GLAUCOMA

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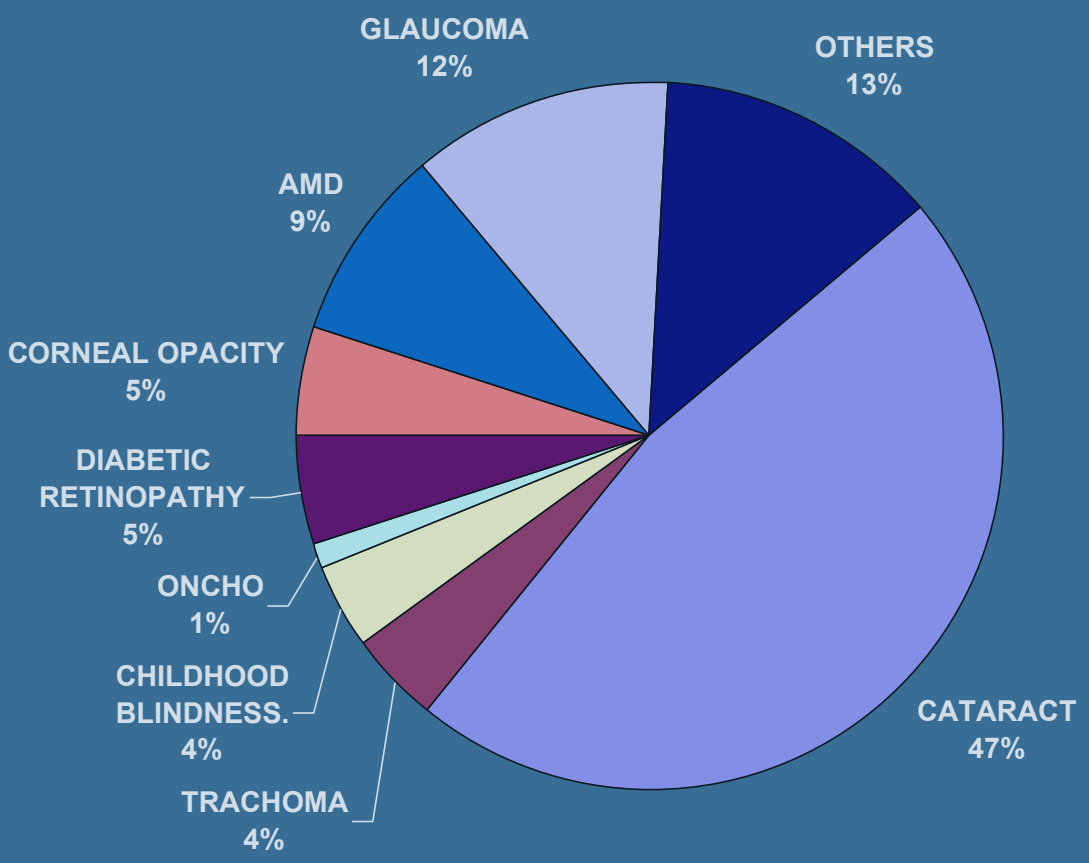
OUTLINE

- Definition
- Anatomy
  - Anterior chamber
  - Posterior chamber
  - Optic nerve head
- Classification
  - Primary glaucoma
  - Secondary glaucoma
  - Congenital Glaucoma
- Diagnosis
- Medical Treatment
- Surgical Treatment

Definition

Glaucoma is an *optic neuropathy* with characteristic appearances of the *optic disc* and a specific pattern of *Visual Field defects* that may/may not be associated with increased *intra-ocular pressure*

