

PEARLS FOR VITRECTOMY FOR PRIMARY RETINAL DETACHMENT



Rethinking a few things we do by habit.

BY JAY STALLMAN, MD, FACS

Vitrectomy has become the preferred method for most retinal detachment (RD) repairs, particularly in the era of small-gauge surgery and wide-angle visualization systems. Just as it was useful to learn from mentors when I was training, to this day I learn from my peers about how they perform common procedures, including vitrectomy for RD. We surgeons can become set in our ways, and we tend to do things as we have always done them. Here are a few pearls from my own techniques to give you a different perspective on this procedure, which I hope invites you to think about returning to some basic principles in the OR.

PEARLS FOR THE OR

Pearl No. 1: Reconsider Infusion Location

In an eye with a large open break, select an infusion site that allows you to avoid infusing fluid through the break and under the retina, which can make the detachment more bullous. There is no law that says the infusion cannula must be placed inferotemporally, and, in some cases, selection of an inferonasal or other site (eg, superior) may help you avoid complications. Similarly, if the plan is to drain fluid through a primary break, a sclerotomy site in the meridian of the tear can be selected for easier access.

Pearl No. 2: Consider Fluid Aspiration Rather Than Perfluorocarbon Liquid

With a mobile retina, it is helpful to clear vitreous from the area of the

break right away to facilitate aspiration of subretinal fluid. Promptly locate the preexisting break, clear the surrounding vitreous, and drain subretinal fluid under fluid infusion. Fluid aspiration, usually performed with the vitrector handpiece, often flattens the retina (or nearly flattens it) and reduces the risk of retinal incarceration into the vitrectomy cutter during the procedure. The flattening effect may be temporary, as additional infusion fluid may migrate under the retina, but the RD will rarely become as bullous as it was originally. This tactic is useful in an ambulatory surgery center setting, where use of perfluorocarbon liquid for countertraction is cost-prohibitive.

Pearl No. 3: Ask Yourself: Must the Retina Be Flat?

Although it is satisfying to see a flat retina after surgery, it is neither necessary nor always advantageous. A thin layer of residual subretinal fluid will resorb in a day or two. If enough fluid has been removed to allow retinopathy

around the primary break and drainage site, then this is adequate.

Even in situations in which you cannot get the retina flat enough to apply laser near the drainage site, it is only necessary to get laser uptake in retinal pigment epithelium (RPE) to create an adhesion. Retinal whitening is not necessary, and use of a long-duration laser application that results in RPE pallor around the break generally will result in adhesion after the fluid reabsorbs. Hot, white laser burns may be more likely to result in secondary atrophic breaks and proliferative vitreoretinopathy. Use of a snake-like subretinal fluid cannula, such as a Grizzard cannula, to try to drain posterior fluid is rarely necessary, and it can leave tracks of RPE damage.

Pearl No. 4: Work in a Pattern

A 2016 study tracked eye movement patterns in radiologists examining chest x-rays.¹ Doctors were grouped based on experience. The study authors found that the eyes of less experienced doctors

AT A GLANCE

- Returning to basic physiologic principles in the OR may improve outcomes of vitrectomy for retinal detachment.
- Given advances in technology, rethinking some common surgical steps and techniques may be worthwhile.
- Preparing patients for the postsurgical period can lead to a less stressful experience for patients and surgeons.

darted from spot to spot on the films, but more experienced readers systematically examined imaging results and did not return to areas already examined. I believe a similar phenomenon occurs in our field during vitrectomy.

It is efficient to move circumferentially rather than randomly during vitrectomy for RD, and it reduces the likelihood that you will have to retrace your steps. I tend to first address areas where the ora serrata is attached using core vitrectomy mode, switching to shaving mode as I approach the clock hours with detachment.

I routinely shave the vitreous base at the ora closely, avoiding the crystalline lens. Changing hands to perform vitrectomy from both sides of the eye to avoid reaching across the lens is paramount during this step. Of course, it is necessary to have an assistant perform scleral depression.

