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## Road Testing the Todorich Illuminated Depressor and the Reddy End-Grasping Forceps

Retina surgery is now safer, more predictable, and easier to perform than when it was pioneered 40 years ago. Improvements in surgical instruments have vastly expanded our armamentarium, enabling retina surgeons to easily attack surgical issues that once would have been difficult or impossible.

In particular, the rise of specialized instruments to tackle singular tasks such as membrane peeling and scleral fixation of intraocular lenses has shortened surgery times and improved outcomes.

Road Test asked 4 ASRS members to test-drive 2 such specialized instruments—the Vortex Surgical Todorich Illuminated Depressor, used for peripheral transillumination to allow peripheral shaving without assistance; and the Bausch+Lomb Reddy End-Grasping Forceps, an innovative membrane-peeling forceps with a novel viewing window. Here, our road-testers report on the quality, ease of use, and utility of both instruments.



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### Todorich Illuminated Depressor

The Todorich Illuminated Depressor from Vortex Surgical is a depressor in only the most limited of descriptions. Surgical illumination for vitreoretinal specialists has mainly consisted of direct illumination from the operating microscope, light pipe, or chandelier systems. However, indirect or even trans-tissue illumination expands the ability to highlight target tissue, and often outperforms direct illumination, much like the use of retro-illumination for visualization of lens capsule or iris transillumination defects.

Bozho Todorich, MD, PhD, took this concept even farther, recognizing that there may be a way to visualize intraocular tissue through transscleral illumination, obviating the need for a skilled assistant for peripheral vitreous work.

It is recognized that even the use of the traditional light pipe at an oblique angle on the sclera can highlight peripheral vitreous; however, the generalizability was limited, as lighting was most effective in eyes with thinner sclera or pigmentation.

The Todorich depressor increases our light pipes' transscleral penetration. It has an acrylic shell with a polished ball-point tip that is agnostic to any vitrectomy system or light-pipe gauge. The ball-point tip allows for smooth entry into the fornices and creates a minimally traumatic focal depression site. The depressor's wide base is also comfortable in the hand, along with a 19-gauge hypodermic needle for rigidity and reduction of posterior light backscatter.

There are several important tips to maximize the illumination effect. Filling the tip with balanced salt solution prior to light pipe insertion allows for greater light diffraction through the tip. Also, it is important to completely insert the light pipe, as any gap from the distal end significantly reduces the illumination. The endoillumination setting must then be increased to the maximum setting. I also found that directing the depressor perpendicularly to the sclera was more effective than depressing with the side of the ball-point depressor.

There is a learning curve with the illuminated depressor; however, it is not difficult to become proficient. As stated, I found it most effective for eyes with thinner sclera and lighter pigmentation. In a cone-rod dystrophy eye with peripheral detachment, the depressor was incredible, with endoillumination comparable to a chandelier lighting system. In a diabetic patient with darker pigmentation, the visualization was more limited due

to poorer scleral penetration as well as vitreous hemorrhage.

However, the majority of cases best suited for this tool are myopic eyes with retinal detachment that generally have longer axial length and thinner sclera. Depressing somewhat further into the globe also helped illumination, and I felt comfortable doing that with this rounded, ball-point tip. It is also important to slowly advance your vitrector once in the eye. The cone of illumination is limited, and it is easy for your vitrector tip to be in an unexpected position.

Lastly, I found that various parts of the vitreous base required small variations in either the depressor angle, anterior/posterior position, or pressure to achieve adequate visualization. I would encourage surgeons to take their time when first using this tool to achieve satisfactory illumination.

The Todorich Illuminated Depressor is a valuable, inexpensive adjunct in our toolbox, especially for those of us who may not have a fellow or skilled technician sitting next to us.

### Reddy End-Grasping Forceps

The Reddy End-Grasping Forceps are part of the Bausch+Lomb/Synergetics line of Pinnacle 360 disposable forceps. Rahul Reddy, MD, MHS, had the inspiration to create a single forceps that would satisfy the spectrum of forceps surgical needs, from initiating membrane peels to peeling proliferative vitreoretinopathy membranes. This efficiency would streamline surgical time while decreasing inventory cost.

There are several noteworthy engineering points. The forceps are microserrated at the tip on all sides of the grasping platform, which allows for more versatility in membrane

induction regardless of the forceps angle on the retinal surface. The microserrations on the appositional platform enhance membrane retention in the forceps during the peel, reducing the need to regrasp which can potentially reduce the incidence of retinal trauma.

