

Retina Surgery Without Compromise

An articulating laser probe with attached illumination provides the best of all worlds in retina surgery—even when using valved cannulas.

BY FIRAS M. RAHHAL, MD



The majority of my cases are operated using 23-gauge instrumentation using valved cannulas whenever possible. While I do use some 25-gauge, I prefer to use the technology with which I am most comfortable. I am not necessarily resistant to change; however, I have been getting very good results with my particular setup for over a decade, and so it is difficult for me to justify modifying my approach. After all, a key to performing retina surgery is about controlling as many of the unpredictable elements as possible.

Because I believe that altering the approach to surgery may affect the possibility to achieve the desired outcome while exposing the patient to undue risk, I also believe that adding any new piece of equipment or technology to our interaction with patients should be done with care and forethought. I believe this is doubly important during surgery, where we are already dealing with numerous variables and, sometimes, unpredictable pathology. Although many factors may ultimately determine whether a new technology is brought on board, generally speaking, it should help to enhance the outcome, make things safer, or improve the efficiency with which I am able to work.

I believe that the Vektor line of probes (Alcon) may be a technology that could do all of the above. In my hands, the application of spots is at least as good as what I am used to. With the addition of an articulation feature and added illumination (Figure), I have found it also largely eliminates the need to ever perform scleral depression and avoids the need

for additional lighting that may compromise the working conditions.

WHAT ILLUMINATED LASER PROBES ADD TO SURGERY

The addition of a light aspect to a laser probe does not seem at first to be a momentous breakthrough. However, if we think about the history of laser probes and the debate over the utility of straight versus curved, the added illumination in the Vektor seems to answer a lot of questions. There was a time when the idea of a curved probe was a technological challenge, and in fact, I remember actually bending the tips on straight probes to achieve a slight angle with which to approach anterior portions of the retina. That is to say that we desired the curved aspect, and the introduction of specifically designed probes with that feature was welcomed.

Over the years, I have preferred curved laser probes almost exclusively, under the notion that anything I would ever need to

AT A GLANCE

Key features of Alcon's VEKTOR Laser Probe include:

- Excellent illumination and ergonomics
- Utility of articulating design
- Consistency of burn
- Designed to work with the PurePoint laser



Figure. The added illumination largely eliminates the need for additional lighting.

do with a straight probe I could also do with a curved probe, but not the other way around. Even reaching the most posterior segments of the retina is possible with a curved probe with a slight pronation of the tip. But that is not to say that having a curved probe has been perfect in every case, because getting adequate lighting while lasering can be a challenge. One of the benefits of straight probes in the past, and perhaps a reason to favor them, was that there were models available with attached illumination, and not so with curved probes.

If illumination were to be necessary while lasering, such as in cases requiring access to the furthest aspects of the peripheral retina, chandelier lighting would certainly be a possibility, but its use requires an additional step and another incision for the patient. A light source with a broad projection could be an alternate, but even the best bullet-style lighting is a challenge in far periphery underneath the second hand. Another option would be to have an assistant perform a scleral depression; yet, for most retina surgeons who are not operating with a fellow assisting the case, a well-trained assistant is not always available. The trick has always been to figure out ways we could do the case ourselves with the fewest number of compromises to technique while not subjecting the patient to unsafe working conditions.

Having illumination in a laser probe that is capable of articulating, then, gives me the best of all possible worlds. I am able to laser any part of the eye without hesitation and without having to figure out how to get adequate lighting on the area of interest. Thus, there is an underappreciated aspect of efficiency in having attached illumination. More importantly, though, the quality and quantity of the illumination on the Vektor is truly amazing, to the point where it is entirely possible to perform the complete lasering aspect of the case using just the probe. Fundamentally, what an illuminated laser probe adds to my surgeries is a greater ability to laser tears in certain quadrants in the anterior retina while never compromising the facility to achieve good results in any other part of the eye.

NO COMPROMISE IN SURGICAL TECHNIQUE

When I decided to try the Vektor probe, I did so because the illumination aspect seemed intriguing for the reasons mentioned above and because I thought it could add something to the way I operate. But if the laser component was not at

least as good as what I had been used to, then there would be no real reason to continue using it. In the cases in which I have used the Vektor (see accompanying video on Eyetube.net), I have noticed no difference in the ability to apply a laser spot.

My preference when using laser is to stand back from the retina as far as I can while still applying a good spot. Intuitively, one might think that doing so would necessitate turning up the power setting. With Vektor, I am able to apply laser under gas, fluid, or air with no compromise in the distance I maintain from the retina, and I have not had to change my typical laser settings.

