

Femtosecond Laser Cataract Surgery and the Glaucoma Patient

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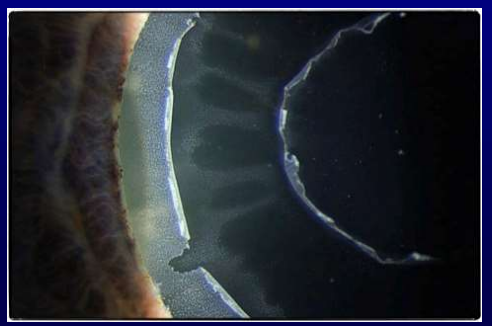
Advantages of Femtosecond Laser Cataract Surgery

Complicated Eyes

- Shallow anterior chambers
- Dense nuclear cataracts
- Weak zonules
- Fuchs' corneal dystrophy
- Glaucoma patients
- Astigmatism management



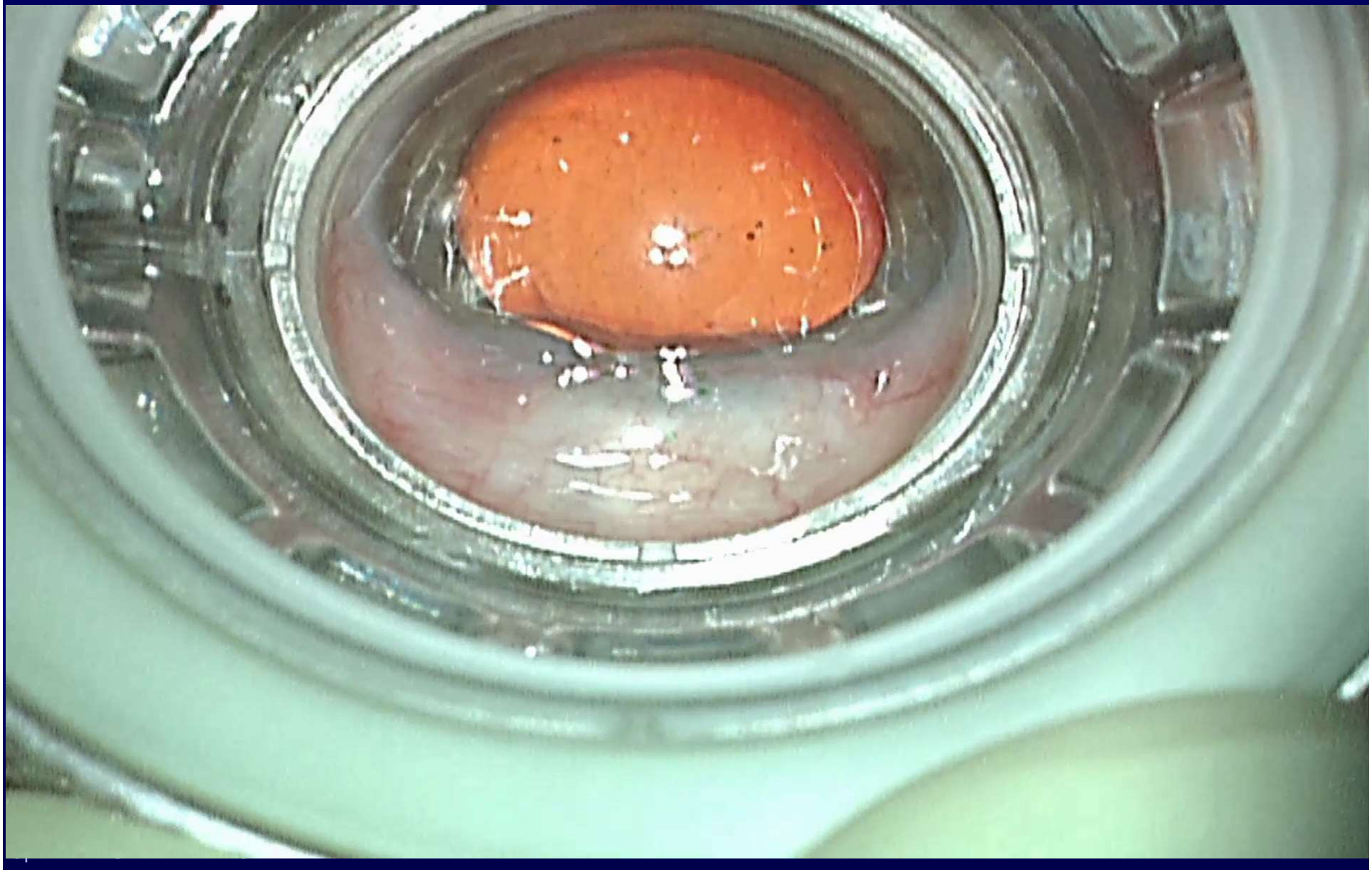
Cataract Surgery and the Glaucoma Patient

- More difficult than conventional cataract surgery in many cases
  - Small pupils
  - Shallow anterior chambers
    - Hyperopes
    - Mature lenses
  - Pseudoexfoliation-loss of zonules
  - Previous surgery
    - Low endothelial cell counts
    - High astigmatism

