PAVEL STODULKA, MD, PhD

After becoming the first European user of the Victus laser (Technolas Perfect Vision GmbH and Bausch + Lomb), I have performed more than 1,000 laser cataract surgeries using the laser and the Stellaris PC (Bausch + Lomb) platforms. Videos of my surgical technique can be viewed at eyetube.net/?v=zugoo and eyetube.net/?v=hineg. The first difference in my surgical technique is that I use a limited amount of ophthalmic viscosurgical device (OVD)—just enough to not completely lose the chamber and to form a layer protecting the endothelium.

Another big change is that I no longer need to use capsulorrhexis forceps to handle the anterior capsule. The quality of the capsulotomy enables me to remove the central capsule safely and reliably with the phaco tip, whether the central capsule is free-floating (Figure 6), free-lying, or still attached centrally. I enter the anterior chamber with a sleeved phaco tip through a 1.8-mm incision and aspirate the central anterior capsule, moving the tip circularly and pulling the capsule anteriorly. This is enough to detach the central capsule from the periphery, even in rare cases of capsular tissue bridges. The capsule is then aspirated through the phaco tip, sometimes with the help of a single ultrasound burst. I have rarely seen minor irregularities of the capsulotomy edge (Figure 7); however, these do not show a tendency to form a radial tear during the subsequent surgery.

The next step is aspiration of anterior cortex inside the capsulotomy area, after which I dip the phaco tip into the fragmented nucleus. Then, while I lift the nucleus with full aspiration (600 mm Hg), I perform limited hydrodissection through the sideport incision. Hydrodissection is facilitated by pneumodissection (ie, gas bubbles created during laser lens fragmentation).

I use a combination laser-fragmentation technique—a pattern of two cylinders and four radial arms—extending across up to 8.0 mm of the optical zone, but automatically limited by the patient's pupil diameter. The fragmentation, therefore, extends beyond the capsulotomy diameter. Laser fragmentation can come as close as 200 µm to the posterior capsule thanks to online OCT monitoring of the entire procedure. The central nucleus is then lifted (Figure 8) and aspirated with a limited amount of ultrasound. Typically, I need about 50% of the phaco power I use with a conventional ultrasound technique. Removing the central cylinder of nucleus allows me to pull each of the four lens quadrants using little to no rotation. I then dip the phaco tip into one of the lower quadrants and pull it toward the center of the capsular bag, with full aspiration, to phacoaspirate it. The other quadrants follow.

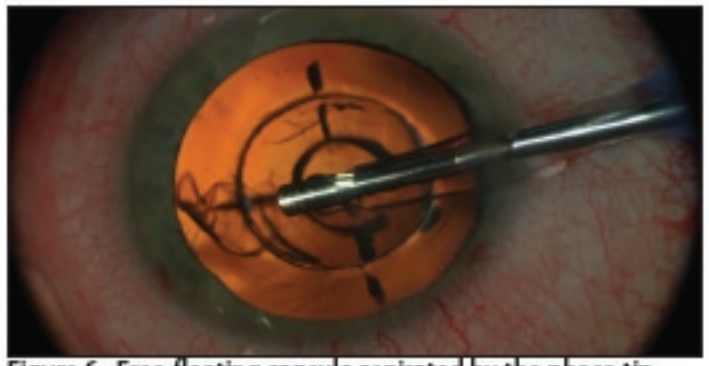

Figure 6. Free-floating capsule aspirated by the phaco tip.

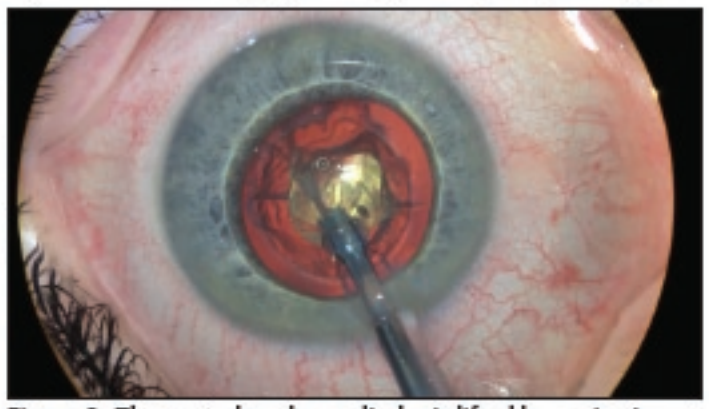

Figure 8. The central nuclear cylinder is lifted by aspiration and phacoaspirated.

