

Visual deterioration 1½ years after wrapping an un-clippable anterior communicating artery aneurysm: report of a case and review of the literature regarding opto-chiasmatic arachnoiditis

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Abstract

Objective: Optochiasmatic arachnoiditis (OCA) is a serious complication that can occur after wrapping of aneurysms in the proximity of the optic pathways. This paper seeks to illustrate one such case with a view to drawing attention to the dangers of this practice. **Method:** Single case report and review of the literature. **Results:** The clinical and radiological features of OCA are presented and discussed, which in this patient involved failing visual acuity as well as an inflammatory mass of the suprasellar area with oedema of the optic apparatus. **Conclusion:** Optochiasmatic arachnoiditis and its attendant visual morbidity is a serious condition. In the setting described, it arose as a result of wrapping an unclippable aneurysm. The tide of aneurysm management has turned, and presently more and more of them are being obliterated by endovascular techniques. Among other benefits, this reduces the likelihood of such complications as OCA.

Key words: Cerebral aneurysms; Optochiasmatic arachnoiditis; Aneurysm coiling; Aneurysm clipping; Aneurysm wrapping

Received: 02-09-2005

Accepted: 08-05-2006

Case report

A middle-aged lady presented with a subarachnoid haemorrhage due to a ruptured anterior communicating artery aneurysm. At surgery it was found to be unclippable and was wrapped with oxidized cellulose muscle and fibrin sealant. One-and-a-half years later she returned complaining of severe, progressive bilateral visual loss.

The general physical examination was unremarkable. Her peripheral blood examination and chest X ray were normal. She had pale optic discs with a visual acuity of 6/36 in the left and

6/60 in the right eye. Magnetic resonance imaging scan of the brain demonstrated a granulomatous inflammatory lesion around the area of the aneurysm as well as marked involvement of the optic nerves, chiasm and tracts (Figures 1-4).

The lesion was not biopsied as she was reluctant to subject herself to another surgical procedure. She was placed on a course of steroids with little benefit on follow-up over a period of 18 months.

Discussion

Aneurysms of the anterior circle of Willis especially ophthalmic segment internal carotid artery aneurysms, cavernous sinus aneurysms and anterior communicating artery aneurysms are well documented as causes of loss of visual acuity.¹ Anterior communicating artery aneurysms may affect visual acuity by a number of mechanisms.

- 1) They may cause direct compression of the optic nerve and/or optic chiasm.¹⁻⁹

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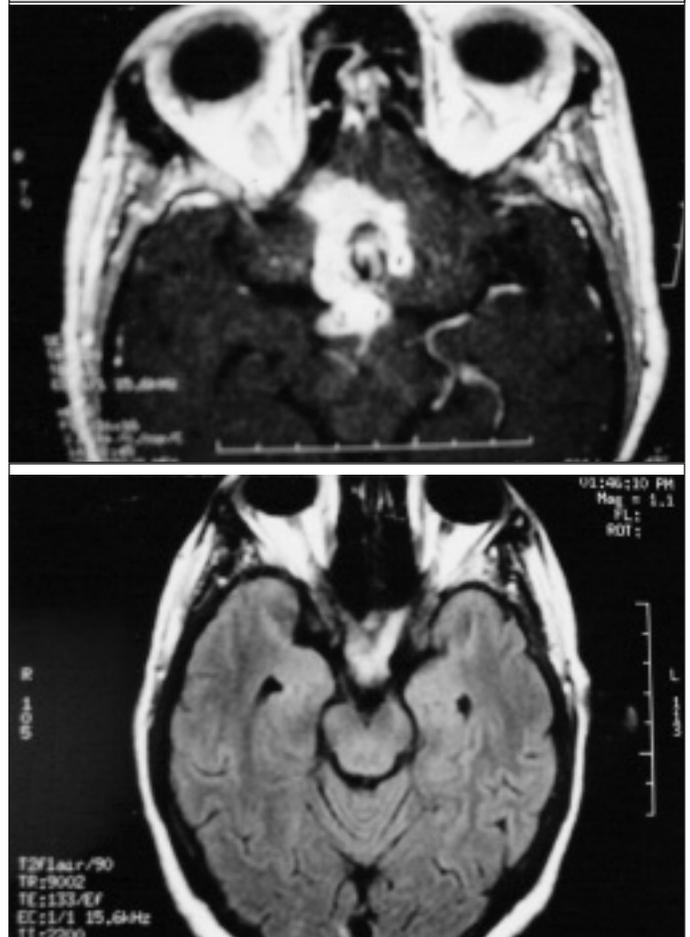
- 2) They may bleed directly into the optic nerve or optic chiasm.³
- 3) They may cause ischaemic optic neuropathy due to insufficient blood supply to the posterior part of the optic nerves as a result of subarachnoid haemorrhage following aneurysmal rupture.¹⁰
- 4) Anterior communicating artery aneurysms may cause optochiasmatic arachnoiditis (OCA). This may directly follow subarachnoid haemorrhage, or complicate the inflammatory reaction to aneurysm wrapping with a foreign body.¹¹⁻¹⁴

Optochiasmatic arachnoiditis is inflammation of the arachnoid of the optic nerve and chiasmatic cisterns, and is associated with varying degrees of visual disturbance.