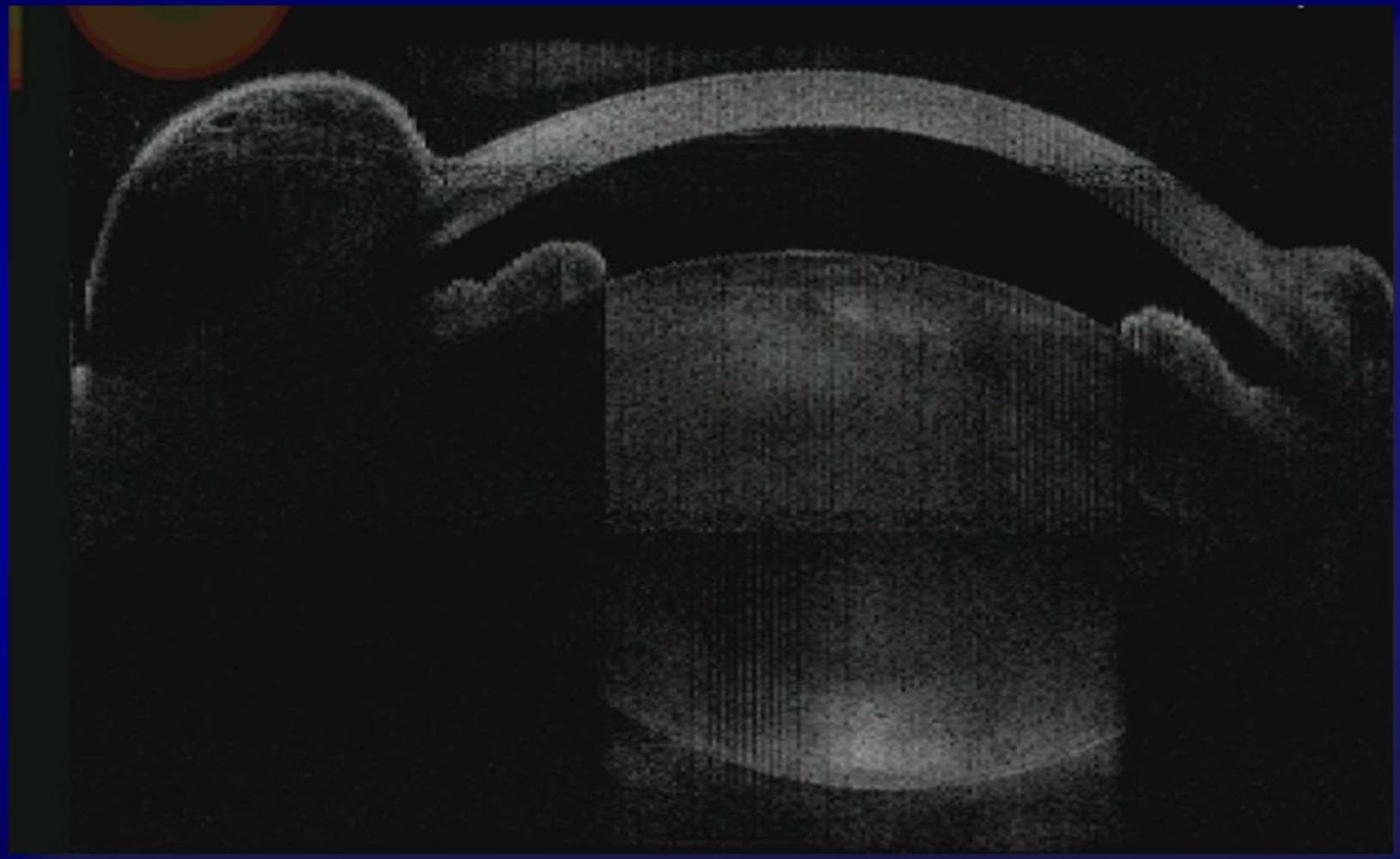
Laser assisted surgery in patients with prior glaucoma procedures

