Cataract & Refractive Surgery TODAY
EUROPE

ZEISS OVDs

ENGINEERED FOR SIMPLICITY

ZEISS OVDs Engineered for Simplicity

With a complete line of OVDs to choose from, there is a product to compliment every surgical technique.

Modern ophthalmic viscosurgical devices (OVDs) are instrumental in the success of cataract surgery. These viscoelastic agents provide additional safety measures for anterior segment surgeons because they create and maintain space in the anterior chamber and stabilize and protect intraocular tissue during surgery. Because OVDs are routinely used, it is easy for the cataract surgeon to overlook their impact on the surgical outcomes. This is where Carl Zeiss Meditec (Jena, Germany) comes in, because the company recognizes that there are more important procedural aspects for the surgeon to focus on during surgery.

ENGINEERED FOR SIMPLICITY

ZEISS' line of OVDs—the result of more than 25 years of research and development—originates from patented continuous biofermentation and is therefore not based on animal tissue. Each OVD has a unique function; however, within the range of innovative OVDs there is a product to compliment every surgical procedure, no matter what viscosurgical tools are required.

When you use a ZEISS OVD syringe, you can feel the determination and the spirit of the highly dedicated Carl Zeiss research and development team and the employees at the company's state-of-the-art production facilities, who give their very best so that surgeons can trust the quality of their work. That is why ZEISS' OVDs are *Engineered for Simplicity*.

TWO OVDs

This supplement explores two ZEISS OVDs, Z-HYALIN plus and TWINVISC, and provides commentary from some of today's leading cataract surgeons who use these products in their daily practice.

Z-HYALIN plus. As ZEISS's reference single-viscosity OVD, this agent can be used for every step and every type of cataract surgery. This cohesive OVD consists of a 1.5% solution of sodium hyaluronate that is derived from a bacterial fermentation (not of animal origin) with a high molecular weight and a high viscosity. Each syringe comes loaded with 1.0 mL of high-viscosity cohesive OVD, offering flexibility of use. The OVD is quick and easy to remove at the completion of surgery.

TWINVISC. This OVD is a unique product because it combines a dispersive and a cohesive OVD in the same syringe. The benefit of TWINVISC is that the surgeon can use both OVDs in the same procedure and only needs to worry about one syringe.

The TWINVISC dispersive OVD is a 2.2% solution of sodium hyaluronate derived from bacterial fermentation (not of animal origin) that has a low molecular weight and a low viscosity. These properties make it possible to inject the OVD through a 25-gauge cannula inserted into a small incision. The volume of dispersive OVD provided, 0.7 mL, is more than sufficient. The TWINVISC cohesive OVD consists of a 1.0% solution of sodium hyaluronate derived from bacterial fermentation (not of animal origin) that has a high molecular weight and a high viscosity. It is also provided in a volume of 0.7 mL.

CONCLUSION

Engineered with simplicity in mind, Z-HYALIN plus and TWINVISC are two credible OVD options. ZEISS has worked hard to develop viscoelastic agents that are safe and reliable so that the surgeon has one less thing to worry about during surgery. ■

Double Viscosity in One Syringe

The perfect product for microincision cataract surgery.

BY THIERRY AMZALLAG, MD

I am a firm believer in using two viscosity sources during cataract surgery. I have tried to complete procedures using only one ophthalmic viscosurgical device (OVD), but in each instance I have struggled with certain steps because the agent did not have the right properties for the job.

The beauty of products such as TWINVISC (distributed by Carl Zeiss Meditec, Jena, Germany), a product that combines a dispersive and a cohesive OVD in two chambers of the same syringe, is that I no longer have to sacrifice any surgical step. I can use the dispersive OVD in the first phases of surgery and the cohesive OVD in the remaining.

BYPASS SYSTEM

Using a patented Bypass system (Figure 1), there is no threat of mixing the dispersive and cohesive agents. Rather, each OVD is released separately because a stopper holds the OVD in place. The Bypass system is automatically activated when the dispersive OVD is completely emptied from the chamber, triggering the release of the cohesive OVD with the next thrust of the injector. There is no reflux during the injection phases.

