

Case Study

A Rare Case of Bilateral Multifocal Metastatic Lesion in the Extraocular Muscles from Pancreatic Cancer

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Metastatic seeding of tumor cells to the orbit is rare. It is seen in 2% to 4.7% of all cancer patients and accounts for 4% to 14.7% of all orbital tumors.¹ Orbital metastases are intrinsically associated with poor survival due to occurrence in advanced disease² and may be the first sign of an undiagnosed primary tumor.³ Among orbital metastases, isolated seeding of the extraocular muscles (EOM) is exceedingly rare and accounts for 5% to 9% of cases.¹ Patients with EOM metastasis typically present with pain, proptosis, diplopia, and restricted eye movement.¹ Extraocular muscle metastasis may not be apparent on initial ocular examination, thus diagnosis is made via computed tomography, magnetic resonance imaging, and fine-needle aspiration biopsy.² We present a case of bilateral multifocal EOM metastasis in a 65-year-old female with known metastatic pancreatic adenocarcinoma.

Case Report

A 65-year-old female receiving chemotherapy for stage IV metastatic pancreatic adenocarcinoma presented with three days of extreme right eye pain and epiphora in the left eye. The patient had an extensive oncologic history with known metastases to the liver and gastrointestinal tract. Best corrected visual acuity was 20/30 OD and 20/40 OS with normal intraocular pressure bilaterally. Pupils were reactive without afferent pupillary defect and visual fields were intact by confrontation. Alignment and extraocular movements were grossly normal. No gross proptosis or facial asymmetry was noted. Anterior segment examination was significant only for mild superficial punctate keratitis in the right eye. No opacities, dendrites, or abrasions were observed in either eye. Posterior exam was unremarkable.

Given the patient's extensive cancer history and unilateral pain out of proportion to what appeared to be a grossly normal eye exam, MRI brain and orbit with and without contrast was ordered. The study revealed multiple enhancing lesions involving the EOMs bilaterally. Lesions in the right orbit involved the superior, medial, and inferior rectus. Lesions in the left eye involved the superior oblique, medial rectus, and inferior rectus muscles (Figure 1). There were also extensive metastatic lesions throughout the brain parenchyma and bilateral parotid glands. There was no involvement of the cavernous sinuses, superior orbital fissures, or trigeminal nerves. Due to widespread disease, further treatment was not pursued. The patient was enrolled in hospice care and died shortly thereafter.

Discussion

Orbital and EOM metastases from pancreatic cancer are exceedingly rare. Among a series of 227 patients who died of malignancy, 28 were found to have orbital involvement and only one patient was noted to have pancreatic cancer.⁴ The majority of orbital pancreatic metastases are due to pancreatic adenocarcinoma.⁵ There have no documented cases of pancreatic adenocarcinoma metastatic to the EOMs. In a case report and review, Leung et al.¹ describes only six cases of bilateral multifocal EOM metastases, none of which originated from a primary pancreatic adenocarcinoma.

In this report, we present the first reported case of bilateral multifocal metastatic lesions to the EOMs from a presumed pancreatic adenocarcinoma. Although the patient's symptoms were nonspecific, her history of cancer along with the MRI findings makes EOM metastases the most likely diagnosis. Neoplastic processes involving the EOMs typically presents with irregular focal or nodular enlargement without signs of inflammation or vascular congestion.⁶ Other etiologies of EOM diseases such as thyroid orbitopathy, inflammatory, and vascular processes were lower on the differential given the overall clinical picture. We speculate that the unequal distribution of tumor seeding and disease burden resulted in the asymmetric symptoms in each eye. With the widespread involvement of EOMs, it was not surprising that the patient had multiorgan metastatic involvement. This case emphasizes that lesions within the EOMs can be ominous signs of disease burden and are associated with poor outcomes.

