

# Direct PFO-Silicone Oil Exchange

*This new maneuver improves surgeon control of the intraocular environment and reduces the risk of retinal slippage.*

By Maria H. Berrocal, MD

**T**he CONSTELLATION® Vision System (Alcon) is one of many recent technological advances that is pushing microincision vitrectomy surgery (MIVS) to the forefront of a growing number of practices. MIVS, 25-gauge in particular, has become my surgical approach of choice for even the most complicated cases. Using the CONSTELLATION® system and its ultra-high-speed vitreous cutter, I can remove vitreous efficiently, maneuver under and around membranes and fibrous tissue and utilize the probe as a pick, a forceps and an aspirator, all with minimal traction on the retina.

The CONSTELLATION® system has several truly unique features, such as its ability to allow injection of fluid and active aspiration simultaneously. I have been using this feature to perform direct exchange of perfluoro-carbon liquid (PFCL) and silicone oil during surgeries to repair retinal detachments complicated by ocular trauma, giant tears, proliferative vitreoretinopathy or the need for extensive retinectomies. The PFCL I typically use is perfluoro-n-octane liquid, or PFO, (Perfluoron, Alcon). It has a high specific gravity, which allows it to be infused over the posterior portion of the retina to facilitate retinal flattening and anterior displacement of subretinal fluid. The high density and low viscosity of PFO provide a significant tamponade force, which helps to stabilize the retina so I can work with it more easily in these difficult cases.<sup>1</sup>

## A More Controlled Exchange

When I plan to perform direct PFO-silicone oil exchange, I begin the case in the usual manner with a complete vitrectomy. Next, I remove any membranes and areas of traction. Once that is complete, I inject the PFO into the eye to flatten the retina. Alternatively, I often prefer to peel membranes under the PFO. The PFO can serve as a tool to open star-folds and help identify their centers. Optically, it can also enhance the visibility of fine membranes in the posterior pole. With the retina flattened, I perform laser photocoagulation through the PFO to seal any tears and reattach the retinal tissue.

In the past, at this stage of the procedure, it would have

been necessary to either remove the PFO and introduce air into the eye before injecting the silicone oil, or remove the PFO passively through a flute needle while injecting the silicone oil. Neither of these options was ideal. In eyes with giant tears or extensive retinectomies, a PFO-air exchange creates a significant risk of the retina slipping posteriorly. Passive removal of PFO is a slow process. Also, it is difficult to take out the PFO at the same rate the silicone oil is

### SILIKON™ 1000 Oil Indications for Use

**CAUTION:** Federal (USA) law restricts this device to sale by, or on the order of, a physician.

**INDICATION:** SILIKON™ 1000 oil is indicated for use as a prolonged retinal tamponade in selected cases of complicated retinal detachments where other interventions are not appropriate for patient management. Complicated retinal detachments or recurrent retinal detachments occur most commonly in eyes with proliferative vitreoretinopathy (PVR), proliferative diabetic retinopathy (PDR), cytomegalovirus (CMV) retinitis, giant tears, and following perforating injuries. SILIKON™ 1000 oil is also indicated for primary use in detachments due to Acquired Immune Deficiency Syndrome (AIDS), related CMV retinitis and other viral infections affecting the retina.

#### CONTRAINDICATIONS:

- SILIKON™ 1000 oil (purified polydimethylsiloxane) is contraindicated in patients with known hypersensitivity to silicone oil.
- SILIKON™ 1000 oil is contraindicated in pseudophakic patients with silicone intraocular lenses.

#### WARNINGS/PRECAUTIONS:

- Oil-induced papillary block and angle closure can occur in aphakic eyes if a six o'clock iridectomy is not performed.
- Do not use a vial for more than one patient.
- Discard unused portion.
- Do not admix with any other substances prior to injection.
- Do not resterilize.
- Do not use expired product.
- An underfill may result in an ineffective inferior tamponade and an overfill may result in corneal abnormalities and elevated IOP.
- The use of SILIKON™ 1000 oil as a long term tamponade has not been studied and must be determined by the treating physician. SILIKON™ 1000 oil should be removed when, in the judgment of the physician, the retinal attachment would not be compromised.

**ATTENTION:** Reference the Directions for Use labeling for a complete listing of indications, warnings, precautions, complications and adverse events.

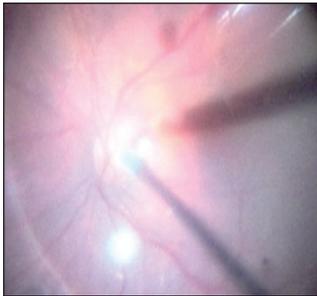
See adjacent page for important safety information.



