

Healon 5 Viscoat Donut

How two very different viscoelastics can work together.

BY WENDELL J. SCOTT, MD

A patient may exhibit mild, moderate, or severe intraoperative floppy iris syndrome (IFIS). Often, this person initially presents with a pupil that is 5mm or larger but becomes progressively smaller as the cataract procedure progresses.¹ Accordingly, preoperative surgical planning is important.

Although I do not know the incidence of IFIS with the other alpha-blockers (Uroxatral [Sanofi-Synthelabo Inc., New York, NY], Cardura [Pfizer Inc., New York, NY], or Hytrin [Abbott Laboratories, Abbott Park, IL]), I have found cataract surgery to be challenging in the eyes of patients taking Flomax (Boehringer-Ingelheim Pharmaceuticals, Inc., Ridgefield, CT). I developed the Healon 5 Viscoat donut technique (Healon 5 [Advanced Medical Optics, Inc., Santa Ana, CA], Viscoat [Alcon Laboratories, Inc., Fort Worth, TX]) as my approach to these difficult cases, and I have found it to be useful for all degrees of IFIS.

WHY TWO VISCOELASTICS?

Viscoelastics are classified based on their molecular weight, chain length, and concentration. They are also categorized by how they behave when they are exposed to shearing fluid forces inside the eye.

Healon 5 is a sodium hyaluronate product. Its high viscosity makes Healon 5 the best viscoelastic for maintaining space in a compartmentalized fashion in the anterior chamber, for moving intraocular tissue, and, in the case of IFIS, for keeping the iris in place. The surgeon can introduce Healon 5 over the peripheral iris and visualize the viscoelastic as it moves the iris upon injection. Because it stays in position between the cornea and peripheral iris, it prevents the iris from flopping forward. Although the viscoelastic can be fractured by low shearing forces, Healon 5 is cohesive under high shearing conditions and will usually emerge en masse upon the initiation of aspiration.



Figure 1. After the central pupillary space has been filled with Viscoat, Healon 5 is directed into the angle over the peripheral iris and visibly depresses the iris as it occupies the space between the peripheral cornea and iris. The author slowly injects the Healon 5 and advances the cannula in a circular fashion.

Viscoat is a combination of sodium hyaluronate and chondroitin sulfate. It is dispersive due to its short chain structure but sufficiently viscous to act as a partition. Although Viscoat will fracture into small pieces if it is near high shearing forces during phacoemulsification, most of the viscoelastic will remain undisturbed. Viscoat acts as a protective blockade between the fluidics of phacoemulsification and the tissue (or, in this case, between the fluidics and a second viscoelastic). By creating a barrier between the Healon 5 and the active removal of the cataract, the donut technique prevents the aspiration of Healon 5, which is stabilizing the iris.

THE HEALON 5 VISCOAT DONUT TECHNIQUE

I rely on the donut technique in all patients who are taking Flomax or who have taken the drug in the past. I also employ this approach selectively in patients who have a history of using other alpha-blocking medications. In the latter group, I use the donut technique at the outset of surgery if there is any sign of a small or borderline pupil. By doing so, I may be able to prevent progressive miosis and perform my routine quick chop phacoemulsification, with lower aspiration and vacuum settings but without a need for iris hooks or a pupil ring. When the initial pupillary diameter is 4mm or less, I couple the donut technique with the use of a Graether Pupil Expander (Eagle Vision, Inc., Memphis, TN) or iris hooks.

After I administer intracameral lidocaine and make a temporal incision with a keratome, I inject Viscoat into the central pupillary space in the anterior chamber to form the donut's hole. Next, I introduce the Healon 5 cannula into the anterior chamber over the peripheral iris and direct it into the angle near the temporal incision (Figure 1). As I instill Healon 5, the peripheral iris is visibly depressed, and the injection continues as I advance the cannula in a circular direction until it is at the temporal incision (Figure 2). The central presence of the Viscoat helps to keep the Healon 5 in the periphery and thus the Healon 5 donut over the peripheral iris. Additional Viscoat is then injected in the center of the pupil. As the volume of Viscoat increases centrally and pushes outward, it further isolates the Healon 5 donut peripherally. In other words, the Viscoat fills the donut hole.

I use a 25-gauge cystotome (attached to the Viscoat syringe) to perform the circular, continuous-tear capsulorhexis. Next, I perform hydrodissection with balanced salt solution between the anterior capsule and cortex, and I rotate the lens until it moves freely.

My settings on the Infiniti Vision System (Alcon Laboratories, Inc.) are as follows: an aspiration flow rate of 22mL/min; vacuum of 260mmHg; a bottle height of 105cm; and power at 40% burst mode under surgeon control. I bury the tip in the central lens and use the quick chop technique to remove the lens. Prior to removing the cortex, I instill additional Viscoat in the central pupillary space. This step is necessary due to the extra space created by the removal of the crystalline lens. Without additional Viscoat, it is possible to aspirate the Healon 5 inadvertently during the I/A process, as the tip is directed more peripherally to engage the cortex. Removing the Healon 5 may result in marked miosis and require the placement of additional Healon 5 and Viscoat before I/A



Figure 2. The author completes the donut of Healon 5 near the incision. Additionally, he injects Viscoat centrally prior to performing the capsulorhexis.

may continue. I leave the settings at an aspiration flow rate of 22mL/min and a vacuum level of 260mmHg for the I/A.

After polishing the posterior capsule and filling the capsular bag with Healon 5, I inject the IOL. I remove all viscoelastic with a high aspiration flow rate and vacuum level. At this point, the floppy nature of the iris and progressive pupillary miosis often become apparent. I discontinue irrigation prior to removing the I/A tip in order to minimize the chance of iris prolapse.

CONCLUSION

After trying various viscoelastics and techniques, I found that the strategic use of Healon 5 and Viscoat allows me to stabilize the iris in most patients with IFIS and proceed with surgery in a more routine way. Depending on the severity of the case, the donut technique can be used in conjunction with intracameral epinephrine, iris hooks, or pupil rings. ■

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1. Chang DF, Campbell JR. Intraoperative floppy iris syndrome associated with tamsulosin. *J Cataract Refract Surg.* 2005;31:664-673.