The advantages and the main features of the Bypass system is that it prevents any reflux of the dispersive OVD into the cohesive space in the first phase of injection, and it improves smooth delivery of the two phases. The plunger is easy to push, and you are not met with any resistance while pushing.

Figure 1. The patented innovative Bypass system holds the two OVDs in two separate chambers to prevent any reflux of the dispersive OVD into the cohesive OVD and to improve smooth and separate delivery of both OVDs.

Figure 2. The BLUEMIXS 180 injector for ZEISS preloaded MICS IOLs.

CHARACTERISTICS

No other system on the market today does what TWINVISC does. There are four distinct characteristics that set this OVD product apart from others on the market today:

- The platform is a unique combination of dispersive and cohesive OVD;
- TWINVISC is the only double-viscosity OVD available in separate chambers of the same syringe;
- The OVDs are separated by a state-of-the-art Bypass system; and
- Each OVD is injected separately to ensure that the viscosities do not mix.

TWINVISC is not a new product, but it has been recently rediscovered because

Figure 3. Depiction of a standard technique using TWINVISC dispersive during the capsulorrhexis and phaco phases.

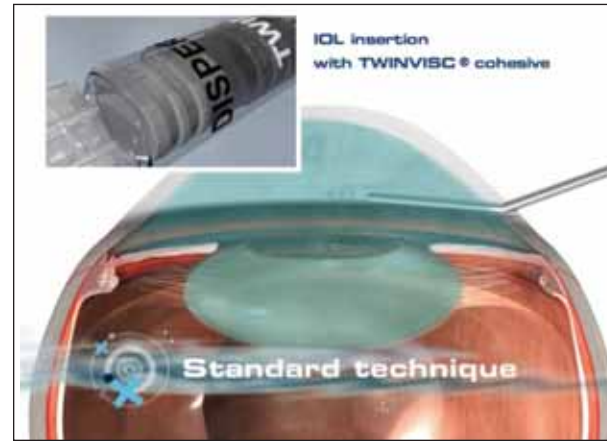

Figure 4. Depiction of a standard technique using TWINVISC cohesive during IOL insertion.

No other system on the market today does what TWINVISC does.

it is a safe and effective way to ensure the right OVD is used at the right time during cataract surgery. It can be used in any patient population and in any cataract surgery, including routine and complicated cases and for microincision cataract surgery (MICS). Below is a description of a typical MICS case using TWINVISC.

SURGICAL STEPS

After creating a 2.0-mm main incision and a 0.9-mm side-port incision, I insert a 25-gauge cannula through the side-port. (Alternatively, the cannula can be inserted through the main incision.) I then inject the TWINVISC dispersive OVD into the capsular bag. There are no air bubbles, and the OVD is very transparent, making it easy to see what you are doing during the capsulorrhexis and any manipulation inside the anterior chamber.

The main function of TWINVISC dispersive is to create and maintain space inside the anterior chamber. This is important, because some OVDs can create space but do not stay inside the anterior chamber during capsulorrhexis. With the dispersive intact in the anterior chamber, the capsular tear is easy to guide, and I am able to make a precise continuous curvilinear capsulorrhexis.

The dispersive OVD stays inside the anterior chamber during phacoemulsification, protecting the endothelium during the ultrasound phase. The same is true during irrigation and aspiration, because part of the design of the dispersive product is to stay in place alongside the endothelium.

