

PHACOEMULSIFICATION WITH HIGH DEGREE OF DIFFICULTY

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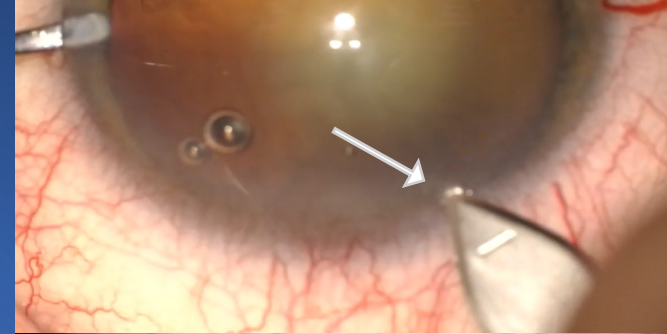
THERE IS NO CONFLICT OF
INTEREST

ABSTRACT

- **Purpose:** To present cataract surgery cases that pose challenges due to special characteristics of the eyes and their potential complications.
- **Materials and Methods:** We present three surgical cases from the General Hospital Papanikolaou in Thessaloniki, Greece and their treatment modalities: 1) An eye with high myopia 2) An eye with endothelial insufficiency 3) An eye with asteroid hyalosis.
- **Results:** Surgical management techniques are presented to achieve optimal intraoperative and postoperative outcomes and avoid complications. These techniques include appropriate use of ultrasound energy, different phacoemulsification techniques, the role of viscoelastics and trypan blue.
- **Conclusions:** The aforementioned surgeries require experience to avoid possible complications and achieve the desired outcome. The methods outlined here contribute to successful surgical outcomes.

1st Clinical Case

Phacoemulsification in high myopia

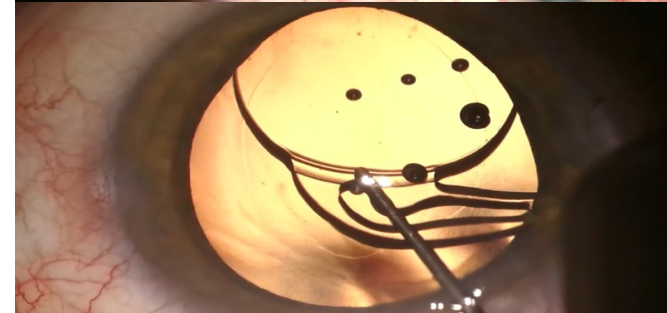
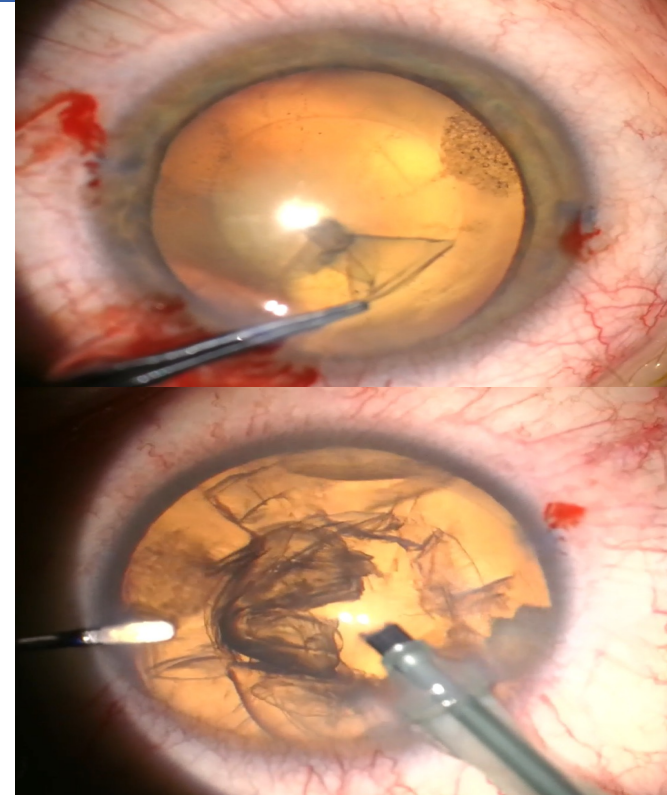


History

Phacoemulsification cataract surgery on a 44 year-old patient with high myopia (-38D axial, length 35.22mm)

