



## MIDDLE SEGMENT SURGERY MASTER CLASS

# NAVIGATING VITREOUS LOSS IN CATARACT SURGERY

An experienced retina surgeon shares his tips.

BY STEVE CHARLES, MD, FACS, FICS



The intersection of anterior and posterior segment techniques presents unique challenges and learning opportunities for cataract surgeons. This article offers an in-depth exploration into the management of vitreous loss—a situation that every cataract surgeon may encounter.

### INFUSION SITE

A sideport limbal incision is the optimal infusion site for performing an anterior vitrectomy for vitreous loss during cataract surgery. Infusion is required—dry vitrectomy lowers IOP, potentially leading to a catastrophic suprachoroidal hemorrhage. The vitrectomy probe can be inserted through a second sideport incision or preferably the pars plana.

### NUMBER OF VITRECTOMY PORTS

A single-port vitrectomy is a bad idea. O'Malley and Heintz developed the three-port vitrectomy system.<sup>1</sup> Separating infusion from the vitrectomy probe reduced turbulence, boosted the efficiency of vitreous removal, and increased flexibility.

### ORIENTATION OF THE INFUSION CANNULA

An elective three-port vitrectomy requires a pars plana infusion cannula, typically placed 3.5 mm posterior to the limbus. The top of the hub of the infusion cannula should align with the horizontal meridian. Placing the cannula in the inferotemporal quadrant poses the risks of a partial pull-out and inadvertent, dangerous suprachoroidal infusion when the eye is rotated inferiorly. A tubing service loop affixed to the drape is essential.

### TROCAR-CANNULA INSERTION

If a pars plana sclerotomy site is used, the anterior-to-posterior pressure gradient will cause vitreous to flow behind the capsule and not come forward, thereby preventing excessive vitreous removal and potentially reducing endothelial damage. If the cutter is introduced through the pars plana during anterior vitrectomy for vitreous loss at the time of cataract surgery, employing a trocar-inserted cannula instead of a microvitreoretinal blade incision offers benefits as well as drawbacks.

More force is required for trocar-cannula insertion than a microvitreoretinal blade, leading to an acute IOP elevation. This increases the risks of an opened phaco incision, iris prolapse, and sudden decompression

of the globe that could cause the trocar to damage the retina on the opposite side of the eye. For these reasons, the cataract incision must be closed with an 8-0 or 9-0 (not 10-0) nylon monofilament suture before a pars plana incision is created.

Many vitreoretinal surgeons favor a biplanar trajectory for trocar-cannula insertion, but the concept is flawed. The purpose of an angulated or oblique trajectory is to create a scleral tunnel to reduce postoperative wound leaks.

### VISUALIZATION

The question about subtotal versus total pars plana vitrectomy is complex. The surgeon cannot visualize areas posterior to the nodal point without employing a fundus contact lens or wide-angle visualization system. Performing vitrectomy without adequate visualization—a blind vitrectomy—can result in a blind patient. For total or near-total removal of the vitreous, endoillumination is essential. An endoilluminator probe is preferable, though a chandelier light source can also be used. Chandelier illumination produces more glare, especially if any corneal edema is present.

## SPECIAL CONSIDERATIONS

Asteroid hyalosis rarely necessitates a vitrectomy. The prospect of removing vitreous condensations (often referred to as *floaters*) during elective cataract surgery can be tempting for anterior segment surgeons, but the procedure is fraught with potential complications. These patients often have an increased peripheral vitreoretinal adherence, which can lead to retinal breaks and detachment when vitreous is removed. Some type of wide-angle visualization, endoillumination, and access to an

endolaser and SF<sub>6</sub> gas are necessary when removing floaters. Scleral depression is essential as well. These patients have high expectations, and some are overly anxious about floaters, a setup for an unhappy patient and litigation.

Using the highest possible cutting rate and lowest effective flow rate or vacuum reduces vitreoretinal traction. The cutter should not be pulled back when vitreous is in the port.

Cellulose sponges should not be used to remove or test for vitreous. The injection of preservative-free

triamcinolone is ideal for visualizing vitreous. ■

1. O'Malley C, Heinz RM Sr. Vitrectomy with an alternative instrument system. *Ann Ophthalmol*. 1975;7(4):585-588, 591-594.

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