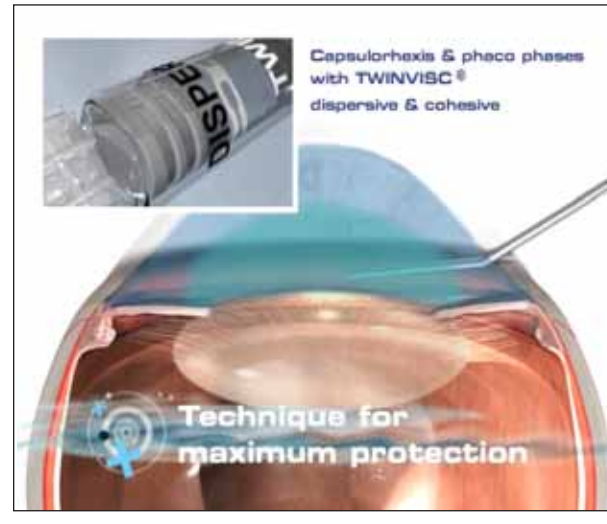

Figure 5. By using both TWINVISC dispersive and TWINVISC cohesive in the capsulorrhexis and phaco phases, the surgeon can obtain the maximum protection possible.

TWINVISC is a safe and effective way to ensure the right OVD is used at the right time.

The protective properties of TWINVISC dispersive remain in the eye through cortex removal.

Before I initiate lens implantation, I expel the remaining dispersive OVD from the syringe so that the Bypass system can automatically switch to the cohesive agent. At this point, I line the BLUEMIXS preloaded injector (Carl Zeiss Meditec; Figure 2) with TWINVISC cohesive and then refill the anterior chamber. The cohesive will expand to create space inside the anterior chamber and will also allow better pupil dilation. Once IOL implantation is complete, I am

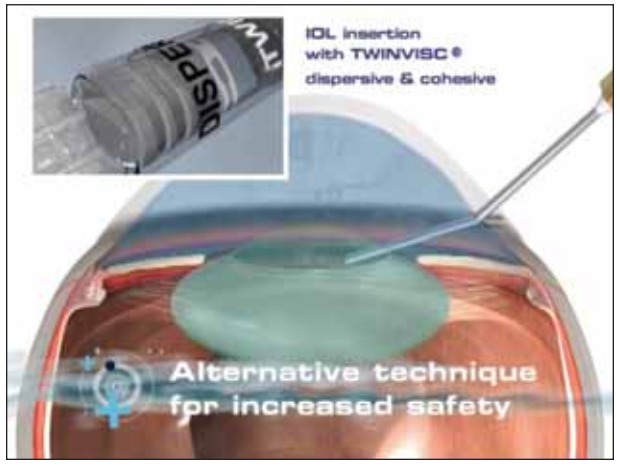

Figure 6. An alternative technique using TWINVISC dispersive and cohesive for IOL insertion. Combining the cohesive and dispersive agents in this phase can increase safety.

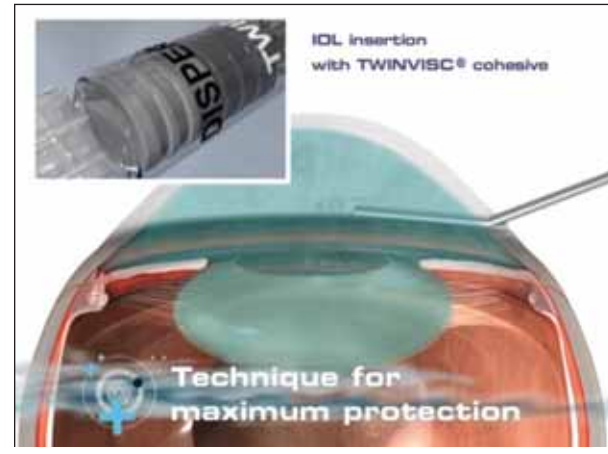

Figure 7. During IOL insertion, TWINVISC cohesive can be used to ensure maximum protection.

careful to remove TWINVISC from the anterior chamber and from behind the lens.

PEARLS

TWINVISC is a great product because the surgeon can use its different properties to his or her advantage. For instance, I rely on the dispersive agent to dilate small pupils, to break synechias, and to protect the endothelium in the presence of corneal guttata. For white intumescent cataract, the ability of the OVD to maintain space in the anterior chamber allows me to perform a safe capsulorrhexis (Figures 3 and 4). For the hard nucleus, the dispersive agent also helps protect the endothelium.

