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CLINICAL RECORD

Laryngeal carcinoma metastasis to the orbit: case report

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Abstract

Objective: We present the first report in the all English literature of a case of laryngeal squamous cell carcinoma metastasis to the orbit.

Method: Case report of orbital metastasis from laryngeal carcinoma; clinical, radiological and pathological findings are discussed.

Result: A 75-year-old man presented to the ENT department with a five-week history of left orbital pain, swelling and reduced vision. Past medical history included laryngectomy, bilateral neck dissection and post-operative radiotherapy for T_4 N_{2c} M_0 squamous cell carcinoma of the supraglottis, 10 months earlier. Imaging showed an orbital mass extending along the roof and lateral aspect of the orbit into the optic canal and superior orbital fissure, and further posteriorly into the left cavernous sinus with meningeal enhancement in the left anterior cranial fossa. Histopathological analysis after biopsy showed the mass to be consistent with metastatic poorly differentiated squamous cell carcinoma.

Conclusion: After searching the all English literature, we report what is, to our best knowledge, the first case of laryngeal carcinoma metastasis to the orbit. Despite its rarity and poor prognosis, such a metastasis should be considered as part of the differential diagnosis of an orbital mass, as timely recognition can improve the patient's quality of life.

Key words: Laryngeal Neoplasm; Carcinoma; Neoplasm Metastasis; Orbit; Pathology

Introduction

Head and neck cancers commonly metastasise via the cervical lymph nodes to distant sites. Haematogenous spread occurs less frequently, accounting for only 10 per cent of all distant metastases. The incidence of distant metastasis in patients with head and neck squamous cell carcinoma (SCC) is relatively low. The risk of distant metastasis is influenced by age, primary tumour site, loco-regional extension, grading and the achievement of loco-regional control with treatment.[1,2]

The most common site for SCC metastasis from the head and neck is the lungs, followed by the liver and skin.[3] Reported unusual sites of laryngeal cancer metastasis have included the forearm,[4] scapular muscle,[5] gluteus maximus muscle[6] and ampulla of Vater.[7] To the best of our knowledge, there have been no previously reported cases in the English literature of laryngeal cancer metastasis to the orbit.

Here, we discuss the clinical and radiological findings and the management of such a case.

Case report

A 75-year-old man presented to the ENT department in December 2009 with a five-week history of a red, swollen, painful left eye and a one-week history of diplopia.

His past medical history included a laryngectomy and bilateral neck dissection, conducted in February 2009. The tumour had been pathologically staged as tumour stage 4a, node stage 2c, metastasis stage 0, and graded as a poorly differentiated SCC of the supraglottis. Nodes had shown extracapsular spread of disease. The patient's case had been discussed at the multidisciplinary team meeting, and adjuvant treatment with radiotherapy had been recommended. The patient had completed all treatment by mid-April 2009.

During the current admission, examination had indicated that the patient was apyrexial with a normal heart and respiratory rate. His left eye was inflamed and proptosed.

The patient was examined by the ophthalmologist, who reported reduced Snellen's vision rating in the left eye: the left and right eyes were 6/9.5 and 6/7.5, respectively. There was also reduced colour vision on Ishihara chart testing in both eyes (10/13), and a left relative afferent pupillary defect. The patient had left hypotropia and exotropia, with limited eye movements and reduced corneal sensation in the left eye.

The patient's inflammatory markers (i.e. white blood cell count and C-reactive protein) were within the normal range.

An urgent computed tomography (CT) scan was requested. This showed a soft tissue swelling overlying the left frontal bone and occupying the superior aspect of the left orbit and extending posteriorly (Figure 1). No definitive breach of bone or bony expansion was seen. The appearance of the mass was not in keeping with an orbital abscess.

