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SHORT COMMUNICATION

Case report

Involution of retinochoroidal shunt vessel after radiotherapy for optic nerve sheath meningioma

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PURPOSE. *To illustrate the development and involution of retinochoroidal shunt vessel of the optic disc in a patient with primary optic nerve sheath meningioma.*
CASE REPORT. *A 38-year-old woman presented with gradual onset of blurred vision in her right eye. Examination revealed a right relative afferent pupillary defect and mild edema of the right optic disc. Computed tomography (CT) showed changes consistent with a primary optic nerve sheath meningioma affecting the orbital portion of the right optic nerve. Patient was observed without treatment and subsequently developed a retinochoroidal shunt vessel on her right optic disc. With progression of the meningioma towards the optic chiasm, treatment with stereotactic radiosurgery was done. Following treatment, the optic disc gradually became pale and the retinochoroidal shunt vessel decreased in caliber with complete involution three years after radiotherapy. (Eur J Ophthalmol 2004; 14: 61-4)*

KEY WORDS. *Eye, Meningioma, Optic nerve, Optociliary shunt vessel, Radiotherapy, Retinochoroidal shunt vessel, Tumor*

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INTRODUCTION

Retinochoroidal shunt vessels of the optic disc (optociliary shunt vessels) are collateral vascular pathways draining blood from the central retinal venous circulation to the peripapillary choroidal veins. They form as a compensatory response to chronic obstruction of the central retinal vein and have been observed in several conditions including optic nerve sheath meningioma, optic nerve glioma, central retinal vein occlusion, and chronic atrophic papilledema (1-7). We had the unusual opportunity to photographically document the development of such a vessel and its involution following radiotherapy in an eye with optic nerve sheath meningioma.

Case report

In February 1992, an otherwise healthy 38-year-old Caucasian woman was referred with an 18-month history of painless, progressive visual loss in her right eye (OD). The visual acuity was 20/30 OD and 20/20 in the left eye (OS) with a right afferent pupillary defect. There was mild edema of the right optic disc and peripapillary retina (Fig. 1). Visual field examination revealed diffuse peripheral loss in the right eye and normal findings in the left eye. Fluorescein angiography showed moderate hyperfluorescence of the right optic disc without retinochoroidal shunt vessels. Orbital computed tomography (CT) revealed changes consistent with a primary optic nerve sheath meningioma

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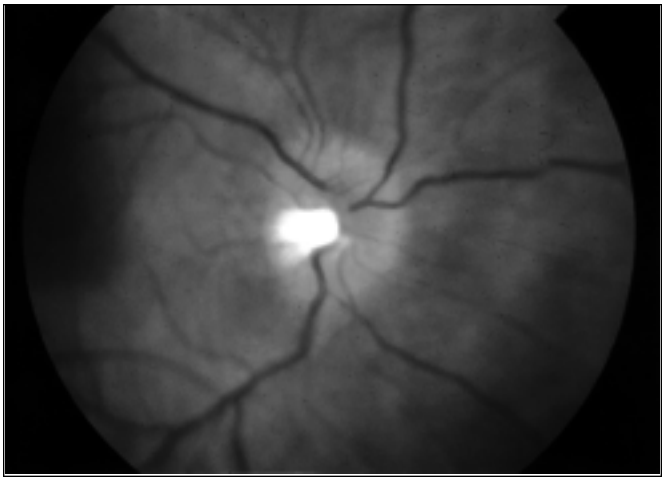

Fig. 1 - *At presentation, mild optic disc edema was noted.*

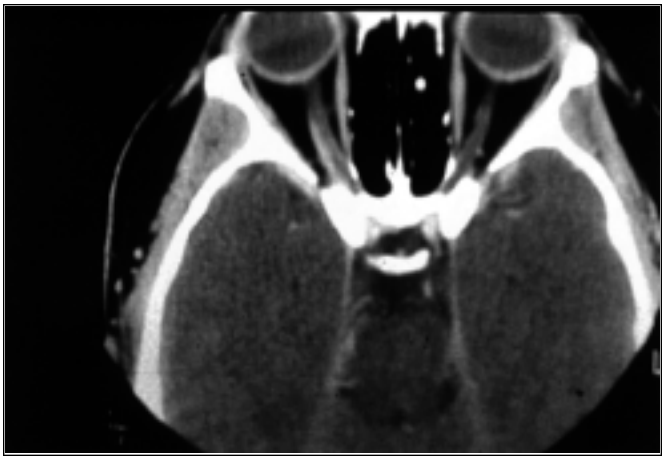

Fig. 2 - *Axial computed tomography showing thickening of orbital portion of right optic nerve with a tram-track appearance consistent with a diagnosis of primary optic nerve sheath meningioma.*