The forceps are also tapered at the tip to allow for improved visualization during surface maneuvers, as well as to improve control of the distal tip, reducing inadvertent retinal strike trauma. The forceps are in the Pinnacle 360 line, with a 360-degree actuation handle rather than a clamshell design. The forceps finish is brushed to reduce glare. Currently the Reddy forceps are available in 23- and 25-gauge options.

In surgical use, the Reddy forceps have an excellent hand feel with a tapered center and wider ends for ergonomic and secure hand positioning. The 360 actuation feels precise, and the grooved actuators reduce slip. The actuation itself also feels accurate, without evidence of the forceps tips either extending or retracting during compression.

Engaging tissue planes for pinch-and-peel maneuvers is facile due to the microserrated tips, especially for internal limiting membrane (ILM) initiation. The microserrations are placed around the entire platform; thus, the “stickiness” is omnipresent regardless of forceps angle. In fact, the adhesion is so impressive that I had difficulty flicking off pieces of ILM with my light pipe, which is typically how I clean my forceps intraoperatively.

In the open position, the forceps open wider than comparable forceps, which I found useful in engaging a large star-fold in a proliferative vitreoretinopathy case. The design process seemed focused on making a one-size-fits-most forceps, which it achieves in many respects.

The 25-gauge version of the Reddy forceps seems more flexible than other available 25-gauge forceps, which can be a limitation with certain maneuvers. The 23-gauge forceps were not trialed for this Road Test, and they may be more rigid. Surgeons may consider placing the trocars more along the horizontal meridian to alleviate some torsional or rotational flexibility concerns.

Also, the tapered, alligator-type tip has a learning curve, as it is not like the traditional flat platform seen with other ILM forceps. The more focused tip increases the ease of ILM grab but decreases the room for error, as the tip does not disperse the focality of the initial pinch. Once initiated, however, the tapered tips actually made the rest of the peel

easier, with improved visualization of previously peeled edges.

Some potential added benefits of this forceps include use as a scraper in the closed position, and utilizing the microserrations to brush epiretinal fibroproliferation or break the fibrotic edge of a chronic macular hole. The increased grip may also be beneficial for scleral fixation of intraocular lens and externalization of haptics. Overall, the Reddy forceps can be a useful addition to a surgeon's toolbox, especially if looking for an effective forceps panacea to reduce operating room costs.



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## Todorich Illuminated Depressor

I recently had the opportunity to check out the Todorich Illuminated Depressor. The device is made of an inert acrylic and functions as an adapter to work with any-gauge light pipe. Any-gauge endoillumination light pipe slides into the depressor and the light pipe tip sits in the depressor tip. For optimal functioning, place a few drops of balanced salt solution in the tip of the depressor before inserting the light pipe. The light intensity is then turned to the maximum setting on the vitrectomy machine (100-115).

The polished ball-point depressor moves smoothly around the globe. The illuminated depressor provides good visualization of the retina, retinal pigment epithelium (RPE), and choroid in the area being depressed. I found the view in a myopic, thin-walled, Caucasian blonde fundus better than in a highly pigmented fundus. It was challenging to see the peripheral vitreous, but adding Triescence (Novartis Pharmaceuticals) to the eye helped.

The Todorich Illuminated Depressor is less expensive than the chandelier. While illumination of the retina with a chandelier is superior, parts of the retina can appear in the dark and there is a possibility of lens touch in a phakic patient.

Using the light pipe externally at maximum light setting on the vitrectomy machine can provide visualization of the retina and RPE. However, the Todorich Illuminated Depressor provides better visualization and nicer depression, and the adapter glides better over the globe than when using the light pipe alone.

## Reddy End-Grasping Forceps

I was excited to try the Reddy forceps by Bausch+Lomb. These forceps have a pointed tip and a long microserrated grasping platform, which facilitated grasping and peeling ILM.

I peeled ILM, epiretinal membranes, and proliferative vitreoretinopathy membranes with these forceps; they were excellent at grasping all types of membranes. The platform is long and microserrated, which grips the ILM so the membrane shreds less when peeling. There is reduced tip retraction so the surgeon does not need to compensate for the tip's advancing while closing. The forceps also have a texturized finish to reduce glare.

The Reddy forceps are a great addition to vitreoretinal instrumentation. Their long microserrated platform and pointed tip are helpful to quickly grasp and delicately peel the ILM.



