

# Bimanual Microincisional Phacoemulsification for Complicated Cases

Learning this technique can augment ophthalmologists' ability to meet select surgical challenges.

BY RANDALL J. OLSON, MD

In certain complicated cases, I find that bimanual microincisional phacoemulsification has some advantages over regular coaxial phacoemulsification. For that reason, I advocate becoming familiar with bimanual microincisional phacoemulsification as a potential means of surgical management. This article describes indications where I believe the procedure's advantages are apparent.

"Performing a capsulorhexis through the stab incision ... can be advantageous in any case in which the anterior chamber is extremely tight."



Figure 1. The author creates the capsulorhexis through a stab incision in a case of hypermature cataract with a distended capsule. The anterior chamber was filled with Healon5. Note the control of the capsulorhexis and how well the milky cortex was held in check.

## HYPERMATURE CATARACT WITH A TENSE CAPSULE

Just starting a capsulorhexis under this circumstance can result in a tear extension, and the use of a very viscous viscoelastic such as Healon5 (Advanced Medical Optics, Inc., Santa Ana, CA) is not sufficient to avoid this complication. Unfortunately, as the surgeon manipulates any of the highly viscous viscoelastic (due to its pseudoplasticity), it will start to flow, thereby eliminating pressurization of the capsule and potentially resulting in an extension. Also problematic is milky cortex, which can make the visualization of the capsulorhexis difficult.

Creating a capsulorhexis through a stab incision and filling the anterior chamber with a viscoelastic such as Healon5 can completely pressurize the system. Both techniques eliminate the risk of a tear extension and minimize visual obscuration by milky cortex (Figure 1). Although performing a capsulorhexis through the stab incision is only a small part of bimanual microincisional phacoemulsification, this skill can be advantageous in any case in which the anterior chamber is extremely tight or there is a risk of iris prolapse. A needle capsu-

lorhexis does not work nearly as well, because the needle does not occlude a stab incision to the same extent that capsulorhexis forceps do.

### CONCERN FOR IRIS PROLAPSE WITH A FLAT ANTERIOR CHAMBER

Iris prolapse with a flat anterior chamber is a concern in nanophthalmos with a very large lens and in phacomorphic glaucoma. With coaxial phacoemulsification and a flat or nearly flat anterior chamber, attempting to pressurize and deepen the chamber through a regular incision often results in iris prolapse. Furthermore, during the creation of a capsulorhexis, the viscoelastic will flow due to its pseudoplasticity, and the chamber will become shallow. Again, the surgeon can completely control the chamber by performing the capsulorhexis with microcapsulorhexis forceps through a stab incision and filling the anterior chamber with Healon5 (Figure 2). This technique is easier than and provides as much control as removing some vitreous through a pars plana vitrectomy, which could increase the risk of a subchoroidal effusion in a case of nanophthalmos.

Complete control of the case continues with nuclear removal through two small stab incisions, a step that eliminates the risk of iris prolapse. In nanophthalmos, it is also advantageous never to allow the anterior chamber pressure to drop to zero, which is when effusion becomes an issue. In all such cases, I maintain infusion and simply switch from phacoemulsification to aspiration. I leave my irrigating chopper in the anterior chamber and then fill the chamber with viscoelastic while I am performing irri-



Figure 2. In a case of nanophthalmos with almost no anterior chamber, the author easily created the capsulorhexis through a stab incision after filling the anterior chamber with Healon5. Adequate space was thereby created and maintained.

gation after removing the cortex. I only remove the irrigating instrument when I have a chamber full of viscoelastic and positive pressure in the anterior chamber.

### CASES WITH A LARGE UNSAFE ZONE

An example of a case with a large unsafe zone is one in which there is a large area of zonular dialysis, especially when vitreous is presenting. Due to the lower infusion and aspiration pressures, by appropriately placing two incisions, the surgeon can work well away from the area of risk. A dispersive viscoelastic will stay in place to protect the area such that entanglement of the vitreous or extension of the zonular rupture is a minimal risk.

“[With] a flat ... anterior chamber, attempting to pressurize and deepen the chamber through a regular incision often results in iris prolapse.”

When removing the vitreous, simply switching instruments after filling the anterior chamber with a viscoelastic allows the cutting instrument to come directly from the opposite stab incision to work in the area where vitreous may be presenting. This is also an opportune time to insert a capsular tension ring or modified capsular tension ring through the second incision.

### CONCLUSION

In time, microincisional technology will prove to have some advantages for other difficult surgical situations. Worth recognizing is that the technology is not simply awaiting new ultrasmall-incision lenses; other reasons exist for considering bimanual microincisional phacoemulsification. In my hands, the procedure has offered distinct advantages over other methods for successfully completing the complicated cases described in this article. ■

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