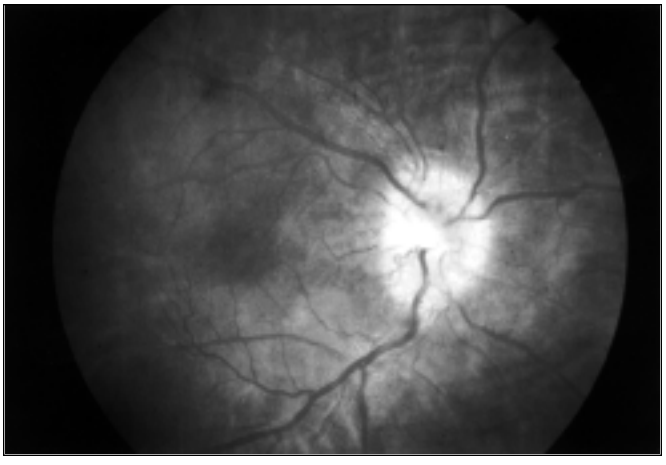

Fig. 3 - *At 21 months after presentation, a subtle retinochoroidal shunt vessel of the optic disc was visible inferotemporally.*

affecting the orbital portion of the right optic nerve (Fig. 2). A diagnosis of optic nerve sheath meningioma was rendered and observation recommended.

In November 1993, the visual acuity had dropped to 20/40, optic disc edema was increased and a retinochoroidal shunt vessel of the optic disc was noted (Fig. 3). Nine months later, the shunt vessel was more prominent (Fig. 4). In January 1998, six years after initial presentation, the visual acuity was counting fingers OD and magnetic resonance imaging revealed slight enlargement of the meningioma toward the optic chiasm and the patient was treated with stereotactic radiosurgery, delivering radiation to the tumor in 1.8 Gy fractions for a total dose of 54 Gy. Twenty months after treatment the visual acuity was no light perception, the optic disc was pale, and the retinochoroidal shunt vessel had markedly decreased in caliber. In addition, abnormal, tortuous retinal vessels were visible inferonasal to the disc (Fig. 5). Three years after radiotherapy there was marked disc pallor with complete involution of the retinochoroidal shunt vessel, inferonasal tortuous retinal vessels were still present, and the meningioma remained stable (Fig. 6).

DISCUSSION

Retinochoroidal shunt vessels of the optic disc have rarely been observed to involute. Perlmutter and associates noted regression of bilateral shunt vessels in a patient with pseudotumor cerebri after bilateral optic nerve sheath fenestrations (1). Disappearance of such vessels has also been documented in two cases of neonatal hydrocephalus after surgical normalization of intracranial pressure (2) and in a patient with otitic hydrocephalus after bilateral optic nerve sheath decompression (3). Additionally, resolution of retinochoroidal shunt vessels has been reported in rare cases following surgical removal of intracranial meningiomas (4). The involution of retinochoroidal shunt vessels associated with optic nerve sheath meningioma has been recognized to occur either spontaneously (5), following surgical removal of the meningioma (6), or following radiation therapy of the tumor /7). In our case, the vessel resolved following radiotherapy but this could represent natural course as the optic nerve underwent atrophy.

