Giant Retinal Tear Repair

A PANEL DISCUSSION WITH MEMBERS OF THE VIT-BUCKLE SOCIETY

Repair of retinal detachments associated with giant retinal tears (GRTs) often presents unique challenges for the vitreoretinal surgeon beyond a common rhegmatogenous detachment. In this month's discussion, a panel of Vit-Buckle Society (VBS) members share their approaches toward this form of complicated retinal detachment. We asked each participant to address issues such as the role of adjunctive scleral buckling, the appropriate approach for phakic patients, techniques to prevent retinal slippage, choice of tamponade agents, and choice of vitrectomy gauge.

Q: WHAT IS THE ROLE OF SCLERAL BUCKLING AS AN ADJUVANT PROCEDURE IN REPAIR OF GRTS?

Brandon G. Busbee, MD: I will only use a scleral buckle if I see preoperative proliferative vitreoretinopathy (PVR). I perform a primary vitrectomy and create small radial relaxing retinotomies (~ 1-2 disc diameters) at the edges of the tear 45° away from the detachment, which I believe aborts the "unzipping" process that led to the GRT and allows the retina to flatten nicely.

John W. Kitchens, MD: I typically do not employ a scleral buckle in cases of a GRT that is greater than 180°. In smaller GRTs, it seems that a buckle can be helpful at reattaching the retina and supporting the uninvolved retina. In these cases (eg, a 3.5-clock hour GRT), I will place a 41 band around the eye (to support the peripheral retina) with a low 287WG in the area of the GRT. I try to get this segmental portion a little more posterior and keep it lower to prevent slippage. I generally don't see PVR at the time of GRT presentation because most patients notice substantial vision loss early, before PVR has a chance to form. If PVR occurs after a GRT, I consider using a buckle. In many instances, however, the PVR can be severe, prompting me to perform a retinectomy.

Geeta A. Lalwani, MD: I always use a scleral buckle, usually a low-lying 41. Although I agree that a buckle is not always necessary, I have never regretted having one in place. In my experience, PVR most commonly occurs after inferior GRT repair. Because I usually already have a buckle in place, I end up performing a retinotomy in these cases.

Charles C. Wykoff, MD, PhD: I like to use a low-lying encircling scleral buckle, usually a 41 band. I am careful not to tighten it too much because a high scleral buckle can increase the chance of the retinal slipping posteriorly. I measure the posterior most extent of the tear (not the flap) and I prefer that the plateau of the scleral buckle extend posterior to this so that the tear edges lie anterior to the crest of the buckle. If the GRT is larger than 180°, I do not place a buckle.

Audina M. Berrocal, MD: I like a scleral buckle when there is other pathology in the retina or if the GRT is old with PVR. I agree that with a low-lying buckle, the higher the buckle the more slippage. But if we have a fresh GRT with no other pathology, I opt for no buckle.

Charles W. Mango, MD: I place a scleral buckle in all cases of GRTs. Two choices for me include a large imbricating buckle (276 solid silicone element) covering the area of GRT combined with an encircling 240 band, or a gentle encircling 42 band. With the former, there is more chance of slippage during the air fluid exchange, but this supports the GRT perfectly. I choose this buckle in patients with a GRT of less than 180° and in patients who have an accessible orbit that allows for placement of a larger-sized element. When comparing the gentle encircling 42 band to a larger buckle element, there is less chance of slippage and this is a much quicker buckle to place on the eye. I choose this buckle in patients with

a GRT of greater than 180º and in patients with a tighter orbit that allows limited access.

Jorge A. Fortun, MD: I place a low-lying 41-style encircling band to support the vitreous base in a majority of these cases. It is important to avoid excess buckle height to prevent posterior retinal slippage, "fishmouthing," or radial folds.

Rohit Ross Lakhanpal, MD: I prefer to place a low-lying 42 band in GRT cases when the GRT is less than 180º and when PVR is present. My rationale is that I will be supporting the attached area and will have an area of additional support in the detached portion. Severe PVR almost always requires a scleral buckle, retinectomy, and silicone oil.

Q: IS THERE ANY ROLE FOR LENSECTOMY IN PHAKIC PATIENTS?

Dr. Berrocal: I try to leave the patients phakic if possible for better tamponade. Sometimes anterior PVR will not allow for a good dissection and sacrificing the lens is necessary to accomplish PVR dissection and retinal reattachment.

Dr. Lakhanpal: I prefer to leave the lens intact and will only perform a lensectomy when my view is compromised or if the anterior PVR does not allow for proper flattening during perfluoron-fluid-air exchange. If the latter occurs, the lens must be removed and it may be necessary to perform further dissection at the vitreous base and possible retinectomy.