Femtosecond Laser Cataract Surgery and Filtering Blebs

Filtering Bleb

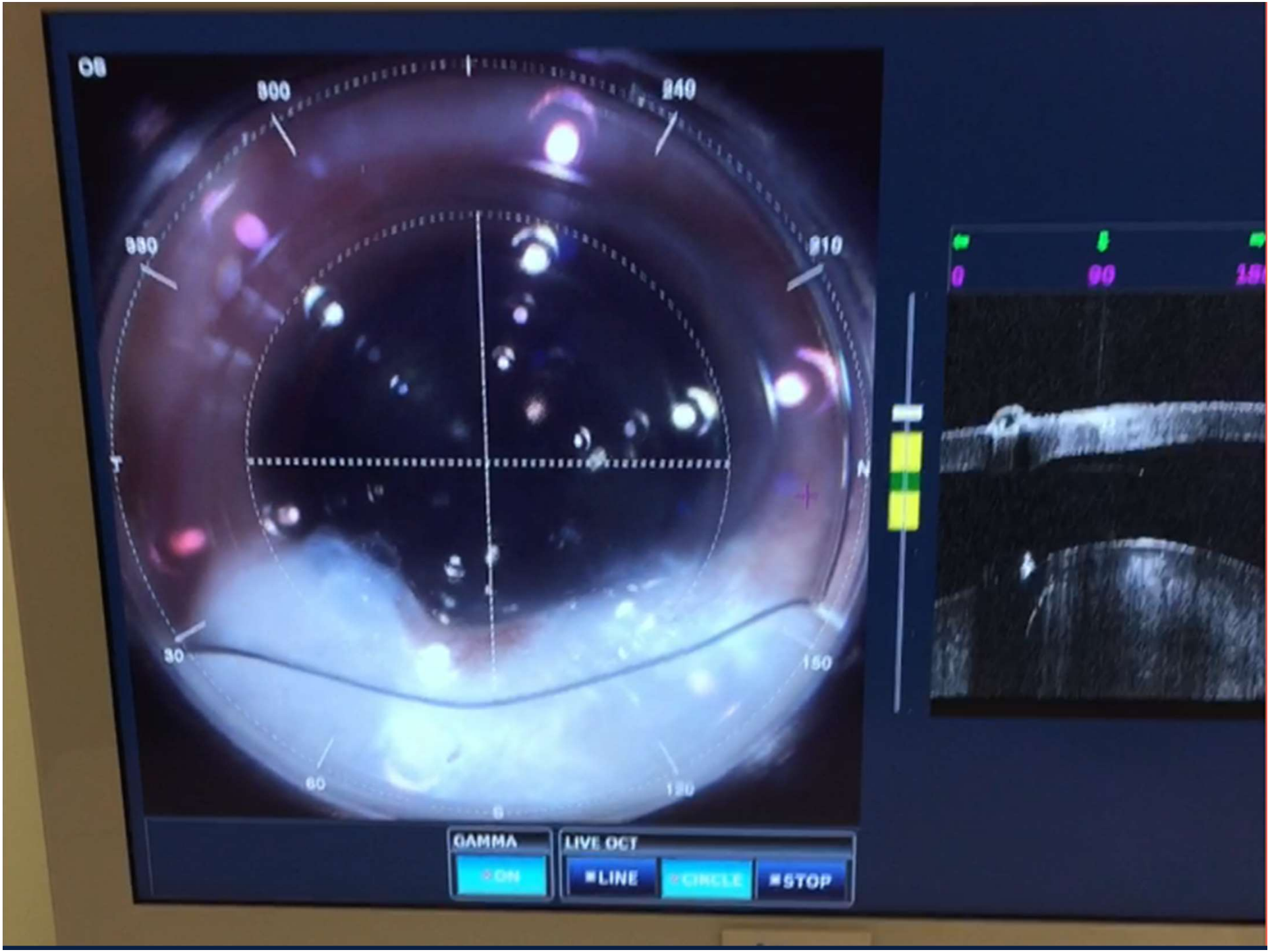


Filtering Bleb-OCT



Methods

- Design: Retrospective case series of 24 consecutive patients that underwent FLACS
- Pre- and post-operative information regarding visual acuity, refractive error, astigmatism, demographic information, bleb morphology, intraocular pressure (IOP), and complications were recorded


OS
300
240
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60
120
90
0
GAMMA
ON
LIVE OCT
LINE
CIRCLE
STOP

