

Orbital Metastatic Tumour as Initial Manifestation of Asymptomatic Gastric Adenocarcinoma

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Abstract

Introduction: Metastatic orbital tumour from gastric cancer is rare. Patients with metastatic disease may present initially to the ophthalmologist with symptoms from metastases instead of from the primary cancer. **Clinical Picture:** We report a case, with clinicopathological correlation, of metastatic gastric adenocarcinoma presenting first in the orbit with diplopia. Computed tomography and magnetic resonance imaging of the orbit showed a well-defined enhancing right intraconal tumour. **Treatment and Results:** Excisional biopsy was performed and histopathology confirmed a metastatic adenocarcinoma. Focused gastrointestinal screening revealed an otherwise asymptomatic Stage IV gastric adenocarcinoma. Chemotherapy was initiated with good tumour response. **Conclusion:** Early biopsy of unusual orbital tumours is critical as orbital metastases may be the initial manifestation of an asymptomatic primary. Histopathological diagnosis can aid localisation of the primary tumour and allow prompt treatment to be instituted.

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Key words: Biopsy, Diplopia, Gastric cancer

Introduction

Metastatic orbital tumour from gastric cancer is rare. In a Japanese survey of metastatic orbital tumours seen over 95 years, gastric metastases accounted for only 8.6% (11 patients)¹ of cases. A series of orbital tumours from 1976 to 1999 by Rootman et al² reported only 2 cases of metastasis from gastrointestinal malignancy. Patients with metastatic disease may present initially to the ophthalmologist with symptoms from metastases instead of from the primary cancer.¹⁻³ We describe a case of metastatic gastric adenocarcinoma presenting first in the orbit.

Case Report

Our patient was a 56-year-old Chinese male with a three-week history of gradual onset of diplopia, especially on right gaze. There was associated right ocular discomfort with eye movements. The patient did not notice any periocular swelling or decrease in vision. He had been previously treated for pulmonary tuberculosis 7 years prior to the current presentation and was otherwise

systemically well.

On examination, there was resistance to retropulsion (Fig. 1a). No proptosis was detected on Hertel's exophthalmometry. There was slight pain on extraocular movements with diplopia in right and up-gaze (Figs. 1b-1e). Elevation and abduction were limited in the right eye. Aided Snellen visual acuity was 6/6 in both eyes. Pupillary light reflex was normal and no relative afferent papillary defect was detected. Ishihara colour testing and intraocular pressures were normal in both eyes. Anterior segment examination was normal in both eyes. Funduscopy showed a blurring of the nasal disc margin in the right eye. No choroidal folds were seen. Diagnosis of a right orbital mass was made. Urgent computed tomography (CT) revealed a well-defined intraconal mass located between the right optic nerve and right medial rectus. There was no globe indentation and the mass was seen to enhance slightly with contrast. Magnetic resonance imaging (MRI) with gadolinium contrast was subsequently performed to better delineate the lesion and its relationship with the optic nerve. MRI showed the same

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Fig. 1. Patient in (a) primary gaze, (b) right gaze, (c) upgaze, (d) left gaze, (e) downgaze. There was limitation of right gaze and upgaze in the right eye.

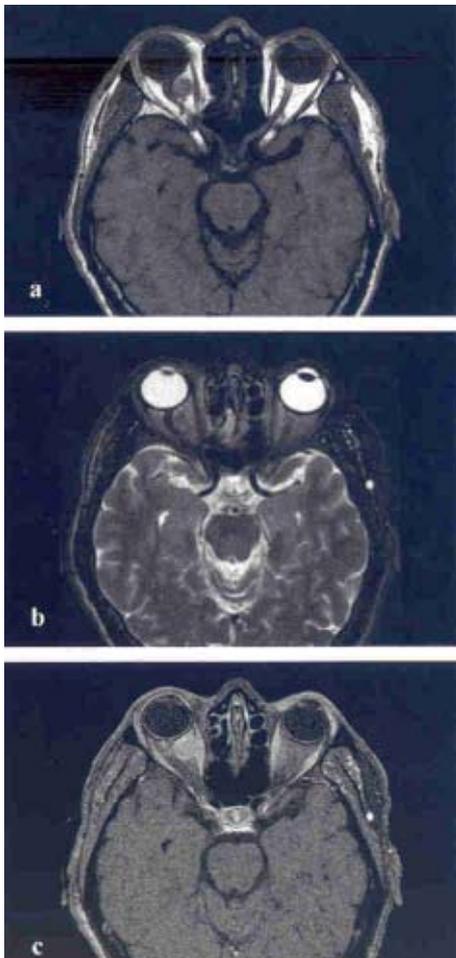


Fig. 2. (a) T1 weighted MRI scan, (b) T2 weighted MRI scan, (c) contrast MRI scan. The scans showed an intraconal mass displacing the right optic nerve laterally. The mass appeared heterogenous with contrast.



Fig. 3. (a) Intraoperative picture showing the lesion being removed whole, with care taken not to crush the tissue. (b) Haematoxylin and eosin (H & E) stained section of adenocarcinoma with inset showing (c) positive immunostaining for CK20 and (d) negative staining for CK7. H & E original magnification x100, CK20 and CK7 original magnification x200.



Fig. 4. CT scan of the abdomen showing multiple lymph nodes and liver involvement. There was thickening of the stomach wall.

intraconal retrobulbar lesion measuring 15 mm in diameter, with well-defined borders displacing the optic nerve laterally. There was low signal intensity on T2-weighted sequence and the lesion enhanced with contrast (Figs. 2a, 2b and 2c). Mantoux testing was not significantly indicative of active tuberculous infection.

