Vitrectomy and Fluid Infusion in the Treatment of Delayed Suprachoroidal Hemorrhage After Combined Cataract and Glaucoma Filtration Surgery

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ABSTRACT

I report the successful treatment of one case of massive, delayed suprachoroidal hemorrhage that occurred after combined intracapsular cataract extraction and trabeculectomy. Significant vitreous incarceration in the filtration site and consequent vitreoretinal traction were present so that a limbal approach anterior vitrectomy was necessary before choroidal drainage could be accomplished safely. An infusion of balanced salt solution through a limbal infusion cannula was employed during vitrectomy and also during drainage of suprachoroidal blood. The simultaneous intravitreal infusion helped to create an efficient, controlled choroidal drainage procedure. In addition to relieving vitreoretinal traction, this technique helps prevent the periods of extreme hypotony experienced when choroidal drainage and anterior chamber reformation are accomplished serially in step-wise fashion. This use of this method also obviates the compromised view of the peripheral retina which occurs when air is introduced into the vitreous cavity.

Drainage of blood from the suprachoroidal space may be accomplished by performing a sclerotomy and then reforming the anterior chamber with balanced salt solution. However, with this surgical approach, significant hypotony and distortion of the globe may conceivably increase the likelihood of further hemorrhaging.

A surgical method of treatment has recently been described which obviates these problems by combining choroidal drainage with simultaneous intravitreal infusion of air via continuous-infusion air pump. In this series, strands of vitreous extending to the filtration site were seen in some eyes but vitrectomies were not required. In all seven cases described, retinal traction was not seen and retinal tears or detachments were not noted.

I have treated one patient who experienced a severe postoperative suprachoroidal hemorrhage after combined intracapsular cataract extraction and glaucoma filtration surgery, in whom significant vitreous incarceration to the filtration site and vitreoretinal traction complicated repair. Because of this traction, treatment was accomplished by first performing a vitrectomy followed by simultaneous intravitreal fluid infusion and choroidal drainage via sclerotomy.

CASE REPORT

A 92-year-old female underwent a right intracapsular cataract extraction combined with trabeculectomy. This operation had been performed successfully in her left eye six weeks earlier. Both eyes had been treated with Carbachol and timolol but their intraocular pressures (IOP) had remained in the high 20s (mmHg). Both discs were approximately 90% cupped. The preoperative blood pressure was 140/80 mmHg; the patient was not taking antihypertensive, antiplatelet, or anticoagulant medications. Her surgery was uneventful.
On the first postoperative day the eye was comfortable, the IOP was 9 mmHg, and the bleb was well formed, but huge dark choroidal detachments were present nasally and temporally. They were so large that they were almost "kissing" centrally (Figure 1). The anterior chamber was slightly shallow; the nasal and temporal pars plana, ora serrata, and anterior retina were bulging forward, only several millimeters behind the plane of the iris. Vitreous had been expelled through the filtration site; vitreous fibers could be traced from the filtration site back to the pars plana, ora, and anterior retina. These fibers were especially apparent nasally where the retina and pars plana seemed to be drawn forward even further with clear fluid separating these structures from the underlying pigment epithelium.

Over the next several days the choroidal detachments diminished, so that they no longer blocked the view of the posterior pole. On the fourth postoperative day, the subretinal fluid under the nasal retina was gone and the retina was applied to its pigment epithelium. The patient, who had been comfortable up until this point however, began to experience a constant dull headache over the operated eye. This headache became increasingly more severe until the ninth postoperative day. On that day, the choroidal detachments suddenly enlarged, and once again were almost "kissing." The intraocular pressure throughout the postoperative period was normal, first in the low teens and later in the high teens.

On the tenth postoperative day, the eye was reoperated under local anesthesia, with the first step, an anterior vitrectomy, accomplished using the Ocutope®. First, the anterior segment infusion pic was introduced through a superior nasal limbal incision. The Ocutope® probe was then introduced through a similar incision at the superior temporal limbus. The gravity infusion bottle of balanced salt solution was placed eleven inches above the eye and the maximum cutting rate and an extremely low suction level were employed. While being careful of the nearby retina, the sheets of vitreous fibers were removed, clearing this area and relieving all vitreous attachments between the retina and trabeculectomy wound (Figure 2). The inferior temporal sclera was then exposed and a partial thickness sclerotomy performed 7 mm from the limbus. When almost complete, the limbal infusion was again introduced and turned on. The posterior sclerotomy was then completed, and at perforation, a copious
amount of dark, golden-red hemorrhagic fluid was drained slowly and easily (Figure 3). The nasal detachment was not affected by the drainage through this sclerotomy so it was necessary to employ the same drainage process in the inferior nasal quadrant in order to drain this large detachment.

At the conclusion of surgery, several small blot hemorrhages were seen within the retina and a small amount of suprachoroidal fluid was still present within each detachment. No holes, tears or detachments were seen. There was one small area of anterior, superior, nasal retina, approximately 2 disk diameters in size, which seemed to be very slightly drawn forward in a subtle traction-like peak, but with no direct vitreous connections. Cryopexy failed to cause the usual retinal reaction presumably because of the minimal remaining suprachoroidal fluid.

The next day, vitreous strands were noted near the midperiphery temporally; they were isolated, floating freely, and did not extend forward toward the filtration site. The choroidal detachments, while extremely shallow, were both slightly larger than they had been at the conclusion of the choroidal drainage surgery; over the next weeks, progressive resolution of these detachments was observed.

Two months after surgery thin hyperpigmented "high water marks," outlining the borders of the former choroidal detachments, were seen, along with a tiny residual persistent temporal choroidal detachment. The filtration bleb was low. The IOP had risen to 30 mmHg. Best corrected vision was 20/60.

This eye was treated with Carbachol 3% and timolol 5% for the next four years. 20/60 vision was maintained although the IOP was always in the mid 20s. The other eye maintained a best corrected visual acuity of 20/25. The intraocular pressure in this other eye was well controlled in the low teens, but required pilocarpine 1% and timolol 5%.

COMMENT

Drainage of fluid from the suprachoroidal space through sclerotomies has been practiced for many years. With modern surgical techniques, large post-operative suprachoroidal hemorrhages are rare, except in eyes undergoing glaucoma filtration surgery. Immediate intraoperative choroidal drainage can be recommended only for situations when the eye cannot be closed effectively, e.g. corneal transplantation.

In the intracapsular aphaka, drainage of fluid from the suprachoroidal space can be accomplished with reformation of the anterior chamber and vitreous cavity by draining and reforming serially. With this method, intermittent hypotony may make the surgical task more difficult and may increase the likelihood of recurrent suprachoroidal hemorrhage. Alternatively, drainage may be accomplished by simultaneously infusing balanced salt solution by gravity or air by infusion pump through a limbal cannula. Simultaneous infusion of fluid through an infusion cannula, placed in the pars plana, has also been employed in cases of retinal detachment combined with choroidal detachment, but the pars plana approach should be avoided if there is a suggestion of extension of the choroidal detachment into the pars plana, as in the present case, or uveal infiltraion may occur, exacerbating the choroidal detachment.

The simultaneous infusion of clear fluid into the vitreous cavity should afford good visualization of peripheral retinal detail without the image minification and air-fluid interface problems seen with intra-vitreal air. Tears in the retina should then be more easily identified and treated during the choroidal drainage operation.

Several surgeons have found it necessary to employ vitrectomy during choroidal drainage operations. The case in this current report was characterized by such apparent vitreoretinal traction that seemed necessary to employ vitrectomy before drainage or risk what appeared to be almost certain retinal tear formation.

REFERENCES