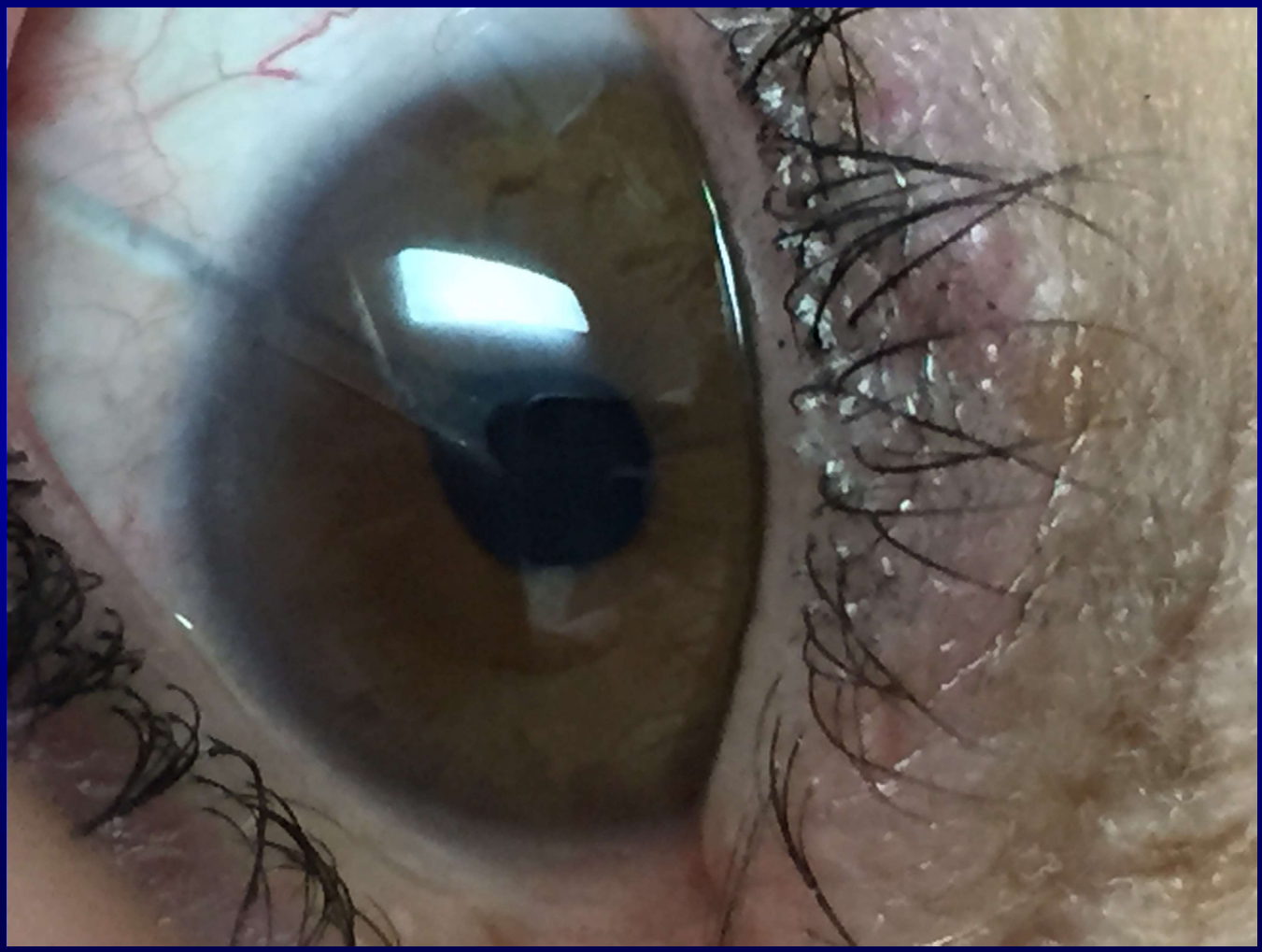
Results

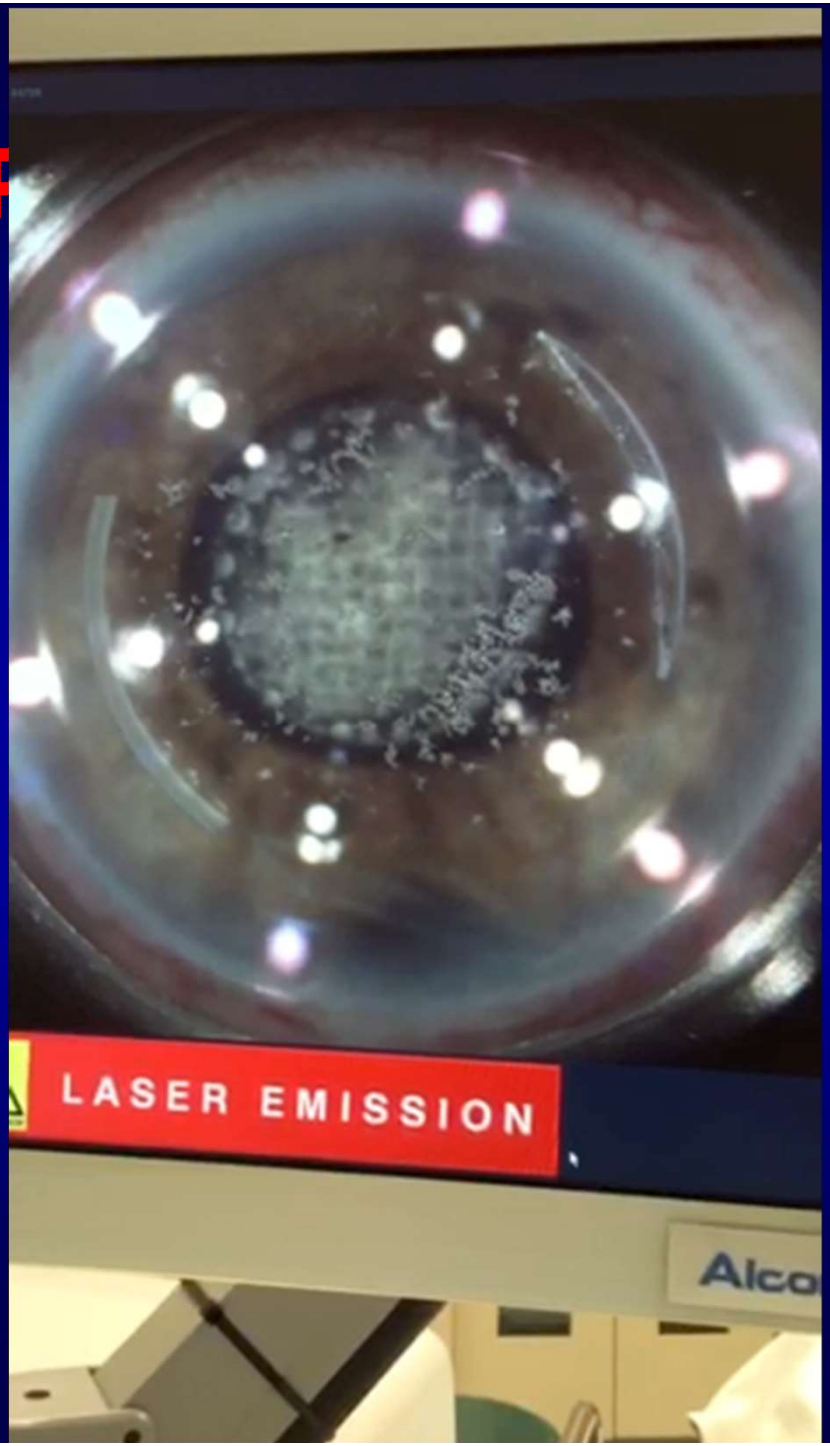
- Femtosecond laser portion of the surgery was successfully completed in all 24 cases.
- Mean pre- and post-operative visual acuity was 20/60 and 20/25 respectively.
- Mean pre and post-operative IOP was 14.3 mm Hg and 15.5 mm Hg respectively.
- There were no cases of intraoperative or post-operative bleb leak

Results

- Two eyes required bleb needling post-operatively.
- There were no cases of long-term post-operative bleb failure.
- The most common post-operative complication was subconjunctival hemorrhage, occurring in 50% (12/24) of patients.
- There was no apparent glaucomatous progression in any patient following the procedure.