The patient underwent right excisional biopsy of the orbital mass via medial and lateral orbitotomy. Medial conjunctival peritomy was first performed and the medial rectus identified and disinserted. An attempt was made to

locate the mass without a marginotomy. However, it became clear that the lateral orbital rim had to be removed for better exposure of the lesion. A lateral orbitotomy was then performed via a lateral canthotomy and inferior cantholysis. The orbicularis muscle was bluntly dissected off the periosteum. The latter was then incised and elevated from the lateral orbital rim. The lateral orbital rim was removed using a sagittal saw and bone rongeur. The globe was then mobilised laterally, giving adequate exposure of the intraconal tumour. A firm mass with a slight bluish hue was noted (Fig. 3a). The tumour was carefully dissected from surrounding tissue and removed en bloc. Of note, a 4.0 silk suture passed through the tumour to aid dissection passed easily through the friable tissue. Care was taken to avoid crushing the tumour. Minimal bleeding was encountered. Once haemostasis was achieved, the removed bone was replaced and secured with mini-plate and screws. The medial rectus was re-attached and conjunctiva closed.

Histopathologic studies showed moderately differentiated adenocarcinoma (Fig. 3b). The tumour cells show positive immunoreactivity for cytokeratin (CK) 20 (Fig. 3c), and were negative for CK7 (Fig. 3d), prostatic specific antigen (PSA) and thyroid transcription factor 1 (TTF1). This immunoprofile favoured a primary adenocarcinoma from the gastrointestinal tract. The patient was referred to the surgical and oncology team for cancer workup, which included oesophago-gastroduodenoscopy, colonoscopy and CT scans of the chest, abdomen and pelvis. The focused systemic workup was directed largely by the histopathological findings. A large gastric lesion was detected and a biopsy confirmed primary gastric adenocarcinoma. There were also multiple metastases to the regional lymph nodes and the liver (Fig. 4).

Postoperative recovery was uneventful. There was residual diplopia in right gaze with mild limitation in upgaze and abduction. Aided Snellen visual acuity was 6/7.5 in both eyes and pupil reactions were normal. The patient was started on chemotherapy with oxaliplatin and 5-fluorouracil 1 month after histopathological diagnosis and consequently completed 8 cycles. There was good tumour response to the chemotherapy. Repeat CT scans showed stabilisation of the liver metastases and decrease in the gastric wall thickening after 6 cycles of chemotherapy. At the time of the case report, the patient had survived 12 months and had not developed any gastrointestinal symptoms.

Discussion

This is a rare case of orbital metastasis from gastric adenocarcinoma that first presented with symptoms of an orbital mass. The secondary manifestation in the orbit and histopathological findings then led to further investigations, where the primary lesion was discovered. In reviewing the

literature, we find that metastatic tumours to the orbit are uncommon and account for 1% to 13% of all orbital tumours²⁻⁴ and 2% to 3% of all systemic cancers. In a survey of 1264 patients with orbital tumour and simulating lesions by Shields et al,⁴ there were 91 metastatic tumours and none were from gastric metastasis. This was in contrast to the Japanese survey by Amemiya et al,¹ which reported 11 patients (8.6%) with gastric metastasis; 7 of these patients had initial ocular signs which had occurred prior to the diagnosis of gastric cancer. The ocular signs preceding the primary lesion included proptosis, ptosis and lid swelling. In the same paper, the average age of presentation was 39.9 years and the time interval from ocular signs to death (3.2 months) was similar in patients who presented with ocular signs first and those who had had primary lesions diagnosed first. Our patient was 56 years old and had survived for 1 year at the time of this case report. Gastric cancer is notorious for its late presentation and consequent poor survival statistics.^{5,6} In our case, the orbital metastasis was the early warning of an asymptomatic primary leading to prompt diagnosis, early treatment with chemotherapy and hence a better prognosis for the patient.

When an intraconal orbital mass was detected on CT scan, cavernous haemangioma was the top differential diagnosis as this is the most frequently encountered intraconal orbital tumour.² However, a closer look at the MRI revealed features atypical of a cavernous haemangioma – low signal intensity on T2-weighted sequence and the absence of initially patchy central enhancement followed by a delayed homogeneous enhancement. Other diagnoses were therefore considered, especially the possibility of a tuberculoma, considering the history of pulmonary tuberculosis. Mantoux testing and chest X-ray excluded this differential diagnosis. Fibrous histiocytomas, neurogenic tumours and metastases were included in the list of differential diagnoses. Intraoperatively, the tumour was friable and could not support a 4.0 silk traction suture that was passed through it. A silk suture would not tear through a cavernous haemangioma and would have been useful in helping to roll out the haemangioma during tissue dissection. The imaging and gross characteristics of the lesion indicated an unusual orbital mass and histopathological findings confirmed the diagnosis of a metastatic adenocarcinoma. Although the immunoperoxidase findings initially suggested a colonic primary,^{7,8} the primary tumour was located in the stomach.

This case clearly demonstrated the importance of a focused approach when dealing with unusual orbital mass lesions. From a short list of differential diagnoses, a biopsy not only yielded the final diagnosis but also effectively cleared the orbit of tumour. In addition, instead of more extensive screening for the primary lesion, the

histopathologic and immunopathologic features showed the way towards a more specific search for the primary tumour in the gastrointestinal tract. Our patient received prompt chemotherapy and was well 12 months following the diagnosis of Stage IV gastric adenocarcinoma.

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