Combined 25/20-gauge Vitreoretinal Surgery: A New 25/20-gauge Plug

BY RONALD C. GENTILE, MD

Retina Pearls is a column that appears regularly in Retina Today. The purpose of the column is to provide a forum for retinal specialists to share informative and exciting tips or “pearls” with regard to specific vitreoretinal surgical techniques, diagnostics, or therapeutics. This installment of Retina Pearls features Ronald C. Gentile, MD, who is affiliated with the New York Eye and Ear Infirmary. Microincision vitrectomy techniques have become widespread in the past few years, but for various reasons, larger-gauge technology remains preferable for some procedures. Here, Dr. Gentile describes a device that will allow surgeons to switch easily between standard and microincision vitrectomy while maintaining as closed a system as possible for enhanced safety and efficiency.

We would like to extend an invitation to readers to submit surgical pearls for publication in Retina Today. Please send submissions for consideration to either Dean Eliott, MD (deliott@doheny.org), or Ingrid U. Scott, MD, MPH, (iscott@psu.edu). We’re looking forward to hearing from you.

– Dean Eliott, MD, and Ingrid U. Scott, MD, MPH

Twenty-five-gauge transconjunctival sutureless vitrectomy has become more attractive since its introduction in 2002. The ASRS Preferences and Trends (PAT) membership survey of 2007 found that microincision vitrectomy surgery, which also includes 23-gauge systems, has gained marked popularity over the years. About 80% of retina surgeons who responded to the PAT survey use microincisional vitrectomy. Although 25-gauge systems predominate, 23-gauge is predicted to be on the rise over the next 5 years. This trend toward smaller incisions appears to be a result of surgeon satisfaction and comfort level in addition to improved instrumentation and surgical techniques.

Although there are many who are skeptical of microincision vitrectomy, similar skepticism existed during the years following Charles Kelman’s introduction of phacoemulsification to cataract surgery. If ophthalmic history can shed any light on the future of vitrectomy surgery, smaller incisions will prevail. However, just as all cataract surgeons have the training and tools to convert to larger incisions, the retina surgeon needs the ability to use a 20-gauge or larger incision during vitrectomy. In most cases, only one 20-gauge sclerotomy is necessary, and usually it is only needed for a portion of the surgery. When combined cases are performed, only the microincisinal vitrectomy pack is needed for the vitrectomy setup.

Case selection by the retinal surgeon is most likely to predict the potential need for a 20-gauge sclerotomy. This selection is based on the individual surgeon’s experience, expertise, and comfort level. Regardless of expertise, however, there are times when an instrument is needed that only a 20-gauge sclerotomy can accommodate. The reasons for using one larger sclerotomy can be divided into two major categories:

**Category 1:** The need to use or remove 5,000 centistoke silicone-oil tamponade

**Category 2:** The need to use an instrument that is either currently not made in a smaller gauge or is not available in a smaller gauge at one’s institution or ambulatory surgery center.

**PLANNED OR UNPLANNED**

Depending on the surgical scenario, combined cases can be planned or unplanned. When planned, a small radial incision in the conjunctiva is made depending on the needed location. For cases in which a 20-gauge sclerotomy or larger is not needed at the beginning of the procedure, the initial sclerotomy can be made with a 25-gauge microvitreoretinal (MVR) blade (Figure 1). Another option is to use the 25-gauge trocar inserted straight in, and then when the larger
sclerotomy is needed the trocar is removed and the sclerotomy is enlarged with a 20-gauge MVR blade through the same opening. During unplanned cases, one trocar is removed and a small conjunctival incision is made to expose the 25-gauge sclerotomy to be enlarged. In some cases another location can be used and the trocar left in place with a plug. If a trocar is removed, it should be kept in the sterile field because it can be reused if repositioned onto the inserter.

**CATEGORY 1**

- 5000 centistoke oil (removal or placement)
- For 5000 centistoke oil removal, the superotemporal quadrant is preferred, especially in aphakic and pseudophakic eyes, because this allows a more anterior approach to remove residual anterior oil. When removing oil, the initial sclerotomy is made 20 gauge or larger. During placement of the oil, the sclerotomy is enlarged at the end of the case only when needed.