Leaving the lens intact also will allow for a better fill with oil and gas, and this is an important factor in the recovery process and for final postoperative vision. Fortunately, most patients with GRTs tend to be younger with a clearer view through the lens, which we are able to preserve.

Dr. Mango: I am able to leave the crystalline lens intact because I am using a peripheral buckle in all cases, which does not require me to be as aggressive with anterior vitreous removal as I would without a buckle in place. If the patient has anterior PVR or if there is a significant cataract that limits my view, then I perform a lensectomy.

Q: WHAT IS YOUR TECHNIQUE TO PREVENTING POSTERIOR RETINAL SLIPPAGE?

Dr. Berrocal: I perform perfluorooctane (PFO)-silicone oil exchanges. I think this is the only way to truly avoid slippage. A PFO-silicone oil exchange is a technique that requires practice and patience. When performed well, it looks like nothing happened in the eye during the exchange because the retina stays completely intact.

Dr. Kitchens: Direct PFO to oil is the key to preventing slippage. There may be an issue with subretinal PFO when this technique is used in association with small-gauge surgery and/or the Constellation system (Alcon Laboratories, Inc.), which may be due to infusion pressure. For that reason, I like to detach the infusion line and have our fellow hold the 25-gauge oil infusion cannula in its place. I then have the light pipe in my left hand and the soft tip in my right hand (open to allow for passive egress of the PFO) so that I can remove the PFO as the oil infuses. If I am operating alone, I use a chandelier because it allows me to remove the infusion line (to avoid the PFO issue) and hold the 25-gauge oil infusion kit in my left hand and the soft tip in my right hand.

Dr. Wykoff: Even if I am using silicone oil, I like to go to air. I perform the fluid-air exchange very slowly with passive fluid removal with a 23-gauge backflush cannula, draining the fluid anterior to the PFO completely before draining the PFO. I drain what I think is all the fluid, then wait a few minutes, drain some more, and repeat this a few times until there is no (or as little as possible) residual fluid. I think many cases of slippage occur when there is significant fluid remaining in the eye during a too rapid fluid-air exchange. I have had success with PFO-silicone oil exchange but I believe that not only is it unnecessary in most cases, but that there are also more issues that can arise, such as pockets of retained PFO, that do not occur with fluid-air exchange.

Steven Yeh, MD: I use PFO in all of these cases with a meticulous, slow subretinal fluid drain along the edge and the elbows of the GRT, making sure where I drain is as dependent as possible (paying attention to shaft of the soft-tip cannula to ensure there is no lens contact). When I think the edge is dry, I drain again. Once it is dry, I drain 1 more time. I generally perform a PFO-air-silicone oil exchange so I can look for blebbing under air and check for any small bubble of retained PFO.

Dr. Lalwani: I prefer the drying technique with PFO to prevent slippage. The key is to remove fluid from behind the flap from the beginning while torqueing the eye in that direction. Removing fluid from behind the flap has allowed me to avoid PFO in about 50% cases. Once an air exchange has been performed and the flap has not

slipped, I have not had any problems with slippage during oil placement.

Dr. Fortun: PFO is necessary in a majority of these cases. Regardless of whether I am using silicone oil, a careful PFO-air exchange is usually successful in preventing posterior retinal slippage. Rotating the eye to place the area of pathology in the most possibly dependent position, adequate visualization of the edges of the tear (particularly anterior) and a patient, meticulous drainage of aqueous along tear-PFO interface with a very gradual removal of PFO are keys to preventing posterior displacement. In cases where visualization is difficult or slippage occurs despite careful PFO-air exchange, I will perform a direct PFO-silicone oil exchange.

Dr. Lakhanpal: Usually, particularly if I have placed a low-lying buckle, I have no trouble with slippage by switching from PFO to air. First, I drain all fluid to achieve an air-PFO interface and then, I slowly remove the PFO by torqueing the eye in the direction of the GRT. If some slippage occurs, as you will see in my video for this discussion, further removal of fluid and repositioning needs to be performed followed by laser treatment at the base of the buckle. Typically, I have to wait 1 to 2 minutes to re-drain the fluid that collects anteriorly and will create slippage. It is important to be patient and get all the fluid out. In PVR cases where I feel that the retina may not flatten completely, once the PFO has been removed, I will perform a direct PFO-silicone Oil exchange. These cases are relatively rare.

Q: WHAT IS YOUR CHOICE OF TAMPONADE AGENT FOR GRT CASES?

