

Little capsulorhexis tear-out rescue

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Backward traction on the capsule flap forms the basis of a predictable technique for rescuing the capsulorhexis from a radial tear-out.

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The continuous curvilinear capsulorhexis (CCC) has provided important advantages for lens removal and intraocular lens (IOL) implantation by prompting the development of endocapsular phacofragmentation techniques and the use of advanced IOL technology. Ophthalmologists have benefited from the work of Fercho, who developed continuous tear capsulotomy (C. Fercho, MD, "Continuous Circular Tear Anterior Capsulotomy," presented at the Welsh Cataract Congress, Houston, Texas, USA, September 1986), and Gimbel and Neuhann, who popularized the CCC.^{1–3}

In constructing the capsulorhexis, it is essential to control the course of the capsule tear. A tear that begins moving peripherally or in a radial fashion (a tear-out) requires immediate attention.

SURGICAL TECHNIQUE

In the case of a tear-out, the first thing the surgeon must do is recognize the situation. At that point, progression of the tear should be stopped and the depth of the anterior chamber assessed. An ophthalmic viscosurgical device (OVD) should be added to the eye, as needed, to maximize the anterior chamber depth. Rescue of the CCC can then be performed.

During the routine capsulorhexis procedure, the progressing anterior capsule flap is folded back on the intact portion of the anterior capsule and is pulled by forceps, with force applied in the plane of the anterior capsule

and in the direction of the projected circular path of the finished capsulorhexis. In the event of a tear-out, the path of the progressing tear veers peripherally toward the lens equator. To "rescue" the capsulorhexis, the tear must be redirected centrally and back to the desired circumferential path. The first step in rescuing the tear with the Little technique is to fill the chamber completely with an OVD. The force applied to the capsule flap is then reversed in direction but maintained in the plane of the anterior capsule. If necessary, a second corneal paracentesis incision is made at the position that allows the optimum angle of approach for applying traction.

To reverse the force, it is necessary to first unfold the capsule flap so it lies flat against the lens cortex, as it did prior to being torn. This unfolding is most safely and effectively accomplished using an OVD to manipulate the flap. Force can then be applied with the capsule forceps holding the capsule flap as near to the root of the tear as possible and pulling backward, along the circumferential path of the completed portion of the capsulorhexis. Traction should be applied in the horizontal plane of the capsule, not upward. The initial pull should be circumferentially backward, and then, while holding the flap under tension, directed more centrally to initiate the tear. The tear will uniformly and predictably propagate toward the center of the capsule (Figures 1 to 3). A needle cystotome is not recommended for this maneuver due to the risk of tearing the capsule with the needle.

In the event the capsule will not tear easily and the entire lens is pulled centrally, the rescue maneuver should be abandoned to avoid a wrap-around capsule tear. Alternate rescue techniques such as completing the capsulotomy from the opposite direction or making a relieving cut in the flap edge and continuing in the same direction would be appropriate alternatives.

DISCUSSION

The Little rescue technique, using reversal of the force vector on the capsule flap within the plane of the

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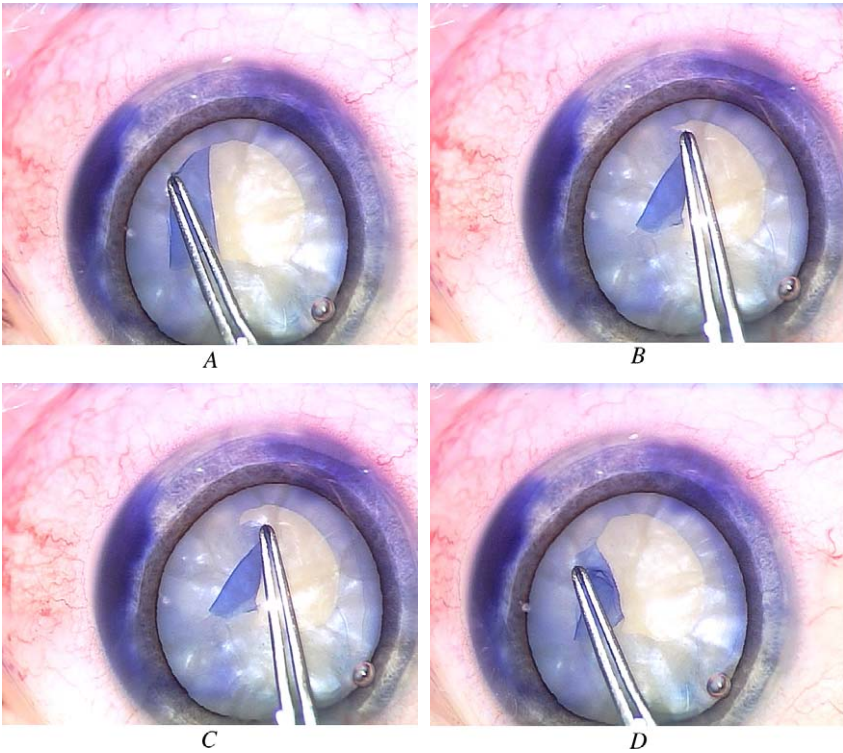


