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Phaco without viscoelastic

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The cataract surgeries are widely performed around the world which are relevant to restore and maintain good sight over the years .

This surgery take place into the anterior chamber of the eye and viscoelastic substance (VS) improves their outcome, because they could be useful to maintain stability and produce protection for the corneal endothelial cells as different publications shows .

Since 1970's, VS has begin to progress and today they are popular and indispensable for integral parts of intraocular surgery.

However, other problems could arise related with VS. Intraocular pressure (IOP) increase when VS remains into the anterior chamber occluding the trabecular meshwork .

Flare or Tyndall effect could be postoperative detected after cataract surgery, which in part is frequent, but in excess could be the manifestation of “Toxic anterior segment syndrome” after cataract surgery (TASS) and VS could be associated with this .

Also, an extra surgery-time is necessary to introduce the VS and to completely remove them from the anterior chamber trying to avoid the problems previously described. In part, VS help to perform a more secure surgery, moreover include other possible problems. Because of that, this work proposes a special technique to perform phaco emulsification cataract surgery without VS.

Viscoelastic substances:

- ❑ All viscoelastic must have high viscosity at zero shear rates for stabilizing the tissues of the eye during surgery
- ❑ They are transparent and easily injected, due to their pseudoelasticity.
- ❑ Visco is commonly made of hyaluronic acid differing in their concentration, molecular weight, and length of chain from one product to another.

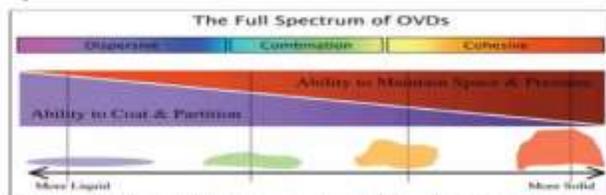


Figure 1. Different viscoelastic devices can be classified according to the consistency spectrum, from dispersive to cohesive. Dispersive OVDs have a better ability to coat and partition, while cohesive OVDs have a better ability to maintain space and pressure. Combination products are in addition both ends of the spectrum.

Types of Viscoelastics:

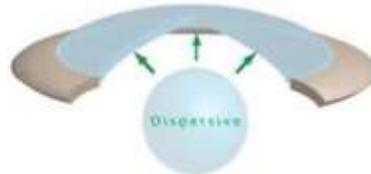
■ Cohesive with high molecular weight and high viscosity

- Help maintain a stable nucleus during Capsulorhexis
- Deepening of chamber
- Opening the capsular bag
- Maintaining space for IOL implantation
- Creating counter pressure on the vitreous.



■ Dispersive with low viscosity and low cohesiveness

- Break up easily when injected in the eye
- Adhere to the tissues
- Protect the endothelium
- Capture nuclear fragments.



The need for a viscoelastic changes according to different steps:

■ Filling the anterior chamber

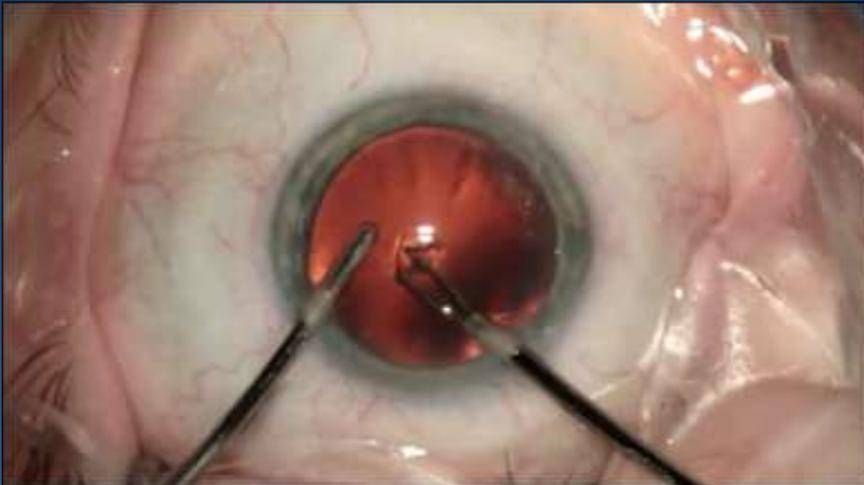
- Transparent, easy to inject viscoelastic
- Maintain space due to its high viscosity with zero shear rate

■ Capsulorhexis

- Deep anterior chamber: substance of high molecular weight and high viscosity
- Transparency
- Stability of the capsular flap: highly cohesive viscoelastic
- Easy manipulation of the instruments: pseudoelastic and highly elastic viscoelastic