A magnetic resonance imaging scan was requested to assess the extent of the mass. This showed a mass in the inner aspect of the left orbital roof, with low signal change on T1- and T2-weighted images and on short T1 inversion recovery (STIR), and marked post-contrast enhancement (Figure 2). The enhancement extended along the roof and

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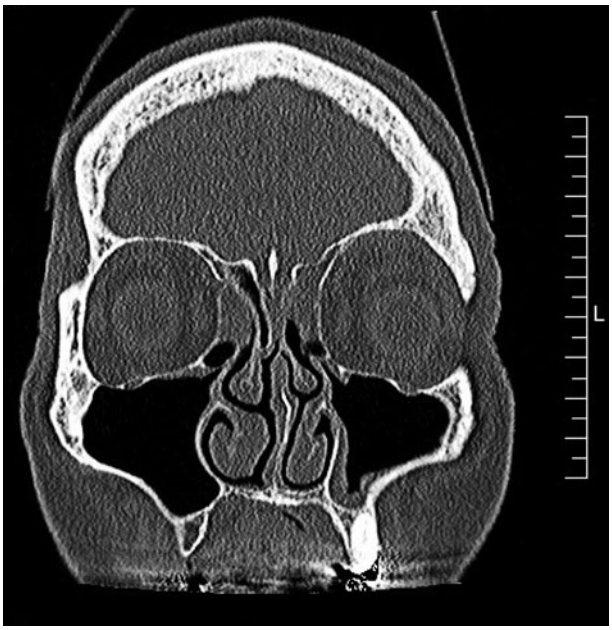

FIG. 1
Coronal computed tomography scan. L = left

lateral wall of the left orbit, and involved the optic nerve, superior orbital fissure and left cavernous sinus. There was also associated marked meningeal enhancement within the left anterior cranial fossa. The right orbit was normal.

The patient was initially commenced on a course of intravenous ceftriaxone, metronidazole and dexamethasone.

An orbital incisional biopsy was carried out by the orbital surgeon. Histopathological examination of the biopsy specimen revealed poorly differentiated metastatic SCC infiltrating fibrofatty tissue, with focal evidence of squamous differentiation. There was no significant cytoplasmic vacuolisation or nuclear crenation. Immunostaining was positive for the markers cytokeratin 5 and 6 (Figure 3).

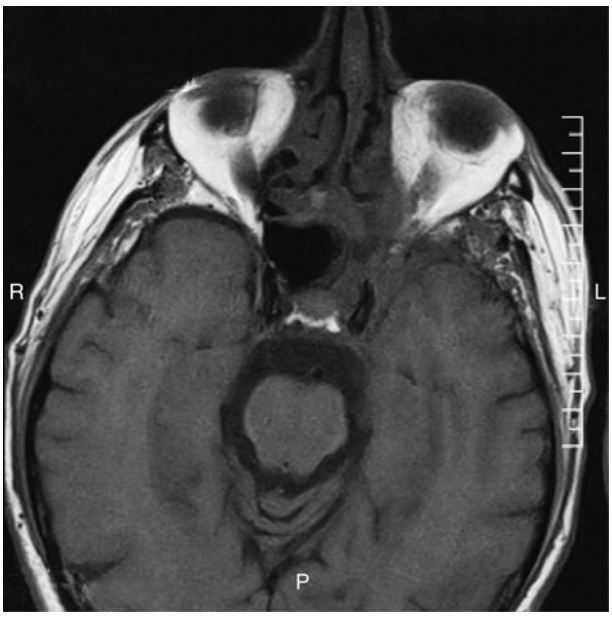

FIG. 2
Axial magnetic resonance imaging scan. R = right; L = left; P = posterior

Further molecular analysis to identify common patterns of mutation and loss of heterozygosity between the primary tumour and the orbital metastases was not carried out, as our unit did not have the required facilities at that time.

The patient's case was discussed at the multidisciplinary team meeting. Due to the extent of the metastatic tumour, a joint decision was made to pursue palliative treatment including steroids, analgesia and antiemetics.

The patient died on the 22 January 2010, 41 days after presenting with eye symptoms.

Discussion

Orbital metastasis from a primary tumour was first described by Horner in 1864.[8] Since then, there have been many other reported cases. Reported primary sources of orbital metastasis have included hepatocellular carcinoma,[9] malignant melanoma,[10] renal cell carcinoma,[11] breast carcinoma[12] and prostatic carcinoma.[13] Breast cancer metastases have been reported to account for the majority of orbital metastasis cases (55–60 per cent).[14]

The incidence of orbital metastasis is equal in male and females, with primary tumours of the breast being more

