

The Ease of the Simplified Surgical Tray

Streamlining my surgical tray to four main instruments has improved my surgical efficiency and peace of mind.

BY UDAY DEVGAN, MD

Although we rely on them every day, handheld cataract surgical instruments often take a backseat to the fanfare that surrounds spectacular cataract machinery. This article is the first in a six-part series that will highlight innovative cataract instrumentation that top surgeons have found beneficial in their routine procedures. Experience has taught me that high-quality instrumentation can make a huge difference in the surgeon's ability to perfect each step of the operation as well as to effectively manage a surgical complication. Here, Uday Devgan, MD, describes how he has streamlined his routine surgical tray to four key instruments that he designed for use in a variety of surgical maneuvers.



—Robert H. Osher, MD



When it comes to instrumentation for cataract surgery, I believe simpler is better. Out of a desire to improve the simplicity and efficiency of routine cataract surgery, I designed a line of five titanium instruments. Four of these instruments I use every day, and the fifth is a hook for eyes that require suturing. All of these instruments are based on the concept of combining and improving upon existing instruments. I worked with Bausch + Lomb/Storz Ophthalmics (Rochester, NY) to design and manufacture these instruments with a high level of quality control.

THE INSTRUMENTS

Lid Speculum

The first instrument I use is a lid speculum to provide access to the anterior segment. Most lid speculae are designed so that their jaws are temporally placed near the surgeon, which works well if the surgeon is seated superiorly at the 12-o'clock position. Most surgeons, however, make their incisions and perform cataract surgery temporally. The Devgan Lieberman Temporal Approach Speculum (ET4077) is configured to provide excellent retraction of the lids while positioning the adjustments over the bridge of the nose, which keeps the temporal region at the incision free from any obstruction by the speculum (Figure 1A). The screw-type adjustment provides an infinitely variable degree of lid exposure and fit for all patient types, especially those with deep orbits. The wire arms are thin in order to be unobtrusive and allow the plastic drapes to tuck into the conjunctival fornices.

Fixation Ring

My second instrument is a fixation ring shaped like a C, based on the Fine and Thornton designs, to gently hold the eye open while I make my incisions. The Devgan Seibel Fixation Ring (ET9044) (Figure 1B) has an offset design to ensure that it maintains its level perspective independent of

hand positioning and to ease placement on the globe. The ring is marked in clock hours. Every hour equals 30° (a typical measuring unit for limbal relaxing incisions [LRIs] and other cuts), and 12 hours equals the full 360°. This ring makes it easy for me to measure degrees while the patient is on the table and gives me greater precision with sizing incisions. In fact, I use this ring to make LRIs—I actually trace the metal footplate of my diamond blade along the fixation ring (Figure 1B). Then, when it is time to make the LRI, my incision is a perfectly shaped and centered arc that is located exactly where I want it. If I made LRIs by freehand, they would not be perfectly shaped. Furthermore, I use the Devgan Seibel fixation ring to determine an eye's axis and to mark the steep axis for implanting a toric IOL.

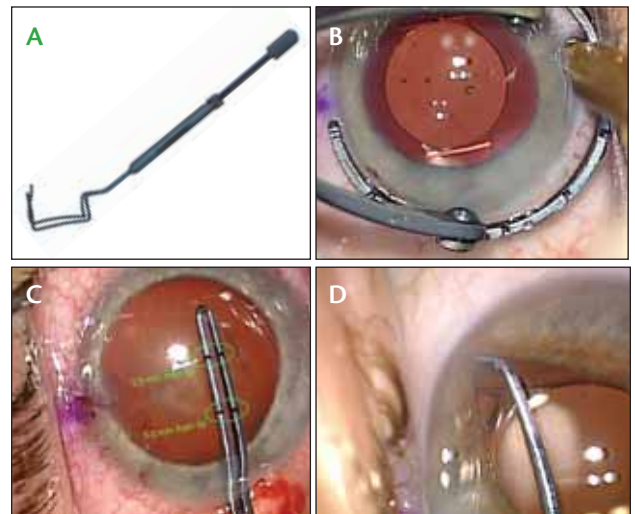


Figure 1. The Devgan Lieberman Temporal Approach Speculum (ET4077) (A); the Devgan Seibel Fixation Ring (ET9044) (B); the Devgan Micro Capsulorhexis Forceps (ET2012) (C); and the Devgan Universal Cataract Chopper/Multi-Tool (ET0703) (D).