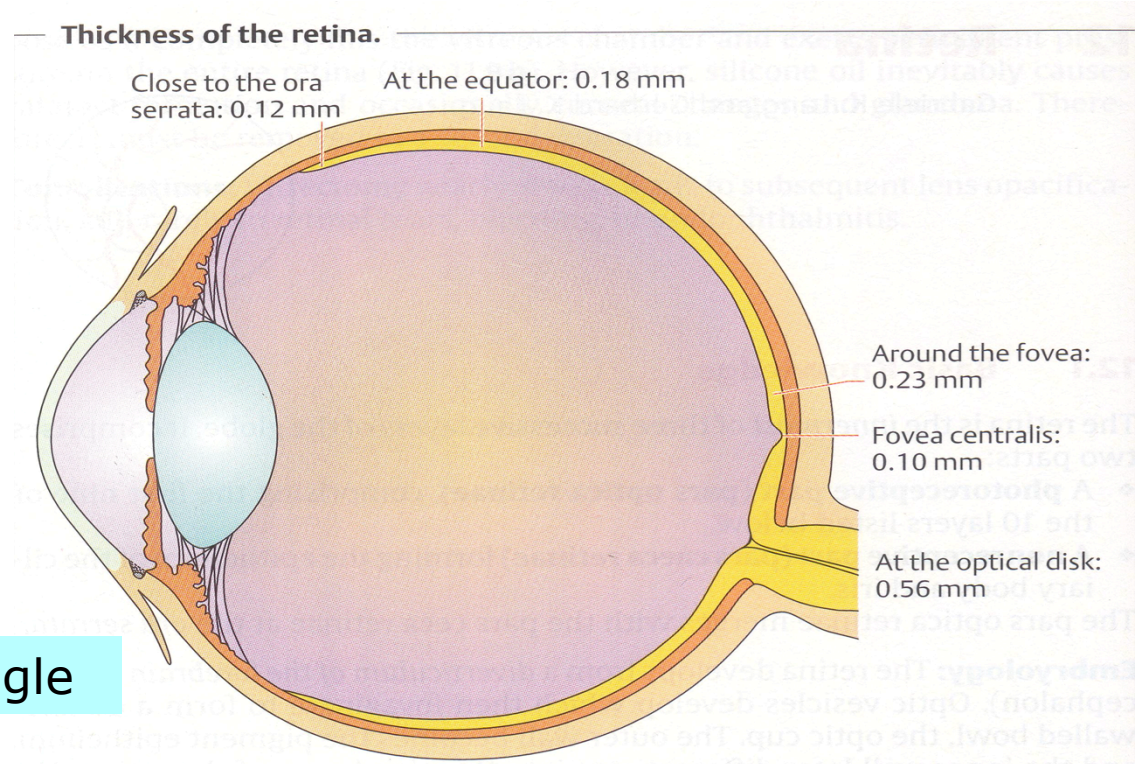
CAUSES OF BLINDNESS



Best VA
< 3/60

Anatomy anterior chamber

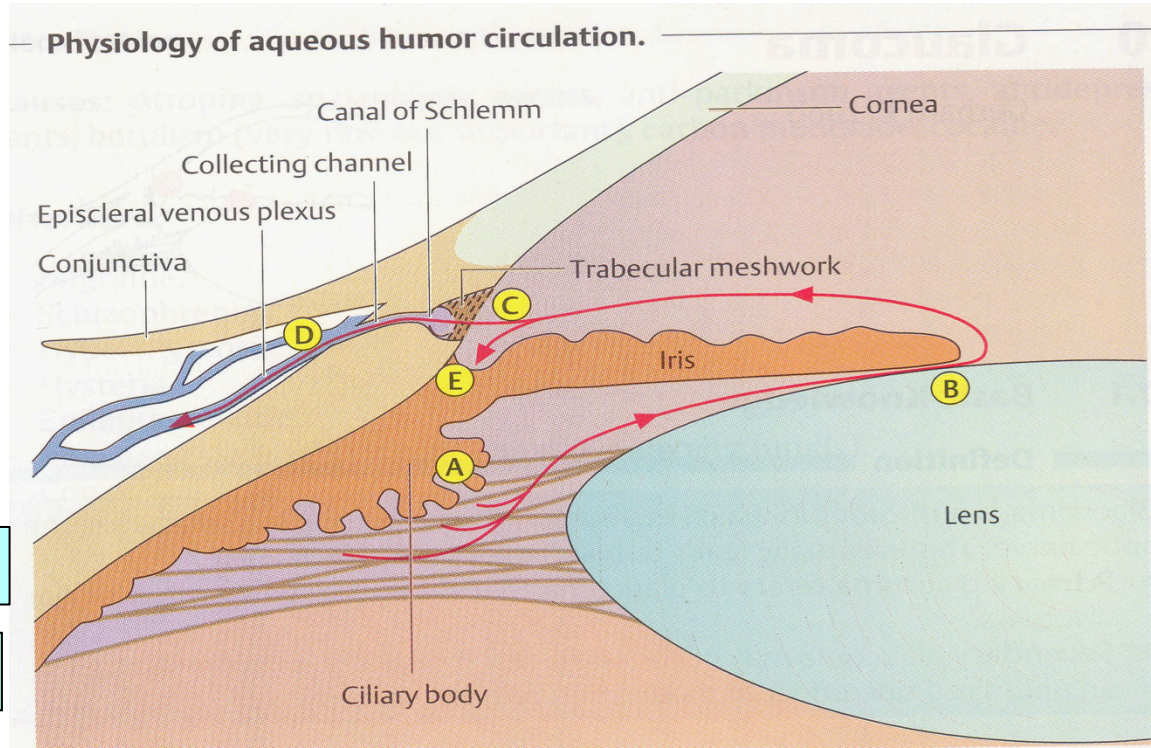
- Boundaries
  - Cornea ant.
  - Iris post.
