

Transitioning to Bimanual Microincisional Phacoemulsification

Part one of a two-part series sharing experts' advice.

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Many ophthalmologists are currently deeply interested in performing bimanual microincisional phacoemulsification. The premise behind this approach is that it provides surgeons with more precise control over phaco energy and fluidics than does phacoemulsification with coaxial irrigation. Additionally, surgeons want to be prepared to execute surgery through a sub-2-mm incision, because future IOL designs will permit implantation through these diminutive incisions. In this article, three experienced surgeons share their insights on how to make this progression without difficulty.

—William J. Fishkind, MD, FACS

RANDALL J. OLSON, MD

Bimanual microincisional phacoemulsification and coaxial phacoemulsification are more similar than dissimilar, and, therefore, the transition need not be difficult if you pay attention to a few important details. First, become comfortable performing the capsulorhexis through a sideport incision with one of the new 23-gauge microcapsulorhexis forceps. It is very easy to make the regular incision and to proceed normally if you encounter any difficulty. Do not switch to microphacoemulsification until you are able to complete the capsulorhexis through such a small incision.

Next, practice performing your regular phaco procedure using your second microphaco instrument through a stab incision, with infusion going through your regular incision. This exercise will allow you to become comfortable with oar-locking of the irrigating second instrument as well as the feel of the extra weight in your hand. Again, the beauty in approaching the transition this way is that, if you run into any difficulty, you can immediately switch to whatever instrument you would otherwise use.

After you have mastered steps one and two, begin

with your appropriate incision for the bare phaco needle with irrigation on to help open the wound. Insert the phaco needle and proceed with your usual approach. I highly recommend with any equipment you use to try Whitestar/hyperpulse/ultrapulse (Advanced Medical Optics, Inc., Santa Ana, CA) to minimize the risk of wound burn. If at any time you feel uncomfortable, extend the incision to the full 3mm and convert to coaxial phacoemulsification rather than risk trouble.

Make sure that you have enough infusion to maintain the chamber. That means creating appropriate incisions for the size of your instrumentation so that the wounds are neither too tight nor too large and a leaking wound does not destabilize the anterior chamber. Elevate the irrigation bottle and make sure you are comfortable with the anterior chamber's stability. Trapezoidal incisions decrease oar-locking and improve surgical maneuverability significantly.



Figure 1. The two 1.2-mm incisions are placed astride a central 2.7-mm IOL incision. Use of Cruise Control (Staar Surgical Company, Monrovia, CA) allows 400-mmHg high vacuum setting.

If you pay attention to the details, transitioning to microphacoemulsification is not difficult. Most of the procedure and its overall feel are so similar to coaxial phacoemulsification that the switch need not be complicated or time consuming.

RICHARD B. PACKARD, FRCS, FRCOPHTH

When transitioning to microincisional cataract surgery, the most important lesson is to learn how to use separated I/A. To facilitate this shift, change from coaxial to bimanual I/A before trying to perform microincisional phacoemulsification. There are numerous reusable and disposable devices available; I currently use both sorts. The size of the tip is important; do not use one smaller than 21-gauge, because the chamber will be unstable. End- and side-opening irrigation probes are available. I prefer tips with side openings, because they are easier to insert and provide a better flow of fluid within the eye.

The incisions for the I/A handpieces should be trapezoidal in shape. The smaller end of the incision will be the entry into the anterior chamber. This wound shape allows good tip movement without distortion. A variety of steel and diamond knives are available. The important issue is the production of relatively leak-free wounds that will also seal easily at the end of the case. You may need to alter the settings for the I/A program to permit a balance between fluid ingress through the irrigation handpiece and egress from the eye due to the pump's speed and wound leakage.

Learning these lessons will greatly facilitate your transition to using an irrigating chopper and bare phaco needle with the appropriate wound construction and fluidics balance.

DAVID F. CHANG, MD

First, practice as many of the component skills as possible in the familiar setting of standard coaxial phacoemulsification. This way, you can first master the microincisional capsulorhexis, coaxial phaco chop, and bimanual I/A as individual skills before ever trying an irrigating chopper. Routine coaxial phaco cases also provide the opportunity to experiment with smaller, 20-gauge phaco tips and with power modulations such as hyperpulse. You can determine the minimum levels of aspiration flow and vacuum needed for efficient nuclear removal with these modifications. In the event of chamber instability with bimanual instrumentation, you will have already determined a less aggressive set of aspiration parameters to use.

Second, the Cruise Control device is a wonderful adjunct to bimanual microincisional phaco.^{1,2} This disposable, inexpensive, flow-restricting device can dramatically reduce postocclusion surge, which otherwise limits the surgeon's ability to use high vacuum levels

with bimanual microincisional phacoemulsification. In terms of chamber stability, Cruise Control significantly improves the margin for error, and it should be used during the transitional phase, when the surgeon's learning curve with respect to fluidics settings and the incision's size is greatest.

Third, instead of struggling to perform the capsulorhexis and hydrodissection through a paracentesis, simplify the transition by concentrating on learning only the bimanual phaco chop technique at first. After making the 2.7-mm, temporal, clear-corneal IOL incision, place the two 1.2-mm bimanual incisions on each side (Figure 1). You can now perform both the capsulorhexis and the hydrodissection maneuvers through the familiar, standard-sized incision. In addition, having already created the larger incision, you can easily change back to a coaxial phaco tip if the chamber is unstable or if you encounter difficulty with the bimanual method. In this way, the IOL incision serves as a contingency incision as well. ■

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