



THE OD'S FUNCTION IN RETINA SURGERY



Tips for comanaging patients following vitrectomy from the early postoperative period on.

BY FRASER MCKAY, OD

Optometrists provide excellent postoperative management for a variety of ocular procedures. Thanks to recent advances in techniques and technology, modern day, small-gauge vitrectomy has revolutionized retina surgery, providing a faster, less invasive, often sutureless procedure for a variety of vitreoretinal pathologies. This article examines the role we can play in comanaging our patients in the days and weeks following a vitrectomy.

VITRECTOMY REVIEW

The term *vitrectomy* means the surgical removal of the vitreous, which is typically accomplished with a vitrector (a small, specialized tool that cuts the vitreous into small segments before removing them from the eye). A vitrectomy is usually performed under monitored local anesthesia and

can take anywhere from 15 minutes to more than 2 hours, depending on the pathology and complexity of the case.

Three points of entry into the eye, called sclerotomies, enable the surgeon to illuminate the retina while performing the vitrectomy. These incisions are performed through

the pars plana, hence the term *pars plana vitrectomy* (PPV). Every surgery, whether for primary rhegmatogenous retinal detachments (RRDs), intraocular foreign bodies, or another retina condition, begins with the generalized removal of the vitreous (Figure 1). This ensures that further manipulation within the globe is less likely to cause iatrogenic retinal breaks through inadvertent vitreous traction.

Once the retina is reattached, or the membrane is peeled, etc., the vitreous cavity may be filled with any number of materials, including gas, liquid, and oil (the type of material chosen depends on the procedure performed). Although PPV for floaters or vitreous hemorrhage may require air-fluid exchange (in which the vitreous cavity is filled with sterile saline), a retinal detachment or macular hole generally requires a tamponade with gas to eliminate trans-hole fluid flow, thus restoring the transretinal pressure

AT A GLANCE

- ▶ A standard postoperative schedule should generally involve visits at days 1 and 7 and one visit between weeks 3 and 4.
- ▶ Low IOP at postoperative day 1 requires close inspection of the sclerotomies for possible leakage. High IOP may be caused by expanding gas or a steroid response.
- ▶ Pain is not common following PPV. Identifying the etiology of the pain is important.

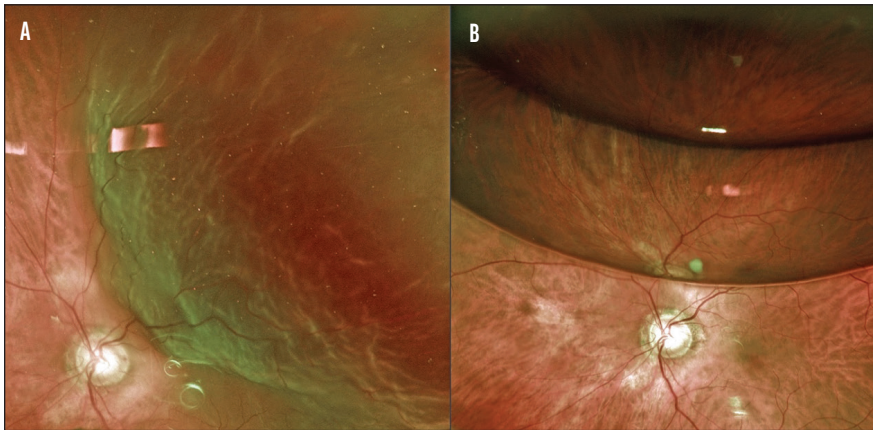


Figure 1. Macula-off retinal detachment before (A) and after (B) PPV.

gradient required to keep the retina attached. The exact composition of the gas varies from surgeon to surgeon but is usually a mixture of either SF_6 plus air or C_3F_8 plus air. Over time, these bubbles are reabsorbed safely into the body, as the vitreous cavity fills with aqueous humor. An air bubble in the vitreous will last 4 to 5 days, whereas SF_6 can last up to 2 weeks and C_3F_8 can last between 8 and 12 weeks.