  - Communicates PC through pupil



A/C angle

Anatomy of Posterior Chamber

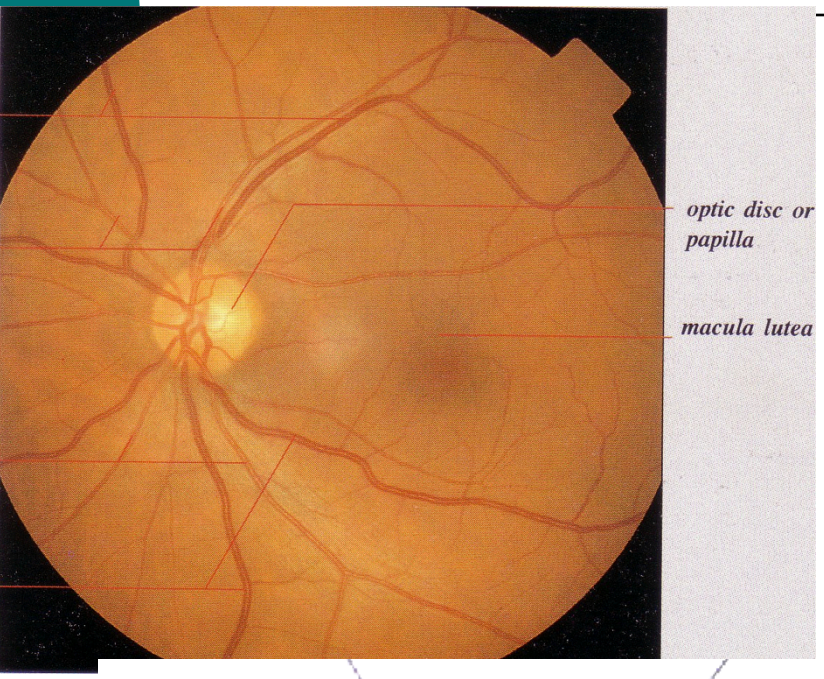
- Triangular space,
- Boundary:
  - Ant.: Post surf iris
  - Post.: lens , zonules
  - Lat.: Ciliary Body