Pre-existing Tube




LASER EMISSION

Femtosecond Laser Cataract Surgery Concerns and the Glaucoma Patient

- IOP elevation
- Cost-safe harbor
  - Refractive IOLs
  - Astigmatic incisions
- Trauma to conjunctiva

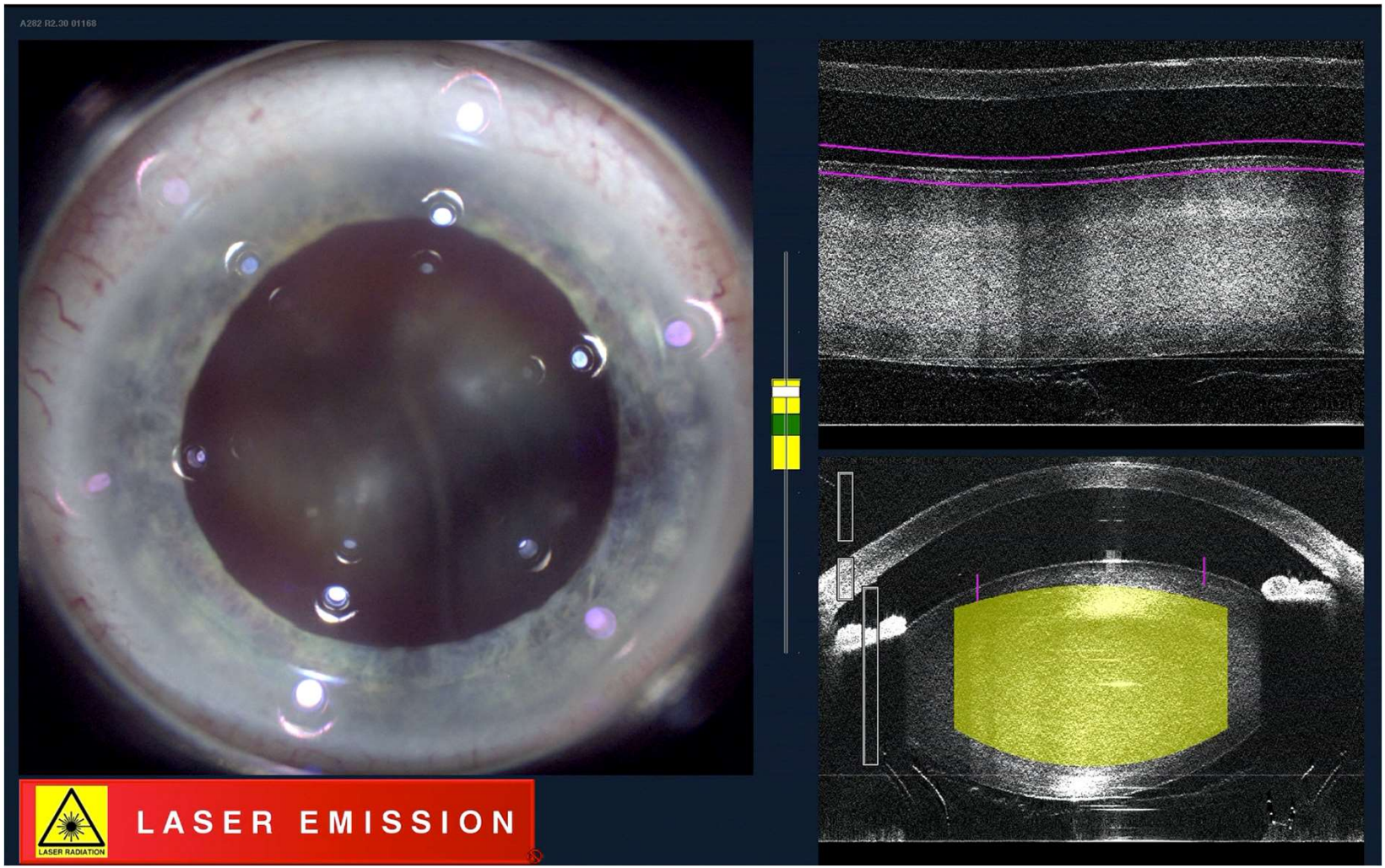
Procedures to do in Combination

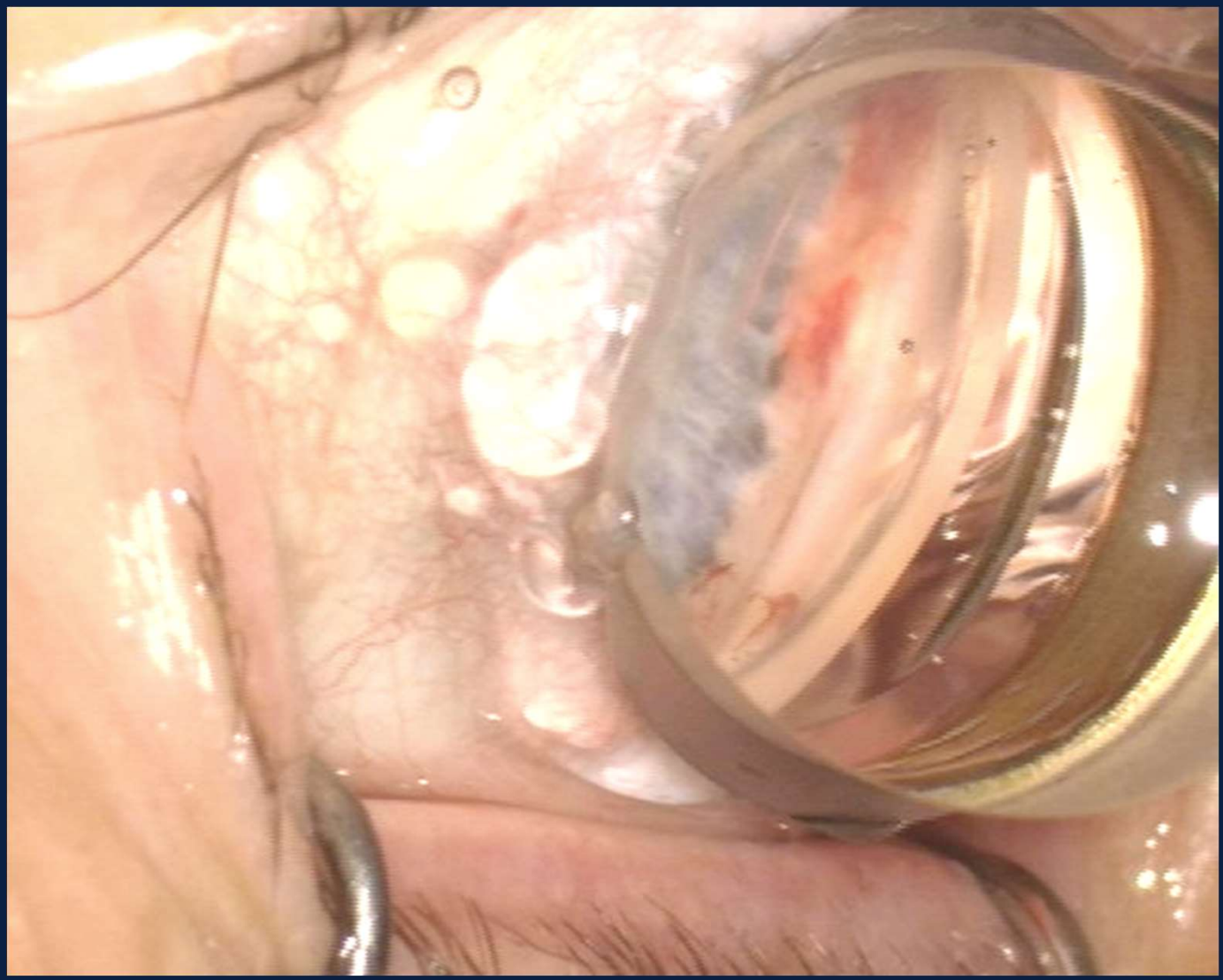
- Minimal effect on astigmatism
  - Istent
  - ECP
  - Ab Interno Trabeculomy
  - Viscocanalostomy
  - Modified Express
  - Tubes

Potential Downsides of Combined Glaucoma Surgergy

- Increased inflammation
- IOP spikes
- Changing the refractive outcome
- Slower visual recovery
- More patient discomfort
- Bleeding

Combined Use of ab Interno Trabecular Micro-Bypass Stent With Femtosecond Laser–Assisted Cataract Surgery in Patients With Glaucoma and Cataracts