Cont'd

- **Nuclear and cortical fragmentation**
 - Elasticity to resist applied forces and mechanical vibrations
 - Adhesiveness to protect surrounding tissue (due to I/A)
 - Maintain space and doesn't escape due to low cohesiveness
 - Persist AC due to low Cohesiveness
- **Filling the capsular bag**
 - Easy to inject due to high pseudoelasticity
 - Allow good visibility
 - Easy to remove when IOL implanted
 - High cohesiveness



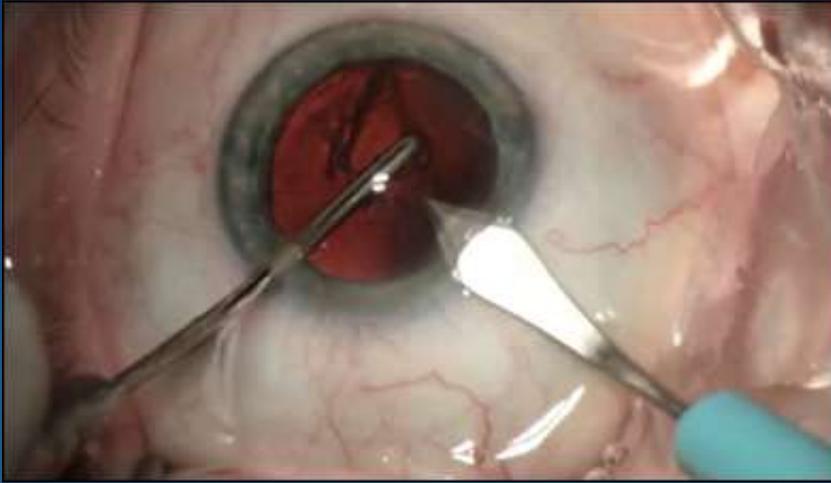
Two corneal incisions 1.1mm for micro-capsulorhexis and irrigation cannula



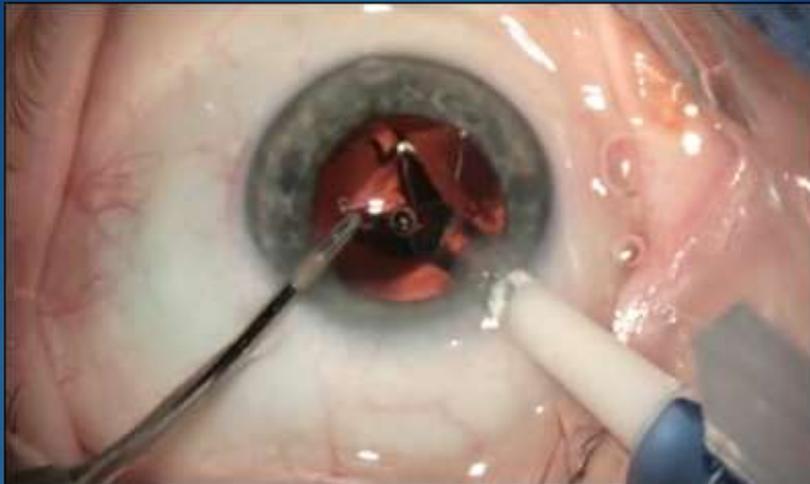
Hydrodissection performed with irrigation cannula which help to produce the nucleus rotation.



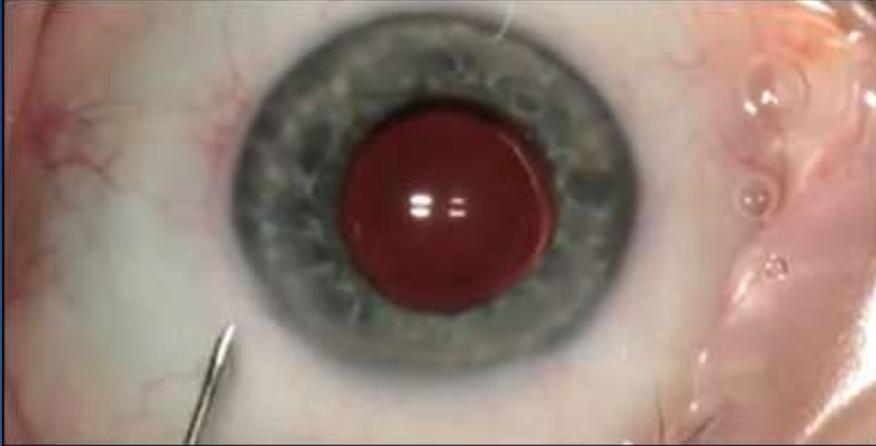
Phacoemulsification was performed.