**CATEGORY 2**

- **Membrane peeler cutter (MPC) scissors**
  - If MPC scissors are to be used, then the 20-gauge sclerotomy could be placed in the quadrant to accommodate the surgeon’s dominant hand if the pathology to be addressed is approachable from that location. Many times, this maneuver may be unplanned, especially when the membranes are either too adherent or too dense to remove with the microvitrector without some segmentation.

**PARS PLANA LENSECTOMY**

- For cases that require a pars plana lensectomy, the superotemporal quadrant is preferred unless the lens material is dislocated posteriorly. If the lens material is posterior, the surgeon has the option to use his dominant hand for the phacoemulsifier. The peripheral cortex can be removed first with the vitrector. The infusion pressure should be set high to keep up with the phacoemulsifier vacuum, and it is important to keep the port occluded with lens material because the 25-gauge infusion will not keep up with the vacuum of the phacoemulsifier. If needed, another 25-gauge infusion can be placed inferonasally using a second bottle. This procedure comes in handy, especially when the cataract surgeon calls for help.

**INTRAOCULAR FOREIGN BODY**

- In selected cases of intraocular foreign bodies, a 25-gauge vitrectomy around the foreign body can be performed to free it prior to enlarging the sclerotomy. Once the foreign body is removed, the sclerotomy can be partially closed with suture.

**NEW 20/25-GAUGE PLUG AND TROCAR ADAPTOR**

- During combined 25- and 20-gauge vitreoretinal surgery, a 25-gauge instrument in many cases is needed after the sclerotomy is enlarged. In such cases, the larger sclerotomy may be partially closed with suture. Because interchanging between 25-gauge and 20-gauge instruments is not uncommon during combined cases, I developed a 20/25-gauge plug (Figure 2). The design of this plug is simple, consisting of a 20-gauge or 18-gauge plug that has been bored out in the center to accommodate a 25-gauge instrument and when not needed plugged with a 25-gauge plug. This allows the surgeon to go back to a 25-gauge instrument and keep the eye as closed a system as possible. Alcon has developed a similar instrument called a sclerotomy adaptor that will be available mid-2008 (Figure 3). This trocar adaptor will allow conversion of a 20-gauge noncannulated incision down to either a 23-gauge or 25-gauge cannula-based surgery.

**CONCLUSION**

- Microincision transconjunctival sutureless vitrectomy surgery is predicted to be the predominant vitrectomy...
approach in the future. This is particularly true as advances are made in instrumentation, wound construction, and surgical techniques. Whether 23 gauge will overtake 25 gauge or become a transitional system is to be determined. The need to either plan a larger sclerotomy or convert to a larger incision sometimes becomes necessary. The new 20/25-gauge plug and sclerotomy adaptor can aid in these combined cases, which should be in the armamentarium of all microincisional vitrectomy surgeons.

Ronald C. Gentile, MD, is Associate Professor of Ophthalmology at the New York Eye and Ear Infirmary, New York Medical College. Dr. Gentile and NYEE have a patent pending on the 25/20-Gauge Plug described in this article. He can be reached at RGentile@nyee.edu; phone: +1 212 979 4120; fax +1 212 979 4512.

Dean Eliott, MD, is Professor of Ophthalmology and Director of Clinical Affairs, Doheny Eye Institute, Keck School of Medicine at the University of Southern California, Los Angeles. Dr. Eliott is also a member of the Retina Today Editorial Board. He may be reached at deliott@doheny.org; phone: +1 323 442 6582; fax: +1 323 442 6766.

Ingrid U. Scott, MD, MPH, is Professor of Ophthalmology and Public Health Sciences, Penn State College of Medicine, Hershey, PA. Dr. Scott is also a member of the Retina Today Editorial Board. She may be reached at iscott@psu.edu; phone: +1 717 531 4662; fax: +1 717 531 5475.

Supported by the Norma Lazar Ophthalmology Research Fund.