

## Sinus involvement in breast cancer: case report

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### Abstract

**Objective:** To report a rare and unique presentation of metastatic breast cancer.

**Method:** Case report and review of related literature.

**Results:** A 62-year-old female with metastatic breast cancer, who had been free from recurrence for 4 years, presented with diplopia secondary to lateral rectus palsy. This was due to a sphenoid sinus metastasis, which was eroding into her cavernous sinus, resulting in VIth cranial nerve neuropathy.

**Conclusion:** All paranasal sinuses and the orbit are potential sites for metastases. Spread to the paranasal sinuses from breast cancer has been documented previously. However, we believe this to be the only reported case with lateral rectus palsy as a result of metastasis to the sphenoid sinus in which this was the only evidence of disseminated disease. Otolaryngology clinicians need to consider metastatic disease to the sinuses in patients with a history of neoplasia, but also recognise that tamoxifen treatment can itself cause visual disturbance.

**Key words:** Breast Neoplasms; Diplopia; Abducens Nerve; Sphenoid Sinus

### Introduction

Metastasis to the sphenoid sinus is rare. When identified, the primary site is most commonly the lung or prostate.<sup>1</sup> Headache and facial pain are common presenting symptoms, along with cranial nerve neuropathies. It is vital that the otolaryngologist recognises this rare occurrence as such symptoms and signs are common reasons for ENT clinic attendance. We present a unique case of breast cancer metastasis causing lateral rectus palsy.

### Case report

At 58 years of age, a female patient had been found to have an 18-mm moderate-grade intraductal carcinoma that was oestrogen and progesterone receptor positive, and human epidermal growth factor receptor 2 negative. She had undergone a combination of surgery, post-operative radiotherapy and tamoxifen treatment. Subsequent histology had revealed a completely excised intraductal carcinoma (closest margin 13 mm), with no evidence of metastasis in the sentinel node.

The patient remained asymptomatic and free from recurrence on routine follow up for four years.

She re-presented (aged 62 years) to her general practitioner with diplopia and dizziness, and was referred on to ophthalmology. At this time, there were no symptoms of sinonasal disease.

The patient deteriorated over a number of months and was admitted as an emergency with a severe left-sided temporal headache and worsening diplopia. She was found to have left lateral rectus palsy, ptosis and right-sided nystagmus.

Computed tomography (CT) showed no space-occupying lesions; however, it did raise the possibility of sinusitis, with mucosal thickening within the sphenoid, ethmoid and

maxillary sinuses. This was a non-contrast scan and in retrospect the abnormality was visible but missed. Subsequent magnetic resonance imaging (MRI) with gadolinium highlighted an extensive area of abnormality within the sphenoid sinus, which was displacing the cavernous sinus and intracavernous carotid (Figure 1). This abnormality had an appearance consistent with a mucocele, and the absence of uniform enhancement made metastatic disease extremely unlikely. The staging investigations included a positron emission tomography scan, which revealed no primary site or evidence of disseminated disease. Biopsies were subsequently performed to determine the nature of the abnormality.

The patient underwent endoscopic sinus exploration under the care of a rhinology specialist, during which multiple samples were taken from a soft tissue mass in the left sphenoid sinus. The mass was confined to the sinus and bled little when biopsied using Blakesley forceps. There were no post-operative complications. The patient was started immediately on dexamethasone to reduce the tumour oedema and to release the pressure on the left VIth cranial nerve. The initial histology was inconclusive as to whether this was a lesion extending from the pituitary gland or a metastatic lesion from the original breast cancer. Two weeks post-surgery, immunocytochemistry confirmed the lesion to be metastatic carcinoma of the breast, with similar morphological and immunophenotypic features to the primary. Again, these specimens were oestrogen and progesterone receptor positive, and human epidermal growth factor receptor 2 negative.

The patient was treated with further radiotherapy to the skull base, and current disease control procedures were enforced. The lateral rectus palsy never fully recovered.

