

# *The Challenge of Glaucoma in the Infant*

*Glaucoma in the Infant*

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## Glaucoma in the infant

- Early onset developmental glaucoma (EODG)
- Developmental glaucoma with other congenital anomalies
- Aphakic glaucoma

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## EODG

- primary defect in the aqueous filtration system of the eye, developmental, goniodysgenetic
- Estimates of incidence;
  - 1:10,00 births in the West
  - 1:2500 births in the Middle East
  - 1:1250 births among the Slovakian Roms.
- More than 80% present before 1 year.

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## EODG

- 70% bilateral
- 65% are males
- Sporadic occurrence in 90% of the cases, the remainder; autosomal recessive with variable penetrance.

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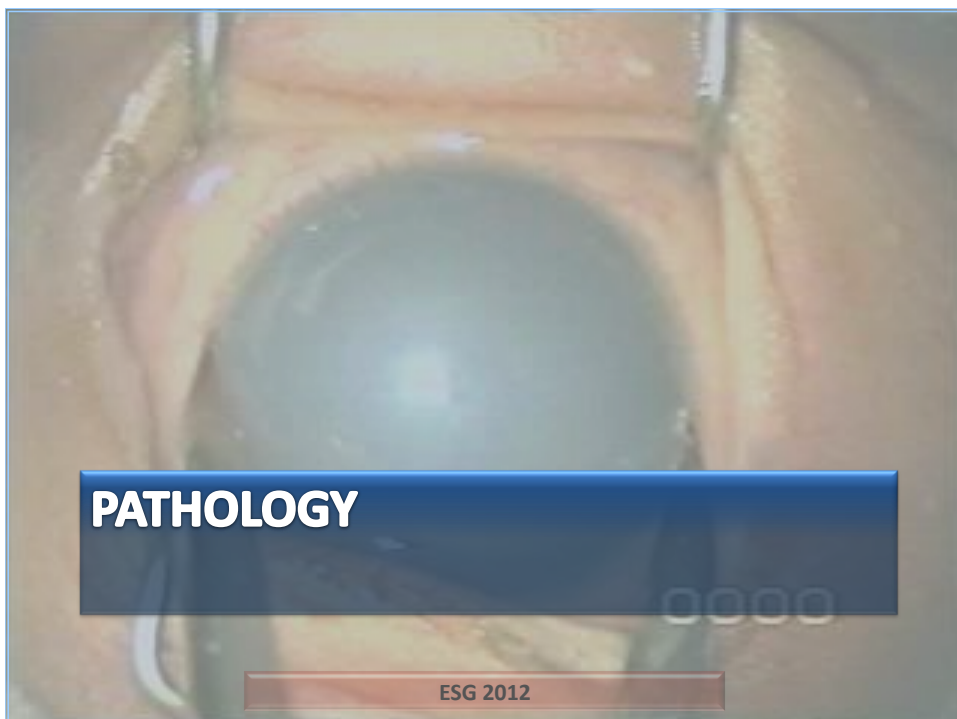
## Gonio-(Trabeculo-)dygenesis

- Glaucoma resulting from malformation of the anterior chamber angle; goniodysgenesis



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## EODG presenting itself..

- Corneal cloudiness
- Large corneas
- Tearful eyes
- Intolerance to light

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## Evaluation of EODG

- IOP
- Cornea
- Optic Disc
- Axial Length
- Further..

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## The Cornea



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## The Cornea

**CCT**

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## IOP AND EODG

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## Examination (cont.)



## The Optic Disc

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## The Infantile disc

Optic disc cupping larger than 0.3, especially if asymmetric between two eyes, is strong evidence that the disc is under pressure and probably glaucomatous.

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## Pediatric Optic Disc Essential Facts

Dilated fundus examination and disc evaluation are essential in the diagnosis and follow up of congenital glaucoma

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## Examination



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## Shape of optic disc cupping in infants

- more often round
- steep walled
- central
- Circumferential enlargement, with the nerve retaining its pink rim until advanced stages of cupping

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## Particularities of optic disc in infants

**Changes in the optic disc occur readily with changes in IOP in infants.**

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## Early appearance of cupping

- mechanical distortion in the disc supporting elements and posterior bowing of the lamina cribrosa
- stretched out globe
- neuronal loss then ensues

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## Pediatric glaucomatous cupping

# Reversible

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## Reversible Cupping

- Remarkable decrease in cupping can be observed as early as one week after normalization of IOP
- The younger the child, the faster the reversibility
- So consistent that it can be used as the main criterion for control of glaucoma in infants rather than using the height of IOP
- Probably related to mechanical changes rather than neural damage?!

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## In EODG

Optic nerve head assessment is an extremely important (the single-most important ) criterion for diagnosis and follow-up of EODG cases

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## Angle Examination



## Medical Therapy for the Management of Infantile Glaucoma

*Is there a role?*

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## Surgical Modalities for the Management of Infantile Glaucoma

*Surgery to Increase Aqueous Outflow  
Surgery to Decrease Aqueous Production*

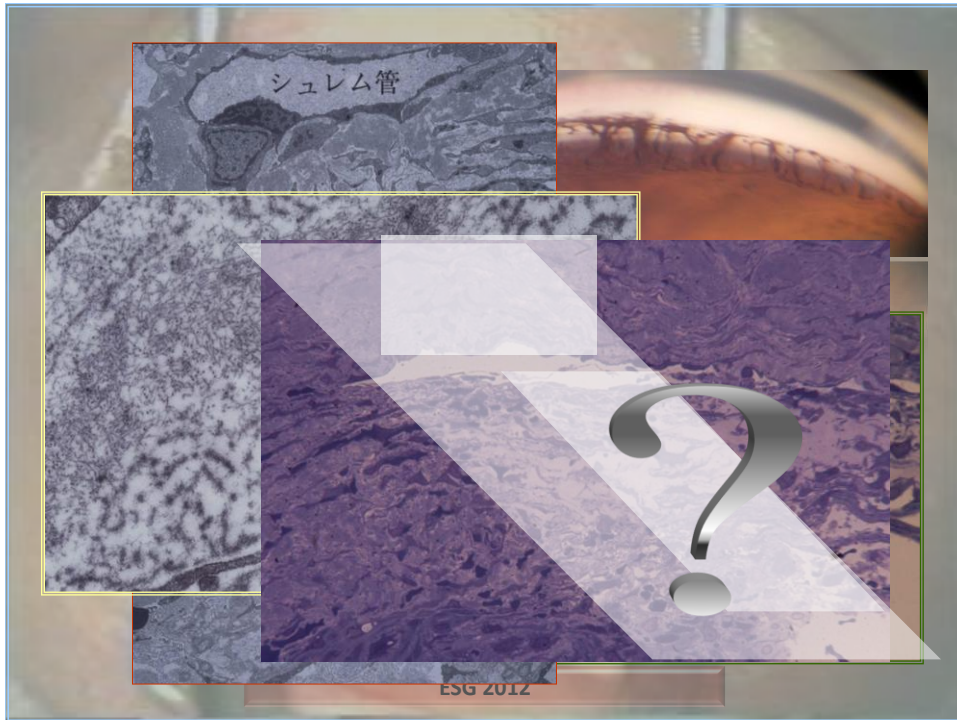
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## Surgery to Increase Aqueous Outflow