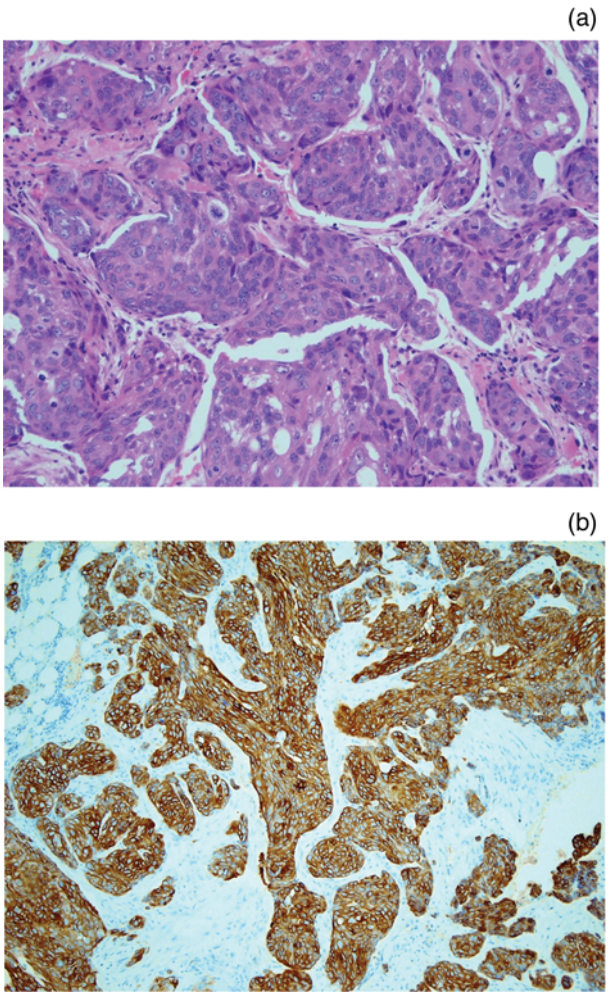

FIG. 3
Photomicrograph of left orbital biopsy. (a) H&E staining shows a poorly differentiated, metastatic squamous cell carcinoma infiltrating fibrofatty tissue, with focal evidence of squamous differentiation and no significant cytoplasmic vacuolisation or nuclear crenation (×400). (b) Immunostaining shows positivity for the markers cytokeratin 5 and 6 (×100).

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common in females and primary tumours of the lung and liver more common in males.[15]

- **This case represents the first report of laryngeal squamous cell carcinoma (SCC) metastasis to the orbit**
- **Previously reported unusual sites of laryngeal SCC metastasis have included the forearm and various muscles**
- **Common clinical signs and symptoms of orbital metastasis include exophthalmos, orbital pain and reduced vision**
- **Early ophthalmology review is needed, followed by incisional biopsy**
- **Treatment is palliative, requiring a multidisciplinary approach**
- **Palliative management may include surgery, chemotherapy, radiotherapy and hormonal treatment**

The clinical presentation of orbital metastasis may be broken down into four generalised syndromes: infiltrative (the commonest), mass, inflammatory and functional.[12]

The most common signs and symptoms of orbital metastasis include exophthalmos, orbital pain, reduced vision, periorbital swelling and diplopia.[16] Symptoms may mimic orbital cellulitis.

A study of 28 cases of orbital metastasis found that the most common sign was exophthalmos (occurring in over 75 per cent of patients), followed by pain (29 per cent) and decreased vision (29 per cent).[16]

It is important that patients presenting with a possible diagnosis of orbital metastasis receive an early ophthalmology review, to aid early diagnosis and palliative intervention. Diagnosis is made histopathologically from tissue obtained from an incisional biopsy of the orbital mass.[12]

Management of orbital metastasis is often multidisciplinary, using a combination of palliative treatments to achieve symptom control. Treatments may include surgery, radiotherapy, hormone therapy and chemotherapy.[17]

Palliative radiotherapy has been shown to improve the quality of life of patients with orbital metastasis, irrelevant of the primary tumour type. Huh *et al.*[18] found that symptoms such as pain, proptosis and reduced vision were either partially or completely relieved by palliative radiotherapy. Radiotherapy to orbital metastasis needs to be individualised according to the location and extent of disease.

However, the mean overall survival of patients with orbital metastasis has been reported to be just over one year. Our patient survived for only 41 days from presentation with eye symptoms.

