Prostate cancer is the second most common cause of cancer death in men. Death rates have been declining since the early 1990s due to early diagnosis in men without symptoms using prostate-specific antigen screening (PSA) and digital rectal examination. Despite the frequency of bone metastasis in prostatic carcinoma, oculo-orbital metastasis is considered extremely rare. Recent studies have placed prostate cancer as the third most commonly identified primary site for orbital metastasis. This article presents the case of a 69-year-old man with a history of metastatic prostate cancer who presented with pain in his left eye, ptosis, and reduced visual acuity. Cranial and orbital magnetic resonance images (MRIs) demonstrated a moderately-sized metastatic lesion in the left orbit.

CASE PRESENTATION

Patient Presentation and History

A 69-year-old man presented to hospital for evaluation of worsening left eye pain, visual impairment, and droopiness of the upper eyelid. The patient began experiencing left eye pain 1 month ago, which was progressively worse over the past 2 weeks. He reported the pain to be constant, throbbing in nature, and nonradiating. The intensity of the pain was rated 8 on a scale of 10. The pain worsened with eye movement and was mildly relieved by pain medications. The patient initially noted blurry vision, followed by trouble with reading and seeing a distant objects. His wife noted dropping of his left upper eyelid 1 week before his admission.

His past medical history was significant for prostate adenocarcinoma widely metastasized to the axial skeleton system. After radical prostatectomy 3 years earlier, his PSA values improved from 484.9 ng/mL to 26.1 ng/mL. Over the past year, the cancer was responsive to aggressive hormonal therapy, radiotherapy, and chemotherapy. Approximately 1 month prior to admission, his PSA level was 161.1 ng/mL. He also had remote history of deep venous thrombosis. His current medications include controlled-release morphine, pantoprazole, and warfarin.

Physical Examination

Review of systems was notable for absence of headache, fever, neck pain, neuromuscular weakness, and numbness in the extremities. In addition, there was no slurred speech or facial asymmetry, and neither redness or eye trauma were apparent. He described some balance problems related to the eye pain and visual impairment but denied overt disturbance of gait or any falls. He reported a loss of 15 lb over the last 6 weeks. He neither drank alcohol nor smoked tobacco.

Physical examination revealed a thin man who was uncomfortable due to eye pain. His blood pressure was stable and in the range of 140/90 mm Hg, with a pulse of approximately 70 bpm. He was afebrile with normal respirations. Eye examination revealed unequal pupil size: the left pupil was 4.5 mm and did not react. The right pupil was 1 mm and reactive to 0.5 mm with light. An afferent pupillary response was not present on the left side. Extraocular movements were full range in the right eye. In the left eye, there was approximately 40% depression with complete impairment of adduction, abduction, and elevation. There was partial left ptosis (Figure 1).

The optic discs were both flat without any apparent venous congestion on either side. Results of cranial nerve and neurologic examinations were unremarkable, as was the remainder of the systemic examination.

Diagnostic Evaluation

Laboratory testing revealed a leukocyte count of $7.9 \times 10^3$/mm$^3$ (84% neutrophils); hemoglobin level of 12.1 g/dL; hematocrit of 39.2%; and platelet count of $101 \times 10^3$/mm$^3$. Biochemistry test results included sodium, 137 mmol/L (normal, 135–145 mmol/L); potassium, 3.8 mmol/L (normal, 3.5–5.0 mmol/L); urea nitrogen, 10 mg/dL (normal, 10–20 mg/dL); creatinine, 0.7 mg/dL (normal, 0.6–1.1 mg/dL); and...
calcium, 8.0 mg/dL (normal, 8.4–10.2 mg/dL). Coagulation studies showed a prothrombin time of 21.2 s, international normalized ratio of 2.1, and partial thromboplatin time of 124 s.

Cranial and orbital MRIs demonstrated a moderately large mass within the left cavernous sinus extending into the left orbital apex and sphenoid sinus (Figure 2). There was mass effect on the optic nerve and the superior extra ocular muscles.

Clinical Course

On the basis of his medical history and laboratory evaluation, the patient was diagnosed with orbital metastasis of primary prostate cancer. During his hospital stay, his pain was managed with morphine. Radiation therapy was recommended, and the patient underwent external beam irradiation to the left posterior orbit without any complications and was discharged after 2 days. He received several courses of radiation therapy as an outpatient. His symptoms improved over the course of radiation therapy. At approximately 2 months into the treatment, his general status had improved significantly, with resolution of his eye pain and ptosis as well as significant improvement of his vision.

DISCUSSION

Clinical Presentation and Evaluation

Metastatic tumors to the orbit constitute between 9% and 23% of all orbital tumors. Nonepithelial metastatic tumors that occur in the orbit include neuroblastomas, melanomas, and sarcomas. The most common epithelial tumors are believed to be adenocarcinomas originating (in order of frequency) from the breast, lung, prostate, stomach, thyroid, and kidney. As in the current case, most patients who develop metastatic carcinoma to the eye have a known prior cancer and, frequently, other known sites of metastasis as well. However, approximately 25% of patients present with metastatic carcinoma to the eye as the initial manifestation of their cancer. The first case of metastatic prostate carcinoma to the eye was reported in 1872; in 1903, Greenwood and Southard reported a case of metastatic prostate carcinoma of the choroid. Since then, only a few cases of orbital metastasis from prostate cancer have been reported in the literature. Clinical signs of
Prostate cancer can metastasize to the orbit by at least 2 routes: One is through lung metastases: tumor emboli pass via the pulmonary circulation into the carotid arteries and subsequently into the ophthalmic artery. Alternatively, prostatic or vertebral lesions may seed into Batson’s plexus and reach the cranial venous sinuses traveling up to the ophthalmic and vertex veins.

Orbital metastasis is diagnosed by fine-needle aspiration biopsy, ocular enucleation, or evisceration of the orbit. The most appropriate indication for performing a diagnostic procedure is suspicion of metastatic carcinoma in a patient who does not have a history of prior nonocular cancer or is without any concurrent extraocular tumor. Enucleation is a rarely used option for cases of complete blindness or intractable pain. Because of the case patient’s history and elevated PSA value confirmed the diagnosis and an invasive diagnostic procedure was not necessary.

**Treatment**

The treatment of orbital metastasis varies depending on the presence or absence of other metastases elsewhere. Treatment options include chemotherapy, hormonal therapy, and radiation therapy (Table). Radiotherapy options include external beam radiation and plaque radiotherapy, in which a radioactive device (the plaque) is sutured the the sclera that overlies the intraocular tumor. Enucleation is a rarely used option for cases of complete blindness or intractable pain. Because of the case patient’s history of widely metastasized prostate cancer, radiation therapy was elected as a palliative treatment because it can potentially cause tumor regression, restoration of vision, and alleviation of pain.

**CONCLUSION**

Orbital metastasis from prostate carcinoma is a relatively uncommon diagnosis. Two distinct pathways by which cancer cells may reach the orbit exist: hematogenous and via Batson’s plexus. Specific diagnostic and therapeutic options may be prescribed to improve quality of life in patients with such metastasis.

**REFERENCES**


**Table. Treatment Options for Metastatic Carcinoma to the Eye**

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