Other materials, such as silicone oil and perfluorocarbon (Figure 2), are used in situations of chronic inferior detachments, repeat detachments, or in the presence of proliferative vitreoretinopathy. Although perfluorocarbon is not intended to stay within the eye for an extended period, as it will lead to inflammation, silicone oil is frequently left inside the eye to prevent further detachments.

EARLY POSTOPERATIVE PERIOD

A standard postoperative schedule should generally involve visits at days 1 and 7, and one visit between weeks 3 and 4. The patient's retina surgeon should have prescribed a postoperative regimen of drops consisting of a topical broad-spectrum antibiotic and a steroid for 1 week, followed by a weekly taper of the steroid. Vision will be counting fingers or worse day 1 in the presence of intraocular gas, which can be particularly unnerving for patients who had good vision preoperatively, such as those with macula-on

detachments. Inflammation and pain are typically mild, depending on the length of the surgery. Small amounts of blood or even a small gas bubble may be present in the anterior chamber.

Your fundusoscopic examination of the post-vitreotomy patient will be limited because internal reflections from the gas and gas-induced cataracts, called *feathering* (Figure 3). Because both liquid (ie, water) and silicone oil/perfluorocarbon have similar indices of refraction and minimal internal reflections, these fundusoscopic examinations are reasonably straightforward. I like to have the patient look down so I can observe the inferior gas meniscus to determine the level of gas fill (generally between 80-90% for most RRDs).

Postoperative head positioning is key to success in certain situations (eg, RRD). Although the literature isn't as clear about full-thickness macular hole surgeries, head positioning for RRD remains straightforward.¹ The position of the original retinal break should be located at the uppermost location of the eye. Any cryotherapy or laser photocoagulation performed during the procedure takes up to 1 month for new chorioretinal adhesions to form. Typical positioning is head down and slightly tilted to the opposite side of the retinal detachment or break during waking hours and sleeping on the opposite side of the break at night.

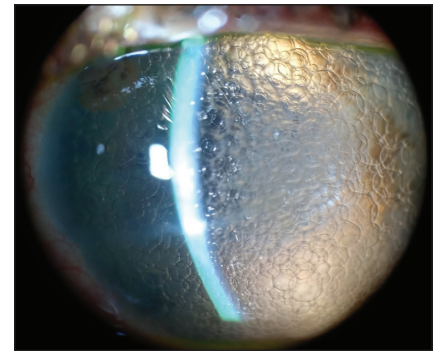


Figure 2. Perfluorocarbon in the anterior chamber of an eye viewed through a slit lamp.

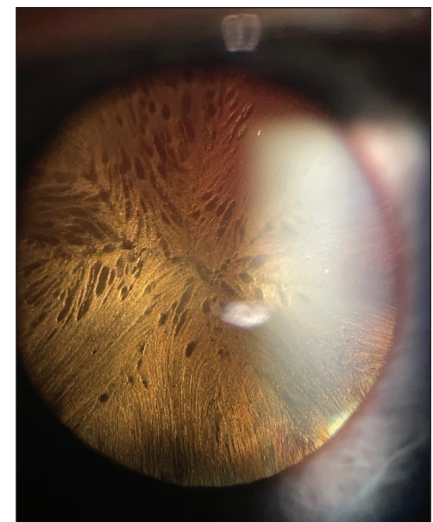


Figure 3. An example of gas-induced cataract, known as feathering.

TROUBLESHOOTING Eye Pressure

The gasses used to fill the vitreous cavity following vitrectomy can expand within the eye, despite using a mixture of air in an attempt to avoid this. Most expansion will occur within the first 3 days post-surgery and have a characteristic appearance. As the gas expands, the lens/iris diaphragm will move anteriorly and, in some situations, collapse the anterior chamber completely. In such situations, removing the gas will remedy the acute problem (the surgeon can often do this in-office), however if the chamber is collapsed, it may need to be reformed in the OR.

