

Infiltrative Optic Neuropathy in a Patient with Gastric Carcinoma: Case Report and State of the Art

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Abstract

Introduction: Metastatic tumors to the optic disc are a rare event. Infiltration of the optic nerve head is usually a unilateral process with characteristic funduscopic features. Loss of vision is its main symptom. Neuroimaging should be performed in every patient suspected of infiltrative optic neuropathy. The patient should be referred for appropriated chemotherapy for the systemic cancer plus external ocular irradiation.

Case Presentation: The case of a 75-year-old man with progressive vision loss in his left eye is presented. Among his medical background a gastric adenocarcinoma (GAC) with multiple liver metastases is highlighted. The exploration showed an optic nerve head invaded by chalky whitish infiltrates, associated to flame-shaped hemorrhages along the vascular arcades; the magnetic resonance imaging (MRI) demonstrated signal enhancement of the posterior region of the left ocular globe, affecting the optic nerve head. Orbital radiotherapy was ruled out due to patient's systemic situation.

Discussion: Metastases and optic nerve infiltration should be suspected in every oncologic patient who develops optic neuropathy. Though a rare condition with poor systemic prognosis, patients should be studied and offered orbital radiotherapy in order to stabilize the ocular progression.

Keywords: Infiltrative optic neuropathy, Ocularmetastasis, Cancer, Optic Disc Edema

Introduction

Infiltrative optic neuropathy is a rare condition characterized by optic nerve dysfunction caused by direct infiltration of inflammatory, infectious or neoplastic cells. Neoplastic infiltration of the optic nerve may be due to primary (far more common) or secondary tumours: among the lasts, the most frequent are metastatic and locally invasive carcinomas and hematologic malignancies [1].

Metastatic neoplasms to the optic nerve might be a result of vascular dissemination via the choroid or through meningeal carcinomatosis.

Depending on the location of the infiltrative process the funduscopic appearance may vary: if settled in the retrobulbar portion of the nerve it might simulate retrobulbar neuritis, evolving directly to optic atrophy; if located in the retrolaminar region, it manifests

as optic disc edemawith associated congestive signs; where as if placed in the prelaminar region it appears as a whitish optic nerve head lesion possibly associated to vascular obstructive phenomena [2,3].

Optic disc metastasis is usually unilateral and characterized by central swelling of the disc. This central disc edema is characteristically intensely white, with chalky infiltrates and sharply margins with scallops or nodules. Hemorrhages in the swollen tissue may be observed.

Neuroimaging should be performed in every patient suspected of infiltrative optic neuropathy. Magnetic resonance imaging (MRI) typically shows and enhancing nerve that may be diffuse enlarged, although enlargement of a circumscribed area has also been

described [1,3].

Metastasis to the optic disc might lead to severe visual loss. Besides the appropriated chemotherapy for the systemic cancer, the patient should undergo external ocular irradiation to the posterior segment and anterior orbit of the affected eye [4].

Herein we present a case of metastatic gastric cancer to the optic nerve head. Diagnosis was based on highly suggestive funduscopy examination, patient's history of cancer, and imaging tests.

Case Presentation

A 75-year-old man was referred to the Ophthalmology Unit with a two-month history of progressive vision loss in his left eye, with no other symptomatology.

Among his medical background, a gastric adenocarcinoma (GAC) with multiple liver metastases (T4N1M1 stage) stands

out. The oncologic condition was diagnosed already widespread, approximately nine months before the visual symptomatology started. The only treatment that could be offered was palliative chemotherapy.

His best corrected visual acuity (BCVA) was 20/20 in his right eye and 20/100 in his left eye.

The anterior segment stood normal, except for an incipient cataract symmetrical in both eyes. Intraocular pressure (IOP) was also in normal range.

Dilated fundus examination of the left eye demonstrated optic disc swelling, obscuration of vessels and an optic nerve head invaded by diffuse, chalky, white infiltrates. Flame-shaped hemorrhages in the peripapillary region and through the vascular arcades were also observed (Figure 1). Right eye fundus appeared completely normal (Figure 2).



Figure 1: Left eye funduscopy showing optic disc swelling, obscuration of vessels and an optic nerve head invaded by diffuse, chalky, white infiltrates. Flame-shaped hemorrhages in the peripapillary region and through the vascular arcades are also observed

