

A Conservative Approach to 23-gauge Vitrectomy

BY ANDREW A. MOSHFEGHI, MD, MBA; AND THOMAS ALBINI, MD



In the December issue of Retina Today, Rohit Ross Lakhanpal, MD, discussed surgical techniques to help limit complications in small-gauge vitreoretinal surgery. These potential complications include the failure to achieve complete wound closure and subsequent early postoperative hypotony, thus allowing an intraocular influx of extraocular fluid and microorganisms. The chief advantages of small-gauge surgery relative to the standard 20-gauge approach are decreased operating times, expedited patient recovery, reduced fluid loss during surgery and improved fluidic stability. Many potential pitfalls of small-gauge surgery, such as hypotony, endophthalmitis, choroidal hemorrhage, or retinal detachment, may be avoided or limited by closure of sclerotomies. In this article, we suggest sutured small-gauge surgery as a prudent compromise between traditional 20-gauge vitrectomy and small gauge surgery in select cases.

—Thomas Albin, MD; and Rohit Ross Lakhanpal, MD

DESCRIPTION OF TECHNIQUE

Using blunt Westcott scissors, three radial conjunctival periotomies (superotemporal, superonasal, and inferotemporal) are performed for 2 mm to 3 mm to bare sclera. The anterior aspect of each periotomy is initiated approximately 1 mm posterior to the surgical limbus to create an uninterrupted and smooth perilimbal region postoperatively.

The first 23-gauge trocar-cannula system is then passed perpendicularly through the bare sclera at an area that is approximately 3.5 mm posterior to the surgical limbus in each desired area. No beveling or angling of the trocar-cannula system is required because postoperative scleral sutures will be passed at the end of the case. Once all three 23-gauge cannulas are in place, the surgical case is carried out to completion.

At the conclusion of the case, each of the cannulas is removed sequentially and closed with a single 7-0 Vicryl suture in an interrupted fashion. The leftover 7-0 Vicryl suture is then used to close the overlying small conjunctival periotomies in a single, interrupted, and buried-knot fashion. The time it takes to create these periotomies is trivial, generally less than 1 minute. A well-trained fellow or practicing vitreoretinal surgeon can typically close the periotomies and overlying con-



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junctiva in fewer than 6 minutes. Therefore the total added time to open and close a 23-gauge surgery with planned suture closure is approximately 7 minutes.

Keep in mind that time is saved when passing the trocar-cannula complexes through the sclera in a perpendicular fashion, instead of the angled/posterior approach required with planned transconjunctival sutureless vitrectomy. Moreover, additional time is saved and frustration averted because an unanticipated scleral wound closure with planned transconjunctival sutureless vitrectomy is avoided. In that scenario, it is often difficult to find the wound to pass a combined transconjunctival/transcleral suture in one fell swoop through hemorrhagic and/or chemotic conjunctiva at the end of the case and requires trying, and potentially failing, to first adequately close the scleral wound. Alternatively, wound closure may be delayed by asking for Westcott scissors (Acme United Corporation,



Figure 1. Postoperative day 1.



Figure 2. Postoperative day 2.

Fairfield, CT) and obtaining the suture by the circulating nurse.

DISCUSSION

Other than sutureless closure, small-gauge surgery affords many benefits over 20-gauge surgery such as smaller incisions, trocars to improve fluidic stability, less manipulation of scleral wound edges, and superior vitreous cutters for stripping membranes. In selected cases, it is important to minimize the increased surgical risk of hypotony associated with these technological advances. In our anecdotal experience, pediatric patients, uveitis patients, patients with thin or weak sclera, and patients who rub their eyes due to allergies,

irritation, or force of habit, may be exceptionally susceptible to postoperative complications following sutureless surgery. Future research in large case series should help better define clinical characteristics associated with postoperative hypotony following small-gauge surgery.

The added step of suturing sclerotomies may often replace a full or partial air-fluid exchange, now routinely employed by many surgeons at the end of a case to decrease the rate of postoperative hypotony in sutureless surgery. This may result in improved patient satisfaction because avoiding a postoperative air bubble will result in better vision in the immediate postoperative period (Figures 1 and 2). Although the recovery may

DISCUSSION

By Rohit Ross Lakhanpal, MD

Andrew A. Moshfeghi, MD, MBA, and Thomas Albin, MD, have recommended sutured closure of sclerotomies in select 23-gauge surgeries. Small-gauge vitreoretinal surgery has progressively improved since its inception nearly 10 years ago. Instruments are now stiffer, fluidics are more stable, vitreous cutting capabilities have been enhanced, and, consequently, patient outcomes have improved. Hypotony and endophthalmitis are infrequent but potentially devastating complications that may be increased with small-gauge surgery systems. Therefore, any step that may decrease the incidence of these complications should be examined. Early small-gauge vitrectomy case series in the literature did not fully examine certain patient populations (ie, pediatric cases, uveitis cases).^{1,2} Recently, however, case series in the literature have described favorable outcomes with small-gauge surgery in retinopathy of prematurity.^{3,4}

Recent improvements in technique of entry and closure

have improved outcomes in small-gauge surgery. At the termination of all cases, the presence of a bleb indicates possible hypotony and warrants suture placement. If the infusion is still in place, the eye will not become hypotonous; however, if the infusion removal creates a bleb, I preemptively have a syringe with air or balanced salt solution ready to infuse prior to suture placement. Thus, there is less risk of a complication.

In summary, all surgery is technique-dependent. Placing sutures at each sclerotomy site may theoretically decrease the risk of hypotony and endophthalmitis. I believe a study examining some of these patient populations would be helpful to determine if the benefit is statistically significant.

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2. Ibarra MS, Hermel M, Prenner JL, Hassan TS. Longer-term outcomes of transconjunctival sutureless 25-gauge vitrectomy. *Am J Ophthalmol*. 2005;139(5):831-836.
3. Gonzales CR, Boshra J, Schwartz SD. 25-Gauge pars plicata vitrectomy for stage 4 and 5 retinopathy of prematurity. *Retina*. 2006;26(7 Suppl):S42-S46.
4. Kychenthal A, Dorta P. 25-gauge lens-sparing vitrectomy for stage 4A retinopathy of prematurity. *Retina*. 2009;29(1):127.

not be as quick and comfortable as sutureless surgery, it appears to be more comfortable than wound closure in traditional 20-gauge surgery, perhaps because the sutures are not placed at the limbus. Most patients would probably prefer the added mild discomfort in exchange for avoiding significant complications. Surgeons should consider sutured small-gauge surgery, particularly in patients thought to be at risk for postoperative hypotony. ■

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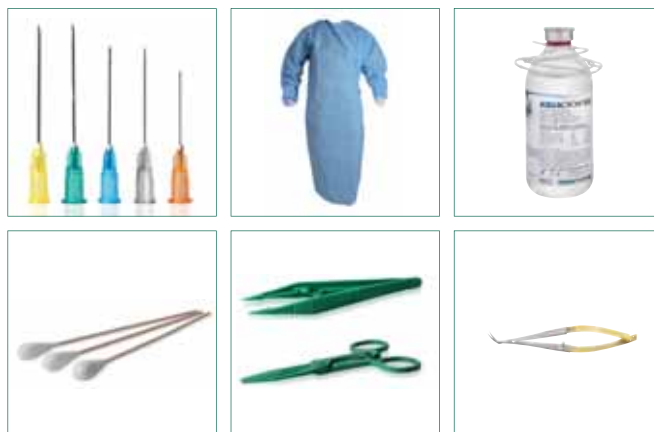


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