

Surgical Techniques and Devices for Cataract and Corneal Surgery

BY ELENA ALBÉ, MD

This installment of “Inside Eyetube.net” begins with a video about an innovative training tool developed in Japan for practicing cataract surgery. The videos that follow highlight skills and techniques that experienced ophthalmologists use to safely address complications that occur during cataract surgery. Also covered are devices designed to help surgeons achieve good outcomes in cataract and corneal surgery. Each video offers the ophthalmologist an opportunity to enhance his or her basic surgical techniques.

FROM THE LABORATORY TO THE OR Cataract Surgery

Invented by Junsuke Akura, MD, PhD, the Kitaro DryLab and WetLab kits (Frontier Vision Co., Ltd) are innovative training tools that allow ophthalmologists to practice cataract surgery using artificial nuclei and lenses. In his video, Dr. Akura demonstrates how the beginning surgeon can practice techniques repeatedly without the added complication of long preparatory times and costly live tissue samples. The training tools simulate the stages of cataract surgery using both a wet and dry laboratory environment to allow new surgeons to practice basic surgical techniques repeatedly. Beginners can learn to manipulate instruments with the DryLab and then move on to the WetLab to learn the intricacies of machine operations before performing actual surgeries.

In his video, Alin Stefanescu-Dima, MD, PhD, manages intraoperative complications due to a Morgagnian or hypermature cataract. His patient presented with a fibrous anterior capsule, extreme zonular weakness, and a hard, brown nucleus, which moved freely in the capsular bag. During the nuclear fracture, as Dr. Stefanescu-Dima attempts to crack the posterior nuclear plate, zonular dehiscence occurs and evolves quickly into a full-blown rupture of more than

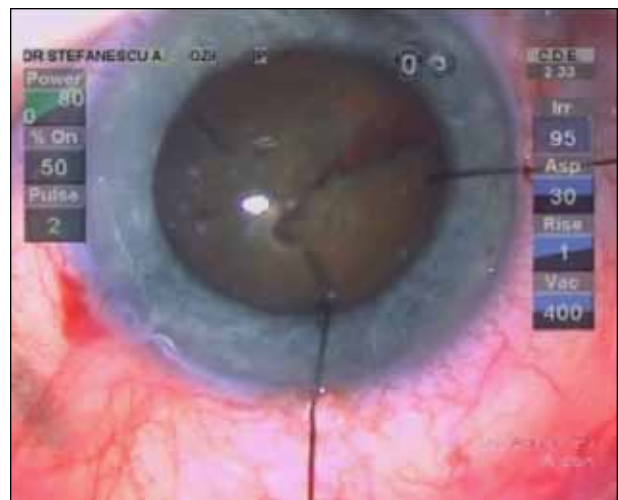


Figure 1. Dr. Stefanescu-Dima anchors iris hooks at the margin of the capsulorhexis to provide vertical support to the capsular bag.

180°. He implants a capsular tension ring to support the bag. At the end of phacoemulsification, he notices a small posterior capsular tear. He prevents vitreous from prolapsing by injecting a highly dispersive ophthalmic viscosurgical device, both inside the bag and posterior to the capsule in the Berger space, and he uses intraocular forceps to turn the tear into a posterior capsulorhexis. No vitreous loss occurs, and Dr. Stefanescu-Dima implants a foldable lens in the sulcus for long-term stability (Figure 1).

Cynthia Matossian, MD, describes a flip and slice technique for cataract surgery. First, using a flattened hydrodissection cannula, she pops the nucleus through the capsulorhexis. She injects Healon5 (Abbott Medical Optics Inc.) to protect the endothelium and uses a Koch Manipulator (Mr. Phaco) to partially slice the cataract. After flipping it



Figure 2. Dr. Matossian bisects the cataract at the fault line created by the Koch Manipulator with the phaco handpiece on sculpting mode.

with the cannula, Dr. Matossian bisects the cataract at the fault line created by the Koch Manipulator with the phaco handpiece on sculpting mode (Figure 2).

