

CONTINUOUS THERMAL CAPSULOTOMY: A SIMPLE SOLUTION FOR A LONGSTANDING PROBLEM

The ApertureRx is a microincision-compatible ring system that automatically captures and removes a perfectly circular cap.

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Capsulorhexis creation has been called both the most challenging and the most crucial step in phacoemulsification.^{1,2} A properly constructed capsulorhexis serves as the foundation for lens extraction and stable in-the-bag IOL fixation, but an errant capsulorhexis or an anterior capsular tear will compound the difficulty of each subsequent step of the procedure.

Anterior capsular tears are particularly significant because they may extend to the equator and beyond. The mean incidence of anterior tears with manual capsulorhexis has been reported to be 2.3%, with a range as high as 5.1% among trainees.^{3,4}

A properly sized continuous curvilinear capsulorhexis (CCC) allows the capsular bag to completely overlap the IOL optic, reducing the incidence of posterior capsular opacification. Histopathologic observations suggest that creating a CCC with a diameter slightly smaller than that of the IOL optic allows the edge of the capsule to adhere to the anterior surface of the optic, creating a closed system that enhances the efficiency of the barrier effect. However, in order to ensure that the anterior capsule overlaps the IOL edge by 360° after implantation, a manual CCC must be created with an average diameter somewhat smaller than ideal because of unavoidable variations in centration, diameter, and circularity.⁵ In clinical practice, where a range of surgical expertise is found, Findl reported 18% of cases with no rhexis overlap of the IOL.⁶

Beyond the safety implications of basic capsulorhexis sizing and location, there is new evidence that a perfectly centered, round capsulotomy results in less IOL tilt and decentration and a more predictable effective lens position, leading to more accurate refractive results.⁷ Although patients today can opt for femtosecond laser cataract surgery in conjunction with premium IOL upgrades, there remains a need for a simpler, safer, more cost-effective, and more predictable solution so that all surgeons can construct the ideal capsulotomy every time. Continuous thermal capsulotomy may offer such a

DEVICE COMPONENTS



ApertureRx Console. Serving as the energy source for the system, the console provides continuous, controlled, low-level energy to the cutting elements on the capsulotomy tip.



ApertureRx Handpiece. The reusable handpiece, designed to resemble a typical phaco handpiece, thereby minimizing deviation from a surgeon's technique, is used to control and introduce the capsulotomy tip into the anterior chamber.



ApertureRx Precision Capsulotomy Tip. Available in sizes from 4.5 through 6.5 mm, the single-use capsulotomy tip can be deployed through incisions as small as 1.8 mm.

(Images in this sidebar courtesy of International BioMedical Devices.)

solution. With the ApertureRx Continuous Capsulotomy System (International BioMedical Devices), thermal power is delivered through a microincision-compatible ring.

THERMAL CAPSULOTOMY

The 360° ring, which extends from an ergonomic handpiece, allows uniform contact with the anterior capsule (Figure). The procedure can be completed in milliseconds under the