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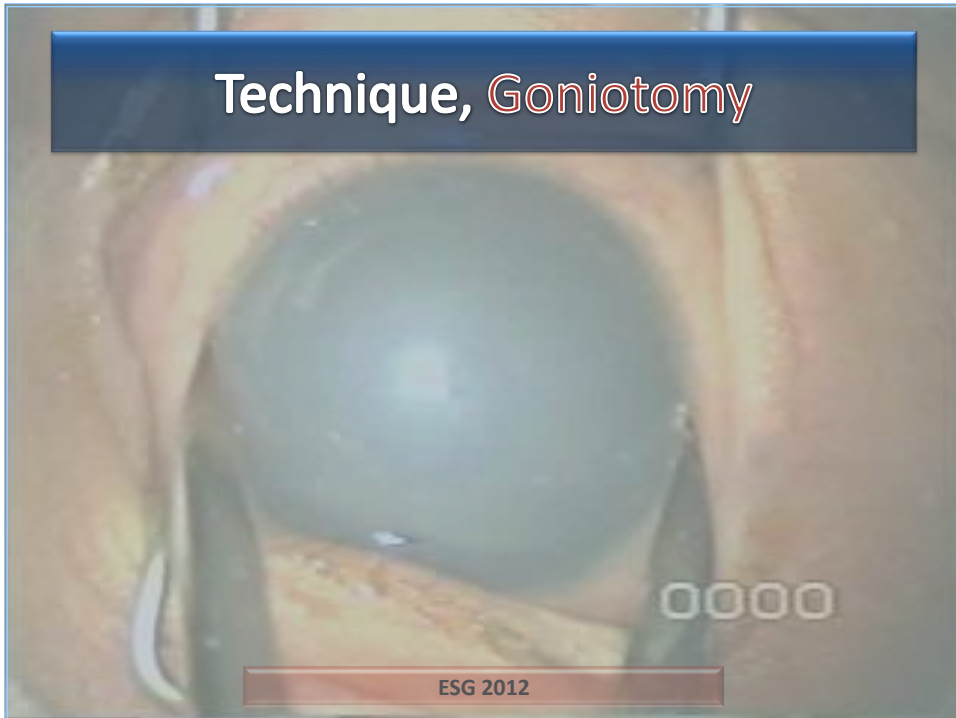
## Gonio- Versus Trabeculo-

- |   |   |
|---|---|
| <ul style="list-style-type: none"><li>• Corneal opacities XX</li><li>• PAS XX</li><li>• Avoids manipulations of conjunctiva</li></ul> | <ul style="list-style-type: none"><li>• Does not require a clear cornea</li><li>• PAS OK</li><li>• Involves conjunctival manipulation</li><li>• <u>More precise targeting</u></li></ul> |
|---|---|

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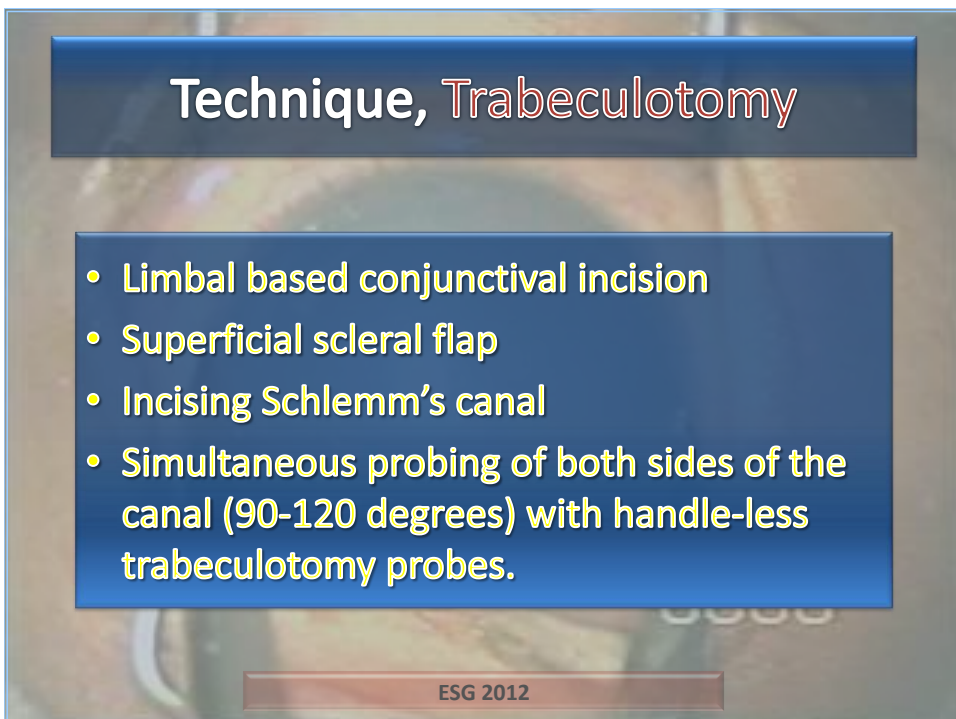


