

# Lens-Iris Diaphragm Retropulsion Syndrome

Recognizing and overcoming the challenge.

BY ROBERT J. CIONNI, MD

In 1992, Zauberman<sup>1</sup> first described a phenomenon characterized by deepening of the anterior chamber, dilation of the pupil, and bowing of the peripheral iris. In 1994, Wilbrandt and Wilbrandt<sup>2</sup> described this same phenomenon as the *lens-iris diaphragm retropulsion syndrome*. An excessively deep anterior chamber makes cataract surgery more challenging and may cause significant discomfort in patients undergoing phacoemulsification with only topical or intracameral anesthesia. The question, therefore, is how to proceed.

## BACKGROUND

Early management options included (1) lowering the infusion bottle to reduce pressure in the anterior chamber and (2) adding a second infusion line with a chamber maintainer as well as lowering the infusion bottle in order to allow sufficient inflow at a lower pressure. The first option necessitates low flow and vacuum levels to prevent chamber collapse, and it results in a more volatile anterior chamber, which increases the risk of intraoperative miosis, damage to the iris, and posterior capsular rupture. The second option decreases but does not eliminate chamber volatility. It requires a second infusion line, an additional incision, and the extra time involved to set up the chamber maintainer.

Over the last several years, it has become apparent that a reverse pupillary block causes lens-iris diaphragm syndrome, which begins when 360° of iridocapsular contact occurs. As a result of the subsequent pupillary block and infusion into the anterior chamber from an elevated irrigation bottle (high pressure), the iris and lens move posteriorly (Figure 1). In most instances, the zonules and ciliary body are strong enough to resist excessive posterior displacement, but certain conditions allow the iris and ciliary body to move backward, often to dramatic degrees. Some of the conditions that favor marked posterior displacement are youth, myopia, and previous vitrectomy.

## MANAGEMENT

After identifying lens-iris diaphragm syndrome due to a reverse pupillary block, the surgeon can manage the complication by separating the iris from the anterior capsule's rim with the I/A tip (Figure 2), the phaco tip, or any available instrument. This step equalizes the pressure between the anterior and posterior chambers. Once this disparity in pressure is eliminated, the iris will immediately return to a more physiologic position, and the chamber will reassume a normal depth. Because the iris root and the zonules both attach to the ciliary body, the lens will also return to a more normal anatomic position.

Any degree of discomfort the patient was experiencing from the syndrome will dissipate when the chamber returns to a normal depth.<sup>3</sup> As this occurs, it is important for the surgeon to realize that the pupil will decrease in size. If the ciliary body has been stretched for a period of time, the pupil may begin to become more miotic, perhaps due



Figure 1. In this endoscopic view of reverse pupillary block, the iris' base is bowed posteriorly.

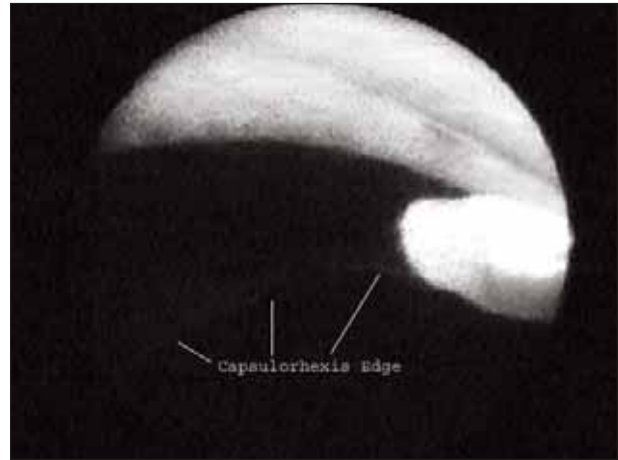


Figure 2. This endoscopic view shows that separating the iris from the anterior capsule with a silicone I/A tip breaks the reverse pupillary block and returns the iris to a more physiologic position and the anterior chamber to a normal depth.

to a release of prostaglandins upon stimulation of the ciliary body.

It is also likely that the reverse pupillary block will recur each time the surgeon initiates infusion anteriorly. For this reason, I often place a second instrument between the iris and the anterior capsule before starting infusion to prevent reverse pupillary block in an eye that shows a propensity for lens-iris diaphragm syndrome.

### CONCLUSION

I find that certain viscoelastics such as Healon5 (Advanced Medical Optics, Inc., Santa Ana, CA) or generous amounts of Viscoat (Alcon Laboratories, Inc., Fort Worth, TX) make the occurrence of lens-iris diaphragm syndrome more common and more difficult to resolve, because they tend to encourage iridocapsular contact and resist the iris' forward displacement. This syndrome has plagued cataract surgeons for years. Realizing its etiology as a reverse pupillary block allows them to manage the problem easily. ■

*Robert J. Cionni, MD, is Medical Director of the Cincinnati Eye Institute in Ohio. He states that he holds no financial interest in the products or companies mentioned herein. Dr. Cionni may be reached at (513) 984-5133; rcionni@cincinnatieye.com.*



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