Our case illustrates the dynamic course of the de-

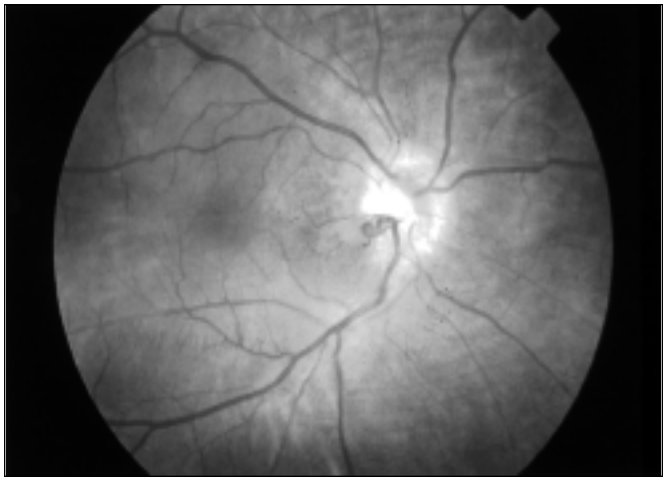

Fig. 4 - *At 30 months after presentation, the retinochoroidal shunt vessel was more prominent.*

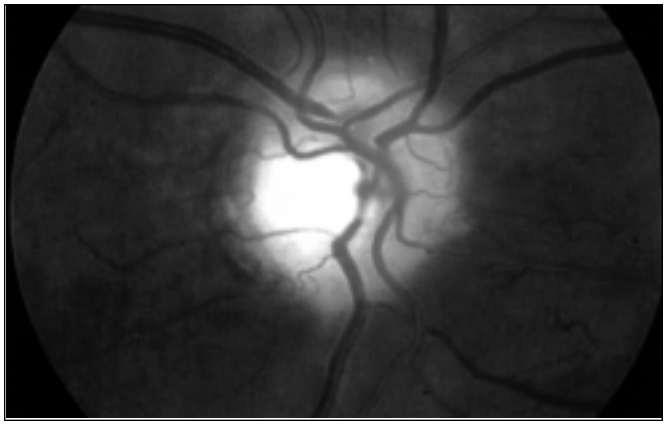

Fig. 5 - *At 20 months after radiotherapy, the shunt vessel decreased in caliber. Tortuous retinal vessels were visible inferonasal to disc.*

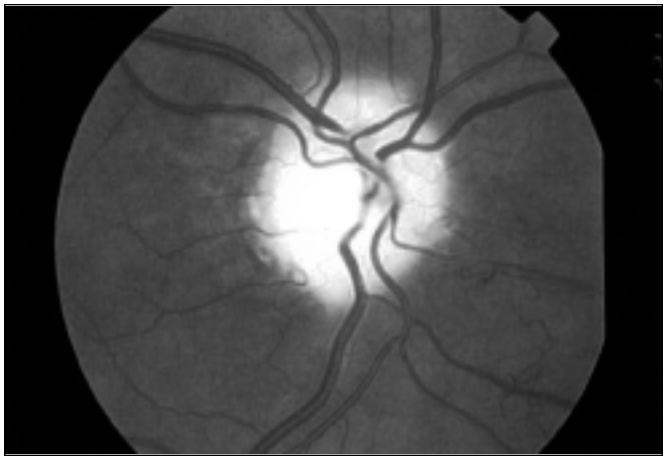

Fig. 6 - *At 3 years after radiotherapy, there was marked optic disc pallor with complete involution of the retinochoroidal shunt vessel and the tortuous inferonasal retinal vessels were still present.*

velopment and involution of a retinochoroidal shunt vessel of the disc over a ten-year period. The development of vessels occurred three years after onset of visual symptoms and was preceded by many months of optic disc edema. The involution occurred within two years of stereotactic radiosurgery, concomitant with development of optic atrophy.

The mechanism for involution of these vessels is unclear. One possibility is that radiotherapy reduces the tumor size, thus improving blood outflow through the central retinal vein. Another possibility is that the development of optic atrophy results in a thinner nerve with less obstruction, allowing decrease in the central retinal vein pressure and decrease in the caliber of retinochoroidal shunt vessels. Development of tortuous, retinal vessels inferonasal to the optic disc also deserves mention. These vessels appeared after radiotherapy, concomitant with involution of retinochoroidal shunt vessels of the disc. Although they resemble shunt or collateral vessels in appearance, it is unclear whether they actually played any role in involution of retinochoroidal shunt vessels of the disc.

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