

# New Technique for Tissue Separation

*Proportional reflux hydrodissection aids surgeon in traction retinal detachment procedures.*

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**T**raction and traction/rhegmatogenous retinal detachments, particularly in patients with diabetes, are among the most challenging cases vitreoretinal surgeons face. Newer surgical platforms and associated small-gauge instrumentation have improved the safety and efficiency with which we can perform the crucial maneuver of separating healthy retinal tissue from fibrous tissue for removal. I recently developed a new technique for accomplishing this that takes advantage of a feature unique to the CONSTELLATION® Vision System (Alcon).

## Leveraging Proportional Reflux

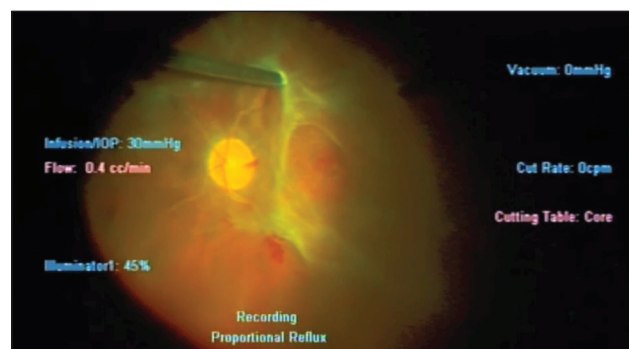
The technique relies on the CONSTELLATION® System's proportional reflux feature, so I call it "proportional reflux hydrodissection." Proportional reflux is a much more versatile tool than the pulse (or momentary) reflux that most surgeons are familiar with. With pulse reflux, we can push a small bolus of fluid through the vitreous cutter port if we need to release tissue that has become incarcerated. With proportional reflux, however, still using the foot pedal, we can create as much fluid flow through the port as desired. Importantly, this takes place in a very controlled, graduated manner. Proportional reflux was designed to allow blood and fluid to wash away from the retina and to clear the port, but it is also the key to the hydrodissection technique.

When I hydrodissect using proportional reflux, I place the vitrectomy probe port in between the normal retinal tissue and the fibrous tissue, then infuse the right amount of fluid for the right amount of time to create a small space so I can remove the fibrous tissue with the cutter. In my opinion, this is more efficient than using viscoelastic for separation or moving in and out of the eye with additional instruments.

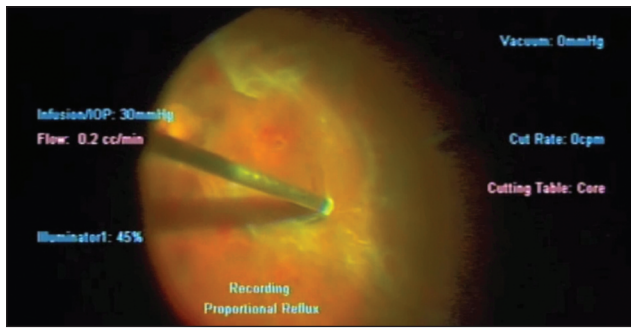
## Supporting Cast of Tools

I perform all of my surgeries with 25+™ instrumentation (Alcon). In my experience, these instruments help to maximize the stability of the surgical platform's fluidics more so than larger instruments. They are sufficiently rigid, and the size of the internal lumen and port opening for the vitrectomy probe are larger than they are for other 25-gauge instruments. In addition, the port is much closer to the tip of the probe than it is with larger instruments. This means we can place the tip right down to the surface of the retina without bumping it in order to get between healthy and fibrous tissue. It also means we do not have to create as large a separation as we would if we were using larger instruments.

The 25+™ probe allows us to use the least amount of flow possible to accomplish our goals. This gives us a smaller what I have termed "sphere of influence." What



**Figure 1. In many traction and traction/rhegmatogenous retinal detachment cases, the new technique "proportional reflux hydrodissection" can be used as the sole tissue separation maneuver. This approach eliminates the need to use viscoelastic or to move in and out of the eye with additional instruments.**



**Figure 2. The “proportional reflux hydrodissection” technique for separating fibrous from healthy retinal tissue is made possible by several characteristics of the CONSTELLATION® Vision System: the advanced proportional reflux feature, the 25+™ vitrectomy probe and the ultra high cutting speed.**

this means essentially is that with lower flow, we can remove tissue more accurately. Picture a bunch of M&Ms strewn on a table. Let’s say only the red M&Ms represent fibrous tissue, and we only want to remove those. If we try to do it with a powerful vacuum cleaner, it won’t work very well because the other M&Ms will also be picked up, which is analogous to inadvertently incarcerating healthy retinal tissue in the probe tip. However, if we use a straw instead, which has lower flow, we can more accurately remove only the M&Ms we choose. During retinal surgery, more accurate and selective tissue removal translates to safer tissue removal.

Along with the advanced proportional reflux feature and the smaller sphere of influence related to the 25+™ instrumentation, the CONSTELLATION® Vision System’s ultra high cutting speed is an advantage for proportional reflux hydrodissection. Using the probe to cut at 5,000 cpm, we can remove tissue without pulsatile traction, which decreases our risk of retinal tears and tissue incarceration.<sup>1</sup> All of these factors combined account for the success of the new technique. My colleagues and I have conducted laboratory studies of these concepts, including the relationship between instrument gauge and tissue attraction, the results of which should be published soon.

### Experience Allows Broader Application of Technique

When I first began using proportional reflux hydrodissection, I was applying it in 40-50% of my traction and traction/rhegmatogenous retinal detachment cases. As I gained more experience, I was able to utilize it in more and more of these cases. Currently, I am completing nearly 80% of these procedures with proportional reflux hydrodissection as the sole tissue separation maneuver. When performing proportional reflux hydrodissection, it is important to remember that what goes into the port is also what will be refluxed out. Therefore, to avoid reintroducing blood into the eye and clouding the view, it is best to aspirate clear fluid for a few seconds before initiating the reflux.

### CONSTELLATION® Vision System 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, 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.

I attempt the technique now in every case. If I find it is not sufficient because of the severity of the patient’s condition, I simply proceed how I would have without it, using bimanual dissection and the necessary forceps, scissors or other instrumentation. I have been pleased with how I have been able to become more expert at using the technique and how it improves each procedure without taking anything away. It requires very little extra time, and in terms of costs and resources, it is free.

**View Dr. Dugel’s proportional reflux hydrodissection online at [www.visioncareprofessional.com/video/Proportional\\_Reflux\\_Hydrodissection.mov](http://www.visioncareprofessional.com/video/Proportional_Reflux_Hydrodissection.mov).**

#### Reference

1. Rizzo S, et al. Comparative study of the standard 25-gauge vitrectomy system vs the new ultra-high-speed vitrectomy system. *Retina Today*, September 2010.

**Dr. Dugel** is managing partner with Retinal Consultants of Arizona, Ltd., whose doctors serve patients in 26 communities throughout the state, and founder of Spectra Eye Institute in Sun City. He is also a clinical associate professor at the University of Southern California’s Keck School of Medicine. Dr. Dugel is a consultant for Alcon Laboratories.