
Stabilization of flat anterior chamber after trabeculectomy with Healon5

Richard S. Hoffman, MD, I. Howard Fine, MD, Mark Packer, MD

A 64-year-old phakic patient had a trabeculectomy complicated by complete shallowing of the anterior chamber 10 days postoperatively. Despite repair of a conjunctival wound dehiscence and reformation of the anterior chamber with sodium hyaluronate 3.0%–chondroitin sulfate 4.0% (Viscoat®), he had a flat anterior chamber again the following day with 360 degrees of pupillary synechias and lens-to-cornea touch. Sodium hyaluronate 2.3% (Healon®5) instilled through a paracentesis at the slitlamp lysed the synechias, stabilized the anterior chamber, facilitated filtration, and prevented complications from hypotony. The unique properties of Healon5 allowed for a conservative and less invasive approach in the management of this particular complication.

J Cataract Refract Surg 2002; 28:712–714 © 2002 ASCRS and ESCRS

With the recent approval of Healon®5 (sodium hyaluronate 2.3%) for use in the United States, we have increased our use of this ophthalmic viscosurgical device (OVD) in cataract and corneal transplant patients. Its unique properties offer many benefits in selected patients, and we believe that over time, more indications for its use will develop. We present a case in which Healon5 helped stabilize a patient's eye after trabeculectomy.

Case Report

A 64-year-old phakic white man with uncontrolled glaucoma had an uneventful trabeculectomy with a limbus-based flap. At the first postoperative examination, he had a well-formed anterior chamber, a diffuse 180-degree bleb, and a Tono-Pen® intraocular pressure (IOP) of 5 mm Hg. He was treated with 5 mg of subconjunctival 5-fluorouracil in addition to topical ofloxacin 4 times daily and prednisolone acetate 1% every 2 hours. He returned on postoperative day 4

with a localized bleb and an applanation IOP of 10 mm Hg. A repeat injection of 5-fluorouracil was given.

Ten days postoperatively, the patient returned complaining of foggy vision. Examination revealed a soft eye secondary to a dehiscence in the fornix incision with a type III shallow anterior chamber and lens-to-cornea touch (Figure 1). He was immediately taken to the operating room for repair of the wound dehiscence and reformation of the anterior chamber with sodium hyaluronate 3.0%–chondroitin sulfate 4.0% (Viscoat®). One hour later, he had a large 180-degree bleb, a formed anterior chamber with 360 degrees of pupillary synechias, and a Tono-Pen IOP of 20 mm Hg. He was started on atropine 1% 4 times daily and oral prednisone 80 mg a day.

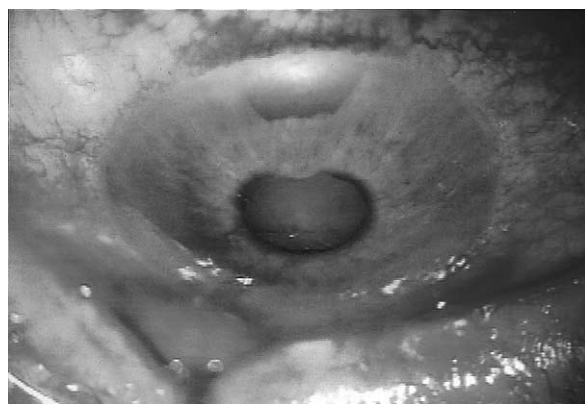


Figure 1. (Hoffman) A completely flat anterior chamber with lens-to-cornea touch and 360 degrees of posterior synechias.

Accepted for publication July 16, 2001.

From a private practice, Eugene, Oregon, USA.

Dr. Packer is a paid consultant to Pharmacia. None of the other authors has a financial interest in any product mentioned.

Reprint requests to Richard S. Hoffman, MD, 1550 Oak Street, Suite 5, Eugene, Oregon 97401, USA. E-mail: rshoffman@finemd.com

The next day, the patient returned with a soft eye, a 360-degree Seidel negative bleb, and a type III flat anterior chamber with lens-to-cornea touch. Fundus examination through a 4.0 mm pupil demonstrated an absence of significant choroidal detachments. The surgeon attempted to reform the anterior chamber at the slitlamp by injecting Healon5 through the previously placed paracentesis. The nasal half of the anterior chamber was filled with Healon5, with unexpected lysis of 270 degrees of nasal and inferior pupillary synechias. The anterior chamber was not completely filled because of the potential for unexpected marked IOP elevation from this extremely viscous OVD.

