

# Metastatic mammary carcinoma to the orbit masquerading as maxillary sinusitis

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## ABSTRACT

**Introduction:** We report on a case of isolated metastatic breast cancer to the medial rectus muscle. This entity is exceedingly rare.

**Case:** A 44-year-old female with a history of breast cancer presented with unilateral maxillary symptoms and was treated for sinusitis. Over time, she developed ocular pain, diplopia, blurred vision and eventually complete adduction deficit.

**Results:** T1-weighted magnetic resonance imaging revealed a medial rectus lesion. Biopsy via transnasal transorbital endoscopic approach revealed metastatic mammary carcinoma.

**Discussion:** Metastatic disease to the orbit should be considered in the differential diagnosis of refractory maxillary sinus pain in patients with a known underlying malignancy.

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Metastatic disease to the eye and to the globe is exceedingly rare.<sup>1</sup> The most common anatomic landmark affected is the posterior choroid.<sup>1–3</sup> Orbital metastases are predominately unilateral and are observed in 2%–3% of patients with an underlying malignancy.<sup>1,4,5</sup> Mammary carcinoma is the leading cause of orbital metastases comprising 40%–70% of all cases.<sup>5</sup> Metastatic spread to the extraocular muscles is seen in 9% of cases.<sup>6</sup> There is a three- to six-year latency period between the diagnosis of breast cancer and ocular signs and symptoms.<sup>5,7</sup> Presence of an orbital metastasis is suggestive of widespread systemic involvement and thus is associated with poor prognosis.<sup>1,5,7</sup> The expected mean survival in patients with orbital metastases is 31 months, with a reported range of 1–116 months.<sup>4</sup> Common signs and symptoms of orbital metastases include proptosis, ophthalmoplegia, lid retraction, ptosis, blurred vision, binocular diplopia, pain, and a palpable mass.<sup>1,4</sup> Treatment for patients with metastatic disease to the globe is often palliative. Hormonal therapy and chemotherapy are used to control orbital and metastatic disease. Orbital radiotherapy is used for tumors that are symptomatic despite chemotherapy or hormonal therapy. Enucleation may be required for severe refractory pain.

In this study, we report a unique case of orbital metastases from mammary carcinoma masquerading initially as maxillary sinusitis refractory to antibiotic treatment. Radiographic imaging revealed a focal lesion in the medial rectus muscle without any sinus involvement. To our knowledge there have been no previous reports of orbital metastatic breast cancer initially presenting as sinus pain, and very few with report of isolated muscle involvement. This case report serves to highlight that refractory maxillary sinus pain in patients with an underlying malignancy should raise suspicion as an early manifestation of metastatic involvement to the orbit. This is particularly true in patients with known breast malignancies.

## CASE REPORT

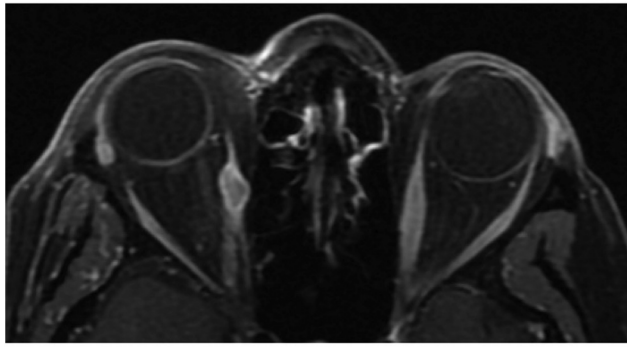
A 44-year-old female presented to her treating physician with isolated right-sided maxillary pain and recurrent sinusitis. The patient was diagnosed with maxillary sinusitis and treated with antibiotics which was refractory to ongoing symptoms. The patient began to develop pain in the right eye seven days afterwards. This was associated with progressive horizontal binocular diplopia, and blurred vision. There was no history of recent trauma, or thyroid eye disease. Moreover, her symptoms did not fluctuate and were not aggravated by fatigue. Relevant past medical history included a T3 N2a M0 (stage IIIA), HER-2 positive, ER/PR positive carcinoma of the right breast three years before, which was managed with radical mastectomy and axillary node dissection. She had received six cycles of FEC-D chemotherapy and 33 radiation treatments, along with a one-year course of Herceptin and a continuous course of tamoxifen.

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**Figure 1.** Axial magnetic resonance imaging of the head with T1-weighting postgadolinium with fat suppression demonstrates abnormal thickening and signal change in the midportion of the right medial rectus muscle. The lesion measures  $6.3 \times 9.6 \times 10$  mm. There is ring enhancement with gadolinium injection and evidence of mild proptosis on this exam.

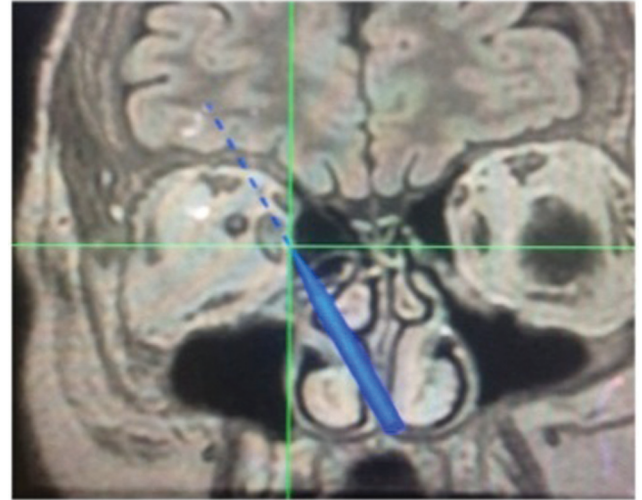
On examination, the patient had a best-corrected visual acuity of 20/30 in the affected eye. The intraocular pressure was 16 mmHg by applanation tonometry. The pupils were equal and reactive to light. There was 3 mm of proptosis. Extraocular movement revealed 100% deficit on adduction. Confrontational fields were full. Anterior segment exam revealed no signs of inflammation or suspicious iris pathology. Dilated fundus exam was unremarkable for any intraocular malignancies. Automated visual fields were benign.