OCA has many and varied causes. Trauma and infection are the commonest causes of this condition, with tuberculosis being particularly noteworthy.¹⁵⁻¹⁹ Other causes of this devastating condition include sarcoidosis, subarachnoid haemorrhage, and foreign bodies such as muslin.²⁰⁻²³ OCA has also been reported to occur in association with tumours such as craniopharyngiomas and pituitary adenomas.^{15,25} Arachnoid cysts, arteriovenous malformations, multiple sclerosis and even exposure to radiant energy have all been implicated in the causation of this condition.^{26,27,28} The patient discussed in this paper is the 31st reported case in the literature of inflammation arising from aneurysm wrapping leading to OCA and visual disturbance, the 30th case only having been reported last year.²² The first report of this kind in the literature was in 1978.²⁹ This underscores the rarity of the condition. Indeed, in one study, only 2 out of 54 patients whose aneurysms were wrapped with muslin developed OCA.²⁹ Endovascular coil occlusion is the current method of choice of treatment of ruptured anterior communicating artery aneurysms, replacing direct surgical clipping. In instances where the aneurysm is judged to be non-coilable due to its structure, or where the requisite skills are lacking, clipping still has a place in the management of these lesions.

Where these aneurysms have been exposed at craniotomy with the intention to clip them but this is then abandoned because of unfavorable anatomy of the neck, size of the aneurysm or else origin of important vessels from its dome, they

Figure 2 and Figure 3: Axial (figure 2) and coronal (figure 3) post contrast T1 MRI scan showing intense enhancement around the aneurysm and area of wrapping.



are usually wrapped with a variety of materials that include muslin, oxycellulose, macerated muscle and tissue thromboplastin. The idea behind this practice is to physically reinforce the aneurysm walls, aided by a degree of inflammatory change which then reduces the likelihood of re-rupture. Re-bleeding rates after wrapping are better than those seen with the natural history of these aneurysms; however they are still far higher than those seen with successfully treated aneurysms. Optochiasmatic arachnoiditis and visual loss is the feared

Figure 1: Axial T2 FLAIR MRI scan showing extensive oedema along the orbito-frontal gyri as well as along the optic chiasm and tracts bilaterally. Note the signal void representing flowing blood in the aneurysm.

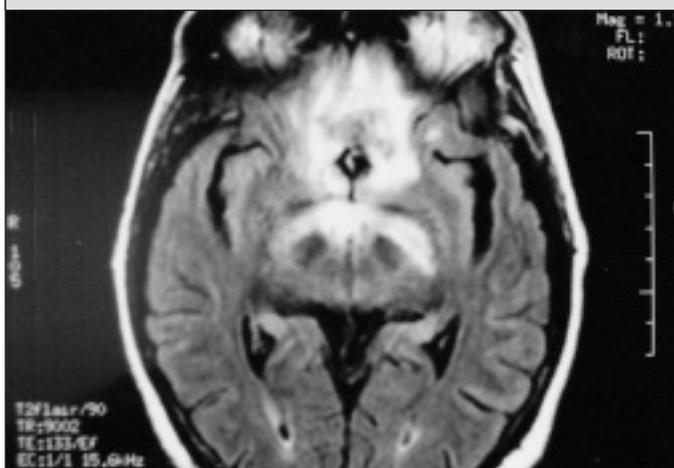
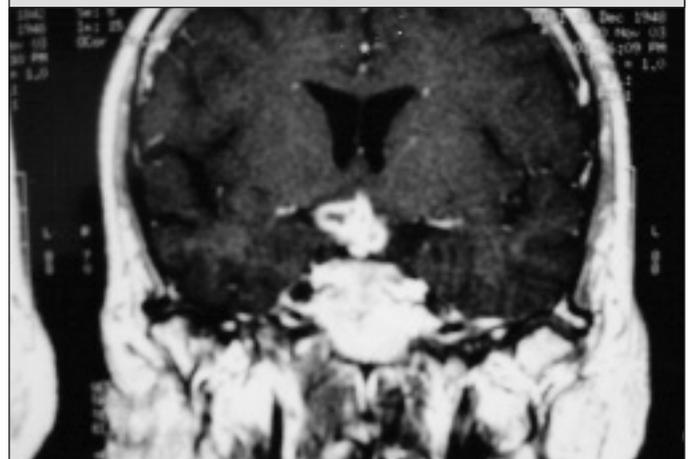


Figure 4: Axial T2 FLAIR image showing oedema of the optic chiasm and nerves bilaterally.



complication of this practice, as this case report illustrates.

The treatment of OCA can be quite challenging. There are a number of reports of success in halting its progression and restoring vision by surgical exploration and lysis of adhesions in the area, relieving pressure on the optic apparatus.^{16,30,31} This is an unattractive option in instances where an unclippable aneurysm lies beneath the inflammatory tissue, as disaster will ensue should its dome be accidentally perforated.

Anti-inflammatory and immunosuppressant drugs have been used as well with some success reported, including steroids and cyclophosphamide.^{7,30} Hyaluronidase irrigation of the subarachnoid space has shown efficacy in the treatment of OCA in the setting of tuberculous meningitis in one report.²⁴

Conclusion

The solution to this problem will lie in its prevention in the first place. This will entail better aneurysm management especially in the area of improved coiling and clipping skills and techniques among surgeons, which will increase the number of properly treated aneurysms. It will also be important that the more complex aneurysms are referred to appropriate units that are better able to treat them effectively. An aneurysm declared untreatable by one unit may be perfectly treatable by another with superior skills.

Clearly, wrapping is not the way to treat aneurysms and the sooner the practice is ended, the better for surgeons and patients alike.

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