Figure 1. The use of trypan blue stain highlights the basic steps of the technique. *A:* The flap is folded forward as the capsulorhexis is constructed. *B:* The flap is unfolded and grasped. *C:* The flap is pulled backward to redirect the tear centrally. *D:* The flap is refolded forward, and the tear is continued.

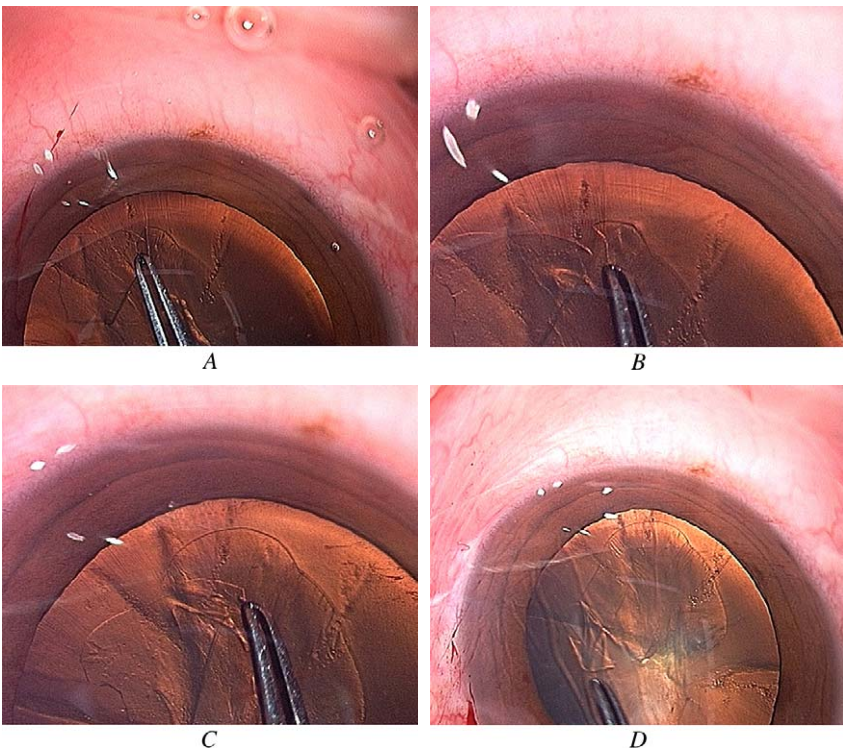


Figure 2. Demonstration of the application of the technique with the capsulorhexis torn in the area of zonular attachments. *A:* The capsulorhexis has inadvertently torn into the zonules. *B:* The flap is unfolded, grasped, and pulled backward. *C:* Backward traction on the flap has redirected the tear. *D:* The capsulorhexis is continued in the standard fashion.