Dr. Berrocal: I normally prefer a long acting gas, but because I often perform surgery for pediatric GRT, I have different opinions regarding this topic. If a child is non-compliant with positioning, I will definitely use oil. If the child is compliant and there is no PVR, I will use gas.

Dr. Lakhanpal: I normally prefer a long acting gas tamponade. My indications for silicone oil are the following: (1) presence of PVR; (2) predominantly inferior GRT; (3) air travel in the next 2 months; and (4) inability to position full-time for 1 week. If these conditions do not exist, particularly in a motivated and compliant phakic patient, I think that gas works beautifully. I typically tell these patients that they need to comply with full-time positioning for 7 days. If they cannot assure me of this, I go directly to oil.

Dr. Mango: I prefer a long-acting gas mixture (C_3F_8) to silicone oil in these cases. I tend to use 1000 CS silicone oil when there is an inferior GRT or when there is PVR present. I prefer my patients position for a week after surgery.

Dr. Wykoff: I prefer to use a long acting gas, usually 16% C_3F_8 with full time patient positioning for a full week. If it's a fresh GRT I will use gas even for inferior GRTs if the patient can be compliant with positioning. I use silicone oil in the presence of PVR for inferior GRTs if there is any doubt about full-time positioning or if the patient needs to travel by air within 2 months postoperatively.

Q: WHAT IS YOUR CHOICE OF GAUGE FOR VITRECTOMY TO FIX GRTS?

Drs. Berrocal, Fortun, Lalwani, and Wykoff: 23 gauge.

Dr. Kitchens: 25 gauge—all the way.

Dr. Mango: My preference is 20 gauge in these cases. I like the improved fluidics of a larger vitrector, the ease of torqueing the eye with the sturdier instruments, better wide-angle lighting options, and the increased variety of instrumentation available in the event of PVR removal (i.e. bent lighted pick). Because I am placing a buckle in all cases, the conjunctiva is already open and I close all sclerotomies with sutures in these cases to ensure no gas leakage or oil leakage.

Dr. Yeh: I also use 20 gauge for GRTs. I like to have the wounds closed with suture in the rare chance that the scleral wounds are not perfectly sealed because of the silicone oil. I'm always a little worried about silicone oil migrating in the subconjunctival space and having a suboptimal silicone oil fill in a phakic patient where the vitreous is incompletely dissected or the vitreous base is broad and adherent. I have found this to be a bigger problem on pediatric GRTs, which seem to have a different pathogenesis.

Dr. Busbee: I use 25 gauge on these cases. These patients are almost all phakic and the reduced infusion helps the cataract issue.

Dr. Lakhanpal: I like using 25+-gauge with the Constellation. In phakic patients (usually seen in GRT), the relatively lower infusion pressures are better for cataract progression. The 25+ design allows for smaller but

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BY ROHIT ROSS LAHKANPAL, MD

Figure 1. Large giant retinal tear extending from 6 to 7 clock hours.

Figure 2. 25-gauge vitrectomy is performed with special care to remove as much as the vitreous base as possible.

Figure 3. Perfluoron is placed. It is important to not allow any bubbles to get underneath the retina.

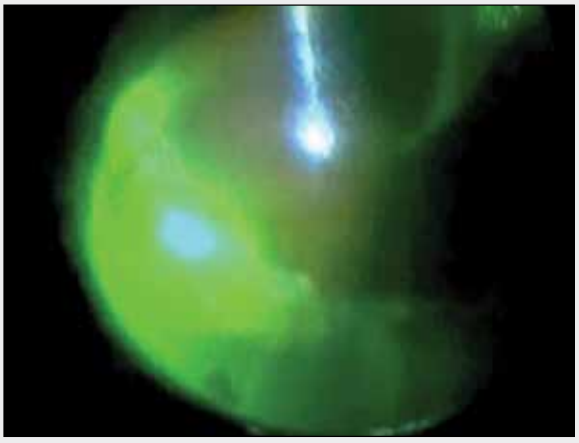

Figure 4. Confluent laser is applied to the edge of the buckle to ensure the GRT does not "slip off."

Figure 5. Fluid-air exchange is performed.

Figure 6. After the silicone oil is administered, it is important to ensure that the peripheral iridectomy remains patent prior to finishing the case. The patient had 20/20 visual acuity at 1-year follow-up.

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eyetube.net/?v=dehal

To view the video of this case, scan the QR code in this article or follow the link to www.eyetube.net.

stiff instrumentation to be used for proper vitreous base dissection. I have even found 25+ to be is as effective as larger gauges in PVR cases. ■

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