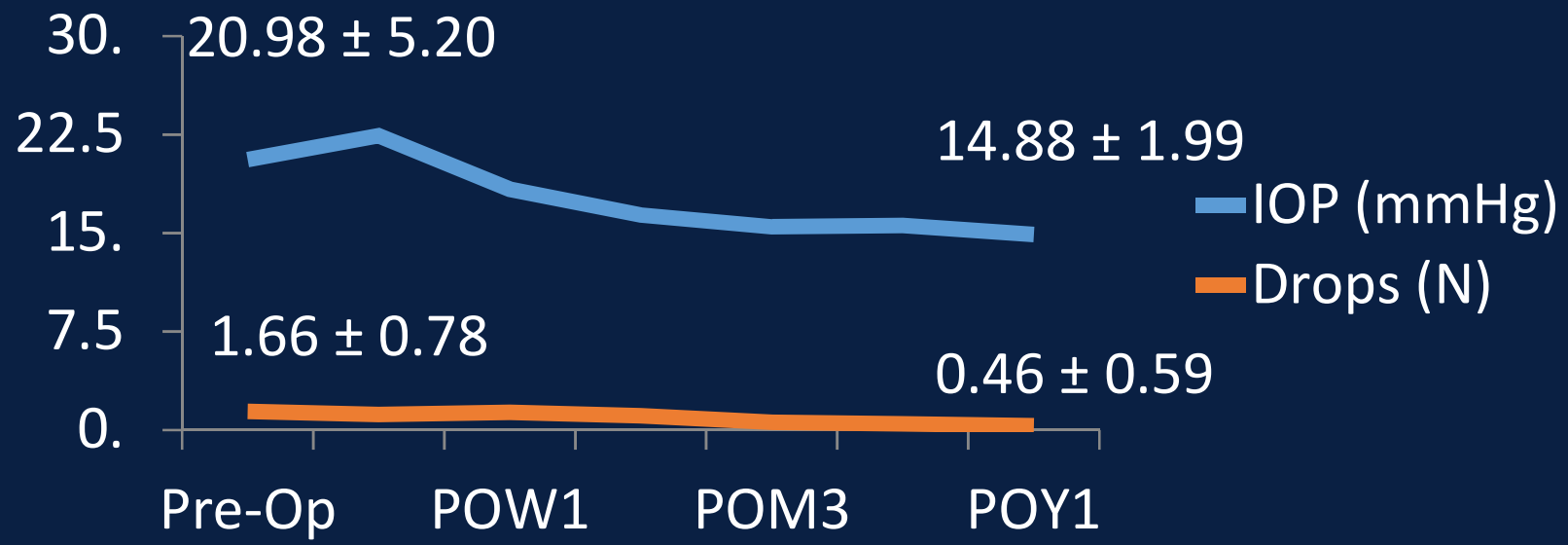




Yale

Results

- 6.1 mmHg (31.1%) reduction in IOP (p=0.03) and 1.2 med reduction (p<0.001) at 1 year



Yale

Results

- Minimal impact on vision and refractive outcome
  - Pre-op LogMAR: 0.33 ± 0.25
  - Post-op LogMAR: 0.12 ± 0.17
  - -0.15 ± 0.7 D difference from predicted
    - IOL Calculation – Spherical Eq.
- Need for more prolonged use of anti-inflammatory medications
  - 4.20 ± 2.58 weeks

Yale

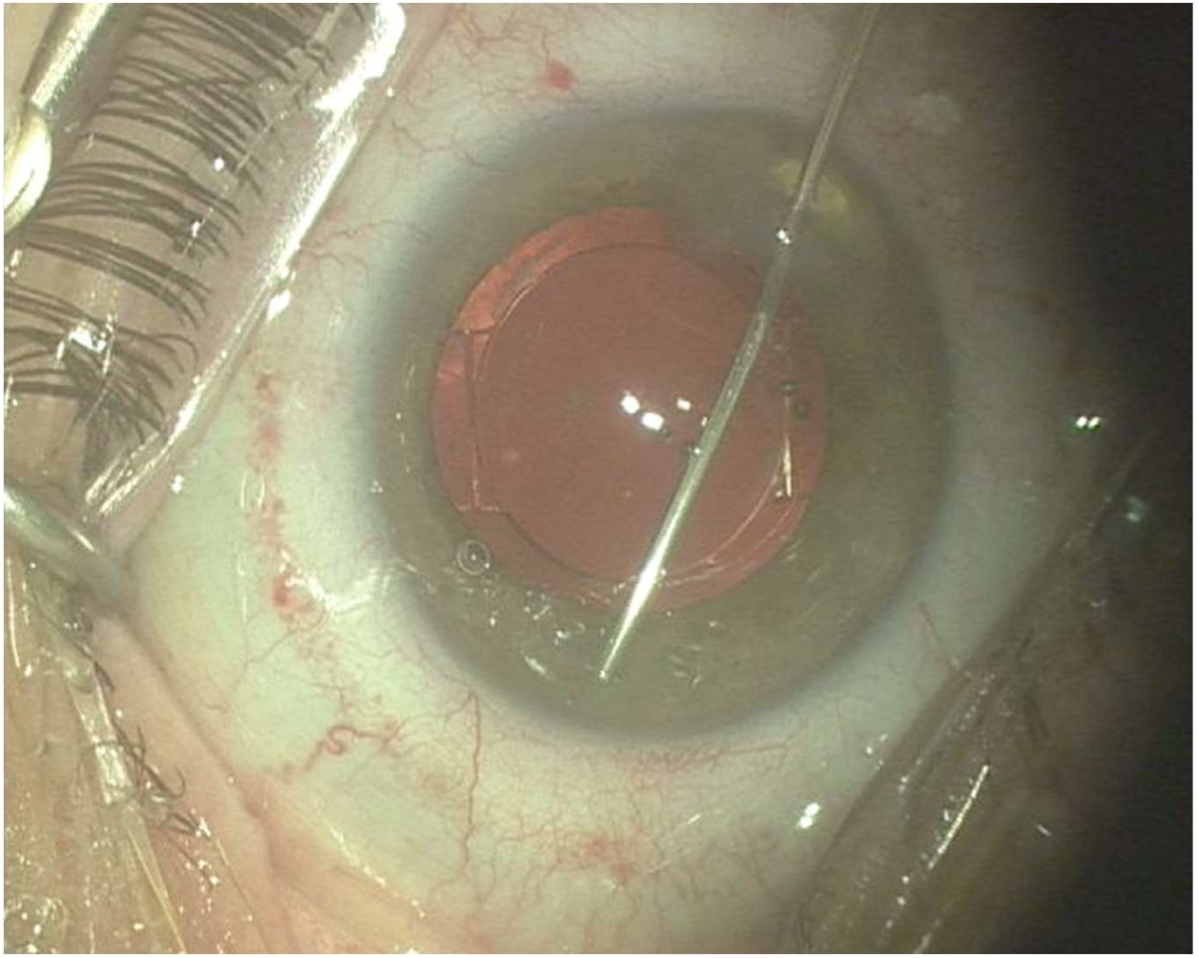
Results

Complications	N (%)
Hypotony	0
Hyphema	16 (42%)
Choroidal detachment	0
Early Corneal Edema	8 (24%)
Endophthalmitis	0