In some cases, I use a combination of TWINVISC dispersive and TWINVISC cohesive in the same step. For example, I sometimes start the capsulorrhexis with the dispersive viscoelastic and switch to the cohesive viscoelastic, placing it alongside the capsule to facilitate the capsulorrhexis (Figure 5). Because it is impossible to switch back to the dispersive OVD, this maneuver must only be used if the surgeon is comfortable completing the procedure with cohesive alone.

> TWINVISC is a great product because the surgeon can use its different properties to his or her advantage.

Alternatively, if carrying out the capsulorrhexis with dispersive alone, I then have the option to use the remaining dispersive to line the endothelium before IOL implantation (Figure 6). I follow this maneuver with injection of the cohesive along the capsular bag (Figure 7). This is beneficial, because I then have a huge quantity of cohesive to inject inside the capsular bag.

> TWINVISC is a very modern product that is suitable for MICS.

CONCLUSION

TWINVISC is a very modern product that is suitable for MICS. The large amounts of dispersive and cohesive OVD allow me to complete each case with just one syringe. This is truly an advantage to me, and it is also quite economic, because I have only one syringe to dispose of after surgery. ■

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TWINVISC: The Advantages of Two OVDs in One Syringe

Get the OVD in the right order to minimize mistakes.

BY NITIN VERMA, MD, MM, FRANZCO

Many surgeons probably do not think twice about what ophthalmic viscosurgical device (OVD) they use in standard cataract cases. However, with the increasing number of viscoelastic agents available today and the improvements to those agents that have been available for quite sometime, it is important to take a closer look at what makes an OVD a good OVD.

All OVDs are transparent, but viscosity and molecular weight vary depending on what the agent is used for. Generally speaking, there are two categories of OVDs: cohesive and dispersive. Cohesive OVDs have a high molecular weight and high viscosity, making them the perfect agent for maintaining space. Cohesive OVDs are easily removed from the eye, but they provide only minimal coating and therefore less tissue protection during surgery. Conversely, dispersive OVDs have a low molecular weight and low viscosity, two excellent properties for coating the eye and offering maximal protection during surgery. The drawback to dispersive agents is that they are difficult to remove from the eye, increasing the risk of elevated intraocular pressure (IOP).

> In typical and atypical cataract cases alike, both cohesive and dispersive OVDs are useful. For this reason, I prefer TWINVISC.

In typical and atypical cataract cases alike, both cohesive and dispersive OVDs are useful. For this reason, I prefer TWINVISC (distributed by Carl Zeiss Meditec, Jena, Germany; Figure 1), an all-in-one syringe containing both types of OVD separated by a unique Bypass system. I have been using TWINVISC for the past 4 years, and I use it mainly on patients who are undergoing anterior segment intraocular procedures such as cataract surgery, corneal procedures, trauma, and anterior segment repair.

With these procedures, cataract surgery being the most common in my practice, the advantage of using TWINVISC is that you get the OVDs in the right order—a dispersive and then a cohesive OVD. In cataract surgery, first the dispersive OVD is used to create and maintain space during the early parts of surgery, including the capsulorrhexis, the delivery of energy with ultrasound, and phacoemulsification of the nucleus. Then the cohesive OVD is used to aid in loading the IOL into the cartridge. It is also injected into the eye right before lens implantation.

SURGICAL ADVANTAGES AND USES

Using a preloaded syringe containing two OVDs is one less way of making mistakes, which is especially important when you have a busy practice with rapid turnover. There is enough viscoelastic in the syringe to carry out the procedure comfortably and effectively during all phases of surgery. The main advantages I have noticed include:

- Controlled injection of the dispersive and cohesive OVDs in the correct order;
- No risk of mixture of the dispersive and cohesive OVDs due to the syringe's unique Bypass system;
- Adequate creation and maintenance of space in the anterior chamber;
- Ample endothelial protection during ultrasound and other traumatic steps;
- Clear view of the surgical field at all stages of cataract surgery; and an
- Uncomplicated OVD removal process.