**Figure 1. A single screen on the CONSTELLATION® Vision System shows parameters for simultaneous active aspiration and viscous fluid injection for 25+™-gauge surgery.**

coming in, which can result in unacceptably high intraocular pressure. Managing the pressure can be especially difficult when small-gauge instrumentation is used. In contrast, using direct PFO-silicone oil exchange with the CONSTELLATION® system, going from a fluid-filled eye to oil instead of having to infuse air first, I can reduce the risk of retinal slippage. In addition, the active aspiration of PFO gives me much better control of intraocular pressure as the silicone oil is going into the eye. To use direct exchange, I can begin injecting the silicone oil as well as initiate active suction to remove the PFO from the same panel on the system's touch screen (**Figure 1**).

When introducing the PFO into the eye, it is important to place an amount sufficient to go over the edge of the



**Figure 2. The perfluoro-n-octane (PFO) bubble is actively aspirated during direct PFO-silicone oil exchange with the CONSTELLATION® Vision System.**

retina. Also, as the oil starts coming in, I remove some of the fluid that is anterior to the PFO bubble. This is another way to help

prevent retinal slippage. Once the fluid is removed, I place a soft-tipped cannula in the area over the optic nerve to remove the PFO as the silicone oil continues to come into the eye (**Figure 2**).

The silicone oil can be injected directly through the infusion trocar by utilizing the silicone injection cannula. However, I prefer to use one of the new infusion lines that can be connected to a trocar and is specifically designed for MIVS (**Figure 3**). For example, the PolyTip VFI Cannula (MedOne Surgical Inc.), which has a very thin wall, makes injection of the oil easier and more efficient for small-gauge procedures.



**Figure 3. Silicone oil is introduced into the eye through the infusion trocar cannula.**

## CONSTELLATION® Vision System Indications for Use

**Indications for Use:** The CONSTELLATION® Vision System is an ophthalmic microsurgical system that is indicated for both anterior segment (i.e., phacoemulsification and removal of cataracts) and posterior segment (i.e., vitreoretinal) ophthalmic surgery.

**Caution:** Federal (USA) law restricts this device to sale by, or on the order of, a physician.

### Warnings and Precautions:

- The disposables used in conjunction with ALCON® instrument products constitute a complete surgical system. Use of disposables and handpieces other than those manufactured by Alcon may affect system performance and create potential hazards.
- Attach only ALCON® supplied consumables to console and cassette luer fittings. Do not connect consumables to the patient's intravenous connections.
- Mismatch of consumable components and use of settings not specifically adjusted for a particular combination of consumable components may create a patient hazard.
- Vitreous traction has been known to create retinal tears and retinal detachments.
- The closed loop system of the CONSTELLATION® Vision System that adjusts IOP cannot replace the standard of care in judging IOP intraoperatively. If the surgeon believes that the IOP is not responding to the system settings and is dangerously high or low, this may represent a system failure. Note: To ensure proper IOP Compensation calibration, place infusion tubing and infusion cannula on a sterile draped tray at mid-cassette level during the priming cycle.
- Leaking sclerotomy may lead to post operative hypotony.

**Important Safety Information:** Warnings and Cautions: A complete listing is available in the CONSTELLATION® Vision System Operators Manual. To obtain a copy, please contact Alcon Customer Service.

**Attention:** Reference the Directions for Use for a complete listing of indications, warnings, and precautions.

## New Option Useful in Several Scenarios

The CONSTELLATION® Vision System is the first vitreoretinal surgical platform to allow simultaneous injection of viscous fluid and active aspiration. This capability enhances how surgeons take advantage of MIVS to improve efficiency. Direct PFO-silicone oil exchange is a useful technique not only in the types of cases described here but also for surgery in children, for whom silicone oil tamponade is almost always used instead of gas tamponade and positioning.

The ability to inject fluid and actively aspirate simultaneously is also beneficial because it allows surgeons to work more effectively in silicone-filled eyes when detachments recur or membranes develop. We can actually work through the oil.

I expect that as surgeons become more accustomed to using this new option, they will find it to be indispensable.

**View Dr. Berrocal's direct PFO-silicone oil exchange online at [http://visioncareprofessional.com/video/sil\\_pfoexch23gvoice.mov](http://visioncareprofessional.com/video/sil_pfoexch23gvoice.mov).**

## Reference

1. PERFLUORON® Package Insert.

**Dr. Berrocal** is a professor of Ophthalmology at the University of Puerto Rico School of Medicine and practices in San Juan. She has consulted for Alcon and Alimera.