## Technique, Goniotomy

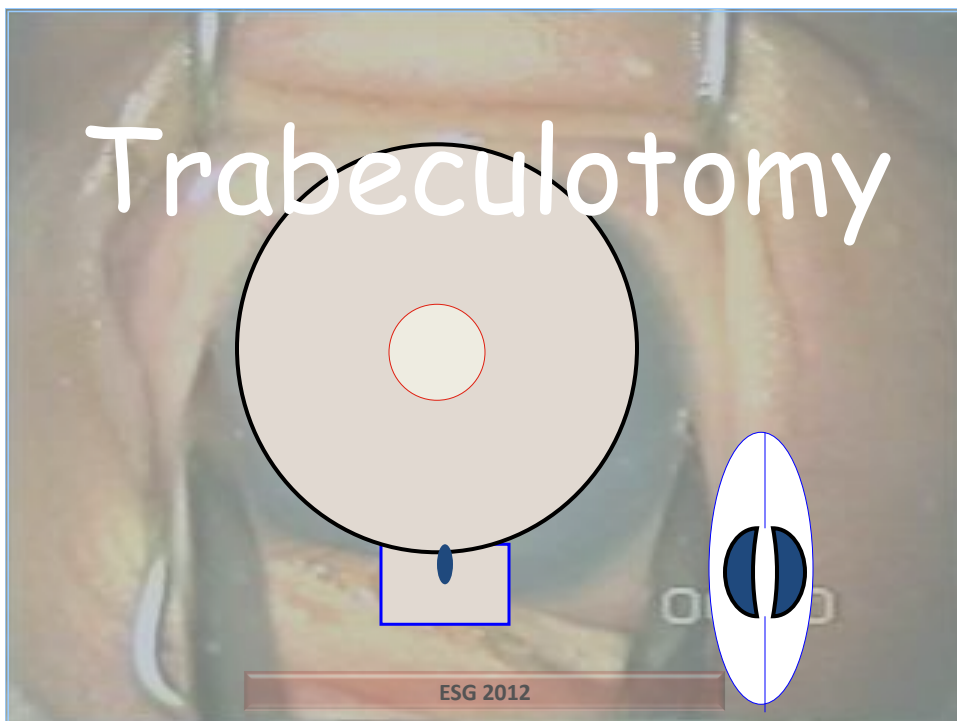
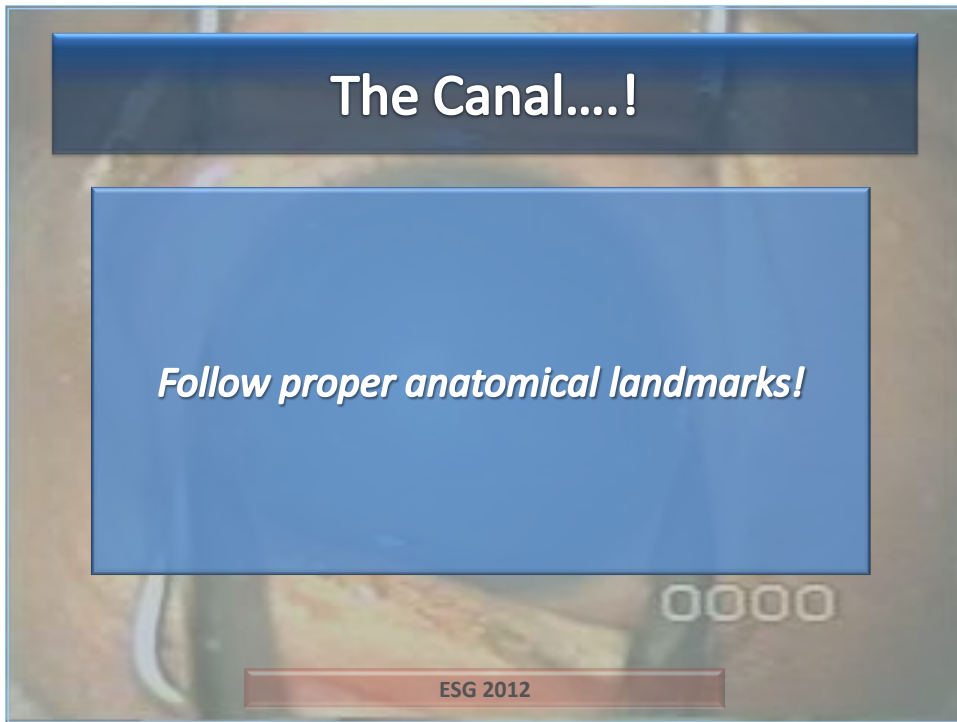


## Technique, Trabeculotomy

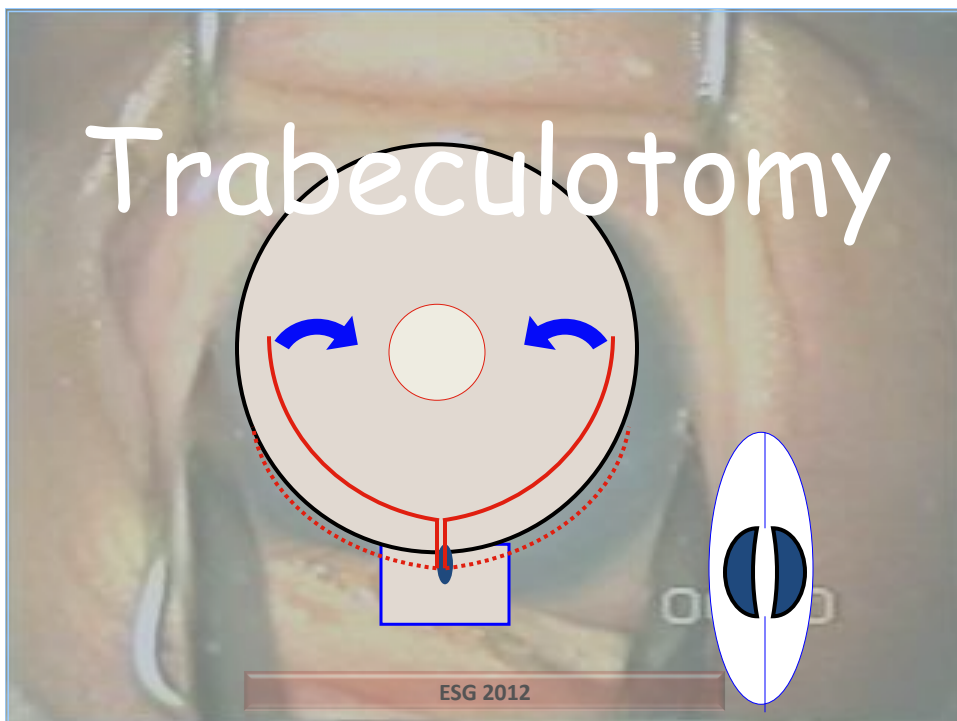
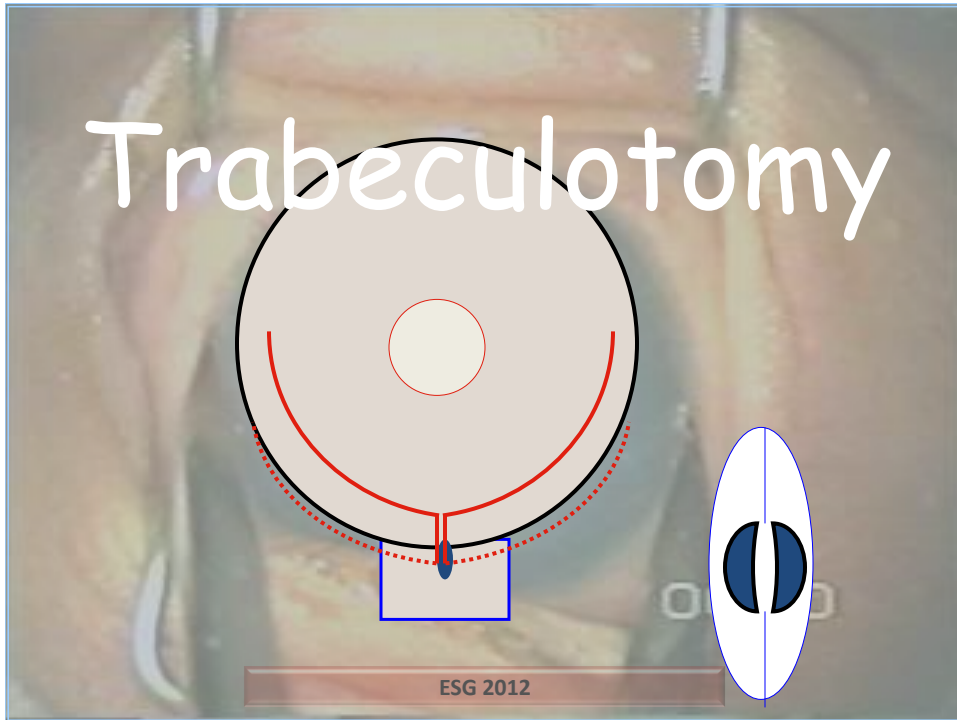
- Limbal based conjunctival incision
- Superficial scleral flap
- Incising Schlemm's canal
- Simultaneous probing of both sides of the canal (90-120 degrees) with handle-less trabeculotomy probes.