With the Vektor line of probes, I also do not have to move away from using valved cannulas, which afford greater control over the fluidics. One might assume that the ridged edge of the tip may avulse the cannula during extraction, dislodging it from the eye. In my hands, this has never been an issue. The Vektor has a slight curve to its tip even in straight mode, and if one follows its natural architecture during removal, it should not be an issue at all. Anyone who has any habituation using a curved probe should have no issue getting used to this step. Nevertheless, it may be prudent to observe the articulation under the microscope prior to insertion to get a sense of its dimensions.

CONCLUSION

For me, the best cases to start working with new instruments would be those that are typically routine for the modality. Diabetic vitreous hemorrhage cases call for a lot of laser, but there is usually pretty good access to the areas of pathology. Lining up and applying the laser should be fairly straightforward—at the least, these kinds of cases ought to be more straightforward compared to complicated tears and retinal detachment where it is sometimes harder to aim.

However, the Vektor has a lot of applicability for applying laser to the retina, above and beyond what may be considered routine. I foresee this technology being an asset in phakic retinal detachment surgery to be able to really see and access peripheral retinal tears with less or no need for scleral depression. If I have my druthers, I prefer not to scleral depress so as to not add any traumatizing element to the case and to avoid any risk of touching the lens. Having a laser probe with an articulation feature and attached illumination equips the surgeon with the proper tools to reach all parts of the globe with a single instrument, even very far anteriorly and around the lens if necessary. ■

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Illuminated Laser Probes Complement 27G Retina Surgery

The availability of a high-quality illuminated 27-gauge laser probe expands the potential applications for smaller gauge surgery.

BY CHARLES W.G. EIFRIG, MD



As a high-volume surgeon operating in seven different centers, I have had the opportunity to try out different surgical platforms, laser probes, and instruments in a variety of different pathologies. While choosing the technology used for surgery is somewhat a matter of personal preference and surgeon comfort, I have learned through experience that there may be subtle yet important differences that can make a huge impact on the surgical procedure.

For me, the cases that call for the use of laser tend to be those that I would prefer be operated with 27-gauge instruments. The work required to repair a diabetic vitreous hemorrhage or detachment, for example, often means maneuvering in and dissecting delicate tissue planes. When it comes time to laser, it would be preferable to use a probe that can get the job done within the confines of a 27-gauge system.

Until recently, however, the market offerings in 27-gauge laser probes have been somewhat limited in their ability to provide consistent laser burns with adequate illumination, especially under air. By and large, the illumination with these probes has been less than ideal, often necessitating a second instrument or another source of illumination. Furthermore, accessing the peripheral retina may require a second pair of hands for depression (or separate port for illumination). Given those limitations, if laser was a consideration, I have been choosing to use 25-gauge.

The Vektor line of laser probes from Alcon changes this paradigm (Figure). The first thing I noticed about these laser probes that was different compared to other probes was how they felt in my hand (see accompanying video on Eyetube.net). I previously favored a competitor's product because of its ergonomics, and under the assumption that laser probes are relatively comparable, I tended to reach for the instrument that allowed me to work most efficiently and with minimal hand stress. But when Alcon introduced the Vektor line, they did so with the end user in mind. The careful engineering of these probes has made them more comfortable in my grip, thus making them easier for me to use. In addition to the ergonomics, the other features of the Vektor line—in particular the illumination—make them quite different than other laser probes on the market.

FACILITATING 27G SURGERY

The trend toward using smaller gauge instruments in retina surgery when the presenting pathology deems their use appropriate makes sense for a number of reasons. The delicate



Figure. The careful engineering of these probes has made them more comfortable in my grip.

micro-maneuvers possible with finer instrumentation (assuming they are sufficiently stiff) yields the potential for less iatrogenic trauma, so long as efficiency and safety are not sacrificed. That said, while the concept of 27-gauge surgery is easy to appreciate, some practical aspects inherent to surgical instrumentation have historically limited its applicability.

For example, the introduction of valved cannulas, coupled with software modifications on the Constellation Vision System (Alcon) that help control IOP, enhanced the ability to maintain a closed system and gain additional control over fluidics in the eye. This, in turn, created an environment in which smaller gauge instruments would add to the ability to be minimally invasive inside the eye. Yet, because of the silicone septum on the valved cannulas, gaining entry with a flexible tip probe has historically been a concern of retina surgeons.