In addition to anterior segment intraocular procedures, this combination is quite useful in other procedures. For instance, I have used TWINVISC during penetrating keratoplasty because the OVDs are used in the same order as they are in cataract surgery. When the host button is cut, it is nice to have a dispersive OVD protecting the intraocular contents. In the later phase of the procedure, I use the cohesive component because it is easier to remove.

I am a general ophthalmologist, and therefore I do all kinds of surgery. I suppose that specialist surgeons only use TWINVISC for one type of surgery, such as cataract or glaucoma. However, it is a good OVD to have in stock regardless of what type of surgery you do. For those surgeons who are interested in expanding their use of TWINVISC to areas outside of cataract

Figure 1. An all-in-one syringe offers a low-viscosity dispersive and a high-viscosity cohesive OVD. TWINVISC is suitable for all surgical techniques from routine to complicated cataract surgery cases.

surgery, I suggest incorporating it into longer procedures. For shorter procedures, usually a cohesive OVD is sufficient, but longer procedures often require both cohesive and dispersive OVDs. In such cases, TWINVISC is beneficial. I also use TWINVISC for corneal lacerations, because I use a dispersive to create and maintain a stable anterior chamber and to keep the iris away from the cornea. A dispersive is better, because it does not leak from the wound. When tidying up, I use the cohesive.

OTHER ADVANTAGES

For modern cataract surgery, we must stock a wide array of consumables. One of the advantages of TWINVISC is that you get two OVDs in one product, meaning I have one less thing to stock. Along those lines, another advantage is that TWINVISC can be stored at room temperature for some days. Therefore, it is easy to transport, and you do not have to put it in the cool box.

I think TWINVISC is reasonably priced compared with other products, but there is something that is more important. If you look at the amount of waste that we create after one procedure—with all the plastic, the knives, the syringes, and the cannulas—this is a way to reduce that waste, by using only one syringe with TWINVISC. There is certainly merit in that.

> Using a preloaded syringe containing two OVDs is one less way of making mistakes, which is especially important when you have a busy practice with rapid turnover.

There are time-saving benefits as well. With just one syringe, the scrub nurse does not have to load two cannulas and open and dispose of two packages. Likewise, when the surgeon is done with the dispersive OVD and ready for the cohesive OVD, it is as simple as picking up the syringe and expelling the extra dispersive OVD to get to the cohesive OVD. From that point of view, it is a lot more convenient for the surgeon.

CONCLUSION

Prior to TWINVISC, I used most OVDs on the market, including DuoVisc, ProVisc, and Viscoat (all from Alcon Laboratories, Inc., Fort Worth, Texas), the latest types of Healon (Abbott Medical Optics Inc., Santa Ana, California), and VISTHESIA (distributed by Carl Zeiss Meditec). I finally settled on TWINVISC because of its long list of advantages. I can use it in standard and difficult cataract cases, but I can also use it in other anterior segment intraocular procedures. That is appealing to me. ■

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Tips for a Better Procedure With TWINVISC

Making adjustments to your procedure is worthwhile to maximize surgical outcomes.

BY BRIAN HARRISBERG, MD

I have been using a combined ophthalmic viscosurgical device (OVD), which includes dispersive and cohesive agents, for several years. I recently switched from one combination product (Viscoat/Provisc; Alcon Laboratories, Inc., Fort Worth, Texas) to TWINVISC (distributed by Carl Zeiss Meditec, Jena, Germany; Figure 1). Although I immediately noticed similarities between the two products, I also found that I had to make slight modifications to my surgical technique to improve efficiency and provide better outcomes.

> The dispersive OVD in TWINVISC does not stick to the endothelium as much as other combination OVDs.

TWO ADJUSTMENTS

Not all OVDs are the same, and once I appreciated the difference between TWINVISC and the Viscoat/Provisc I was used to, I found two adjustments that improved the efficacy of the procedure. This process took me approximately 4 weeks.