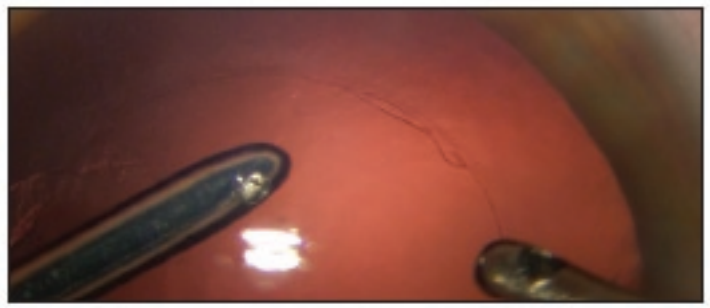

Figure 7. Capsulotomy irregularity.

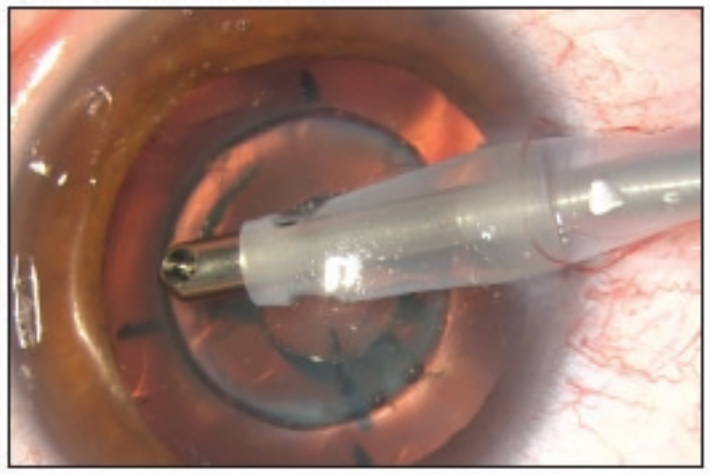

Figure 9. Intraocular laser probe for all-laser cataract surgery.

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After the nucleus and epinucleus have been removed, I still like to aspirate most of the cortex with the phaco tip, as the material goes faster through the tip's wider opening. The remaining cortex is aspirated with biaxial cannulas placed in the sideport incisions. After cleaning the posterior capsule, the eye is ready to receive the IOL. I usually inject the lens through an unenlarged incision using a wound-assisted technique with a biaxial cannula through a sideport incision. There is almost no need to aspirate the OVD from the eye.

Since implementing laser cataract surgery, I have begun to implant multifocal IOLs more frequently, as the precise circular capsulotomy decreases the risk of IOL dislocation due to asymmetrical capsular contraction. I prefer diffractive IOLs, including the Versario (Croma), EyeDiff (EyeolUK), Acriva Reviol (VSY), and the trifocal FineVision (PhysIOL). I implant few toric IOLs, as we treat astigmatism mostly by creating arcuate laser incisions on the cornea. The arcuate laser cuts are more precise compared with manual incisions in terms of position, shape, length, and depth. When these laser relaxing incisions are performed on stable corneas, the results seem to be accurate and reliable with up to 1-year follow-up.

Sometimes I read or hear advertising claiming that laser cataract surgery is superior to ultrasound surgery. However, I believe the emphasis should be on the combination of laser and ultrasound, as this technique is still a manual surgery vastly dependent on a surgeon's skills. Nevertheless, it is possible to perform no-ultrasound cataract surgery on selected eyes with a special surgical modality called *all-laser* or *dual-laser, no-ultrasound cataract surgery*. In this technique, we perform incisions, capsulotomy, and lens fragmentation with the Victus and then emulsification with a disposable intraocular laser probe manufactured by ARC Laser (Figure 9). The laser hits a titanium target inside the probe and generates shock waves to facilitate emulsification. This method is suitable for cataracts up to grade 3 only.

High-volume laser cataract surgery has made my surgery more precise and safer. ■

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