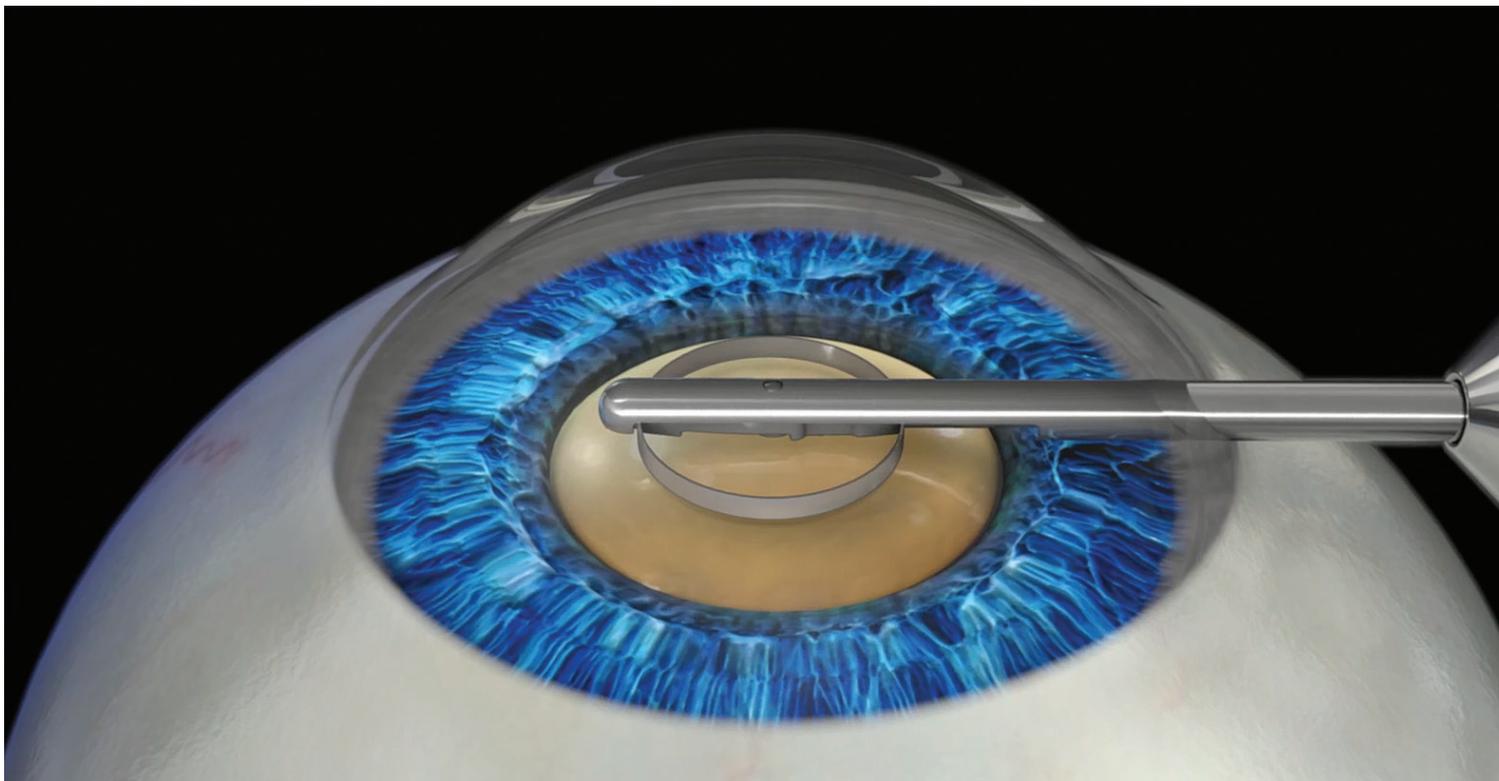


Figure. The 360° ring extends from an ergonomic handpiece and allows uniform contact with the anterior capsule.

protection of an ophthalmic viscosurgical devices. As the ring is retrieved, it automatically captures and removes the perfectly circular cap. The disposable tip is discarded after the case, and the reusable handpiece is sterilized in standard fashion. For more information on the components of the ApertureRx, see *Device Components*.

The key features of the ApertureRx are its continuous 360° thermal element, which overcomes the inevitable gap required by radiofrequency devices with loop wire or ring cutting elements, and its uniform contact with the anterior capsule, which obviates the necessity for vacuum suction. This technology has the potential to ensure safer cataract surgeries

and may also provide more predictable visual outcomes for patients.

CONCLUSION

By simplifying the current manual CCC procedure, the ApertureRx may allow a broader range of surgeons throughout the world to construct the capsulotomy with precise placement and a high degree of consistency. The ApertureRx Continuous Capsulotomy System has not been cleared or approved for use in Europe or the United States. After pre-clinical studies are complete, we surgeons can look forward to initiating clinical trials of the ApertureRx technology. ■

AT A GLANCE

- The ApertureRx automatically captures and removes a perfectly circular cap.
- The device's key features are its continuous 360° thermal element and its uniform contact with the anterior capsule.
- By simplifying the current manual CCC procedure, the ApertureRx may allow a broader range of surgeons throughout the world to construct the capsulotomy with precise placement and a high degree of consistency.

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