Elevated IOP in the presence of less than 100% gas fill (remember the inferior meniscus) or in the presence of a deeply formed chamber is unlikely

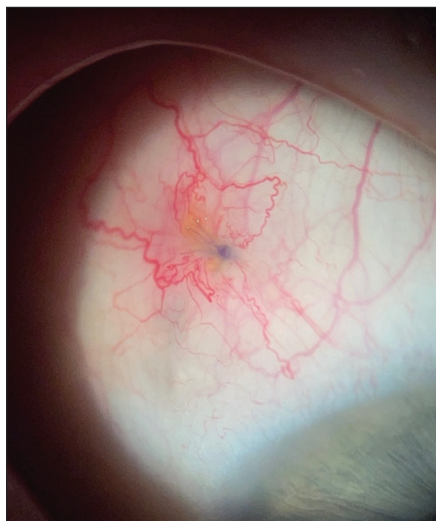


Figure 4. Occasionally, a PPV will require a single dissolvable Vicryl suture (purple area).

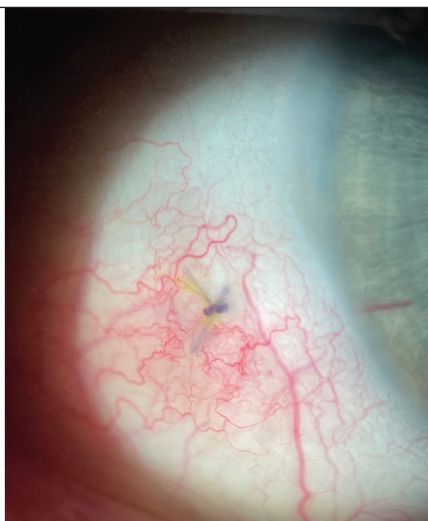


Figure 5. Recurrent retinal detachment inferiorly, despite recent vitrectomy.



Figure 6. Emulsified silicone oil creating a reverse hypopyon appearance.

to be from gas expansion. Steroid responses may be present during the postoperative period as early as days 6 to 7, and quickly discontinuing the steroid in addition to adding an IOP-lowering medication will help. Low IOP at postoperative day 1 requires close inspection of the sclerotomies for possible leakage. Choroidal effusions can be seen with or without a leaking

sclerotomy and are almost always inferior. A leaking sclerotomy should be sent back to the OR for suturing.

Pain

Pain is not common following a PPV, and identifying the etiology of the pain is important. Although most PPVs can be sutureless, some require a single suture using polyglactin (Vicryl, Ethicon) at each opening. These sutures (purple in color; Figure 4) are dissolvable, but may cause significant pain, which is often out of proportion to the clinical examination. Digital inspection of the affected area generally confirms the source. Sutures can be removed in-office under local anesthetic by the OD. I recommend using lidocaine gel because proparacaine is often not enough. These sutures are generally safe to remove after day 4 or 5, but it's always useful to confirm with the patient's surgeon if you are unsure.

Redetachment

Redetachment is a real possibility and is estimated to occur in 10% to 20% of primary RRD cases (Figure 5). Dilating these patients at every visit after a vitrectomy to monitor for redetachment and examining the retina is important, but can be difficult

when half of the eye is filled with gas. Having the patient sit in a reclined position so the gas interface is uniform will enable better views. Look inferior first, as this is likely the first location for a redetachment.

LONG-TERM CARE

Patients who undergo vitrectomy rarely have lasting complications. Phakic patients will almost certainly develop a visually significant cataract, sometimes within months of the original procedure. Be sure to communicate to your patient's cataract surgeon their ocular history, as it may alter their surgical plans. Complications from silicone oil may arise, specifically emulsification of the oil (a breakdown in the surface tension due to increased friction between silicone oil and other intraocular fluids). This gives rise to a characteristic "reverse hypopyon" appearance and has been shown to block trabecular meshwork and increase IOP (Figure 6).

WITH KNOWLEDGE COMES POWER

Knowing what to expect post-vitrectomy not only allows you to be more confident and comfortable in the after care of your patients and in communicating these post-surgical expectations to them, but it also enables you to identify signs and symptoms that aren't typical. Being able to spot a complication and act early can save a patient's sight. As vitreoretinal surgery continues to advance, consider working alongside a retina specialist to comanage these patients comfortably. ■

1. Chaudhary V, Sarohia GS, Phillips MR, et al. Role of positioning after full-thickness macular hole surgery: a systematic review and meta-analysis. *Ophthalmol Retina*. 2022;52468-6530(22)00322-0.

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