

A long and distant journey: a case of rectal cancer with metastasis to the orbit

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Abstract

We present the case of a 33-year-old man with acute onset of eye pain and diplopia as the presenting symptoms of rectal cancer with orbital metastasis. Colorectal cancer with orbital metastasis is exceedingly rare with only 7 cases worldwide despite the prevalence of colorectal cancer. The rarity of this presentation may be related to the long path through multiple vascular beds that tumor emboli from the rectum must travel in order to reach the orbit.

Keywords Rectal cancer, colon cancer, orbit, metastases, eye

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Introduction

Colorectal cancer is the third most common cancer with more than one million new cases of colorectal cancer each year worldwide. However, metastases from colorectal cancer to the orbit are exceedingly rare with only eight cases reported in the world literature [1-3]. We herein report the first patient from the United States with such a presentation. The reason for the rarity of colorectal metastases to the eye and orbit is not clear but may be related to anatomical barriers and routes of metastasis.

Case report

A 33-year-old man presented to the emergency department with acute onset of right eye pain, blurry vision, and diplopia over the preceding 5 days. Physical examination revealed right-sided proptosis and restricted upward gaze. Computed tomography (CT) and magnetic resonance imaging scans of the head (Fig. 1) demonstrated a 3.9 × 3.0 × 2.2 cm right retro-orbital mass with 1 cm of intracranial invasion. Neurosurgical consultation recommended mannitol and dexamethasone for management of possible intracranial vascular congestion. He subsequently underwent right orbitotomy for tumor biopsy and debulking. Pathology demonstrated metastatic

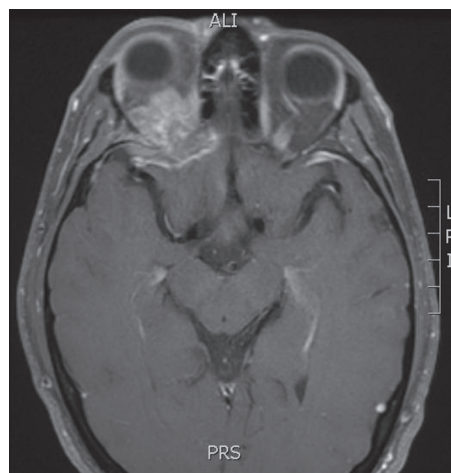


Figure 1 Brain magnetic resonance imaging demonstrating a 3.9 cm retro-orbital mass displacing the right eye anteriorly and also intracranial invasion

glandular carcinoma eroding through bone of orbital roof (Fig. 2). Immunostains for CDX2 and CK20 were positive, while CK7 was negative, consistent with a colorectal origin of his malignancy. Upon further questioning, the patient reported frequent rectal bleeding for a year that had previously been attributed to hemorrhoids without prior endoscopic investigation. Labs were notable for iron deficiency anemia with a hemoglobin of 11 g/dL and an iron saturation of 5%. Colonoscopy revealed a hemicircumferential rectal mass located 3 cm from the anal verge (Fig. 3). There was no polyposis of the colon. Biopsies of the rectal mass revealed moderately differentiated adenocarcinoma that was microsatellite stable based on immunostains and polymerase chain reaction. There was no family history of malignancy. Positron emission tomography CT confirmed metastases involving the right orbit, liver, lung, and femur. He underwent palliative radiation to the right orbit, and despite multiple chemotherapy regimens, his

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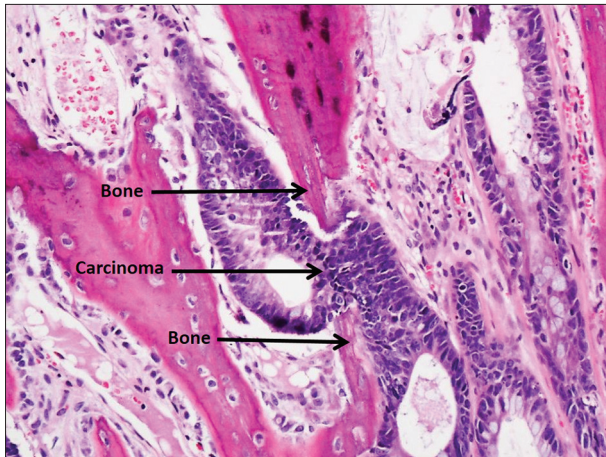


Figure 2 Orbital mass biopsy with hematoxylin and eosin stain. Carcinoma cells are seen eroding through bone of the orbital roof

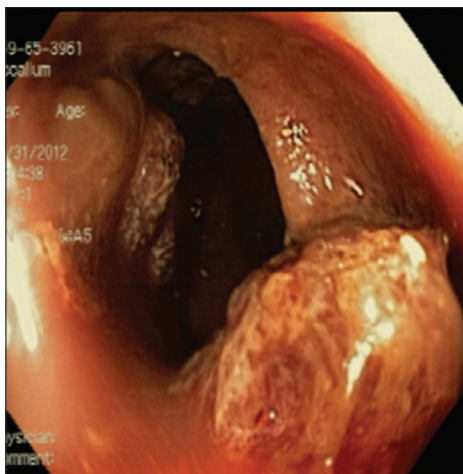


Figure 3 Endoscopic image of a large malignant rectal mass and likely primary source of orbital metastasis

disease progressed. He passed away 11 months after his initial presentation.

Discussion

Patients with orbital metastases generally present with eye pain, proptosis, visual loss, and diplopia with symptoms usually present for approximately 2 months prior to diagnosis [4]. 85% of patients with orbital metastases have a previously diagnosed primary malignancy. Orbital metastases were discovered after a mean of 43 months after diagnosis of the primary malignancy

but intervals up to 22 years have been reported [3]. Melanoma, breast cancer, and prostate cancer comprise the most common malignancies with orbital metastasis.

Despite the prevalence of colorectal cancer worldwide, eye and orbital metastases are extremely rare. Six of the 8 documented cases of colorectal cancer metastasizing to the orbit originated from the rectum with the other cases from the sigmoid colon [2] and ileocecal valve [3]. From an anatomical standpoint, rectal cancers may have an advantage in reaching the orbit compared to colon cancer based on their systemic and portal venous routes of metastasis, respectively. Rectal cancer can metastasize to the orbit through 2 possible routes. Tumor emboli may travel through the middle and inferior hemorrhoidal veins followed by the inferior vena cava, pulmonary circulation, carotid arteries, and finally into the ophthalmic artery. Patients often have pulmonary metastases at the time of orbital metastases given the path through the lungs. Alternatively, rectal tumors may seed Batson's venous plexus, a network of valveless veins extending up the vertebral column, and reach the cranial venous sinuses followed by the ophthalmic vein [5]. In this route, patients are prone to vertebral metastases. In contrast to the spread of rectal cancer through systemic veins, the hematogenous dissemination of colon cancer is predominantly through the portal venous circulation leading to the liver which may provide an additional barrier to reaching the systemic circulation and orbit.

The rarity of colorectal metastases to the orbit may be a result of the long course through multiple vascular beds that tumor emboli must travel in patients with a limited survival. Orbital metastases from colorectal cancer portend a poor prognosis as all cases reporting survival died less than 1 year after detection of orbital involvement. The limited survival is likely the result of widely metastatic disease by the time orbital metastases are detected. Management often includes palliative radiation for local symptom control and systemic chemotherapy.

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