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We practice in a privileged time when nearly every instrument from the surgeon's tray can be customized to fit the surgeon's style and need. For a new product to make a splash, it has to be easier to use, offer a novel functionality, or be more efficient at completing the desired task. We reviewed 2 new instruments that offer innovative approaches and add new custom options to our armamentarium.

## Todorich Illuminated Depressor

The Vortex Todorich Illuminated Depressor is marketed as a solution to peripheral shave vitrectomy when a trained assistant is not available and as an alternative to endo-illuminating chandelier systems. It is a disposable adapter that allows conversion of any 23-, 25-, or 27-gauge Alcon Constellation light pipe into a hybrid scleral depressor-transilluminator.

The device itself is a translucent acrylic sleeve, reinforced with a 19-gauge hypodermic needle and molded into a traditional ball-point scleral depressor. Once assembled, the device is used as a traditional depressor, providing both scleral indentation and transscleral illumination of the peripheral retina while the other hand is free to perform a peripheral shave vitrectomy.

We tested the Todorich Illuminated Depressor on patients using a 25-gauge light pipe and both a traditional microscope and the NGenuity 3D heads-up system. We found the illuminated scleral depressor to be easy to set up and begin using, requiring less than a minute to unpack the device and dock the light pipe.

Notably, a moderate amount of force is required to fully dock the light pipe into the plastic sleeve so the illuminated terminal end is within the distal depressor tip. On first attempt, we did not fully insert the light pipe sleeve, which resulted in poor scleral transillumination. Maximum illumination of the light pipe is also required to obtain an optimal visualization.

The Todorich Illuminated Depressor is not marketed as, and is not a replacement for, a thorough depressed examination under traditional endoillumination. After performing a core vitrectomy, we used a traditional scleral depressor and endoillumination light pipe to visualize the peripheral retina and identify retained vitreous and peripheral pathology. We then used the Todorich Illuminated Depressor to visualize the previously noted areas to remove remaining vitreous with the vitrector in the other hand without issue.

We were not able to visualize small breaks in the retina with transscleral illumination alone. These were best viewed with traditional endoillumination, marked with diathermy, and then shaved with simultaneous illuminated



The Vortex Surgical Todorich Illuminated Depressor is used for peripheral transillumination to allow peripheral shaving without assistance. *Image courtesy Vortex Surgical, Inc.*

depression and vitrectomy. With regard to the viewing system, we found that visualization was somewhat enhanced with the 3D heads-up display, but was quite safe and effective with a traditional light microscope as well.

The inventor and manufacturer suggest a 5- to 10-case learning curve to gain comfort with the transillumination view produced by the illuminated depressor, and note that blonde, myopic fundi produce the optimal viewing scenarios.

Overall, we found the Todorich Illuminated Depressor to be an effective alternative to a trained assistant and an endoilluminating chandelier for peripheral shave vitrectomy.

### Reddy End-Grasping Forceps

The Bausch+Lomb Reddy End-Grasping Forceps are touted as multipurpose forceps with increased distal visibility due to their symmetrically tapered tip and can be used for inner limiting, epiretinal, and denser tractional membranes. Additional features

include a microserrated grasping platform for increased grip strength and a glare-reducing finish on the forceps tips. The Reddy forceps are also covered with microserrations on all external surfaces, allowing improved membrane-edge identification and flap initiation with gentle stroking motions.

We tested the Reddy End-Grasping Forceps on a variety of membranes and found the instrument truly versatile. The wide range of motion and serrated grasping platform allowed for excellent membrane purchase and provided a strong grasp even on dense, fibrotic membranes. Simultaneously, the forceps' symmetrically tapered tips allowed for improved visualization of more-delicate membrane edges. With subsequent re-grasps, we utilized the wider, more proximal grasping platform to maintain hold and peel without shredding.

The Reddy forceps use the updated, lower-profile, disposable Pinnacle 360 handle, which features an ergonomic shape suitable for most hand sizes. The handle has 6 actuator levers with similar-sized interdigitation zones, theoretically allowing for 360 degrees of actuation. However, the distant lever spacing still requires some cognitive placement of your fingers on the actuator levers for optimal control.

We found the glare-reducing texturized surface of the instrument tip impressive, and we hope this finish becomes a universal trend in posterior-segment instrumentation. The glare reduction was most appreciated when using a 3D heads-up display (such as the Alcon NGenuity or the Zeiss Artevo).



The Reddy End-Grasping Forceps feature microserrations on both the grasping platform and external surfaces of the distal tip. *Image courtesy Bausch+Lomb, Inc.*

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