

Personal experience in the use of the Twinvisc during phacoemulsification

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For nearly 15 years phacoemulsification has been the reference technique for cataract surgery. Viscoelastic products are used during this surgery as actual instruments: they permit maintaining the anterior chamber during the capsulorhexis, protection of the corneal endothelium during phacoemulsification and an opening of the capsular sack during the implantation (Arshinoff 1995). The viscoelastics can also be used to plug an unsealed incision, to help separate the cortex, or to plug a capsular breach while performing an aspiration flushing of the masses with a cannula.

However the qualities required from the viscoelastic products can be antinomic: The maintenance of the anterior chamber during the capsulorhexis, specifically in a patient with ocular pressure, and the protection of the corneal endothelium requires a product that persists in the anterior chamber and which adheres to the endothelium (Glasser 1991, Madsen 1989). On the other hand after implant installation, the viscoelastic product must be easily flushed to avoid post-operative hypertonicity.

Assia and Coll (1992) demonstrated in vitro, by mixing the viscoelastics with fluorescein that said cohesive products (sodium hyaluronate at 1% or sodium hyaluronate 1.4%) are flushed from the anterior chamber in 20 to 25 seconds, whereas the dispersive products (sodium hyaluronate 3% - chondroitin sulfate 4%) are flushed in 3 to 4 minutes with the same system.

The use of dispersive product for the first time in intervention therefore permits better maintenance of the anterior chamber and better endothelial protection due to the adhesion of this product type to the corneal endothelium (Poyer 1998, MCDermott 1998).

On the other hand, the use of cohesive product at the time the implant placement permits decreasing the risk of post-operative hypertonicity (Kovacevic 2005).

Twinvisc responds to these specification by combining in the same syringe in two compartments, based on an innovative concept, a dispersive type viscoelastic in its first part, and a cohesive viscoelastic in the second part.

The dispersive viscoelastic:

Twinvisc dispersive viscoelastic is obtained by bacterial fermentation. It involves sodium hyaluronate at a concentration of 22mg/ml. Its viscosity is 85000 cPs.

The amount of 0.7 ml permits filling the anterior chamber even in very myopic patients, and to be used as an instrument during intervention without needing to open a second ampoule. The persistence of the product in the anterior chamber permits the accomplishment of the same capsulorhexis in patients having a strong posterior ocular pressure. The use of this viscoelastic also permits realizing phacoemulsification in patients who have silicone in the vitreous cavity. Anterior chamber integrity should be maintained but without significant damage to the anterior capsula, allowing both capsulorhexis with forceps, and/or with the needle which is useful in case of bimanual technique.

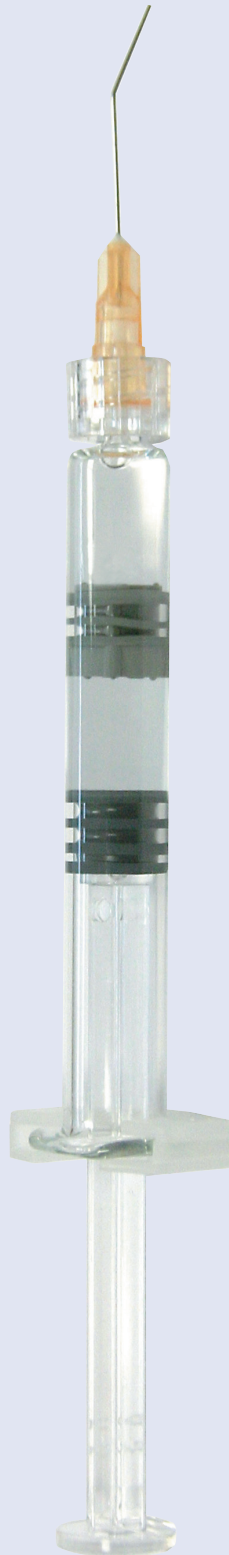
The cornea appearance observed in post-operative, in our experience of the Twinvisc, is the evidence of good protection of the endothelium, with a satisfactory clarity even when the intervention was realized on the hard nucleus. This impression must be however confirmed by counting studies.

The cohesive viscoelastic:

The Twinvisc cohesive viscoelastic obtained by bacterial fermentation is composed of sodium hyaluronate at the concentration of 10mg/ml and a viscosity of 150000 cPs. This product permits maintaining the bag during the implantation and an easy flushing at the end of intervention that avoids post-operative hypertonicity. The use of an unique syringe for the two viscoelastics permits placing a small dispersive viscoelastic plug at the entry point in order to protect the iris, then to open the capsular bag with the cohesive viscoelastic.

Conclusion

Twinvisc combines two complementary products compartmentalized in a single syringe. Our experience is that this form is easy to use and the dispersive viscoelastic permits easy execution of the capsulorhexis and a satisfactory endothelial protection. The cohesive viscoelastic permits a good opening of the bag during the installation and a high-speed flushing of the product.



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