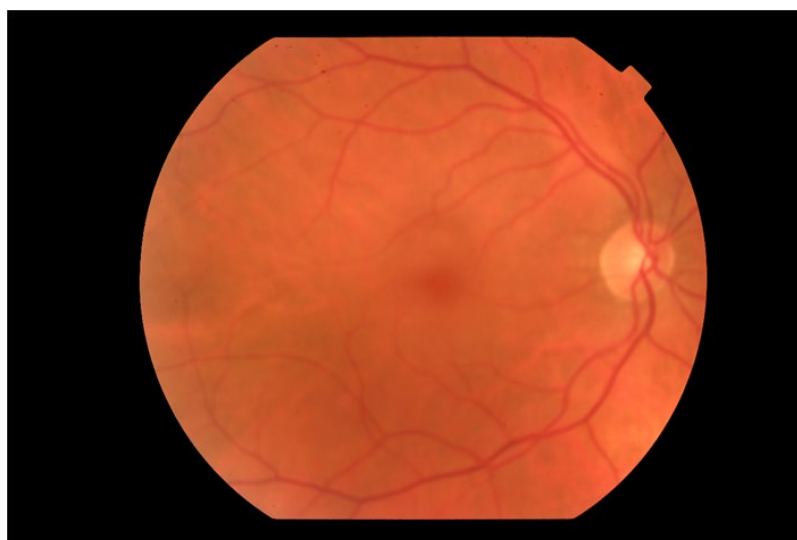


Figure 2: Right eye funduscopy showing no pathological changes

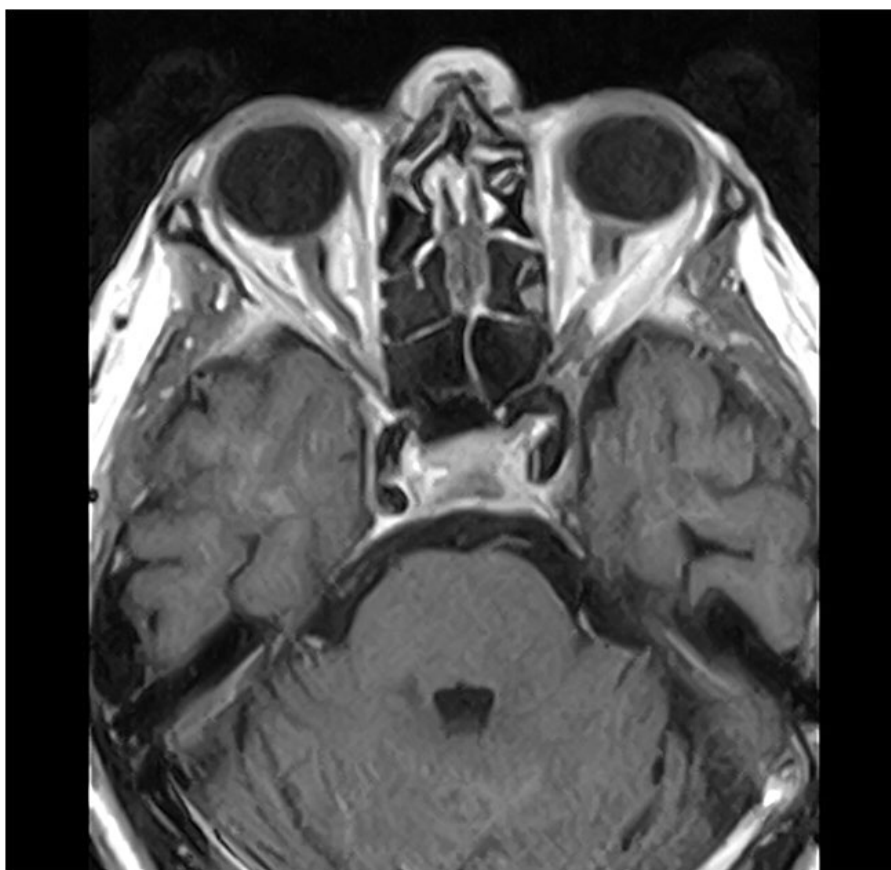


Figure 3: Magnetic resonance imaging (T1 sequence) showing unspecified signal enhancement of the posterior region of the left ocular globe, affecting the optic nerve head

No other ancillary studies were performed because of clinical and radiological diagnostic certainty. External radiotherapy was also ruled out given the advanced stage of his systemic condition, the absence of visual recovery prognosis and patient's preference.

The systemic disease became rapidly progressive once the

ocular metastasis was diagnosed. In fact, this quick progression was also evidenced by the funduscopy features changes: one month after the first examination the optic nerve head was much more unstructured, with a vitreous body gradually invaded by tumor cells (Figure 4). The patient died 8 months after the optic nerve head metastasis was diagnosed.



Figure 4: Left eye funduscopy one month after the first picture was taken. The quick progression of the optic nerve head destruction can be seen. The poorer definition of the retinal details is due to the gradual invasion of the vitreous body by tumor cells

Discussion

Isolated infiltrative optic neuropathy resulting from a metastatic process is a rare event. Large-scale reviews estimate the prevalence of intraocular metastasis involving isolated the optic disc in approximately 1.3% and 4.5% respectively, as most metastatic cancers affect the uveal tract [4,5].

Optic disc metastasis occurs almost exclusively in adulthood, with a mean age of 55 years. In most cases loss of vision is the main symptom [4,6].

Due to its low prevalence, there are not many case series in the literature. The most extensive one finds the primary neoplasm to be in the breast (43%) and in the lung (27%), being the rest in the intestine, kidney and prostate [4]. Other reports get to the same conclusions [7,8]. The most common metastatic tumours to the optic nerve are adenocarcinomas: in women, carcinomas of the breast and lung, whereas carcinomas of the lung and bowel are most common in men [1,3]. Other tumors that have been described to metastasize to the optic nerve are stomach, pancreas, uterus, ovary, prostate and kidney carcinomas. To the best of our knowledge, there are only very few publications in the literature reporting a gastric cancer with a subsequent optic disc metastasis [9,10].

Most patients with visual loss secondary to metastatic tumor to the optic nerve already have a known diagnosis of a primary carcinoma with other evidence of metastases. If so the situation, the diagnosis is made straightforward, as any person with oncologic background who develops an optic neuropathy should be suspected of having cancer as the cause until proven otherwise [1].

The patient with infiltrative optic neuropathy should undergo orbital radiotherapy, despite the optic nerve metastasis response to radiotherapy is variable: although patients generally show stability or regression of the optic disc tumour, visual acuity usually does not improve after such treatment.

The systemic prognosis for patients with optic disc metastasis is generally poor. Mean survival in the literature, after such a diagnosis, is 13 months.

In conclusion, cancer metastatic to the optic disc is a rare condition of adult hood that generally occurs unilaterally as enlargement of the optic disc due to tumour infiltration. The most common

primary tumours to account for optic disc metastasis are breast and lung cancers, though almost every carcinoma may cause this condition. Thus, metastases and infiltration should be suspected in every oncologic patient who develops optic neuropathy.

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Declarations of Interest

The authors report no conflicts of interest.

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