

**Case Report**

Bilateral Extraocular Muscle Metastases from Breast Cancer in a Patient with Thyroid Eye Disease

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Abstract

Introduction: Breast cancer is a very rare cause of bilateral extraocular muscle metastasis. Extraocular metastasis can be missed in patients with concurrent orbital pathology.

Presentation of Case: We present a further case of a 71-year-old lady with concurrent thyroid eye disease. She initially presented with bilateral restriction of extraocular movements before developing unilateral ptosis and visual reduction. An extraocular muscle biopsy confirmed metastatic lobular breast carcinoma.

Conclusion: This case adds to the literature base on extra-ocular muscle metastasis and highlights the importance of maintaining a high index of suspicion particularly in the presence of co-existing orbital pathology. We also review the other cases in the literature and the differences in clinico-radiological presentation of thyroid eye disease and extraocular muscle metastases.

Keywords: Extraocular muscle metastasis; breast cancer

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Consent: We confirm that the patient has given the informed consent for the casereport to be published.

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Introduction

Breast cancer metastasis is an unusual cause of extraocular muscle (EOM) enlargement. It can present with symptoms such as diplopia, ptosis, exophthalmoplegia and visual impairment from extraocular muscle dysfunction and optic nerve compression and is seen as nodular muscle enlargement on orbital imaging. Bilateral breast cancer metastases of multiple EOMs has only been reported in 9 cases [1-9]. We present a further case in a patient with thyroid eye disease and discuss the differences in clinical presentation of these two conditions.

Case presentation

A 71-year-old lady with known metastatic breast cancer initially presented with a 4-month history of diplopia. She had been diagnosed with bone and liver metastases 6 months previously and had a past history of thyroid eye disease three years prior. She was seen by a general ophthalmologist who found bilateral global restriction of extraocular movements. There was no evident proptosis or other signs of thyroid eye disease such as eyelid retraction. She was presumed to have reactivation of her thyroid eye disease and referred to an orbital surgeon. When seen 2 months later she had developed left ptosis with lid lag, and a palpable mass beneath the left superior orbital rim, in addition to, bilateral restriction of extraocular movements in all directions of gaze. She had no proptosis and the pupillary reactions and colour vision were normal. She had positive thyroid-stimulating hormone (TSH) receptor antibody test. Magnetic resonance imaging (MRI) head and orbit demonstrated nodular, non-fusiform enlargement of multiple extra-ocular muscles in both eyes (Figure 1). A left levator palpebrae superioris muscle and lacrimal gland biopsy confirmed metastatic lobular breast carcinoma that was infiltrating these tissues and had focal perineural invasion. Treatment with orbital radiotherapy improved the diplopia and the right eye vision.

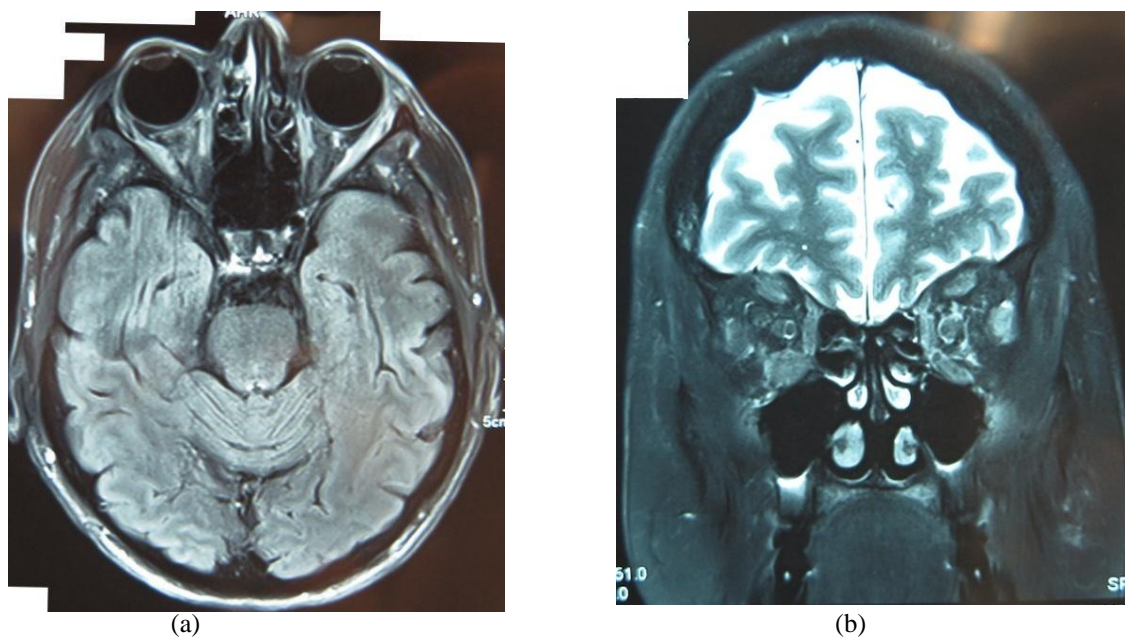


Figure 1 MRI scans showing bilateral extraocular muscle enlargement due to breast cancer metastases. Figure (a). Coronal view; (b). Transverse view.

Discussion

Bilateral extraocular metastasis is very rare. It has been reported to occur with breast cancer in 10 cases including the present case [1-9]. There are even fewer reports of it occurring with other tumours: prostate cancer, carcinoid tumours and rhabdomyosarcoma [10-14]. The relative incidence, in part probably reflects the incidence of the tumours themselves. However, there may also be a propensity for orbital spread in some cancers, with breast cancer having a predilection for soft tissue, including orbital fat and extraocular muscle, while prostate cancer usually spreads to bone [15].

The presenting symptoms and signs in the reported cases, including the present case, were diplopia (7/10 cases), visual disturbance (3/10), pain (1/10), ophthalmoplegia (3/10), lid oedema (2/10), proptosis (1/10), chemosis (1/10), and ptosis (1/10). As in our case multiple muscles bilaterally were involved in 8/9 previously reported cases [1-8]. In the 9th case both superior recti only were only involved, although autopsy studies were not done, which may have found further sub-clinical involvement [9]. In 4/9 cases the EOM findings precipitated the diagnosis of breast cancer [5-9].

EOM metastasis can be missed in patients with concurrent orbital pathology, such as thyroid eye disease (TED). The following clinico-radiological features will differentiate the two conditions: (1) EOM metastasis typically affects medial, lateral, superior and inferior recti in descending order, as compared to inferior, medial, superior, and lateral in TED [16]. (2) Orbital imaging demonstrates nodular muscle enlargement in EOM metastasis as compared to fusiform enlargement with tendon sparing enlargement in TED [16]. (3) Careful examination may detect a palpable orbital mass in EOM metastasis [16]. (4) Reduced levator palpebrae superioris function in EOM metastasis of the superior rectus/levator palpebrae superioris complex and normal function in TED. (5) Ptosis with lid hang-up in downgaze in superior rectus/levator palpebrae superioris metastasis as compared to lid retraction in TED [17]. Extra-ocular muscle biopsy enables a definitive diagnosis to be made and may guide chemotherapy according to tumour features such as the human epidermal growth factor receptor 2 status [18].

Conclusion

This case adds to the literature base on extra-ocular muscle metastasis and highlights the importance of maintaining a high index of suspicion particularly in the presence of co-existing orbital pathology.

Abbreviations

Extraocular muscle (EOM); Magnetic resonance imaging (MRI); Thyroid-stimulating hormone (TSH); Thyroid eye disease (TED)

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