- There was minimal effect on visual acuity (p=0.37)
  - Pre-op: 0.24 ± 0.18
  - POM 6: 0.19 ± 0.20

Yale

Femto iStent



Femto Laser Issues for iStent Use

- Presence of arcuate incisions
- Tighter primary incisions
- Incision location may be more variable
- Bubble formation in anterior chamber
- More lens debri at beginning of case
- Higher expectation of femto patients

IOP/Meds (Means)

Pre-op	! day	1 week	1 month	3-6 months	1 year
21.5 (+/- 2.3)	17.5 (+/- 1.8)	18.4 (+/- 1.5)	17.3 (+/- 1.6)	16.4 (=/- 1.2)	16.9 (+/- 1.5)
1.4	1	1.1	0.9	0.9	0.9

Visual Outcomes (Median)

	Pre-op	Day 1	Week 1	Month 1	Month 3-6	Month 12
BCVA	20/50	20/30	20/25	20/25	20/20	20/20
Cylinder	1.12	0.25	0.37	0.3	0.23	0.19

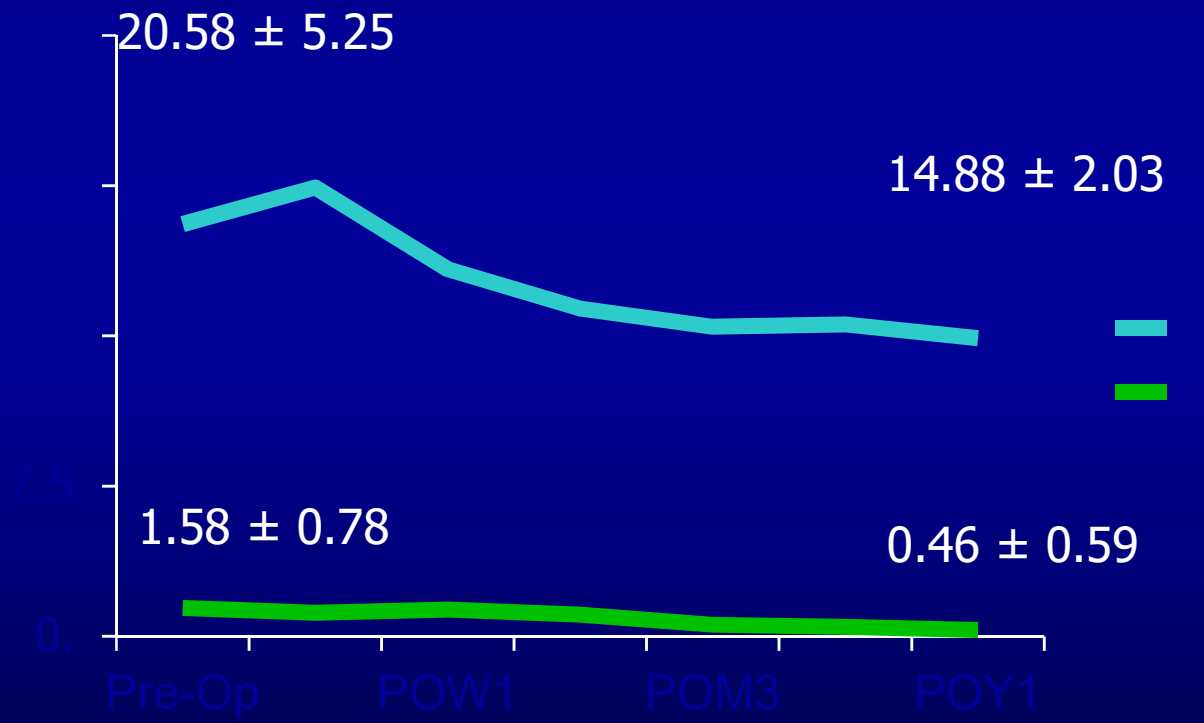
Secondary Measures

- 1 year Mean Spherical Equivalent Error= -.30
- Median time until off post-op meds= 1 month
- No serious complications
- Mild hyphema post-op day 1 in 6/30 patients
- IOP spike in 1 patient

Femto ECP

Femto ECP

- 5.7 mmHg (29.1%) reduction in IOP (p=0.03) and 1.1 med reduction (p<0.001) at 1 year



Femto ECP

- Minimal impact on vision and refractive outcome
  - Pre-op LogMAR: 0.34 ± 0.27
  - Post-op LogMAR: 0.14 ± 0.18
  - -0.19 ± 0.7 D difference from predicted
    - IOL Calculation – Spherical Eq.
- Need for more prolonged use of anti-inflammatory medications
  - 5.20 ± 3.18 weeks

Conclusion
Femtosecond Cataract Surgery

- Novel technology provides image-guided laser cataract surgery.
- Computer-controlled and laser accurate incisions
- Improved capsulotomies in difficult eyes
- Reduced phacoemulsion time and energy
- May be advantageous in many glaucoma patients needing cataract surgery