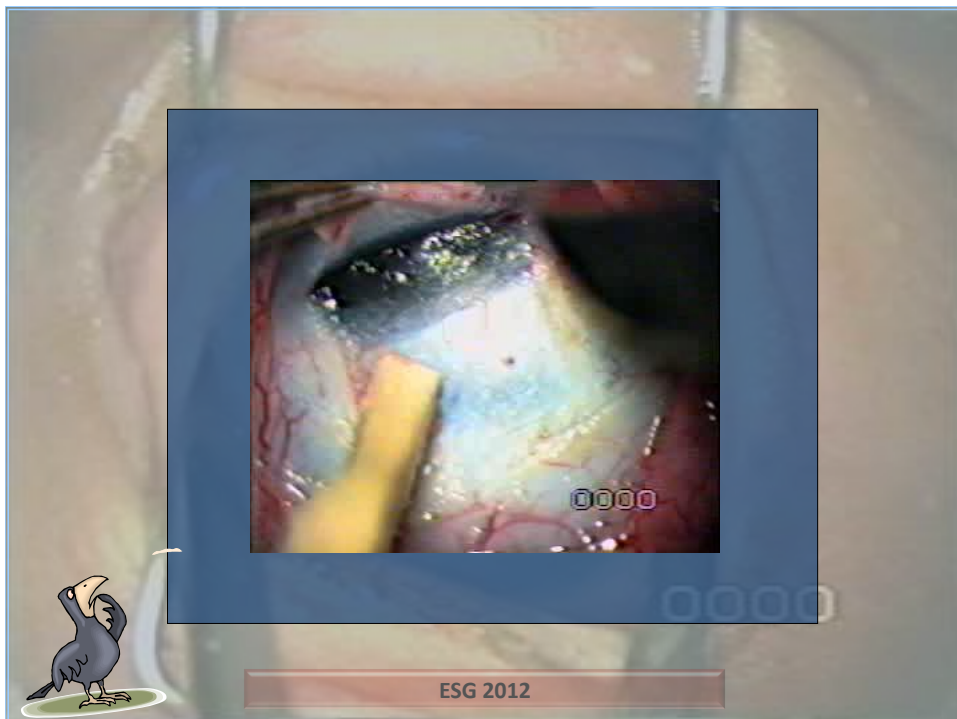
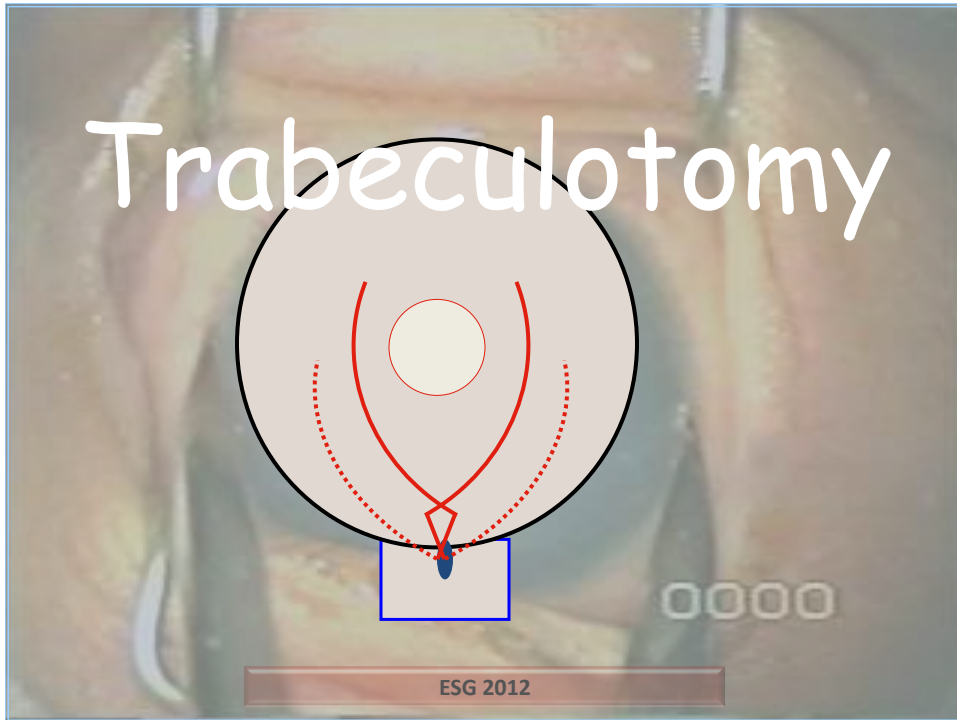




