Small-Incision Bimanual Phaco Chop

Specialized instruments help to perform the chopping technique through a microincision.

BY JÉRÔME C. VRYGHEM, MD

Most cataract surgeons obtain excellent results with divide and conquer phacoemulsification through a 2.5-mm incision. In these cases, a conventional foldable IOL is easily implanted and the procedure is safe and effective. Patients are in the habit of demanding a safe, high-quality, and effective procedure. The way I deliver these results is to offer microincision cataract surgery (MICS).

An experienced cataract surgeon loves to push his limits because it provides excitement in the routine of daily surgery. Once a surgeon manages to try MICS, conquer the learning curve, and improve upon his surgical parameters, he develops a system that is difficult to abandon for his old, broader incision technique.

In an attempt to decrease ultrasound distribution in the anterior chamber and shorten my procedure times, I first moved from the divide and conquer to stop and chop technique. I then transitioned to phaco chop. Using the Sovereign phaco system (Advanced Medical Optics, Inc., Santa Ana, California; Figure 1), I was able to reduce my effective phaco time to an average of 1.43 seconds.

Once I started phaco chop, my procedure immediately became bimanual. The chopper helps me to crack the nucleus as well as manipulate or stabilize the fragments. The phaco probe fragments the nucleus by means of ultrasound and, thanks to its holding properties, helps to dislodge the nuclear fragments. Higher flow and vacuum levels and the mechanical action of the chopper compensate for the lower ultrasound settings. In a bimanual procedure, the instruments can easily be switched, making access to all parts of the anterior chamber more reachable.

When the incision size is reduced, the sleeve of the phaco tip must be removed. Modern phaco technolo-

Figure 1. Dr. Vryghem at the operating microscope.

Figure 2. The Vryghem Chopper has an ultrathin wall, a bigger lumen, and a Nagahara tip.

Figure 3. The Duet Capsulorrhexis forceps provide control of the rhexis through a microincision.

gy, such as that of the WhiteStar software (Advanced Medical Optics, Inc.) developed for the Sovereign phaco machine, makes sure that thermal burns at the site of the incision are avoided. Only a perfect match between the size of the sideport and the phaco tip in one hand and the main incision and the irrigating phaco chopper in the other hand can ensure anterior chamber stability. In the beginning, this can be a challenge to achieve, as fluctuations in the anterior chamber cause the patient discomfort.

Therefore, under a Healon5 (Advanced Medical Optics, Inc.) dome, I inject intracameral lidocaine before creating the capsulorrhexis (ie, Arshinoff technique) and while performing hydrodissection and hydrodelineation.

To ensure a good anterior chamber depth and a high flow rate, I developed a titanium irrigating chopper with an ultrathin wall (50 µm), a bigger lumen, and a Nagahara tip. The Vryghem Chopper (A.R.C Laser GmbH, Nuemberg, Germany; Figure 2) provides a flow of 80 mL/minute and makes sure that the bottle height of the balanced salt solution does not need to be increased.

The actual size of my sideport incision is 1.2 mm for the 20-gauge slightly bent phaco tip. The main incision is 1.4 mm during phacoemulsification; it is enlarged to 1.9 mm for IOL insertion.

Appropriate instruments are needed when using smaller incisions for MICS. The MST Duet Capsulorrhexis (MicroSurgical Technology, Redmond, Washington; Figure 3) forceps provide perfect control of the rhexis even when performed through a small incision. IOLs for MICS must have a suitable design for stability in the capsular bag and a normal-sized optic (6 mm). To avoid damaging the IOL during MICS, I prefer injection using a Medicel 1.8 mm cartridge (Medicel AG, Wolfhalden, Switzerland). The cartridge is docked into the incision; the tip does not penetrate into the anterior chamber. I prefer hydrophilic acrylic IOLs, such as the Acri.Tec Acri.Smart 36A (Carl Zeiss Meditec AG, Jena, Germany) or the PhysIOL MicroSlim (Liége, Belgium). Both lenses give excellent visual results and are stable over time.

> Only a perfect match between the incisions and the instruments can ensure anterior chamber stability in MICS.

I believe that the differences in induced astigmatism between a broader, 2.5-mm incision and a MICS incision are nonsignificant. Since first performing my small incision bimanual phaco technique, I have been able to analyze and fine-tune my phaco parameters so much that I feel more in control of these parameters now than when I used a broader incision. For me, since transitioning to MICS as my routine procedure, there is no way to return to a broader incision again. I am completely comfortable performing MICS in all cases. ■

TAKE-HOME MESSAGE

- Incisions of 1.2 and 1.4 mm can be used for nucleus removal with a MICS chopping technique; the main incision is widened to 1.9 mm for IOL insertion.
- Dr. Vryghem's effective phaco time with MICS is 1.43 seconds.
- Intracameral lidocane is injected under a Healon5 dome before creating the capsulorrhexis.
- The differences in induced astigmatism between a 2.5-mm and a microincision are nonsignificant.

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