Case Report

Metastasis of Prostate Carcinoma to the Paranasal Sinuses: A Case Study

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Abstract Primary carcinoma of the paranasal sinuses is extremely uncommon, accounting for only 3% of head and neck malignancies, and 0.3% of all malignancies. Metastatic disease to the paranasal sinuses is even more rare. Here, we present a rare case of metastasis to the maxillary and ethmoid sinuses from a primary tumor of prostate carcinoma in an 85-year-old man.

Keywords paranasal sinuses; sinonasal malignancy; metastasis; ethmoidal cells; maxillary sinus; prostate carcinoma; occult

1. Introduction

Prostate cancer is the most common neoplasm in males in the United States with an occurrence of over 30% of men over the age of 50 years [1]. Metastasis of occult prostatic carcinoma is not a bizarre presentation, with the majority of these cases involving osseous metastasis to the axial skeleton [2]. Metastasis of this type of primary tumor to the paranasal sinuses is extremely rare contributing to delayed diagnosis.

2. Case report

An 85-year-old Caucasian male presented to the otolaryngology clinic with a three-month history of constant right-sided numbness in the cheek down to the lip, and a shooting pain that radiated to the right eye and temple. He reported that the area of facial numbness was sometimes tender to palpation. Associated symptoms included decreased visual acuity in his right eye, nasal congestion and drainage, numbness to the roof of the mouth, dental and mouth pain, and an altered sense of taste. He denied any sinus headache, diplopia, or fever. He was previously treated with amoxicillin for sinusitis with no relief. The patient’s past medical history was significant for poorly differentiated adenocarcinoma of the prostate previously treated with chemoradiation.

Clinical examination of the head and neck was remarkable for decreased sensation of the maxillary division of cranial nerve V on the right, a serous effusion of the right middle ear space, and abnormal appearance and medialization of the right inferior nasal turbinate. The patient had no facial deformities or tenderness to palpation of the paranasal sinuses, and the nasal cavities and oropharynx appeared normal on inspection. No other cranial nerve deficits were appreciated and no enlarged lymph nodes were felt in the neck.

Computed tomography of the sinuses revealed a soft tissue mass at the right orbital floor centering around the infraorbital foramen with associated bony destruction and periosteal reaction of the posterolateral and medial walls of the right maxillary sinus and orbital floor laterally. Opacification of the right maxillary sinus and ethmoid air cells, with few adjacent moderate sized lymph nodes, were also present (Figure 1).

Figure 1: Coronal sinus CT. Opacity of the right maxillary sinus and ethmoids, with bony destruction and 1.3 × 0.9 cm tumor extending into the orbit, invading posteriorly along the pterygoid plates.
Figure 2: H&E stain. Tumor cells with very high nuclear-to-cytoplasmic ratio. Benign surface epithelium is at the left side of the image.

Figure 3: H&E stain. High power view showing crush artifact—a common artifact in small cell carcinomas. There is bone in the center of the image.

Figure 4: Pan-cytokeratin immunohistochemistry stain. Tumor cells are positive for pan-cytokeratin by immunohistochemistry, confirming the tumor is a carcinoma, rather than lymphoma, which is in the differential based on H&E images.

3. Discussion

Prostate cancer is the most common neoplasm in males in the United States. Up to 70% of men with prostate carcinoma will present with distant metastasis [3]. Prostate cancer most commonly metastasizes to bone and characteristically presents with painful, osteoblastic lesions, in contrast to the majority of carcinomas that produce lytic lesions. The lumbar and sacral spine are most commonly affected, followed by the femur, pelvis, ribs, sternum, skull, and humerus [4].

Metastatic disease to the paranasal sinuses is extremely uncommon, with limited cases documented to date. A review by Prescher and Brors in 2001 showed the occurrence of 169 cases of metastasis to the paranasal sinuses with primary tumors originating most commonly from the kidney (67), followed by lung (15), breast (14), thyroid (13), and prostate (12). Of the paranasal sinuses, the maxillary sinus is most commonly affected, whereas the sphenoid sinus is affected the least [5].

Although the absolute mechanism of metastasis to the sinuses from the prostate is unknown, it has been postulated that the low-pressure, valveless paravertebral venous plexus provides a potential route of hematogenous spread by connecting the prostate gland to the skull base. The pelvic venous plexus communicates with the intercostal veins, venae cavae, and azygos; and as a result, malignant cells are able to travel from the prostate to the pterygoid plexus, cavernous sinus, and paranasal sinuses [6,7,8]. A study by Buglione et al. shows that the detection of circulating tumor cells in peripheral blood may play a prognostic role in predicting response to nonsurgical treatment and survival in
patients such as ours with prostate cancer that disseminates to the head and neck [9].

Signs and symptoms of paranasal sinus metastases may present well after a primary tumor is diagnosed, or these may be the presenting symptom of an occult primary. The most common symptom of metastasis to the paranasal sinuses is epistaxis, followed by nasal mass or swelling, nasal obstruction, and pain [10]. Cranial nerve deficits are also not uncommon in late stages of the disease, which include facial anesthesia, blurred vision, and diplopia [11].

The early symptoms of paranasal metastasis are often consistent with the more commonly occurring sinus infection; thus, if these symptoms persist following treatment with antibiotics, one should consider malignancy within the differential, especially in the case of a patient with pre-existing or suspected malignancy.

Conflict of interest The authors declare that they have no conflict of interest.

References