No. 1: Insertion technique. TWINVISC has a 25-gauge cannula, which initially I found was more difficult to insert into the sideport incision than the 27-gauge cannula I was used to. After my first few cases, I adapted my approach to insert the 25-gauge cannula at a steeper angle, aiming it vertically and then rotating or pivoting the tip and guiding it into the wound. The cannula then slides in quite easily.

No. 2: Topping up. The dispersive OVD in TWINVISC is terrific, and compared with other OVDs you can feel the subtle differences. It does not stick to the endothelium as much as the other combined OVD I have experience with, which has an advantage and a disadvantage. You will feel the subtle differences. The advantage is that the TWINVISC dispersive is easier to remove. The disadvantage is that it may not necessarily protect the endothelium as well. For this reason, I have learned to top up frequently, and there is plenty of dispersive OVD in TWINVISC to do so at any time. I make it a habit to add more dispersive before I begin phacoemulsification, but I may even top up during the capsulorrhexis, particularly in hyperopic patients if the anterior chamber is shallow. Furthermore, injecting more TWINVISC does not translate into additional removal time.

Figure 1. TWINVISC comes preloaded in a 25-gauge cannula.

BYPASS SYSTEM

Overall, TWINVISC is a good product for me because of its large volume and single injector system. When I am ready for the cohesive OVD, the Bypass system has worked without fail. The Bypass system separates the two OVD chambers, and prevents them from mixing. It automatically activates when the dispersive chamber is empty and the plunger is depressed, allowing access for injection of the cohesive OVD. This, however, does preclude a soft-shell technique.

TWINVISC compliments my surgical technique, with the dispersive followed by cohesive OVD. The latter fills the bag rapidly and maintains the anterior chamber dimensions very well during IOL implantation, and it is easy to remove. I always remove the cohesive OVD behind the IOL. I use an alternative product if I need a cohesive OVD straight away, but I use TWINVISC in 99% of my cataract surgeries.

CONCLUSION

There is no doubt that I am happy I made the switch to TWINVISC, although it required some slight adjustments to my surgical technique. A rule of thumb when switching to a new and slightly different product is to identify necessary changes that will maximize outcomes, ensuring better results and safer surgery. In one challenging case I had, the capsulorrhexis extend without apparent cause. After some analysis, I realized that the anterior chamber was too shallow. As a result, I chose to be more proactive, topping up with the dispersive OVD.

There is no doubt that I am happy I made the switch to TWINVISC.

Each surgeon will develop his or her own surgical protocol and be able to achieve good surgical outcomes with this new product. ■

Brian Harrisberg, MD, practices with Central Sydney Eye Surgeons. Dr. Harrisberg states that he has no financial interest in the products or companies mentioned. He may be reached at e-mail: bharrisberg@bigpond.com.

Figure 1. This video showcases TWINVISC cohesive and dispersive OVDs in one syringe and the patented Bypass system.

Figure 2. This video showcases the BLUEMIXS 180 injector, which is used for insertion of the preloaded ZEISS MICS IOLs.

Z-HYALIN Plus: A Versatile Cohesive Agent

This OVD is designed for every surgical need.

BY HARRY DOMACK, MD

Of all the essential tools required for cataract surgery, perhaps the most overlooked instrument is the ophthalmic viscosurgical device (OVD). Without its viscous and elastic properties, surgeons would not be able to create and maintain space in the anterior chamber, nor would they have the ability to coat and protect ocular tissue such as the endothelium. Because of OVDs, surgeons can safely and efficiently create a continuous curvilinear capsulorrhexis, perform phacoemulsification, and facilitate IOL insertion—all while not having to worry about a shallow anterior chamber or iris prolapse.