Challenges/Cautions

- ❖ IOL power calculation and selection was challenging. Thorough biometry was done with A-scan to measure axial length and B-scan to rule out staphyloma and avoid surprises from refractive surprises (hyperopic shift). Formula used to select IOL targeting myopic residual refraction based on fellow eye.
- ❖ Larger eye dimensions require caution with anesthesia. Retrobulbar or peribulbar anesthesia risks globe perforation. Subtenon or topical anesthesia preferred.
- ❖ Clear cornea incision enables better maneuvers compared to scleral tunnel. Sclera is thin and higher risk of leak. If any doubt about wound leak, must suture main incision.
- ❖ Smaller capsulorhexis required, proportional to eye size. Large capsulorhexis risks IOL dropping out of the bag.
- ❖ Deep anterior chamber requires vertical phaco maneuvers. Iris protection needed to avoid pain from forward-backward movement of iris-lens diaphragm.
- ❖ Low infusion pressure, lower bottle height, use iris lifter to protect iris



2nd Clinical Case

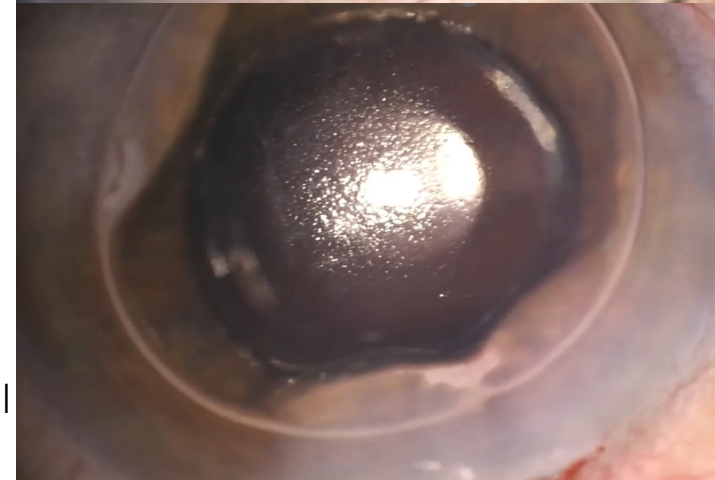
Phacoemulsification in eye with endothelial insufficiency

History

- ❖ Phacoemulsification in 70 year-old patient with ECD: 1100 cells/mm²

Challenges/Cautions

- ❖ It is critical to limit intraoperative time to preserve endothelial cells. Use viscoelastics continuously (soft shell technique with dispersive viscoelastic protecting endothelium).
- ❖ Employ techniques to minimize phaco energy on endothelium:
 - Use direct chop or phaco chop techniques rather than divide and conquer
 - Consider femtosecond laser cataract surgery
 - Position phaco bevel down and away from endothelium
 - Avoid directing infusion jet at endothelium
- ❖ Limit hydration and irrigation on wounds to avoid further endothelial stress
- ❖ In cases of more severe endothelial disease, consider non-phaco emulsification techniques:
 - ECCE (extracapsular cataract extraction)
 - Triple surgery with endothelial keratoplasty (DMEK or DSEK) performed along with cataract surgery
- ❖ Important to evaluate endothelium closely preoperatively with specular microscopy and determine level of endothelial compromise. Tailor surgical plan and technique to protect endothelium.



3^d Clinical Case

Phacoemulsification in eye with Asteroid Hyalosis

History

- ❖ Phacoemulsification in 63 year-old male patient with Asteroid Hyalosis

Challenges/Cautions

- ❖ Cataract surgery in patient with asteroid hyalosis caused poor visibility due to decreased red reflex, especially of the posterior capsule
- ❖ Used trypan blue dye intraoperatively to stain and improve visibility of the anterior capsule for capsulorhexis
- ❖ Anterior capsule is more fragile in these patients and requires extra care and precision during capsulorhexis
- ❖ After phacoemulsification, the posterior capsule is an indistinct structure during irrigation/aspiration due to poor visibility
- ❖ Trypan blue staining can also improve visibility of the posterior capsule intraoperatively
- ❖ Choosing the optimal IOL is challenging in these patients - should avoid multifocal IOLs as they can reduce contrast sensitivity and depth perception