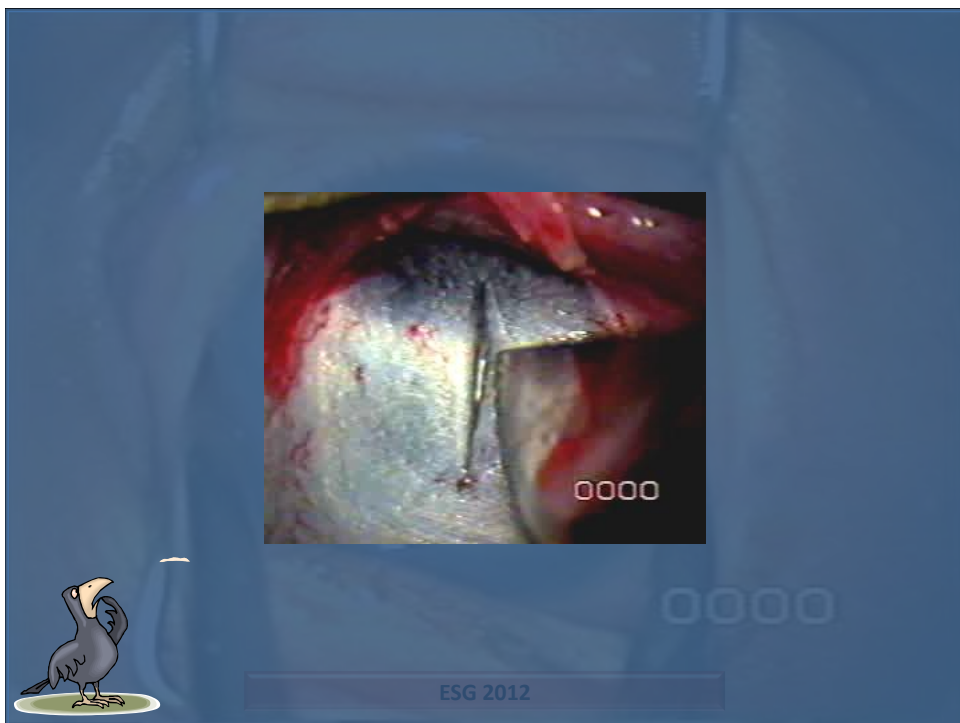
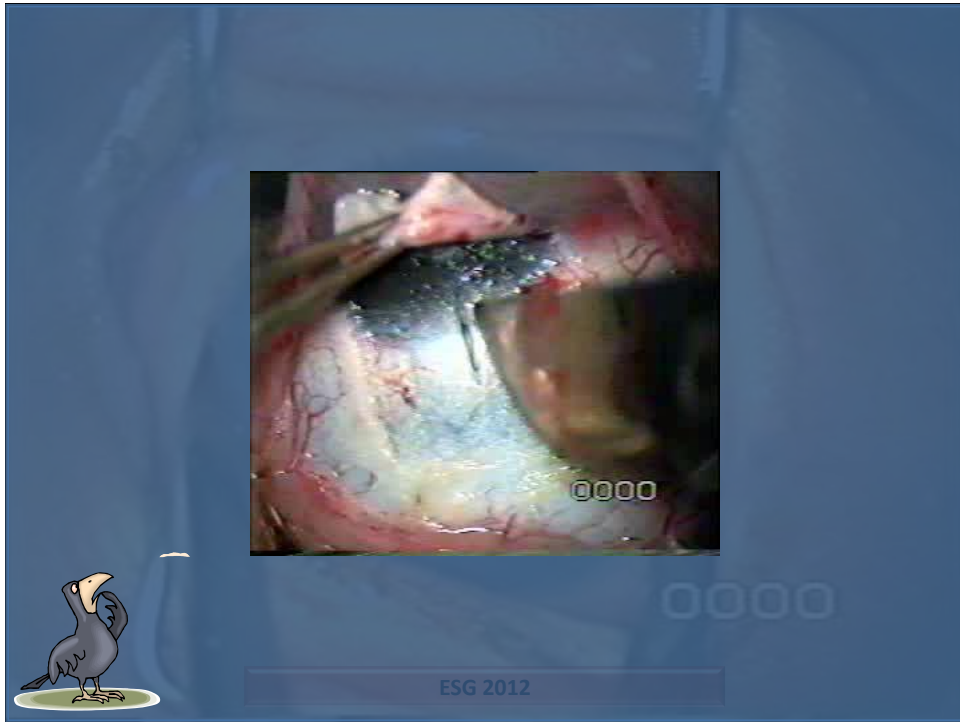




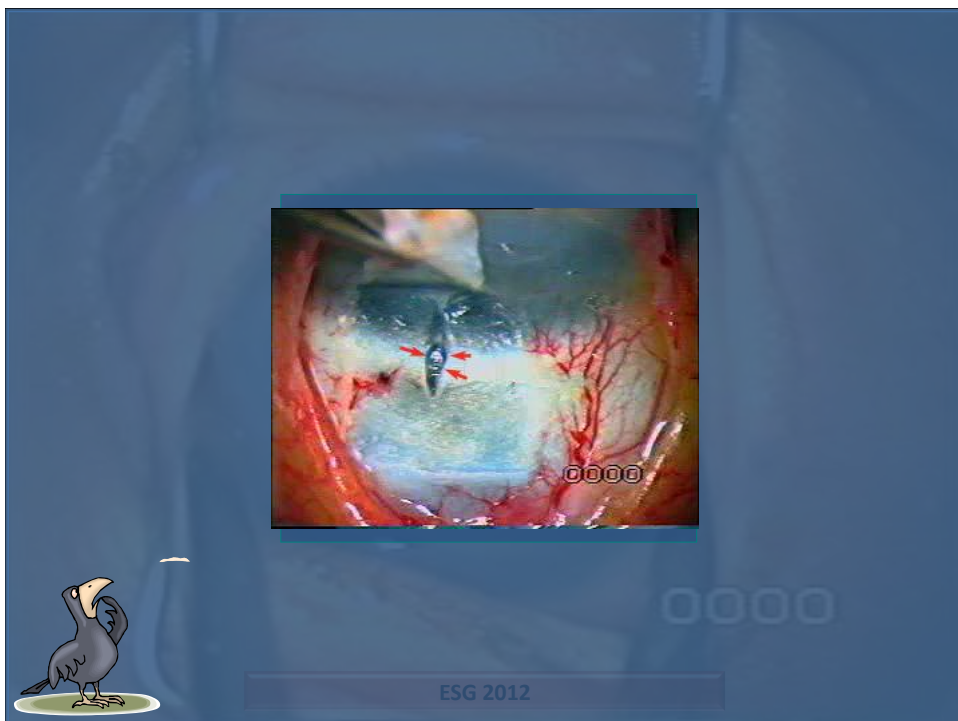
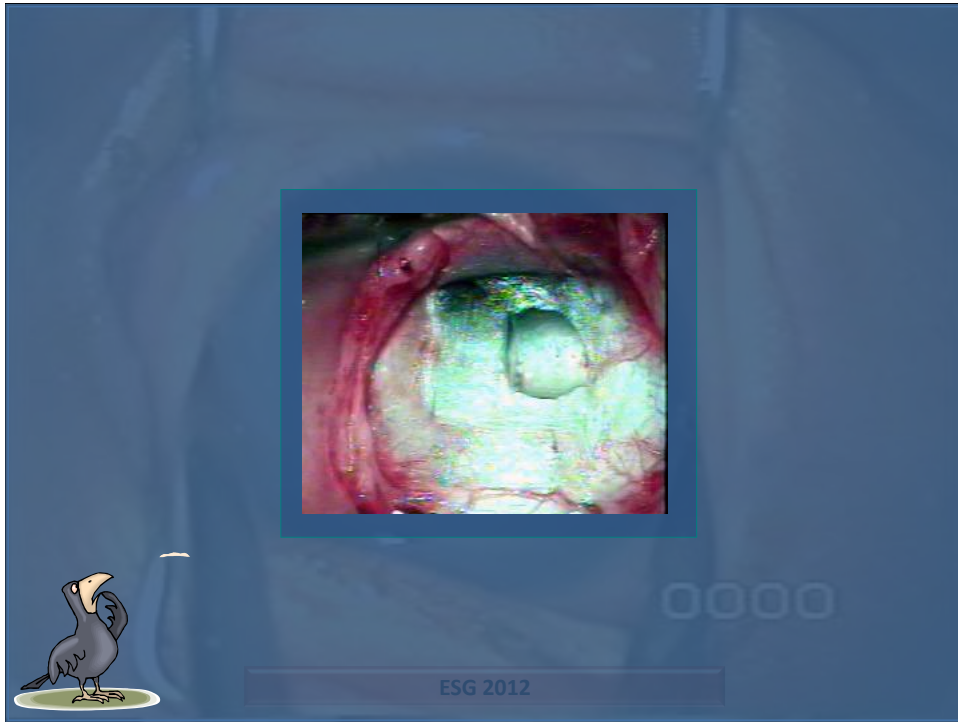