Capsulorhexis Forceps

The Devgan Micro Capsulorhexis Forceps (ET2012) is made to pass through phaco incisions as small as 1.8 mm. When most forceps are open, the arms open wide in the incision, causing it to gape and leak viscoelastic, which can flatten the anterior chamber and reduce the surgeon's control during capsulorhexis creation. To address this issue, I created forceps with cross-action. Squeezing the handle of the Devgan Micro Capsulorhexis Forceps opens the tip, but the pivot point does not expand in the incision.

Secondly, I made the tips of the Devgan Micro Capsulorhexis Forceps sharp to eliminate the need for a cystotome to begin the tear. By slightly tilting the forceps and entering the capsule with one tip, the surgeon can close the forceps to securely grab the lens capsule for capsulorhexis formation. I arched the arms of the forceps so that they fall in the contour of the capsule. The iris-stop feature gives the surgeon an excellent grasp of the capsule without engaging the iris.

My favorite feature of these forceps, however, is the measuring scale placed right on the tips. Hash marks at 2.5 mm and 5.0 mm from the tip (Figure 1C) represent the radius and diameter of the 5-mm capsulorhexis, which is ideal for overlapping and holding a 6-mm lens optic in place. The hash marks on the Devgan Micro Capsulorhexis Forceps enable me to measure the capsulorhexis as it is created, so that it is correctly sized and reproducible every time.

Chopper

My final instrument for cataract surgery is the Devgan Universal Cataract Chopper/Multi-Tool (ET0703) (Figure 1D). It is a truly universal cataract management tool, allowing multiple functions in one simple and efficient double-ended instrument. This chopper features a versatile chopping tip that provides excellent control of the nucleus with all chopping techniques: vertical, horizontal, tilt-chop, and others. The chopping tip is modeled after the Nichamin design and is gently curved and smooth, making it ideal for protecting the posterior capsule from the phaco probe during removal of the nucleus.

The chopping tip also features grooves to engage the optic or haptics for IOL manipulation and for iris push-pull in cases with small pupils. The curved tip is useful for lifting the corneal incision to ease the placement of instruments and stabilize the eye, thereby providing countertraction via the paracentesis during IOL implantation. At the other end of the Devgan Universal Cataract Chopper/Multi-Tool is a traditional spatula for intraocular manipulation of the iris, lens fragments, or if need be, vitreous. There are endless uses for this instrument.

Hook

The fifth tool in my surgical line is not one that I use routinely, but it is quite useful for intraocular suturing. In

complex cases that required suturing inside the eye, suturing an IOL to the back of the iris, or repairing an iris defect, I used to find it challenging to grasp the suture to pull it back through the paracentesis amidst the viscoelastic. Therefore, I designed the Devgan Suture Hook with a tiny pigtail on its end (*see a video of Dr. Devgan using this hook at <http://eyetube.net/video/suture-hook/>*) that makes it easy to capture the suture inside the eye and pull it out through the sub-1-mm paracentesis incision. This hook has saved me a lot of time, particularly in challenging eyes in which the lens is dislocated and needs to be sutured to the back of the iris, and in eyes where scleral suture fixation is warranted. The Devgan hook may also be used to grab sutures during a repair of damaged iris tissue.

ADVANTAGES OF A SIMPLIFIED TRAY

Although my instruments are certainly advantageous in difficult surgeries like those that require intraocular suturing, they really shine in routine cataract cases. Again, the fixation ring is very helpful for making LRIs; I can measure the incisions on the spot and do not need additional instruments. The capsulorhexis forceps lets me achieve a precisely sized and positioned 5-mm capsulorhexis every time. The forceps are the most popular instrument in the line. Manufacturers are building femtosecond lasers for cataract surgery that promise to deliver an accurate and perfectly sized capsulorhexis every time. Until that technology becomes readily affordable for the masses, I feel that the Devgan Micro Capsulorhexis Forceps provides an inexpensive and immediate option. Although capsulotomies made with this device may not be quite as perfect as laser-cut ones, the ability to measure the tear as you go with the Devgan forceps certainly improves upon the freehand method.

Again, my goal in designing this line of instruments was to simplify my surgical tray. With cataract surgeons performing more surgeries per day, we need to work very efficiently. For me, having three surgical trays in each operating room with dozens of instruments for each was unnecessarily expensive and cumbersome. I felt that several instruments could be combined into fewer, more streamlined devices. Being able to use fewer instruments to perform multiple tasks saves me time in the eye and also allows my technicians to respond faster if a problem arises. I chose titanium for the material because it is stronger, lighter, and more rust resistant than surgical steel. Although I do not benefit financially from the sale of these instruments, I am gratified by how well other surgeons have received them. *

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