

# Sewing Through the Capsular Bag

A brief history of the technique.

BY ROBERT H. OSHER, MD

In the mid-1980s, I was invited to speak in Japan. During my visit, I learned that Okihiko Nishi, MD, of Osaka, Japan, had been investigating capsular sewing with 11-0 nylon. When I returned to the US, I continued to expand my series of patients with zonular dialyses and loose crystalline lenses in whom I had performed phacoemulsification (presented at the 1986 AIOIS Congress). At that time, the loose lens was a contraindication to phacoemulsification, but a growing number of interested surgeons were beginning to recognize the possibility of performing small-incision surgery (in contrast to intracapsular cataract extraction with the placement of an anterior chamber IOL). Surprisingly, the actual removal of the nucleus and cortex were not as great a challenge as the subsequent secure placement of a posterior chamber IOL (PCIOL).

## IOL FIXATION

The aforementioned intellectual spark from Japan was the key to my early attempts to fixate an IOL by sewing through the capsule. I reasoned that partial zonular dialysis could be managed by placing the haptic opposite the dialysis into the capsular bag while sewing the adjacent haptic through the equator and creating "synthetic zonules." As the capsular bag contracted, the opposite haptic would fibrose into the normal capsular fornix while the sewn haptic would remain well fixated, despite the asymmetric support. Fortunately, this theory proved true.

I also learned that placing only one arm of the lasso below the haptic and exiting through the capsular bag was less invasive if the other arm of the lasso, which was placed above the same haptic, exited above the bag and out through the ciliary sulcus. A characteristic tenting of the anterior capsule would occur as the bag fibrosed after surgery. A video demonstrating this method won first prize in

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the 1993 ASCRS film competition.<sup>1</sup>

Subsequently, I attempted a bolder approach. I placed the lasso suture around each haptic and sutured through the bag in several patients with severe subluxation associated with Marfan's syndrome. To my satisfaction, the IOL remained centered, supported by both the fibrosed capsules and the lasso sutures. A video of this approach also won an award at the 1996 ASCRS Film Festival.<sup>2</sup>

It was not a great intellectual leap to apply this concept to correcting certain cases of malpositioned lenses. In fact, it was even easier to introduce a lasso suture through a fibrotic versus a clear capsule, because the former was less likely to tear. At the annual AAO course on the malpositioned lens in 1997, I demonstrated this technique. I learned that Ehud Assia, MD, of Kfar Saba, Israel, was also teaching this maneuver when we each presented a similar case during the Video Symposium at the 1999 ASCRS annual meeting.

My final modification occurred 3 to 4 years after I implanted the first capsular tension ring (CTR) in the US in 1993. I recognized that the CTR would re-expand the capsular bag but would do nothing to recenter a subluxed capsular bag. I therefore began placing a double-armed PROLENE lasso suture (Ethicon Inc., Somerville, NJ) above and below the ring after inserting it into the capsular bag. This technique created a centered, well-supported capsular bag capable of housing a PCIOL.<sup>3</sup> In 1998, Vladimir Pfeifer, MD, of

Ljubljana, Slovenia, published his technique of suturing the ring,<sup>4</sup> and Jorge Villar-Kuri, MD, of Mexico City, Mexico, demonstrated his technique for suturing the capsule in the *Video Journal of Cataract and Refractive Surgery*.<sup>5</sup> More recently, Dennis Lam, MD, of Hong Kong published a modified approach in the *Journal of Cataract and Refractive Surgery*,<sup>6</sup> and Roger Steinert, MD, of Boston successfully repositioned a PCIOL within a subluxed capsular bag by sewing the IOL-bag complex through the ciliary sulcus.<sup>7</sup>

"[The modified CTR's] hook that extends around the edge of the capsulorhexis and ends in an eyelet ... [provides] a way to secure the capsular bag without violating its integrity."

### AN ALTERNATIVE TO CAPSULAR SEWING

My experience with capsular sewing came to a halt when my colleague, Robert Cionni, MD, of Cincinnati introduced the modified CTR (Morcher GmbH, Stuttgart, Germany).<sup>8</sup> Thanks to his ingenious addition of a hook that extends around the edge of the capsulorhexis and ends in an eyelet, the surgeon now has a way to secure the capsular bag without violating its integrity. Ike Ahmed, MD, and his colleagues recently introduced a capsular tension segment (Morcher GmbH) that may offer additional advantages.<sup>9</sup> As a result, the patient with severe zonular damage has an even better chance of achieving endocapsular implantation. Surgeons' concerns over technique are now redirected toward suture material, owing to questions about the long-term stability of PROLENE.

### CONCLUSION

Tackling challenging cases such as those described in this article has been quite an adventure, but it has also been very satisfying to contribute to the surgical solutions that allow these patients to enjoy successful outcomes. The future will inevitably bring even better techniques for operating on patients with severely compromised zonules. ■

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