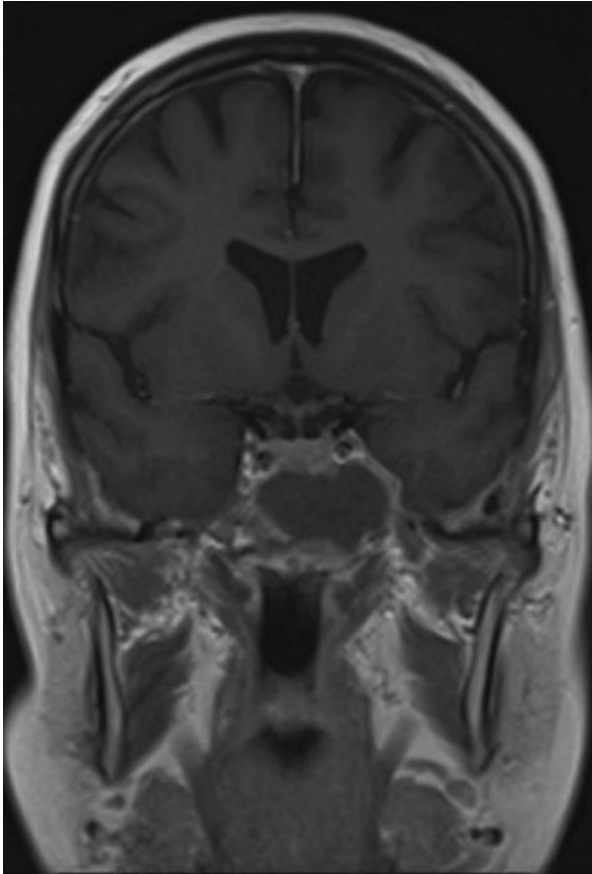


FIG. 1

Coronal MRI (Magnetic Resonance Imaging) Head image showing sphenoid sinus metastasis.

## Discussion

Metastasis to the paranasal sinuses from breast cancer is a rare but reported event. It is thought to arise from haematogenous spread via the vertebral venous plexus. The case reported is unusual as it appears to be the only reported case in which the initial presentation of metastatic disease was diplopia secondary to abducens nerve palsy.

Rhinosinusitis is a recognised presentation of metastatic breast cancer,<sup>2</sup> and this may be the first indication of disseminated disease. Other presenting symptoms can include ophthalmic pain and blurred vision. Up to 40 per cent of all orbital metastases arise from a breast primary,<sup>3</sup> and it has been suggested that ophthalmic manifestations of breast cancer can occur in as many as 5.8 per cent of asymptomatic patients.<sup>4</sup>

Regardless of grade, metastasis to the paranasal sinuses and orbit carries a very poor prognosis; it does not respond well to traditional therapies<sup>5</sup> and most patients will already have widespread disease. This case is therefore unusual because the sphenoid lesion was the only evidence of metastatic disease.

Retinal deposits, macular oedema and corneal changes have all been linked to tamoxifen use, especially when it is administered at high doses.<sup>6</sup> These may present with similar symptoms to a possible paranasal or orbital

metastasis, and can therefore (uniquely to breast cancer) lead to confusion regarding the cause of the presenting complaint.

In the current case, the abnormality on the initial CT scan was missed by a senior radiologist. This highlights the need for detailed clinical information to be included on scan requests in order to direct reporting staff to the pathology. (In this case, the scan was requested to determine whether there were any areas of collapse and made no mention of neurological deficits.) The benefits of MRI and contrast CT are also clear in the diagnosis of anterior skull base pathology.

- **Breast cancer can spread to the sphenoid sinus**
- **Isolated cranial nerve palsies may be the only indicator of disease**
- **Otolaryngology clinicians need to consider metastatic disease to the sinuses in patients with a history of neoplasia**
- **All paranasal sinuses and the orbit are potential sites for metastases**
- **Tamoxifen treatment alone can cause visual disturbance**

It is vital to maintain a high index of suspicion in patients previously treated for breast cancer who present with new sinus symptoms or visual disturbance, even those on high-dose tamoxifen therapy. Although relatively uncommon, a diagnosis of such metastases will drastically change a patient's prognosis and the focus for subsequent treatment, and improve their overall quality of life.

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Mr D T Walker takes responsibility for the integrity of the content of the paper

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