

special report

EVOLVING STRATEGIES
IN CATARACT SURGERY

OVD BOLUS: Putting the eye to the grindstone

Procedure ensures removal of cortical remnants, capsular fibrosis during cataract surgery

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Reviewed by **Andreas F. Borkenstein, MD**

Refinement of a procedure to remove residual cortical material adjacent to the posterior lens capsule during cataract surgery without need for additional instrumentation seems safe and highly effective in the first cases in which it was performed, according to Andreas F. Borkenstein, MD, who is in private practice in Graz, Austria.

Borkenstein presented the data at the American Society of Cataract and Refractive Surgery's 2022 annual meeting in Washington, DC. The study's coauthor is Boris Malyugin, MD, PhD, a professor of ophthalmology and deputy director general at the S. Fyodorov Eye Microsurgery Federal State Institution in Moscow, Russia.

Borkenstein noted that the step in removing any cortical remnants and primary capsular fibrosis is critical in cataract surgery because damage to the posterior capsule can occur. It was 2 years ago that the technique arose out of his recognition of the "excellent" capability of a highly viscous cohesive ophthalmic viscosurgical device (OVD) (Pe-Ha-Luron F 2.2%; Alomed Germany) to remove primary capsular fibrosis without damaging the posterior capsule with the irrigation/aspiration cannula when performing the mechanical capsular polishing step.

With normal jetting during the procedure, residues often remain or the capsule can be destroyed by the pressure of the jet stream. During the next year, Borkenstein sought an ophthalmologist with a surgical and scientific background. This led him to Malyugin, an internationally recognized expert in challenging cases in cataract surgery and inventor of useful instruments.

OVD BOLUS

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patients. In addition, Borkenstein would like to demonstrate the grindstone effect in a lab study using the "Miyake-Apple posterior video analysis technique" and is seeking collaboration. ■

Borkenstein explained that the idea to use a fluid stream from the irrigation cannula attached to the balanced salt solution (BSS) syringe to clean the capsule dates to the late 1990s (Steven Arshinoff, MD, and Thomas Neuhann, MD) and the safety and efficacy of the procedure have been reported.^{1,2}

The difference between the tried-and-true procedure and the one under discussion is that the latter does not use a BSS stream but rather a bolus of the OVD. This approach is trying to avoid excessive collateral irrigation trauma to the delicate corneal endothelium and posterior capsule.

Cohesive OVDs seem ideal for this technique in that they have high molecular weight and surface tension and are made of large molecules. In addition, they are ideal for maintaining the anterior chamber, helping to perform the capsulorrhexis, and creating space. They are easy to remove because of their high surface tension, Borkenstein explained.

The procedural steps

Borkenstein outlined the 3-step process. First, the capsular bag is filled to about one-third of capacity with the cohesive, highly viscous OVD to create the bolus.

Second, the surgeon increases the BSS jet stream by introducing a 27-gauge or 30-gauge cannula attached to the syringe and directing it toward the posterior capsule slightly tangential to the OVD bolus. Finally, the OVD bolus starts to rotate and creates a "grindstone" of sorts.

Borkenstein explained that this can be detected when the thick viscoelastic cords start to rotate quickly in the capsule as a ball with a relatively rough surface that grinds down the cortical material. The jet stream remains in the same position (ie, tangential to the posterior capsule).

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This article is adapted from Borkenstein's presentation at the American Society of Cataract and Refractive Surgery annual meeting in Washington, DC.

REFERENCES

1. Liu Z, Cao Q, Qu B, et al. Fluid-jet technique to polish the posterior capsule for phacoemulsification surgeries: efficacy and safety evaluation. *J Cataract Refract Surg.* 2020;46(11):1508-

Air bubbles in the anterior chamber remain at the same location, indicating that no fluid or shear forces reach the anterior chamber or the endothelium/cornea.³

The first OVD cases

Borkenstein also pointed out that the first 62 cases were performed with no problems. No intraoperative or postoperative complications were detected; on day 1 after surgery, no corneal edema or hypertension occurred. The mean best-corrected visual acuity was -0.01 ± 0.11 logarithm of the minimum angle of resolution.

The procedure seems safe with no additional irrigation trauma and no pressure, mechanical force, or sharp objects applied to the capsule. "The anterior chamber and corneal endothelium also are safe because the OVD remains in the capsule due to its molecular weight," he said.

The new technique added only 30 to 60 seconds to the time of the routine cataract surgery.⁴ A big advantage in challenging cases is that it may potentially lead to the lower risk of posterior capsular opacification (PCO) developing postoperatively. No additional surgical devices were needed. It is safe and simple—ideal for challenging cases like posttraumatic eyes, pseudoexfoliation syndrome, or floppy iris syndrome, he noted.

Moreover, Borkenstein explained that it will be interesting to see over the long term whether the PCO rate decreases due to this technique, and with more surgeons performing the technique worldwide, if the intraoperative complication rate can be reduced.

A further multicenter study is planned to evaluate long-term results regarding the PCO rate and endothelial cell count with more

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4. Visco polishing technique by Dr Andreas F. Borkenstein, Graz, Austria. <https://www.youtube.com/watch?v=iulMd2GvX-sw&t=12s>