Selecting and Using OVDs

Personal preference, viscoelastic properties, and stage of surgery all play parts in choosing the right product or products.

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JORGE L. ALIÓ, MD, PhD

My ophthalmic viscosurgical device (OVD) of choice is Viscoat (Alcon); however, I also use sodium hyaluronate (Provisc; Alcon) to further expand the capsular bag.

Before I inject the OVD, I dilate the pupil with intraocular mydriatics. I have abandoned topical medication due to its toxicity to the corneal epithelium and the ocular surface.

ROBERTO BELLUCCI, MD

I use a cohesive OVD with a medium weight (Beaver-Visitec International) in almost every case. Cohesive OVDs with low molecular weights decrease visibility, can entrap nucleus fragments, and take longer to remove. I prefer Healon GV (Abbott Medical Optics) to deepen a shallow anterior chamber and to enlarge small pupils and Viscoat when superior endothelial protection during phacoemulsification is required, as in an eye with low endothelial cell count. In all these cases, a standard cohesive OVD is injected for IOL implantation.

BJÖRN JOHANSSON, MD, PhD

OVDs have completely changed anterior segment surgery in general and cataract surgery in particular, and, today, many formulas are available with different rheologic properties. For routine surgeries, I use a standard cohesive OVD. With my technique, an 0.8-mL package supplies enough coverage for the entire procedure, provided it is a routine case. It is also adequate for most cases that require pupil dilation, iris hooks, and/or capsular tension rings.

In eyes with corneal endothelial dystrophy or a damaged zonular apparatus, I prefer a viscoadaptive OVD. Because the anterior capsule interacts differently with a higher viscosity OVD than a cohesive one during creation of the capsulorhexis, I place a small bolus of cohesive OVD on top of the lens capsule, underneath the high-viscosity OVD. This is known as the double-shell OVD technique (Figure 1).

Coating the cornea with OVD may decrease the need to irrigate it with balanced saline solution. More important, it can also provide a clearer view through a cornea that is not optically perfect, for example due to scarring, previous corneal transplant, or slight stromal haze.

SIMONETTA MORSELLI, MD

Selecting and using an appropriate OVD can be key in managing complicated cases. I use a cohesive OVD with...
a low molecular weight for routine cataract surgery, including IOL implantation. When the complication of vitreous loss occurs during surgery, I inject an OVD with a high molecular weight (ie, dispersive) to maintain anterior chamber depth during maneuvers such as cutting the vitreous or pushing it back into the posterior vitreous cavity.

A dispersive OVD is also useful in white intumescent cataracts, as it can counteract the internal pressure within the crystalline lens and help to obtain a correct capsulorrhexis without tears. Additionally, a dispersive OVD is useful to protect the endothelium during phacoemulsification and irrigation/aspiration, endothelium and the tissue inside the eye and create sufficient space. Using these agents together, in sequence, to protect the corneal endothelium during phacoemulsification in eyes with low endothelial cell counts.

**TOBIAS H. NEUHANN, MD**

To hold the anterior chamber in position after preparing the incision for standard cataract operations, I use a cohesive, short-chain OVD. This serves two purposes: (1) stabilization of the anterior chamber during capsulorrhexis using tweezers and (2) protection of the endothelium during phacoemulsification and irrigation/aspiration.

In patients with endothelial problems such as cornea guttata, I prefer to use the dispersive-cohesive OVD soft-shell technique first described by Arshinoff. The soft-shell technique maximizes the advantages and minimizes the disadvantages of both dispersive and cohesive OVDs by using these agents together, in sequence, to protect the endothelium and the tissue inside the eye and create sufficient space for phacoemulsification, irrigation/aspiration, and lens implantation.

**KHIUN F. TJIA, MD**

I have always used the DuoVisc Viscoelastic System (Alcon), which provides both a dispersive (Viscoat) and a cohesive (Provisc) OVD in one package. I like having the dispersive OVD because it provides good working space in the anterior chamber and protects corneal endothelial cells during the first half of the phaco procedure.

For IOL injection, I clearly prefer a cohesive product, which is the easiest type of OVD to remove.

In the future, I might consider using a less expensive product for routine cases. With my newest phaco machine (Centurion Vision System; Alcon), the amounts of ultrasonic energy use and fluid consumption are significantly lower than with all other machines I have used in the past. Therefore, I might feel comfortable using a regular sodium hyaluronate or methylcellulose OVD in straightforward cases. I would still use DuoVisc for compromised eyes and challenging cases.

**ABHAY R. VASAVADA, MS, FRCS**

Products originally described as viscoelastics are now recognized as OVDs due to the complexity of their properties and their varied functions at different stages in surgery. Using the appropriate OVD for the appropriate function helps surgeons to enhance outcomes in all types of complicated scenarios. Selection, therefore, depends on the purpose of use.

Cohesive OVDs are preferred during anterior capsulorrhexis and IOL implantation due to their ability to maintain space. Particularly when inflating the capsular bag prior to IOL implantation, I prefer a cohesive OVD (sodium hyaluronate) so that removal is easier. Dispersive and viscoadaptive OVDs are difficult to remove because they are short-chain molecules and tend to fracture with high flow rates.

I routinely use the soft-shell technique. A dispersive OVD (Viscoat) is first injected, followed by a cohesive OVD beneath it. This sequence of injection pushes the dispersive OVD to the corneal endothelium in order to protect it during surgery. I find this especially useful in patients with Fuchs endothelial dystrophy, in those who have had prior penetrating keratoplasty or Descemet stripping endothelial keratoplasty, and in eyes with dense cataracts. In these cases, it is helpful to supplement the Viscoat repeatedly during nuclear fragmentation to protect the endothelium from fluid turbulence and the mechanical impact of dense fragments.

In the event of a posterior capsular rupture (PCR) with vitreous prolapse, a dispersive OVD should be injected to tamponade the area of the PCR and prolapse. This should be done prior to withdrawing any instruments from the eye in order to maintain a closed chamber and prevent further enlargement of the PCR.

In special situations such as eyes with a small pupil or a floppy iris, both dispersive and viscoadaptive OVDs (Healon 5) can help in viscomydriasis, tamponading the iris, and preventing prolapse. Furthermore, I find dispersive and pseudodispersive OVDs such as DiscoVisc useful in eyes with subluxated lenses or posterior polar cataracts, in which I often perform viscodissection to provide a mechanical cushion and create additional space to prevent transmission of stress to the capsular bag-zonular complex.

Overall, different OVDs serve different purposes. However, if a surgeon wants to use a so-called all-in-one OVD for routine cases, DiscoVisc has properties of both dispersive and cohesive OVDs and should work pretty well.