SURGEON’S CORNER

A Novel Method of Draining Intraoperative Choroidal Detachments During 23-Gauge Pars Plana Vitrectomy

Andre J. Witkin, MD; Mitchell Fineman, MD; Allen C. Ho, MD; Marc Spirn, MD

A choroidal detachment may form during pars plana vitrectomy when the infusion line is partially disinserted and fluid is infused into the choroid or suprachoroidal space instead of into the vitreous cavity. We describe a new surgical technique that was used successfully in 4 patients who developed intraoperative choroidal detachments during 23-gauge vitrectomy after the infusion cannula was accidentally partially disinserted. During surgery, the infusion line was disconnected from the partially disinserted cannula and was reconnected to another fully inserted cannula. After resuming infusion into the vitreous cavity, the partially disinserted 23-gauge cannula was left in position and was used to immediately drain the choroidal detachment that had formed intraoperatively. In all 4 patients, the surgery then proceeded without complication.

Intraoperative choroidal detachment is a rare but potentially devastating occurrence during vitrectomy surgery. Common causes of intraoperative choroidal detachment during vitrectomy include initial placement of the infusion cannula into the choroid or suprachoroidal space and partial retraction of the infusion cannula into the choroid or suprachoroidal space. Correct initial placement of the infusion cannula can be confirmed by direct illumination using an external light source before turning on the infusion. However, retraction of the infusion cannula can sometimes occur inadvertently during surgery, particularly during scleral depression. Herein, we propose a simple technique for draining choroidal detachments formed intraoperatively secondary to partial retraction of the infusion cannula.

METHODS

During the past 12 months, 4 eyes of 4 patients experienced intraoperative choroidal detachment due to partial retraction of the infusion cannula tip into the choroid or suprachoroidal space during 23-gauge, 3-port pars plana vitrectomy. One patient had a macular hole and the other 3 had rhegmatogenous retinal detachments. All the patients were pseudophakic. Intraoperative choroidal detachment occurred inadvertently during scleral depression in 3 patients and during drape repositioning (to which the infusion line was attached) in 1 patient. In all the patients, an enlarging choroidal detachment in the inferotemporal quadrant was noted during vitrectomy as the initial sign of displacement of the infusion cannula.

Once the problem was recognized and the cause of the enlarging choroidal detachment was determined (to be a partially retracted infusion cannula), the infusion line was immediately disconnected from the inferotemporal cannula, taking care to leave the partially disinserted cannula in the choroid or suprachoroidal space (Figure A). The infusion line was then connected to the superotemporal cannula, and the infusion was turned on after confirming its location in the vitreous cavity using an indirect light source. The superonasal cannula was then plugged, and the intraocular pressure was increased to 60 mm Hg for a short period.

In all 4 patients, this technique resulted in complete drainage of the suprachoroidal fluid.
through the partially retracted inferotemporal cannula (Figure, B). A new 23-gauge trocar was then placed in the inferonasal quadrant, and the inferotemporal cannula was removed (Figure, C). The infusion line was repositioned to the inferonasal quadrant, and after confirming its correct placement in the vitreous cavity, the infusion was turned on and the surgical procedure proceeded as planned (Figure, D).

**COMMENT**

Choroidal detachment occurs when fluid accumulates between the potential space between the choroid and the sclera. With the advent of 23- and 25-gauge pars plana vitrectomy, it has been postulated that the risk of intraoperative choroidal detachment may be increased compared with that of 20-gauge vitrectomy.2 Whereas the infusion port is sutured in place in 20-gauge vitrectomy, 23- and 25-gauge vitrectomy systems use self-fixating, unsutured cannulas, which may be more likely to retract and subsequently infuse into the choroid or suprachoroidal space. Rates of intraoperative choroidal detachment during 20- and 23-gauge vitrectomy range from 0.5% to 2.0%.1-4 During small-incision vitrectomy, inadvertent infusion into the choroid or suprachoroidal space most commonly occurs during scleral depression; however, the infusion cannula may be displaced for other reasons.1-3

A variety of techniques can be useful for addressing the formation of choroidal detachments during vitrectomy. Before starting surgery, the light pipe may be used to directly visualize the correct position of the infusion cannula in the vitreous cavity. Care should also be taken to insert the trocars at a steep enough angle to penetrate into the vitreous cavity.2 If choroidal detachment forms intraoperatively, a longer, 6-mm 20- or 23-gauge infusion cannula may be substituted to ensure that the cannula tip reaches the vitreous cavity.1 Alternatively, the infusion line can be completely removed and changed to another location away from the choroidal detachment. However, neither of these techniques enables drainage and resolution of the newly formed choroidal detachment. Instead, we propose leaving the partially displaced 23-gauge cannula in the same position and using it to drain the suprachoroidal fluid.

Rossi et al5 reported a technique for draining subacute and chronic choroidal detachments in 3 patients using a 23-gauge cannula placed 3.5 mm from the limbus. In these patients, care was taken to place the cannula in areas of the highest choroidal detachment. After placement of the infusion line into the anterior chamber, hemorrhagic or serous fluid drained through the 23-gauge cannula until the choroidal detachment was nearly or completely resolved. Perfluorocarbon liquid was used to “iron” the remaining suprachoroidal fluid out through the cannula, and the eyes were left with silicone oil fill to prevent choroidal fluid reaccumulation. Similarly, the present technique used a 23-gauge cannula to drain choroidal detachments that had formed intraoperatively.

None of the present patients had suprachoroidal hemorrhage, which may not drain as easily through the 23-gauge cannula. If valved cannulas are used, the valve may prevent fluid egress through the partially disinserted cannula; however, the valve may be cut using the vitrector instrument to allow fluid to pass through the cannula. We did not perform the technique using 25-gauge cannulas, but the same technique could be applied during 25-gauge vitrectomy surgery.

In summary, we report a new technique for draining intraoperative choroidal detachment due to partial retraction of the infusion cannula during 23-gauge vitrectomy. By leaving the partially disinserted cannula in position, the distal end remains in the suprachoroidal space and can be used to drain fluid intraoperatively so that the surgery can...
proceed without further complication.

Submitted for Publication: February 13, 2012; accepted March 21, 2012.

Correspondence: Marc Spirn, MD, Department of Ophthalmology, Mid Atlantic Retina, The Retina Service of Wills Eye Hospital, Thomas Jefferson University, 840 Walnut St, Ste 1020, Philadelphia, PA 19107 (spirnm01@yahoo.com).

Author Contributions: All authors had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Financial Disclosure: None reported.

REFERENCES


Congratulations to the winner of our March quiz, Steven G. Naylor, MBChB, Department of Ophthalmology, York Teaching Hospital, York, England. The correct answer to our March challenge was congenital cytomegalovirus retinitis. For a complete discussion of this case, see the Research Letters section in the April Archives (Lalezary M, Recchia FM, Kim SJ. Treatment of congenital cytomegalovirus retinitis with intravitreous ganciclovir. Arch Ophthalmol. 2012;130[4]:525-527).

Be sure to visit the Archives of Ophthalmology website (http://www.archophthalmol.com) and try your hand at our Clinical Challenge Interactive Quiz. We invite visitors to make a diagnosis based on selected information from a case report or other feature scheduled to be published in the following month’s print edition of the Archives. The first visitor to e-mail our web editor with the correct answer will be recognized in the print journal and on our website and will receive a 1-year complimentary online subscription to Archives of Ophthalmology.