Michael A. Lawless, MD, uses the LenSx Laser (Alcon Laboratories Inc.) to remove a 3+ to 4+ cataract. First, Dr. Lawless describes how he determined the placement of the incision, and then he programs the laser to perform the primary incision and a corneal intrastromal incision on the axis of astigmatism (Figure 3). After removing the lens and cortical material, Dr. Lawless uses a wound-assisted insertion to implant an AcrySof IQ Restor IOL (Alcon Laboratories, Inc.). Throughout the procedure, he shares pearls on how to use the laser for removal of a cataract of these grades, and he explains the differences between conventional and laser cataract removal.

Corneal Surgery

An instructional video by Ocular Systems, Inc., demonstrates how to use the company’s EndoSerter, a

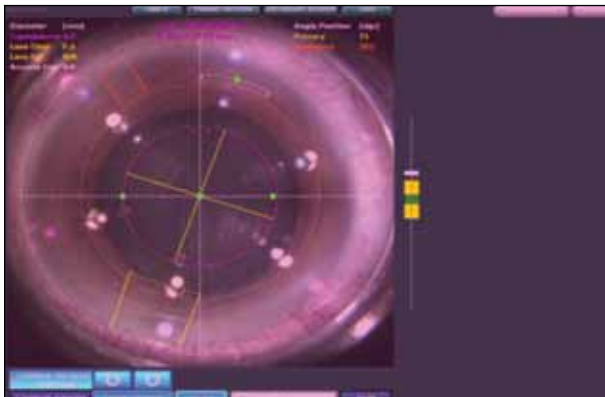


Figure 3. Dr. Lawless programs the LenSx Laser to perform the primary incision and a corneal intrastromal incision on the same axis.

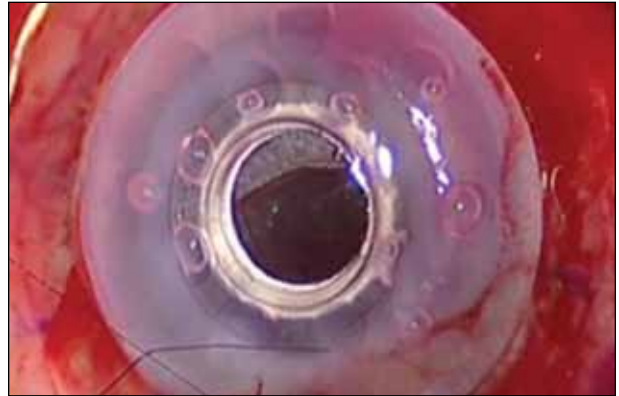


Figure 4. Dr. Güell sutures the cornea with the Boston Keratoprosthesis on the recipient eye.

corneal endothelium delivery instrument, to insert the autograft during Descemet stripping endothelial keratoplasty or Descemet stripping automated endothelial keratoplasty. The instrument is designed to reduce manipulation of the flap, endothelial cell loss, and any eventual damage to the flap that could increase the rate of endothelial transplant failure.

Jose L. Güell, MD, uses a Boston Keratoprosthesis (Massachusetts Eye and Ear Infirmary) in a patient with a history of three failed penetrating keratoplasties. The video illustrates how Dr. Güell includes the artificial PMMA optical central corneal structure in the donor cornea before transplanting it onto the recipient eye (Figure 4). He explains that the use of an artificial cornea should be considered to increase positive outcomes and provide patients with a good visual and refractive result.

CONCLUSION

When viewed in combination, this month’s selection of videos illustrates how, once a surgeon masters basic skills, he or she can successfully resolve unpredictable complications. ■

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Direct link to Dr. Matossian's video:
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Direct link to Dr. Lawless's video:
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Direct link to the video on the EndoServer:
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Direct link to Dr. Güell's video:
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