

# BACK TO THE



BY KATE XIE, MD; AND SUMIT "SAM" GARG, MD

A perfectly sized, circular, and centered capsulorhexis is a work of art, as well as the mark of an excellent surgeon. A well-executed capsular opening maximizes exposure of the optic while stabilizing the lens implant and decreasing the risk of IOL tilt/dislocation and dysphotopsias related to capsular phimosis. These benefits are important, especially when a patient has received a premium lens implant, because centration and exposure of the optic are keys to maximizing visual outcomes. It takes practice, and bearing in mind the following six tips can set you up for success with this important step of the cataract procedure.

## TIP NO. 1

### ESTIMATE THE SIZE

The optimal diameter of a capsulorhexis is between 5 and 5.5 mm. Many tools are available to help beginning surgeons estimate the size of the tear. A circular marker is a useful choice because it leaves an impression on the cornea that serves as a path you can trace. Alternatively, if you have

access to the Callisto Eye (Carl Zeiss Meditec) or Verion Image Guided System (Alcon), you can turn on either unit's digital capsulorhexis marker. A third option is to use a model of Utrata forceps that is marked at 2.5 and 5 mm, which allows you to size the capsulorhexis while creating it. A fourth alternative is to take all the guesswork out of sizing by using a femtosecond laser or the Zepto Capsulotomy System (Mynosys Cellular Devices). With either technology, a perfectly sized capsulotomy can be created at the click of a button.

## TIP NO. 2

### SEE THE WHOLE PICTURE

Ultimately, it is important to learn to size the capsulorhexis based on landmarks of the eye. Before initiating the capsulorhexis, step back and evaluate the situation. Is there adequate pupillary dilation? What is the white-to-white diameter? A good rule of thumb is to strive to create a capsulorhexis that spans half the white-to-white distance. Be wary of floppy irises and constricted or dilated pupils because they can mislead you. Ask the patient to fixate

on the coaxial illumination lights and the light reflex to center your mental image of the capsulorhexis. Some surgeons, ourselves included, believe that a slight nasal decentration of the capsulorhexis creates better alignment with the visual axis.

## TIP NO. 3

### DETERMINE THE BEST TECHNIQUE FOR YOUR HANDS

Most cataract surgeons use a combination of a cystotome and Utrata forceps to create the capsulorhexis, but capsulorhexis forceps and microforceps are alternatives. There are innumerable ways to initiate a capsulorhexis, starting clockwise, counterclockwise, and at different locations. A single, deliberate stroke to initiate the capsulorhexis and create a flap will allow you to easily visualize where to grasp next. Be careful not to initiate the flap too peripherally, or it will tend to run farther out.

To maximize control, fill the anterior chamber with enough OVD to flatten the anterior capsule as much as possible. As you create the capsulorhexis, consider pausing to refill the anterior chamber with OVD because

# BASICS

## Six tips for sizing and centering the capsulorhexis.

some will inadvertently burp through the main incision. Keep your instrument and the flap as flat as possible; if you are pulling upward on the flap, it will tend to run out.

No matter where you initiate the capsulorhexis, tearing will likely be most difficult in the subincisional area. This is the hardest place to redirect the flap, so plan to regrasp it prior to entering this area.

### TIP NO. 4

#### BE VERSATILE

Although consistency is key to mastering the basic capsulorhexis technique, versatility is crucial to regularly achieving success. Familiarity with the different ways in which the capsule can behave only comes with experience, but it is helpful to know that the capsule becomes more brittle with age and with trypan blue staining. Consider trypan blue staining in pediatric eyes to stiffen the capsule and allow a more controlled capsulorhexis creation.

In cases of significant zonulopathy, you may need to place capsular hooks to stabilize the capsule enough for you to complete the capsulorhexis.

Pseudoexfoliation can lead to aggressive anterior capsular phimosis, so making a larger capsulorhexis than usual can be beneficial in the long run. Master the capsulorhexis tear-out rescue maneuver developed by Brian Little, MD,<sup>1</sup> and learn to perform a can-opener capsulotomy; these techniques will save you in tough situations.

### TIP NO. 5

#### LOOK BEFORE YOU LEAP

Even the newest cataract technologies come with caveats. For example, although the Zepto and femtosecond lasers allow creation of a perfectly sized and perfectly circular capsulotomy, the openings that these devices create can be incomplete. Any remaining bridges of tissue are points of potential radialization. After performing a laser capsulotomy, fill the anterior chamber with OVD, placed directly on top of the capsulotomy to avoid putting stress on a potentially incomplete opening. Before grasping the capsulotomy, pull its edges centrally and prove to yourself that the capsulotomy is complete.

### TIP NO. 6

#### MAKE ADJUSTMENTS AS NEEDED

Remember that you can always adjust the capsulorhexis after it has been completed. Once the IOL has been implanted, you can enlarge the capsulorhexis if exposure of the optic is insufficient. If there is an area where the capsulorhexis has run out, orient the haptics of the lens away from that area to maximize stability of the IOL. ■

1. Little BC, Smith JH, Packer M. Little capsulorhexis tear-out rescue. *J Cataract Refract Surg.* 2006;32(9):1420-1422.

#### SUMIT "SAM" GARG, MD

- Vice Chair of Clinical Ophthalmology; Medical Director; Director of Technology; and Associate Professor of Cataract, Corneal, and Refractive Surgery, Gavin Herbert Eye Institute, University of California, Irvine
- gargs@uci.edu
- Financial disclosure: Consultant (Carl Zeiss Meditec, Johnson & Johnson Vision)

#### KATE XIE, MD

- Ophthalmology Resident, University of California, Irvine
- kcxie@uci.edu
- Financial disclosure: None