With so many OVDs on the market, making the right selection could become overwhelming. Because these products have an array of viscosities, pseudoplasticities, viscoelasticities, and coatabilities, they all act differently in the eye. One OVD that meets all of my expectations is Z-HYALIN plus (distributed by Carl Zeiss Meditec, Jena, Germany; Figure 1). This cohesive OVD is a quality product that I can use in every surgical procedure and for every surgical need. Because it has a high viscosity, Z-HYALIN plus has been useful to create and maintain space in the anterior chamber, to protect endothelial cells during high-energy phacoemulsification, and to inflate the capsular bag. It is also quick and easy to remove at the close of surgery. I have used this product since November 2010.

> One OVD that meets all of my expectations is Z-HYALIN plus; it has all of the same qualities as a dispersive OVD without their associated shortcomings.

Figure 1. (A, B) Z-HYALIN plus is a high-viscosity cohesive OVD that can be used in every surgical procedure.

BENEFITS OF AN ALL-PURPOSE OVD

An all-purpose OVD such as Z-HYALIN plus facilitates safe and controlled cataract surgery without complicating it, which is especially important during delivery of ultrasound energy in the phacoemulsification phase. I have noticed that Z-HYALIN plus has all of the same qualities as a dispersive OVD without their associated shortcomings. For instance, with the use of a dispersive OVD, it is likely that the flap of the capsulorrhexis will push against the anterior capsule.

But with the cohesive properties of Z-HYALIN plus, there is more support, increasing control of the capsulorrhexis and therefore safety during this phase of surgery. Additionally, Z-HYALIN plus guards against capsular breakage during hydrodissection whereas with a dispersive OVD there may be too much pressure on the eye.

In some cases, choosing the correct OVD is challenging, but with an all-purpose viscoelastic there is no choice because it can be used in every case and at every step during the procedure. Z-HYALIN plus can also be used for microincision cataract surgery (MICS), because it can be injected through a very thin cannula placed in either a main incision or a sideport incision.

I prefer Z-HYALIN plus because it is easy to inject, easy to remove, and it preserves the endothelial cells.

Z-HYALIN plus can be used in almost every patient. The only time that I add another OVD (high-adhesive) is right before phacoemulsification in patients with corneal problems, such as those with cornea guttata or low cell counts. I will return to using Z-HYALIN plus for lens implantation. I prefer Z-HYALIN plus because it is easy to inject, easy to remove, and it preserves the endothelial cells. Additionally, because of Z-HYALIN plus' transparent color, visibility is good during surgery and the cornea is mostly clear on postoperative day 1.

IMPRESSIVE RESULTS

Our standard surgical approach with Z-HYALIN plus is described herein. After the first 0.9-mm paracentesis is created, we fill the anterior chamber with OVD and proceed with the second paracentesis followed by the 2.2-mm temporal clear corneal incision. After the continuous curvilinear capsulorrhexis is created, we perform phacoemulsification with bimanual aspiration of the cortex. After capsular polishing, the anterior chamber is again filled with Z-HYALIN plus, and the IOL is implanted in the bag using the BLUEMIXS 180 injector.

Z-HYALIN plus is my first choice for routine cataract surgery because it is biocompatible with ocular tissue, and it successfully achieves a stable anterior chamber in all cases.

We recently conducted a study in 55 consecutive cataract surgery cases that used Z-HYALIN plus as the sole OVD during phacoemulsification and lens implantation. The average loss of endothelial cells after phacoemulsification was 3.9 ±2.2%—a very impressive result. The average removal time of Z-HYALIN plus after lens implantation in these 55 cases was 34.5 ±12.6 seconds.

CONCLUSION

Z-HYALIN plus is my first choice for routine cataract surgery because it is biocompatible with ocular tissue, it successfully achieves a stable anterior chamber in all cases, and it protects ocular tissue including the corneal endothelium and the posterior capsule. The added benefit is that Z-HYALIN plus is easily removed from the eye at the close of surgery. It will continue to be my go-to OVD for years to come. ■

Harry Domack, MD, is the Director of the Augenklinik and Augenlaserklinik Mainfranken, Schweinfurt, Germany. Dr. Domack states that he has no financial interest in the products or companies mentioned. He may be reached at e-mail: domack@t-online.de.

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