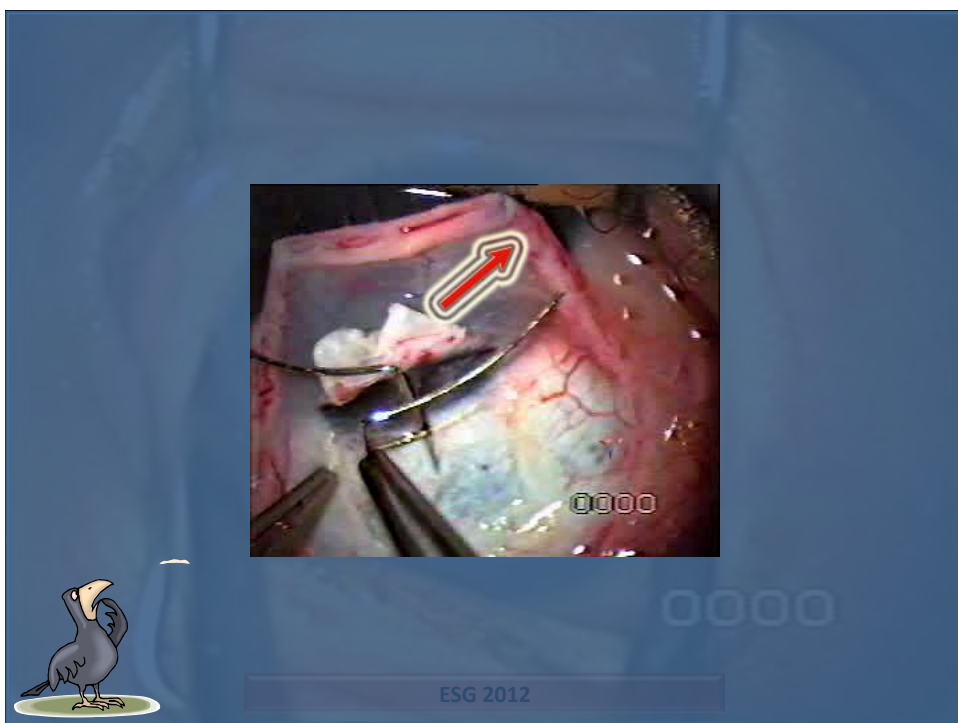
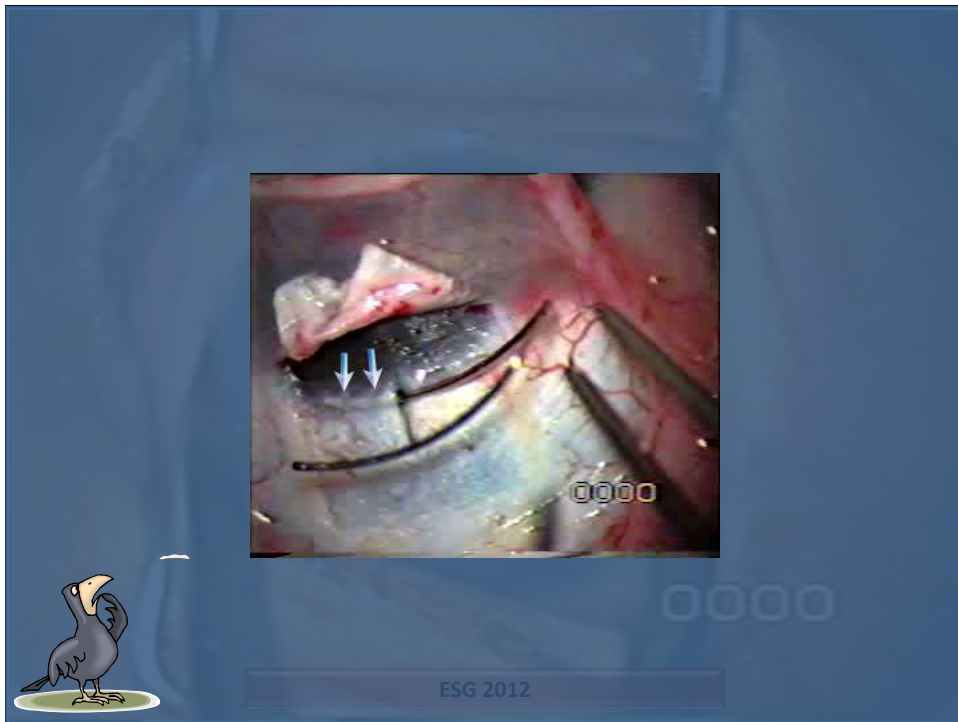