Conclusion

Orbital metastasis from laryngeal SCC is extremely rare. To the best of our knowledge, the presented patient represents the first reported case in the English literature. Further reports are needed to more clearly define the clinical manifestations and management of laryngeal metastasis to the orbit. Facilities to identify common molecular features shared by both the primary laryngeal tumour and the orbital metastasis are currently mainly confined to research units. However, once such techniques become routine pathology practice, further information may be obtained which may improve prognosis.

Despite the poor prognosis of patients with orbital metastasis, early diagnosis is paramount to enable optimal palliative intervention, in order to relieve patient symptoms and thus improve quality of life.

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References

1 Garavello W, Ciardo A, Spreafico R, Gaini RM. Risk factors for distant metastases in head and neck squamous cell carcinoma. *Arch Otolaryngol Head Neck Surg* 2006;**132**:762–6
2 Spector GJ. Distant metastases from laryngeal and hypopharyngeal cancer. *ORL J Otorhinolaryngol Relat Spec* 2001;**64**:224–8
3 Spector GJ, Sessions DG, Haughey BH, Chas KS, Simpson J, El Mofty S. Delayed regional metastasis, distance metastasis and second primary malignancies in squamous cell carcinomas of the larynx and hypopharynx. *Laryngoscope* 2001;**111**:1079–87
4 Korkmaz H, Dursan E, Saylam G, Akmansu M, Eryilmaz A. An unusual metastatic pattern of larynx cancer: the forearm. KBB-forum 2007 www.KBB-Forum.net
5 Yucel EA, Demirel T, Demiryont M, Egeli U, Deger K. An unusual metastatic site of laryngeal carcinoma: scapular muscle. *J Laryngol Otol* 2003;**117**:85–7
6 Marioni G, Blandamura S, Calgaro N, Ferraro SM, Stramare R, Staffieri A *et al*. Distant muscular (gluteus maximus muscle) metastasis from laryngeal squamous cell carcinoma. *Acta Otolaryngol* 2005;**125**:678–82
7 Buyukcelik A, Ensari A, Sarioglu M, Isikdogan A, Icli F. Squamous cell carcinoma of the larynx metastasized to the ampulla of vater: report of a case. *Tumori* 2003;**89**:199–201
8 Horner F. Carcinoma of the dura mater. Exophthalmos-Carcinoma of the rectus muscle. General Carcinoma [in German]. *Klin Monartsble Augenheilkd* 1864;**2**:186–90
9 Srinivasan R, Krishnanand G. Cytologic diagnosis of metastatic hepatocellular carcinoma presenting as an orbital mass. A case report. *Acta Cytol* 2007;**51**:83–5
10 Rosenberg C, Finger PT. Cutaneous malignant melanoma metastatic to the eye, lid and orbit. *Surv Ophthalmol* 2008:**53**;187–202
11 Shome D, Honavar SG, Gupta P, Vemuganti GK, Reddy PV. Metastasis to the eye and orbit from renal cell carcinoma: a report of three cases and review of literature. *Surv Ophthalmol* 2007;**52**:213–23
12 Goldberg RA, Rootman J, Cline RA. Tumours metastastic to the orbit. A changing picture. *Surv Ophthalmol* 1990;**35**:1–23
13 Saleh HA. A case of prostatic cancer metastatic to the orbit and ethmoid sinus. *Ann Otol Rhinol Laryngol* 1996;**584**:105–7
14 Aspraudis I, Garezis S, Konstantines C, Stefaniotau M. Breast carcinoma metastasis to the orbit and paranasal sinuses: a case report. *Exp Oncol* 2004;**26**:246–8
15 Wang Y, Yang XJ, Li YY, Hei Y, Xiao LH. Diagnosis and management of orbital metastatic tumors [in Chinese]. *Zhonghua YanKe ZaZhi* 2008;**44**:687–90
16 Font RL, Ferry AP. Carcinoma metastatic to the eye and orbit. A clinicopathologic study of 28 cases metastatic to the orbit. *Cancer* 1976;**38**:1326–35
17 Valenzuela AA, Archibald CW, Fleming B, Ong L, O'Donnell B, Crompton J *et al*. Orbital metastasis: clinical features, management and outcome. *Orbit* 2009;**28**:153–9
18 Huh S, Nisce LZ, Simpson LD. Value of radiation therapy in the treatment of orbital metastasis. *Am J Roentgenol* 1974;**120**:589–61

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