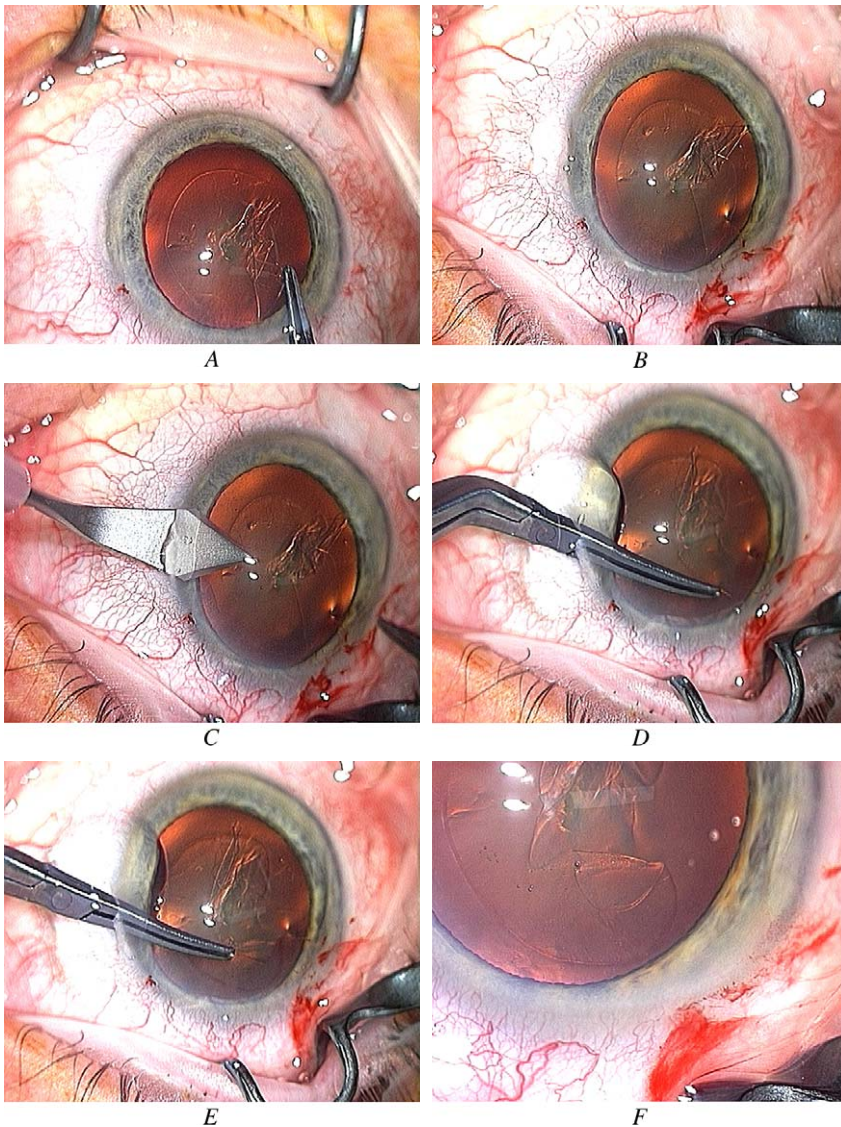


Figure 3. Demonstration of the use of a new paracentesis to obtain optimal positioning for redirecting the tear. *A:* The capsulorhexis is tearing out. *B:* The forceps is removed from the eye and the tear-out examined. *C:* A new incision is made across from the position of the tear-out. *D:* The apex of the flap edge is grasped and pulled backward from the direction of the tear. *E:* The tear is redirected centrally. *F:* Demonstration of the capsulorhexis U-turn.

capsule, results in consistent and effective central redirection of a capsule tear. Once the tear is rescued, the capsule flap is folded back over the anterior lens surface and the capsulorhexis tear is continued in the routine fashion.

As advancing IOL technology demands increasing technical precision in our phacoemulsification procedures, it becomes more important to identify reliable maneuvers for addressing intraoperative challenges. This technique for rescuing a CCC tear-out provides a simple and effective

method for dealing with this common and potentially difficult surgical occurrence.

REFERENCES

1. Neuhann T. Theorie und Operationstechnik der Kapsulorhexis. *Klin Monatsbl Augenheilkd* 1987; 190:542-545
2. Gimbel HV, Neuhann T. Development, advantages, and methods of the continuous circular capsulorhexis technique. *J Cataract Refract Surg* 1990; 16:31-37
3. Gimbel HV, Neuhann T. Continuous curvilinear capsulorhexis [letter]. *J Cataract Refract Surg* 1991; 17:110-111