CASE REPORT

Rectal adenocarcinoma: rare metastasis to the optic nerve

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SUMMARY

We present the first reported case of histologically proven colorectal adenocarcinoma with metastatic spread to the optic nerve. A 49-year-old man, with a known history of rectal adenocarcinoma, presented with progressive loss of vision in his left eye. On presentation, he had no perception to light in his left eye and Snellen acuity of 6/36 in the right eye. Fundus examination showed a left globally swollen optic nerve with a few flame-shaped haemorrhages. A gadolinium-enhanced MRI scan demonstrated abnormal thickening of the anterior and mid-section of the optic nerve with high signal on STIR and postgadolinium enhancement. Optic nerve biopsy confirmed the presence of epithelial adenocarcinoma compatible with metastasis of gut origin. The patient died within 4 months of presentation.

BACKGROUND

Metastatic tumour spread to the optic nerve is extremely rare. A retrospective review of 227 cases of intraocular and orbital metastasis found that only 1.3% of patients had metastatic cancer limited to the optic nerve or optic nerve sheath.¹ We present a rare case of metastatic optic nerve disease due to histologically proven colorectal adenocarcinoma.

CASE PRESENTATION

A 49-year-old man was referred to our outpatients department by his general practitioner with progressive loss of vision over 3 months in his non-amblyopic left eye. With a background of rectal adenocarcinoma (BRAF mutant KRAS wild type) and pulmonary and hepatic metastatic disease, his prior treatment had included 18 cycles of chemotherapy.

Figure 1 A colour fundus photograph of the left eye showing global optic nerve swelling.

Figure 2 An axial gadolinium-enhanced MRI scan showing abnormal thickening of the anterior and mid-section of the optic nerve.

He had no perception to light in his left eye and Snellen acuity of 6/36 in the right eye due to amblyopia, with examination revealing a left relative afferent pupillary defect and exotropia, without proptosis. His left anterior segment was unremarkable with normal intraocular pressure, but fundus examination identified swelling of the optic nerve with a few flame-shaped haemorrhages (figure 1). The appearance of the right eye was normal.

INVESTIGATIONS

1. A gadolinium-enhanced MRI scan demonstrated abnormal thickening of the anterior and mid-section of the optic nerve with high signal on Short-TI Inversion Recovery (STIR) and postgadolinium enhancement (figures 2,3).
2. Lumbar puncture revealed normal opening pressure, and Cerebrospinal Fluid (CSF) analysis was normal.
3. With the uncertainty of the underlying aetiology, the patient underwent a lateral canthotomy approach orbitotomy with excision biopsy of a section of the optic nerve. Histological examination identified compression of the optic nerve and surrounding adventitia by well-differentiated adenocarcinoma producing copious amounts of mucin, consistent with metastasis from the colorectal tract (figures 4,5).

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Figure 3 A coronal gadolinium-enhanced MRI scan showing abnormal thickening of the anterior and mid-section of the optic nerve.

TREATMENT

A 5-day trial of methylprednisolone failed to improve the patient's symptoms.

OUTCOME AND FOLLOW-UP

The patient died within 4 months of presentation to the eye clinic despite systemic treatment with methylprednisolone.

DISCUSSION

Optic nerve swelling is typically due to inflammation, ischaemia due to reduced perfusion, invasive disease or raised intracranial pressure. In the case described above, the prior history and orbital imaging strongly indicated disseminated metastatic disease as a cause for visual loss.

Rectal adenocarcinoma most commonly metastasises to the liver and the lung. The prognosis is poor with 5-year survival of 8%, and treatment for orbital and optic nerve metastasis is usually palliative. However, the introduction of new treatments and the use of novel biomarkers, such as KRAS and BRAF provides optimism for improved management and, in particular, allows more patient-tailored treatment.² Orbital metastasis of gut origin is uncommon, with a sparse number of cases reported in the literature.

Most patients with optic nerve metastasis also have choroidal metastasis, which facilitates the diagnosis of metastatic disease.³ When uveal metastasis is absent, a systemic assessment of the patient is required and consideration of an alternative diagnosis should be

Figure 4 Low power image showing replacement of the optic nerve by mucin with collections of epithelial cells.

Figure 5 Higher power image confirming the epithelial cells as atypical and mucinous, compatible with gastrointestinal origin. The adjacent optic nerve and adventitia are compressed.

made. In our case, systemic screening was negative for other cases of optic nerve pathology while histology evaluation confirmed the clinical suspicion.

Patients with optic nerve tumour usually present with ocular pain and various degrees of visual loss. No correlation has been found between the visual acuity and the type of tumour. Funduscopy can demonstrate various degrees of optic nerve swelling while tumour tissue can appear fleshy, pink or nodular.

In such cases of metastatic rectal adenocarcinoma, a high disease burden correlates with poor survival, which ranges between 10 and 20 months.⁴ Our patient had a high disease burden with metastatic disease to the lung and liver.^{5 6} Thus, with a poor prognosis at presentation, his demise followed barely 4 months later.

Treatment for orbital and optic nerve metastasis is usually palliative and different protocols have been endorsed in various centres. Corticosteroid and chemotherapy can play a role, and radiotherapy for metastatic disease has been reported to reduce tumour size in a large proportion of patients.⁷

Although presumed rectal adenocarcinoma metastasis to the optic nerve has been reported, this case is unique with histology clearly identifying compressive disease within the optic nerve.

Learning points

- ▶ Ocular complaints should not be taken lightly in patients with a history of malignancy; a thorough history, clinical examination including orbital examination and fundus check, along with appropriate imaging are required.
- ▶ Gastric adenocarcinoma may metastasise to the optic nerve.
- ▶ Treatment for patients with optic nerve metastasis is usually palliative and life expectancy is short.

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