Ocular Ischemia following Vitreoretinal Surgery in Unsuspected Carotid Insufficiency

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ABSTRACT

Purpose: To report two cases that developed neovascularization of iris, secondary to anterior segment ischemia following vitreoretinal surgery with encirclage.
Methods: Retrospective chart review.
Patients: Two patients of age 64 and 67 years, who had successful vitreoretinal surgery with encirclage for rhegmatogenous retinal detachment, presented few months later with NVI and features of anterior segment ischemia. Carotid evaluation revealed 50 to 60% carotid obstruction in both patients. Encircling band was sectioned in both the patients.
Results: Partial regression of NVI with reversal of symptoms occurred in one patient while ocular ischemia could not be reversed in the other.
Conclusion: Carotid insufficiency should be suspected in elderly patients when anterior segment ischemia develops following placement of encircling buckle.
Keywords: Carotid obstruction, Encirclage, Neovascularization of iris (NVI), Retinal detachment.

INTRODUCTION

Two patients aged 64 and 67 years respectively, who had successful vitreoretinal surgery with encirclage for rhegmatogenous retinal detachment, developed features of anterior segment ischemia were noted few months later on subsequent follow-up. About 50 to 60% carotid obstruction was noted in both patients. Reversal of symptoms occurred in one patient following sectioning of the encircling band.

CASE REPORTS

Case 1

A 64-year-old male patient was referred with pseudophakic retinal detachment in the left eye. He was a diabetic for the past 10 years. On examination, the best corrected visual acuity (BCVA) was 20/20 in right eye and 20/800 in the left. Slit lamp examination showed normal anterior segment and a well-centered intraocular lens (IOL) in both eyes. Intraocular pressure (IOP) was 15 mm Hg in the right eye and 13 mm Hg in left eye. The right fundus was unremarkable with no clinical evidence of diabetic retinopathy. The left fundus showed total retinal detachment and 360° serous choroidal detachment. The patient underwent retinal detachment surgery with 2.5 mm wide 360° encirclage (240 MIRA), vitrectomy, internal drainage of subretinal fluid and silicone oil tamponade. At all subsequent visits the retina was attached and the best corrected visual acuity (BCVA) was 20/200. Three months following surgery, he complained of dull pain in the left eye. On examination, BCVA of left eye was 20/400. The upper lid was edematous. Anterior segment examination showed corneal descemet’s folds and neovascularization of the iris (NVI). There was mild inflammatory reaction in the anterior chamber. Fundus examination showed attached retina and only a mild buckle effect. Carotid Doppler study showed 50 to 55% obstruction of both the carotids. A diagnosis of anterior segment ischemia precipitated by encirclage was made. The patient was advised cutting of the encirclage. Two months following the procedure his symptoms reduced. His BCVA was 20/400 and IOP was 10 mm Hg and the new vessels of the iris had partly regressed.

Case 2

A 67-year-old male patient was referred with retinal detachment with attached macula in the right eye. He was hypertensive on treatment for the past 2 years. On examination, his BCVA was 20/20 in both eyes and anterior segment of the both eyes was unremarkable except for grade 2 nuclear sclerosis. Fundus examination of the right eye showed partial retinal detachment with giant retinal tear (GRT). The left
fundus was within normal limits. He underwent 360° encirclage, lensectomy and vitrectomy. Perfluorocarbon liquid (PFCL) was used to unfold the flap of the GRT, endophotocoagulation was done and PFCL was exchanged with silicone oil. At subsequent visits, the BCVA was 20/40 and IOP was 14 mm Hg with attached retina. The patient underwent silicone oil removal (SOR) with anterior chamber intraocular lens implantation 4 months after initial surgery. Two months following the second surgery, he complained of sudden decrease of vision in the right eye. On examination his visual acuity had reduced to 20/400. Anterior segment examination revealed edematous lids and corneal descemet’s membrane folds. AC showed 0.5 mm of hyphema with neovascularization of the iris (Fig. 1). Retina was attached with mild peripheral buckle effect. A diagnosis of anterior segment ischemia was made. Carotid evaluation revealed 60% obstruction of both carotids. The patient underwent cutting of encircling band. The hyphema increased (Fig. 2) and at the end of 8 weeks, the patient had lost perception of light. The IOP was 6 mm Hg and a blood-stained cornea was noted. (Fig. 3).

DISCUSSION

Neovascularization of the iris is not an uncommon complication following vitreous surgery for retinal detachment. Anterior proliferative vitreoretinopathy, anterior segment ischemia following high buckle and residual anterior retinal detachment are associated with rubeosis iridis after vitreous surgery.1-3 Anterior segment ischemia is a rare but recognized complication of scleral buckling surgery. The reported incidence is 3% in a general retinal detachment population but more common (71%) in people with sickle cell disease.4

Buckling predisposes to anterior segment ischemia by vortex vein compression.5 A tight encirclage might impair both the long posterior ciliary arteries which contributes to the choroidal circulation and the choroidal venous drainage.6

In our patients, signs of anterior segment ischemia developed despite the encircling band being not tight, as evidenced by the shallow indentation seen. These eyes were predisposed to ocular ischemia as partial bilateral carotid occlusion of 50 to 60% was noted in these patients. The encirclage used in these patients could have precipitated anterior segment ischemia. In the presence of bilateral carotid obstruction, the fellow eye did not develop symptoms or signs of ocular ischemic syndrome and could perhaps be considered as controls, thereby identifying the encirclage as the precipitating factor for anterior segment ischemia.

The management of anterior segment ischemia precipitated by encirclage should be directed at improving blood flow7 by relieving the compression of buckle. Cutting of encircling band could not reverse anterior segment ischemia in both the patients. The probable cause could be chronic permanent ischemia with additional risk factors, such as diabetes mellitus, hypertension and elderly age.

CONCLUSION

Carotid artery obstruction as a predisposing factor and encirclage as a precipitating factor for the development of
anterior segment ischemia following successful retinal reattachment surgery in elderly is always a possibility.

REFERENCES