Pearl No. 5: Use Passive Aspiration in Selected Cases

For draining subretinal fluid, use of a low-flow approach can reduce the risk of incarcerating the lip of the drainage site into the port of the soft-tipped cannula. This can be accomplished with passive aspiration, an old technique originally done with instruments such as the Charles flute needle. We now have various backflush handpieces with soft tips. In this manual technique, aspiration is controlled by feathering your finger over the side port of the handpiece to allow egress of fluid, which is passively driven by air infusion.

Alternatively, the Eva surgical system (Dutch Ophthalmic USA) allows users to achieve the same effect by use of the flow control mode, whereby the user can specify a low flow rate of 0 cc to 6 cc/min or 0 cc to 3 cc/min. On the Constellation Vision System (Alcon), you can simulate this effect by reducing the maximum vacuum to 150 mm Hg to 200 mm Hg, which produces a flow rate to about either 0-2 cc/min or 0-5 cc/min.

These low-flow methods require patience because the fluid movement is

slower. Positioning the cannula tip well above the opening or deep through the opening will help to avoid retinal incarceration. The natural tendency is to hold the tip almost level with the retinotomy, but this technique creates the highest likelihood of occluding the port. Of course, rotating the globe to make the break dependent may allow drainage through the primary break, obviating the need for creating a new retinotomy at all.

Pearl No. 6: Remember the Importance of Visualization

Visualization is important during vitrectomy for RD, and it can get complicated during fluid-air exchange. Advance the light pipe into the fluid during air-fluid exchange to eliminate reflections from the surface of the fluid interface. When the fluid level is reduced so that air fills at least 80% of the eye, the field of illumination becomes too small, and then the light pipe must be withdrawn to illuminate a broader area. If using a BIOM (Oculus), refocus it by raising it off the eye when working under air.

PEARLS FOR THE POSTOPERATIVE PERIOD

Pearl No. 7: Reconsider Postoperative Positioning

We routinely impose positioning requirements on patients that make an already stressful experience more difficult. Often, however, these positioning requirements are not needed. Imagine, for example, a pseudophakic patient presenting with an RD with superior breaks. After surgery, the retina is flat. There is no reason this patient should remain face down. In an upright position, with a 50% or greater gas fill, any superior breaks and drain site will still have tamponade. Therefore, the patient should be able to sit up normally during the day and sleep on his or her side with the head elevated. Similarly, a break at the 6 o'clock position can be easily closed, as long there is a 60% or more gas fill. The patient should position on the side, not face down. With prone positioning, the gas bubble

moves posteriorly and may not contact the 6 o'clock position.

For patients in whom prone positioning is required, it is helpful to avoid the phrase *sit and tip*. Patients sometimes think this means that they should maintain their torso upright and hang their head down. This puts excessive strain on the neck and back and is often impossible for older patients with cervical arthritis or disc issues. It is much more practical to advise that the head and neck be maintained in a straight line with the spine and that the patient should bend forward from the hips. The patient can then lie on a pillow on a table or use a massage chair with a donut face rest. Some patients use a safety pin to attach a sock with a tennis ball in it to the back of their pajamas to serve as a wake-up call should they happen to roll onto their backs at night.

Pearl No. 8: Prepare for Postoperative Quirks

You will save yourself many an evening phone call if you specifically advise patients that they will see the meniscus of the gas bubble—"a line going across their vision," as I tell them—and that this fluid wave will jiggle and bounce, especially when they walk up stairs. I advise them that the line will move progressively lower in their field of vision and that, when it passes the halfway point, it will seem as though they can look over the top of the bubble (even though they are actually looking under it). Eventually, I tell patients, they will be able to tell when it is gone.

PREPARATION IS KEY

These items can help to make vitrectomy for RD less stressful for doctors and patients alike. ■

1. Kelly BS, Rainford LA, Darcy SP, Kavanaugh EC, Toomey RJ. The development of expertise in radiology: in chest radiograph interpretation, "expert" search pattern may predate "expert" levels of diagnostic accuracy for pneumothorax identification. *Radiology*. 2016;280(1):252-260.

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