A magnetic resonance imaging of the head with contrast demonstrated abnormal thickening and signal change of the right medial rectus with ring enhancement with gadolinium injection (Fig. 1). The segment was 6.3 mm in maximum transverse diameter, 9.6 mm in maximum SI diameter, and 1 cm in maximum AP diameter. The remaining ocular and periorbital structures were unremarkable, and total body imaging was unremarkable for further concerning findings.

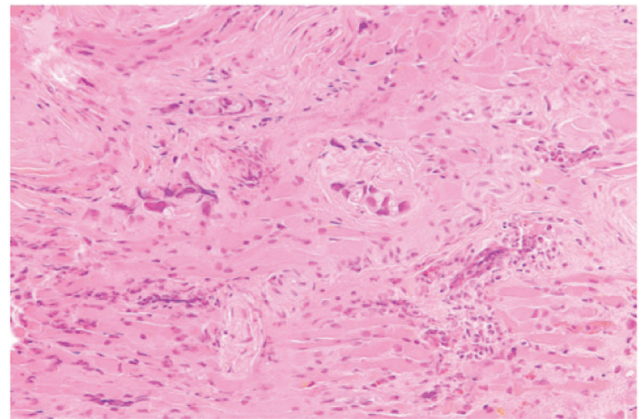
An endoscopic transnasal transorbital exploration and biopsy were performed using image guidance (Fig. 2). This revealed an extremely thickened and abnormal appearing right medial rectus muscle with granular tissue. Biopsy of the superficial and deep medial rectus muscle revealed skeletal muscle tissue containing several foci of infiltrating adenocarcinoma consistent with metastatic mammary carcinoma (Fig. 3). The patient was referred on an urgent basis to the radiation-oncology service and received 3000 cGy in 10 fractions by radiation oncology over a 14-day span for severe ocular pain. Metastatic spread to the hips, thoracic spine, and to the liver was later detected on radiographic imaging.

## DISCUSSION

Metastatic cancer to the orbit is exceedingly rare.<sup>1</sup> Breast cancer is the leading cause of metastasis to the



**Figure 2.** Intraoperative image guidance aids in localization of the thickened and abnormal appearing right medial rectus muscle. The cross hairs and the blue probe confirm the localization before biopsy.



**Figure 3.** Orbital biopsy specimen demonstrating neoplastic cells (hematoxylin eosin; original magnification,  $\times 200$ ).

orbit. Neuroimaging is pivotal in delineating the specific site of spread in the orbit. Diagnosis is confirmed by an orbital biopsy. This has been historically achieved through anterior orbitotomy however modern endoscopic techniques lends themselves to a safe and direct transnasal corridor to the eye. Metastatic breast disease to the orbit associated with a poor prognosis. Treatment options mainly service a palliative role and include systemic chemotherapy, orbital radiation and enucleation. Diplopia, blurred vision, and ocular pain are common symptoms of metastatic disease to the orbit. This case report suggests that clinicians should be suspicious of refractory sinus pain to antibiotic treatment in patients with underlying malignancy.

A broad initial differential diagnosis in our case study included thyroid eye disease, myasthenia gravis, infections, and Tolosa-Hunt syndrome. Thyroid eye disease was ruled out based on normal serologic (thy-

roid stimulating hormone) and clinical parameters. Myasthenia gravis tends to affect females more than males but has a fluctuating course and is aggravated by fatigue, which this patient did not endorse. Rather, her symptoms were progressive in nature. Radiographic imaging did not support inflammatory changes in the cavernous sinus and superior orbital fissure that seen in Tolosa-Hunt syndrome. A rheumatological, infectious and inflammatory work up included anti-ds-DNA, anti-ENA screen, pANCA, cANCA ESR, CRP, and VDRL, which was noncontributory.

There are many benefits to the transnasal endoscopic approach to the orbit versus the traditional external method.<sup>8</sup> Firstly and most widely recognized is the elimination of any external scars. Although the transconjunctival and transcaruncular approaches virtually eliminate scars, the endoscopic approach also eliminates disruption of the medial or lateral canthal ligament, which can reduce the incidence of postoperative visual complications. The addition of image-guidance to an endoscopic approach assists in distinguishing the boundaries between pathology and vital structures, such as the orbital apex, skull base, optic nerve, and carotid artery. Although endoscopic approaches have become the mainstay for more common orbital problems such as decompression for Grave's disease or dacryocystorhinotomy, the endoscopic transnasal transorbital approach is now increasingly being used for a wider array of pathology, including compressive mucocles, neoplasms, orbital solitary tumors, and fractures.<sup>8</sup>

## CONCLUSION

This case report highlights that orbital metastases can masquerade initially as ipsilateral focal sinus pain for up to one week before ocular signs and symptoms. Clinicians should be suspicious about refractory sinus pain to conventional antibiotic treatment in the context of a history of underlying malignancy. Individuals with mammary carcinoma in particular have a higher likelihood of metastatic disease to the orbit and should be monitored very carefully in the setting of refractory sinus pain.

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