Reference

1. Leung V, Wei M, Roberts TV. Metastasis to the extraocular muscles: a case report, literature review and pooled data analysis. *Clinical & experimental ophthalmology*. 2018;46(6):687-694.
2. Char DH, Miller T, Kroll S. Orbital metastases: diagnosis and course. *British journal of ophthalmology*. 1997;81(5):386-390.
3. Geetha N, Chandralekha B, Kumar A, Ittiyavirah AK, Ramadas K, Joseph F. Carcinoma of the pancreas presenting as an orbital tumor: a case report. *American journal of clinical oncology*. 1998;21(5):532-533.
4. Font RL, Ferry AP. Carcinoma metastatic to the eye and orbit. III. A clinicopathologic study of 28 cases metastatic to the orbit. *Cancer*. 1976;38(3):1326-1335.
5. Rong AJ, Choi C J, Ghassibi MP, Dubovy SR, Johnson TE. Orbital metastatic small cell carcinoma of the pancreas with optic nerve compression. *Canadian Journal of Ophthalmology*. 2018;53(1): e22-e24.
6. Lacey B, Chang W, Rootman J. Nonthyroid causes of extraocular muscle disease. *Survey of ophthalmology*. 1999;44(3):187-213.

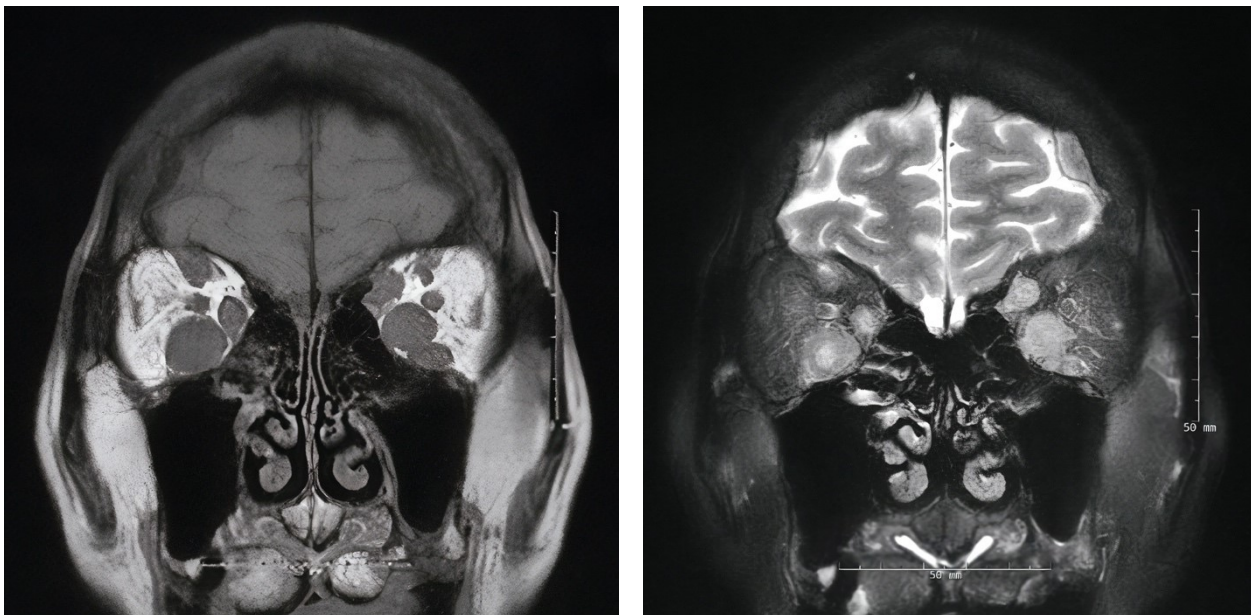


Figure 1. Coronal T1 (a) and T2 (b) magnetic resonance imaging of the orbit showing multiple enhancing lesions are seen involving extraocular muscles bilaterally. Lesions in the right orbit involve the superior muscle complex, medial and inferior rectus muscles. In the left orbit there is involvement of the superior oblique and medial and inferior rectus muscles.