

## Brief Communications

### Cataract surgery in a case of carotid cavernous fistula

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A carotid-cavernous fistula (CCF) is an abnormal communication between the cavernous sinus and the carotid arterial system. The ocular manifestations include conjunctival chemosis, proptosis, globe displacement, raised intraocular pressure and optic neuropathy. Although management of CCF in these patients is necessary, the ophthalmologist may also have to treat other ocular morbidities such as cataract. Cataract surgery in patients with CCF may be associated with many possible complications, including suprachoroidal hemorrhage. We describe cataract extraction surgery in 60-year-old female with bilateral spontaneous low-flow CCF. She underwent phacoemulsification via a clear corneal route under topical anesthesia and had an uneventful postoperative phase and recovered successfully. Given the various possible ocular changes in CCF, one must proceed with an intraocular surgery with caution. In this communication, we wish to describe the surgical precautions and the possible pitfalls in cataract surgery in patients with CCF.

**Key words:** Cataract, carotid-cavernous fistula, proptosis, small incision cataract surgery

Cataract surgery in cases of carotid-cavernous fistula (CCF) has been rarely documented in literature. Slochower and Dowhan first described cataract extraction surgery in CCF.<sup>[1]</sup> Hagan subsequently reported the occurrence of suprachoroidal hemorrhage while performing cataract extraction in a patient with CCF.<sup>[2]</sup> In both these reports, the lens was extracted by extra capsular route with a large limbal incision. Jethani and Ajani have reported a similar patient of CCF where a self-sealing scleral wound was used<sup>[3]</sup> [Table 1].

### Case Report

A 60-year-old Asian Indian lady presented with a 6 month old history of gradual painless diminution of vision. Her visual

acuity was 6/18, N12 and 6/24 N12 in the right and left eyes, respectively. On slit lamp examination, the conjunctiva was found to be chemotic; prominent iris vessels, corkscrew episcleral vessels and Grade II nuclear sclerosis were noted in both eyes. The left eye was found to be more proptotic than the right eye. Pupillary reactions were normal as were ocular motility, color vision and gonioscopic examination. Intraocular pressure (IOP) in both eyes was 14 mm Hg. There was no appreciable bruit; however prominent pulsations of the applanation mires were noted while measuring IOP using Goldmann's applanation tonometer. Dilated fundoscopy was normal. She had a history of left Sixth. nerve palsy, 2 months prior to presentation from which she had fully recovered. She denied any history of trauma. She was diabetic and hypertensive and on medication for the past 6 years. Automated perimetry showed normal visual fields. Magnetic resonance imaging showed bilateral prominent extra ocular muscles and dilated superior ophthalmic veins [Fig. 1]. The patient was subsequently advised to undergo angiography, however the patient declined. A diagnosis of spontaneous, low-flow, bilateral CCF was made. A neurosurgeon's consult was sought who advised conservative management in the form of carotid massage. To improve her vision, the patient underwent a cataract extraction surgery with intraocular lens implantation under topical anesthesia using 0.5% proparacaine drops (Paracaine, Sunways Ltd, India), in the left eye. A superior clear corneal route was used in the phacoemulsification technique in our patient. Postoperative recovery was uneventful and the patient regained a corrected visual acuity of 6/6, N6 in the left eye. In this letter, we wish to highlight the precautions to be taken and possible pitfalls while performing cataract surgery in a case of CCF.

### Discussion

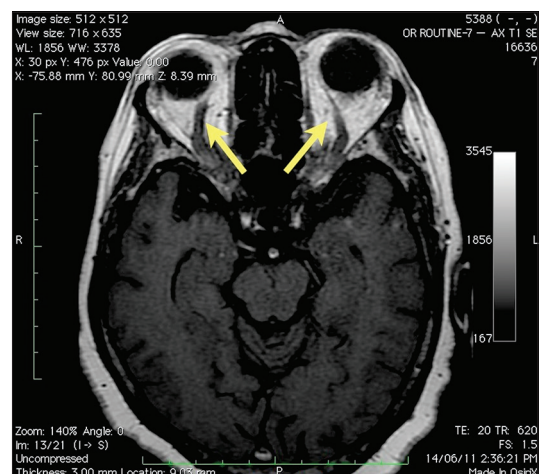
While performing cataract surgery in cases of CCF, topical anesthesia is preferred over peribulbar or retrobulbar anesthesia. Retrobulbar anesthesia may lead to extensive bleeding and cause an increase in the intraorbital pressure and subsequently a raised IOP, which may make the cataract surgery difficult. Phacoemulsification via a corneal entry is preferred over manual small incision cataract surgery (SICS) or conventional extra-capsular cataract extraction (ECCE) as the

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**Figure 1:** Axial T1-weighted magnetic resonance image showing dilated superior ophthalmic veins bilaterally (yellow arrows)

**Table 1: The cases of cataract extraction in CCF**

	Our case	Slochow and Dowhan <sup>[1]</sup>	Hagan <sup>[2]</sup>	Jethani and Ajani <sup>[3]</sup>
Type of CCF	Spontaneous, low-flow	Spontaneous, low-flow	Posttrauma-induced, direct	Spontaneous, low-flow
Secondary glaucoma	Absent	Absent	Present	Absent
Surgery performed	Phacoemulsification	Extracapsular cataract extraction	Extracapsular cataract extraction	Extracapsular cataract extraction
Surgical incision	Clear corneal self-sealing	Limbal	Limbal	Scleral self-sealing
Complication	-	-	Suprachoroidal haemorrhage	-

CCF: Carotid cavernous fistula

conjunctiva in CCF is often chemotic and highly vascular and conjunctival handling could lead to bleeding. Further, both SICS and ECCE require large conjunctival peritomy, which was done in the three cases previously described, and may be avoided in phacoemulsification. Conjunctival scarring could also be an issue since CCF is known to cause secondary glaucoma, which may need filtering/drainage surgeries later. Expulsive suprachoroidal hemorrhage is a dreaded intraoperative complication of cataract surgery. Going by the case report by Hagan,<sup>[2]</sup> patients of CCF may be more prone to suprachoroidal hemorrhage during cataract surgery, hence it seems reasonable to alert the operating surgeon to the possibility of suprachoroidal hemorrhage from increased choroidal pressure secondary to the elevated venous pressure in cases of CCF.

After entering the anterior chamber, a sudden decrease in the anterior chamber depth was seen, possibly due to increased positive retrobulbar pressure. When the eye is surgically entered the IOP falls to zero. This may increase the venous perfusion, which can cause choroidal effusion.<sup>[3]</sup> Furthermore, the anterior chamber must be formed at all times to maintain an adequate IOP as a lowered IOP could cause blood to egress hindering visualization and possible postoperative inflammation. In our case, a high molecular weight viscoelastic substance, Healon (1% Sodium hyaluronate, Abbott Laboratories Inc., Illinois, USA) was used to maintain the anterior chamber. During phacoemulsification, a high bottle height was maintained through out to ensure that the anterior chamber was well formed at all times. Anterior segment changes, namely dilated iris vessels are known to occur in CCF. Trauma to these vessels

may cause bleeding and subsequent difficulty in visualization.<sup>[3]</sup> Should such bleeding occur, a high molecular weight cohesive viscoelastic substance might be used as tamponade.

Cataract surgery in cases of CCF may be prone to more complications,<sup>[2,3]</sup> however visual recovery and prognosis is good after cataract extraction in patients of CCF. Given its advantages over conventional cataract surgery techniques, phacoemulsification should be the technique of choice, where possible, in the management of cataract in cases of CCF. Meticulous preoperative planning and intraoperative care are imperative while operating on such cases.

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