The Vektor line of laser probes, and the 27-gauge model in particular, does not present any such challenge. Since the default position of the probe tip is nonarticulated (straight), entry with the probe is smooth and I have not had any issues gaining entry through valved cannulas. Thus, the advantages of tight fluidic control inherent to using valved cannulas are maintained, with additional benefit for wound closure postoperatively.

The articulation of the Vektor Probe is an interesting feature worth mentioning here, particularly because this is something I have never really felt was beneficial to my surgeries. I have long preferred curved tips because I am confident that I can access the peripheral retina and areas around the lens with the correct maneuver. Yet, after using the Vektor Probe in a few cases and trying out the articulation feature, I found it to be well-designed and beneficial. Despite my preconceived notions, I found the articulation feature allowed me greater efficiency in applying laser spots in

difficult-to-reach spots around the retina with perhaps a greater ease of avoiding the lens.

ILLUMINATION

The benefits of the Vektor Probe I mentioned above reflect stepwise improvements in surgical technology. In the context of delicate retina surgery, however, every slight advantage surgeons can gain in terms of fluidics control and dissecting fine tissue planes safely, efficiently, and effectively helps to improve the odds of achieving the goals of the particular surgery. In truth, it is the totality of the technology we use and how they complement one another that levels the playing field.

What is truly impressive to me with the Vektor line of laser probes, and with the 27-gauge instrument in particular, is that they offer improvements over other products. One of the more truly impressive aspects of this probe is the illumination, which is brighter and broader than I thought possible in a 27-gauge platform. A limitation I have found with doing more 27-gauge cases in the past is the lack of a good illuminated laser probe, a problem that is easily answered by the Vektor Probe. With it, I can perform scleral depression unassisted (if this step is even necessary given the articulation feature) while delivering laser spots precisely where I want them.

Good visualization is an important aspect of retina surgery for myriad reasons. As it pertains to application of laser, it translates

to the ability to maintain a consistent distance from the retina. Yet, the ability to maintain comfortable distance from the retina is only beneficial if the laser burn is consistent. This is another aspect where I have found the Vektor to outperform other products. It may be an aspect of using the Vektor probes that is better understood with personal experience, but the consistency of the burn with Vektor is excellent compared to other probes I have tried, especially under air. I am not sure why this is the case, but I have found that laser spots placed under air with other probes can be inconsistent; not so with the Alcon Vektor.

CONCLUSION

I currently use 25-gauge instruments in about 95% of cases, with the remainder performed with 27-gauge. Now that I have access to a high-quality illuminated laser probe with the Vektor line, I imagine I will do more cases with the smaller gauge. For instance, I currently operate most rhegmatogenous retinal detachments with 25-gauge, but the performance of Vektor certainly makes me more likely to use 27-gauge when presented with this pathology. ■

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PUREPOINT® Laser Important Product Information

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

Indications for Use: The PUREPOINT® Laser is indicated for use in photocoagulation of both anterior and posterior segments of the eye including:

- Retinal photocoagulation, panretinal photocoagulation and intravitreal endophotocoagulation of vascular and structural abnormalities of the retina and choroid including: Proliferative and nonproliferative retinopathy (including diabetic); choroidal neovascularization secondary to age-related macular degeneration; retinal tears and detachments; macular edema, retinopathy of prematurity; choroidal neovascularization; leaking microaneurysms.
- Iridotomy/Iridectomy for treatment of chronic/primary open angle glaucoma, acute angle closure glaucoma and refractory glaucoma.
- Trabeculoplasty for treatment of chronic/primary open angle glaucoma and refractory glaucoma.
- And other laser treatments including: internal sclerostomy; lattice degeneration; central and branch retinal vein occlusion; suturelysis; vascular and pigment skin lesions.

Contraindications: Patients with a condition that prevents visualization of target tissue (cloudy cornea, or extreme haze of the aqueous humor of the anterior chamber of vitreous humor) are poor candidates for LIO delivered laser treatments.

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.
- Back scattered radiation is of low intensity and is not harmful when viewed through a protective filter. All personnel in the treatment room must wear protective eyewear, OD4 or above at 532nm, when the system is in Standby/Ready mode as well as during treatment. The doctor protection filter is an OD greater than 4 at 532nm.

Complications: Corneal burns, inflammation, loss of best-corrected visual acuity, loss of visual field and transient elevations in intraocular pressure can occur as a result of ophthalmic laser treatment. Unintentional retinal burns can occur if excessive treatment beam power or duration is used.

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