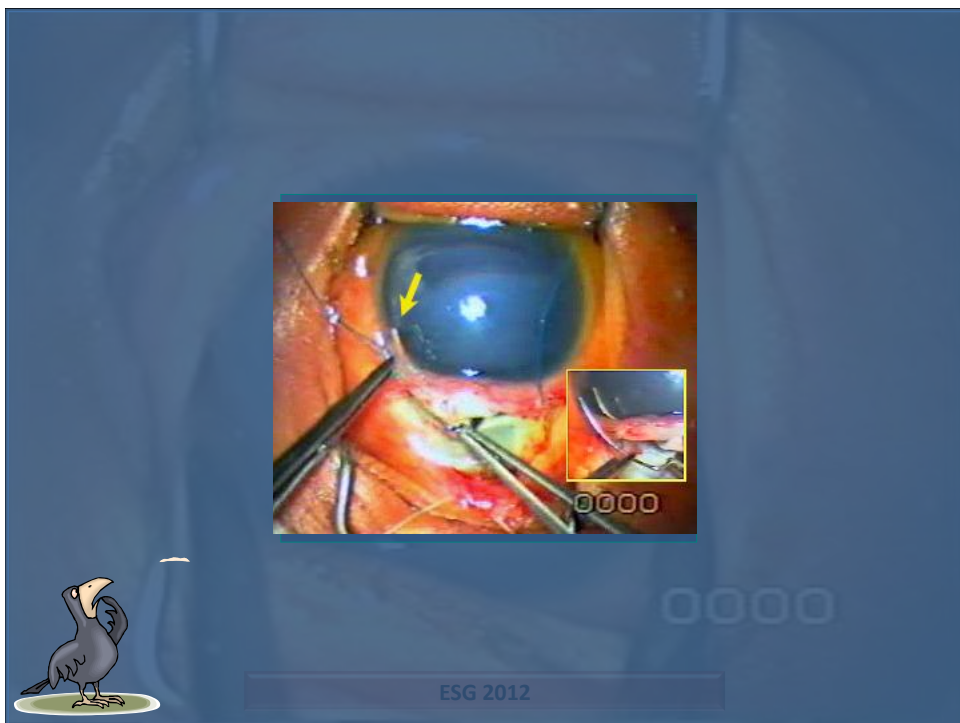
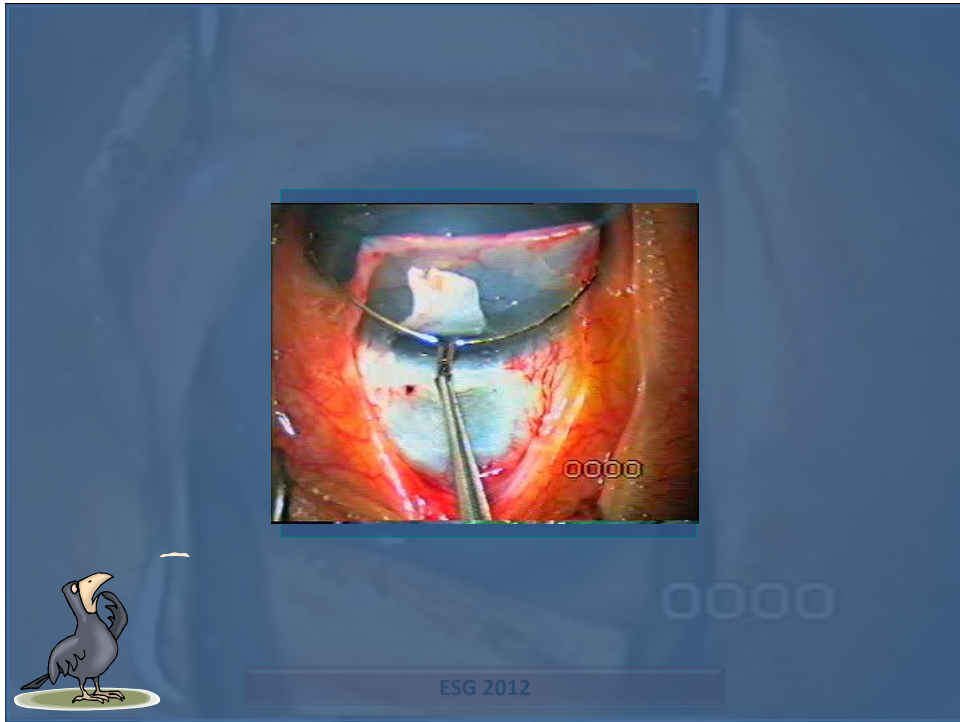




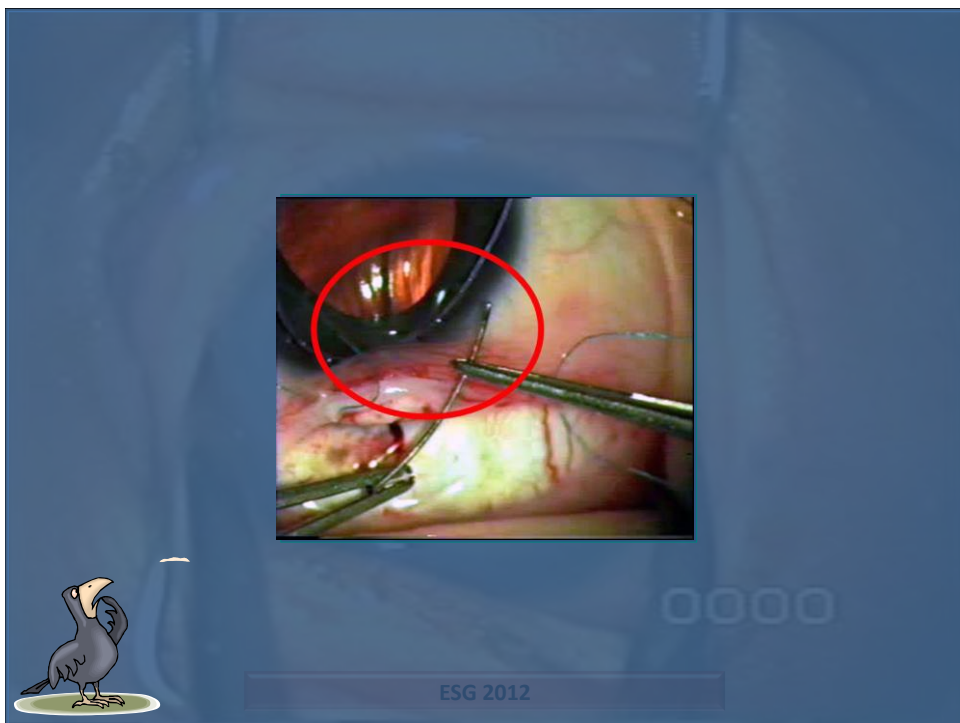
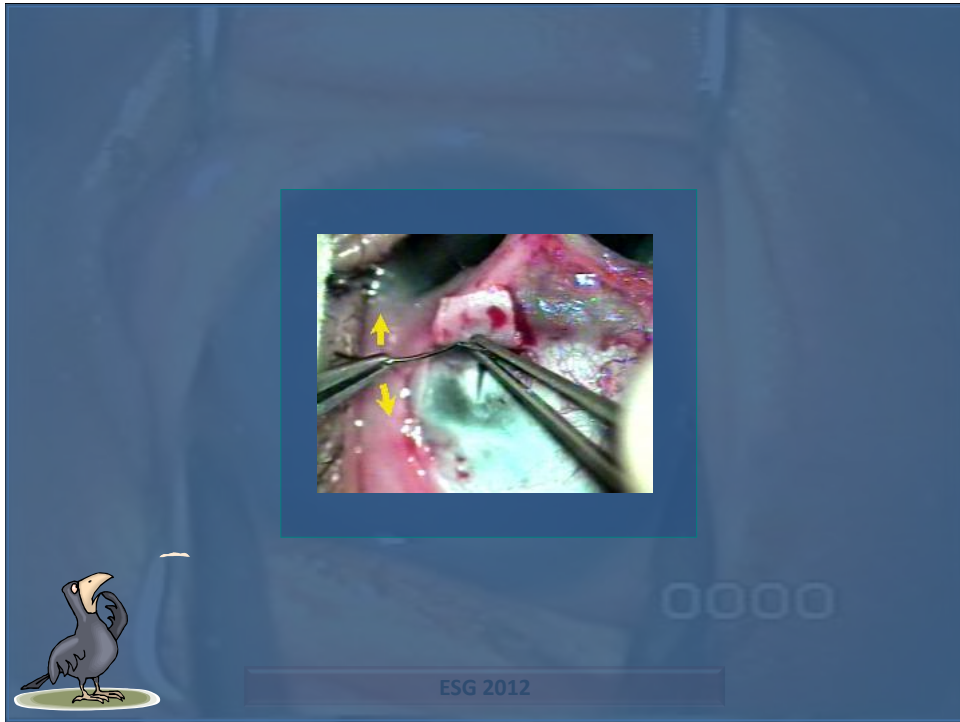




