical areas such as orbita, peritoneal cavity, larynx, maxillary sinus, adrenal glands, the inside of the inguinal hernia sac, mandible, pituitary fossa, and clivus.^[5]

Cancer metastasis to orbita is a relatively uncommon condition.^[1,3,4] The patients with orbital metastatic cancer, in 75% of them there is a history of a known primary tumor, but in 25% of patients the orbital metastasis is the first sign.^[6] The major primary sites for orbital metastasis are the breast, lung, prostate, and melanoma, with prostate cancer being responsible for 8.3% of these cases.^[7] Prostate carcinoma metastasis is considered to spread in the brain, calvarium, and orbita by two ways.^[8] First, it spreads directly through paravertebral venous plexus. Second, it spreads initially to the areas such as lung and bone where prostate cancer frequently metastasizes and then it spreads secondarily by seeding from here. In our case, normal abdominal and thoracic CT, lack of involvement in bone scintigraphy has suggested that metastasis occurred directly through paravertebral venous plexus.

In the literature review of the atypical clinical features of metastatic prostate cancers, the involvement of CNs 2,3,5,6,7,8, and 12 was encountered even though it is rare.^[2,3,5,8-10] While most of these involvements consist of known prostate cancer patients, the number of cases who are diagnosed with CN palsy is very small as in our case. Clinicians should remain vigilant in terms of prostate carcinoma metastasis in male patients with CN palsy.

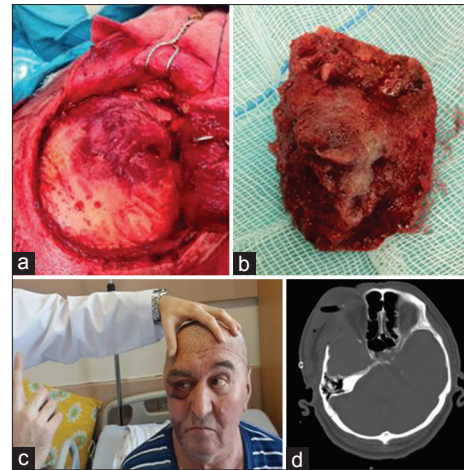


Figure 2: Intraoperative imaging of osteoblastic tumor in orbital-frontal-sphenoid bone (a and b). Significant improvement in the 6th cranial nerve palsy in patient's early neurological examination (c). The patient's early postoperative bone window computed tomography (d)

Clinical signs develop with nerve infiltration or direct compression of nerve in prostate metastases causing CN involvement.^[11] Localization is usually cranial base and clivus in the patients with metastatic prostate cancer who have 6th CN involvement, clinical findings appear as a result of nerve infiltration.^[8,12] It has caused 6th CN palsy without cranial base involvement, it is another aspect of our case rarity and a rapid improvement after surgical intervention.^[11,12]

The average life expectancy is 4 months after the CN involvement in patients who have prior prostate cancer diagnosis.^[8,9] Interestingly, the average life expectancy is up to 84 months in cases of prostate cancer diagnosed with CN involvement.^[9,13] In our case, he continues his life in the 54th month with Karnofsky performance status scores of 70%. This can be explained by metastatic load and its prognostic significance.^[13] In the present case, there was only orbito-calvarial metastasis and metastatic load was less than advanced state carcinoma which include multiple spine, lymph nodes, liver, and lung metastasis.

There is insufficient information in the literature regarding the impact of a new chemotherapy or hormonal therapy on the clinical findings of the CNs in metastatic prostate carcinomas causing CN involvement. It has been suggested that the radiotherapy may lead to partial neurological improvement and it should be immediately started when the CN involvement.^[9,10] Based on the rapid neurological improvement in our case, we consider that if the neural structure is in a surgically decompressed localization, surgical excision may be an alternative treatment. Therefore, we preferred orbitozygomatic craniotomy to orbitotomy for wide sixth nerve decompression.

While typical prostate cancer metastases are often seen in advanced stages of the disease, distant metastases can

sometimes be the first sign of the disease as in our case. Enlightenment of atypical clinical features of metastatic prostate cancers will reduce the diagnosis delays, allow accurate staging and provide a fast, appropriate, and effective therapy.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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