The patient returned 3 hours later with a formed anterior chamber and an IOP of 6 mm Hg. The Healon5 remained in the anterior chamber for 3 days, at which time the patient returned with a small conjunctival dehiscence and a type I shallow anterior chamber. The conjunctiva was sutured at the slitlamp and the entire anterior chamber filled with Healon5 through the paracentesis. This resulted in complete synechiolysis and a deep anterior chamber. The chamber remained formed with the Healon5 for an additional 4 days (Figure 2), at which time additional wound leaks and progressive anterior chamber shallowing necessitated a return to the operating room for additional suture placement at the trabeculectomy flap. This final revision stabilized the anterior chamber without additional OVD injection.

Discussion

Healon5 is a new viscoadaptive formulation that exhibits unique properties relative to other OVDs. It demonstrates fracturable pseudodispersive or cohesive properties that change depending on the intraocular fluid turbulence. Under conditions of low or zero shear, Healon5 demonstrates extreme viscosity and high cohesion. As the shear increases (higher turbulence secondary

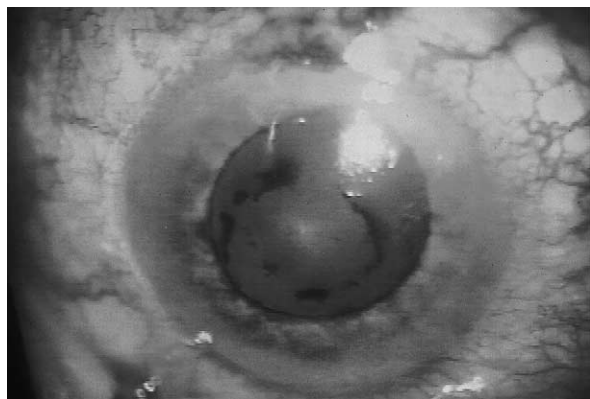


Figure 2. (Hoffman) Four days after the second instillation of Healon5, the anterior chamber is shallow but formed. Note the complete lysis of posterior synechias.

to higher flow rates), however, as encountered during nuclear phacoemulsification, Healon5 becomes less viscous and begins to fracture into smaller pieces.¹⁻³ This viscoadaptive behavior aids the cataract surgeon by creating a deeper, more controlled anterior chamber during low-flow situations such as capsulorhexis formation and allowing easier removal of Healon5 from the eye during high-flow conditions such as aspiration of OVDs after intraocular lens implantation.

In our case, the flat anterior chamber resulting from the wound dehiscence was initially treated by surgical repair of the conjunctiva and reformation of the anterior chamber with Viscoat. The following day, there was no Viscoat in the anterior chamber; the chamber was again flat despite an intact incision. Only after the more viscous Healon5 was placed in the anterior chamber was relative stability achieved. The initial injection of Healon5 just inside the paracentesis site spontaneously broke most of the posterior synechias that were not lysed by the addition of Viscoat the previous day. In addition, Healon5 remained in the anterior chamber for at least 3 days before new conjunctival dehiscences required placement of additional Healon5. The second larger dose of Healon5 lasted 4 days before overfiltration and poor conjunctival wound healing necessitated additional suturing of the trabeculectomy flap.

The use of OVDs to stabilize the anterior chamber after trabeculectomy is not a new concept. Ophthalmic viscosurgical devices have been placed intraoperatively⁴⁻⁸ and postoperatively^{9,10} to prevent and treat flattening of the anterior chamber after trabeculectomy. One limitation of less viscous OVDs is their tendency to wash out of the anterior chamber in filtered eyes by the third postoperative day.¹¹ We think that the absence of shear forces within the anterior chamber of our patient allowed the Healon5 to remain in place in its most viscous state for as long as it did before fragmentation and dissolution developed.

Although this patient ultimately required additional trabeculectomy revision to stabilize the anterior chamber, we believe other patients with flat anterior chambers from overfiltration and intact filtering blebs may benefit from this surgical intervention. The use of Healon5 in this patient allowed us to stabilize the eye with a low but significant IOP and may have averted the formation of serious choroidal effusions or other grave complications. In addition, stabilization of the anterior chamber al-

lowed us the luxury of time for observation and surgical planning.

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