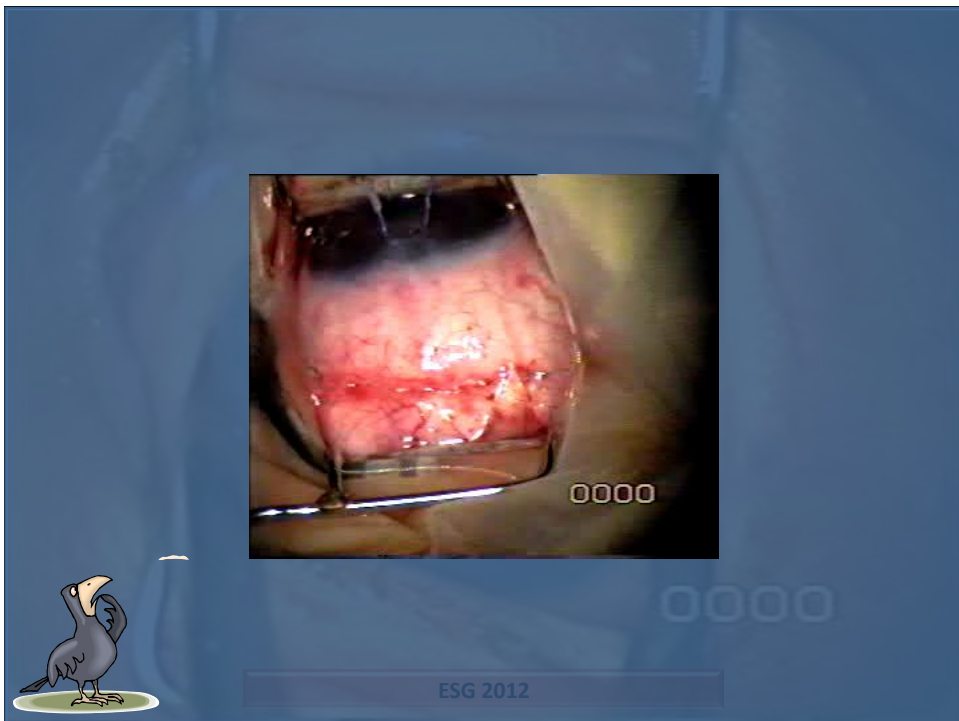




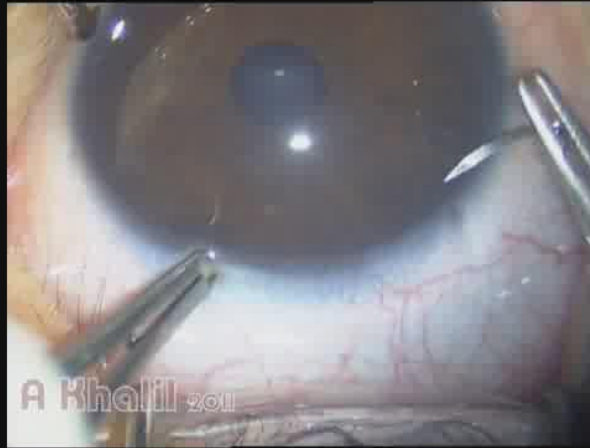












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## Results, Complications

- Failure to probe Schlemm's canal; uncommon.
- Hyphema; Self limited (*My lovely hyphema!*).
- Recurrence, *larger corneas, iris vessels*
- No other serious intra- or postoperative complications.

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## Results, Outcome Parameters

A favorable outcome: *All of the following*

- Resolution of corneal oedema.
- Stabilization +/- regression of corneal diameter.
- IOP control ( $\leq 21$  mmHg).
- Stabilization +/- optic disc cupping.

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## Results

progressive improvement of outcome parameters  
was observed 2 years postoperatively in:

(92%)

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## Practical Tips for the Infrequent Glaucoma surgeon,

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## Follow up and rehabilitation, the story begins

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## The Follow-up, the Story Begins!



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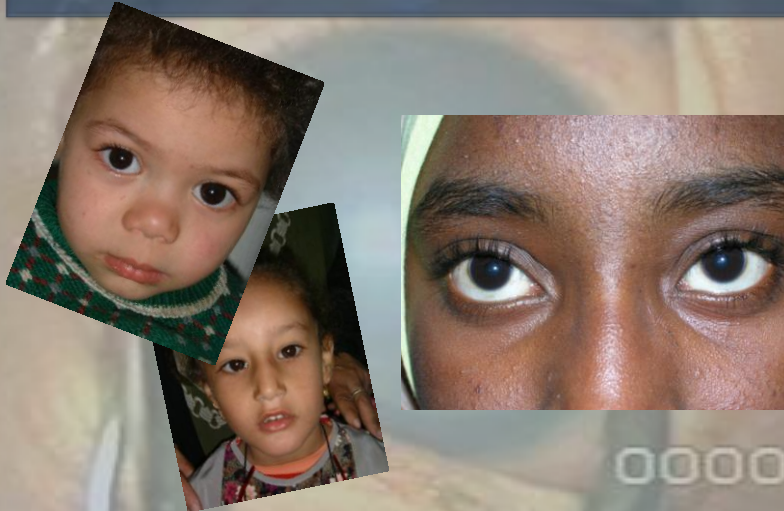
## The Follow-up, the Story Begins!



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## The Follow-up, the story begins



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## The Future

- The future holds a promise of designing specific strategies, based on the molecular mechanism of disease, to slow or halt the progression of glaucoma.
- Gene Therapy

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