

# THE ESSENTIAL ROLE OF CAPSULE RETRACTORS

These instruments provide temporary zonular support that can help surgeons safely remove the lens and plan for permanent capsular stabilization.



BY BEERAN MEGHPARA, MD

Managing profound zonular compromise is one of the most demanding challenges in anterior segment surgery—one that tests the surgeon’s composure and technical acumen. Whether caused by pseudoexfoliation syndrome, prior ocular trauma, Marfan syndrome, or advanced age-related changes, generalized or localized zonulopathy threatens the stability of the capsular bag.

The primary surgical goal in these cases is to remove the lens without damaging the capsule or allowing lens fragments to become posteriorly displaced into the vitreous. One useful tool in this setting is the capsule retractor; it is designed to provide atraumatic support and centration of the capsular bag throughout cataract extraction.

These instruments feature an elongated nylon shaft and a broad, blunt terminal paddle or loop that cradles the capsular equator without causing iatrogenic trauma. A sliding silicone element on the shaft rests externally against the limbus and allows the surgeon to adjust the amount of tension required. Although retractors can be placed as a rescue maneuver when unexpected zonular dialysis becomes apparent during phacoemulsification or cortical aspiration, the instruments are most effective when used prophylactically.

## WHEN TO DEPLOY CAPSULE RETRACTORS

The timing of capsule retractor deployment is critical to preventing progressive capsular instability. If significant phacodonesis is observed at the slit lamp preoperatively or if

the lens appears flaccid during initial capsulorhexis creation, early intervention is warranted. Ideally, capsule retractors are inserted immediately after completion of the continuous curvilinear capsulorhexis and before hydrodissection or any manipulation of the nucleus.

Early placement can stabilize the capsular bag against the torsional, compressive, and fluidic forces of phacoemulsification. The retractors act as artificial, temporary zonules that prevent posterior displacement of the capsule, maintain the equator in its physiologic position, prevent the capsular bag from being aspirated into the phaco tip, and block vitreous from prolapsing anteriorly into the surgical field.

## SURGICAL PEARLS FOR PLACEMENT

### Incision Location and Angle

The insertion process begins with the creation of appropriately positioned limbal paracenteses. These incisions are typically a little larger than those used for standard second instrument access and are angled slightly posteriorly to direct the capsule retractor toward the plane of the capsular edge. The instrument is then advanced through the incision, and its distal end is positioned beneath the edge of the capsule.

### Creating Space Beneath the Edge of the Capsulorhexis

To facilitate placement, an OVD can be injected beneath the capsulorhexis’ edge to create space between the capsule and the lens material.

### Achieving the Right Amount of Tension

Once the capsule retractor has been positioned appropriately, the silicone stop is advanced along the shaft until it engages the external limbus. Just enough tension to center and stabilize the capsular bag should be applied; overtightening must be avoided. Depending on the extent of zonular compromise, one to four capsule retractors may be used. Once they are in place, cataract removal can proceed.

### Preventing Dislodgement

During lens removal and manipulation of the eye, the external ends of the retractors can catch on the eyelid or lid speculum. This inadvertent contact can dislodge a retractor, destabilize the lens, or tear the capsule. To reduce this risk, the external end of the capsule retractor can be trimmed with drape or Westcott scissors.

### WHY IRIS HOOKS ARE NOT AN ALTERNATIVE

If capsule retractors are not immediately available, a surgeon may be tempted to use standard flexible iris hooks to stabilize the capsular bag. Although the devices may appear similar, iris hooks and capsule retractors are designed for different tissues and functions.

Iris hooks have a short, sharp, U-shaped tip designed to engage the relatively tough, fibrous iris sphincter rather than the delicate anterior capsule. Focal stress on the capsule runs the risk of creating a radial tear. Additionally, the shaft of standard iris hooks is not long enough to reach the capsular bag equator. As a result, these instruments tend to pull the anterior capsule toward the cornea, tilt the bag out of

its physiologic position, and fail to provide the equatorial support required for safe nuclear disassembly.

### PLANNING FOR PERMANENT SUPPORT

After complete cataract removal, the surgeon must decide what form of permanent capsular support is required because the capsule retractors must be removed. Whether that support is a capsular tension ring or a scleral-fixated capsular tension segment depends on the extent of zonular compromise. When it is time to remove a capsule retractor, the silicone stop can be loosened, and the device may be withdrawn through the paracentesis. Alternatively, the silicone stop can be removed completely, and the retractor can be grasped and externalized through the main incision with a hook or microforceps.

Managing severe zonular insufficiency requires both surgical dexterity and the appropriate use of specialized devices. Capsule retractors can temporarily replace the structural role of the native zonules and counter the destabilizing forces of cataract extraction. By understanding when to place them, mastering the nuances of their use, and recognizing the instruments' advantages over iris hooks in this setting, cataract surgeons can approach these challenging cases with greater control and confidence. ■

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