The corneal incision must be enlarged: 2.2mm to 2.8mm, according to the phaco-emulsification tip.

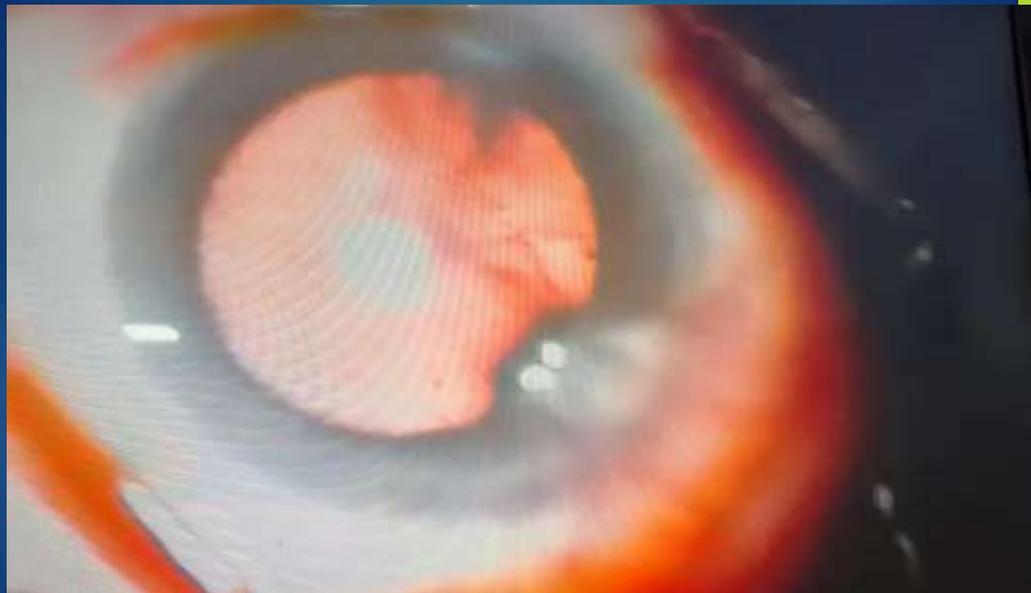
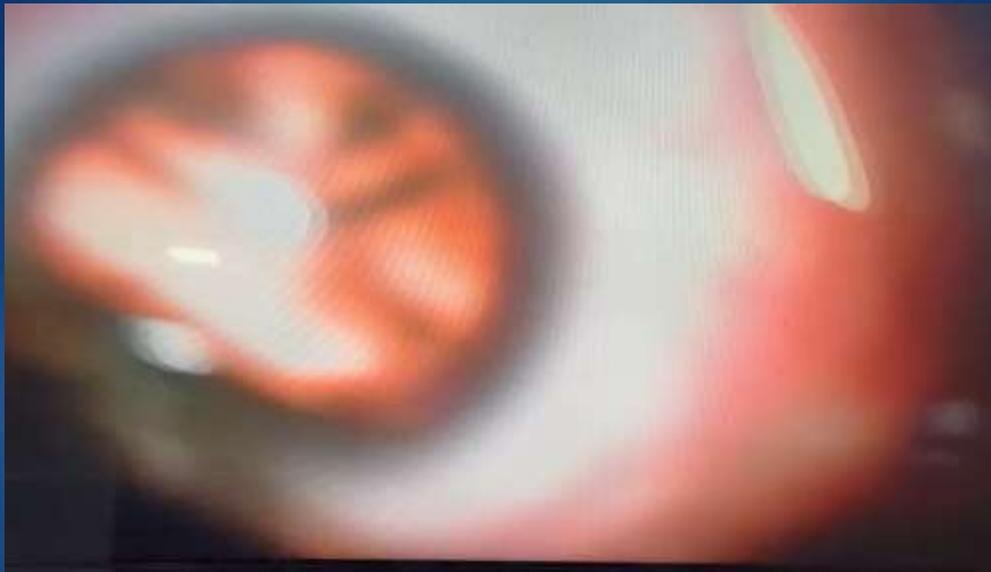


The intra ocular lens is injected.



This picture shows the eye at the end of the surgery.





conclusion

technique without VS to perform capsulorhexis, but they use it after hydrodissection and for the IOL implantation.

Finally, they aspirated it from the anterior chamber , avoid their use, only during IOL implantation, without found difference in endothelial cell loss.

THANK YOU