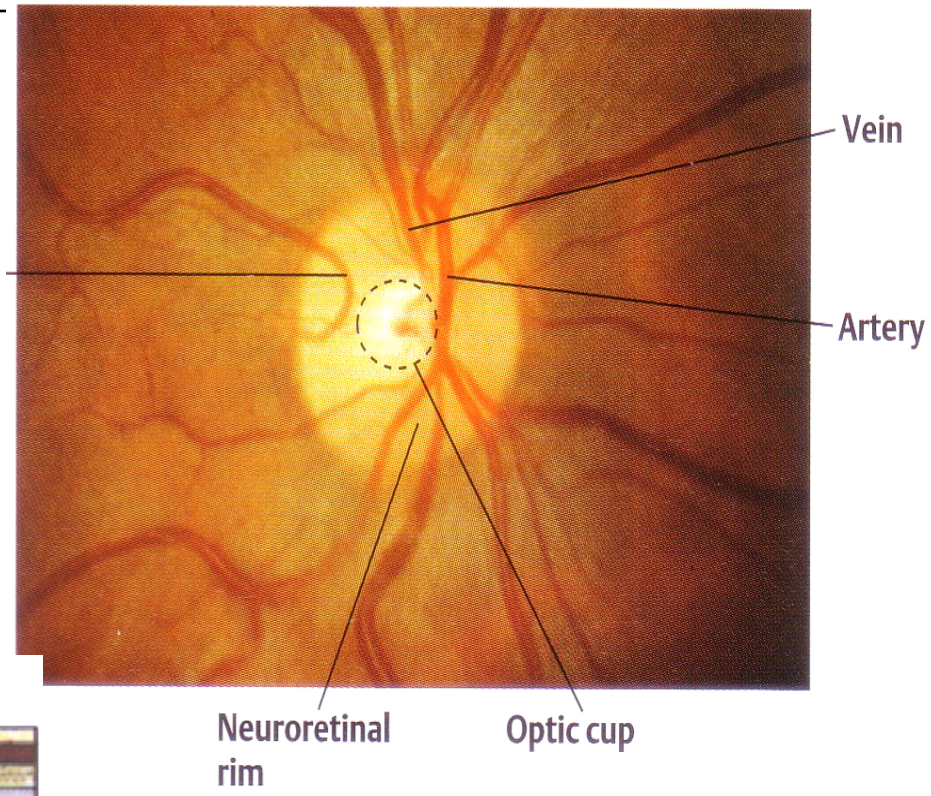


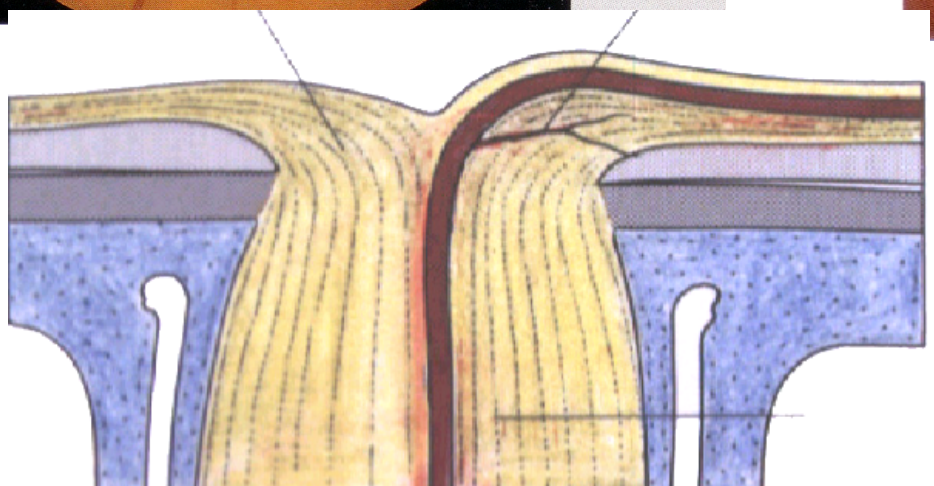
Flow of aqueous

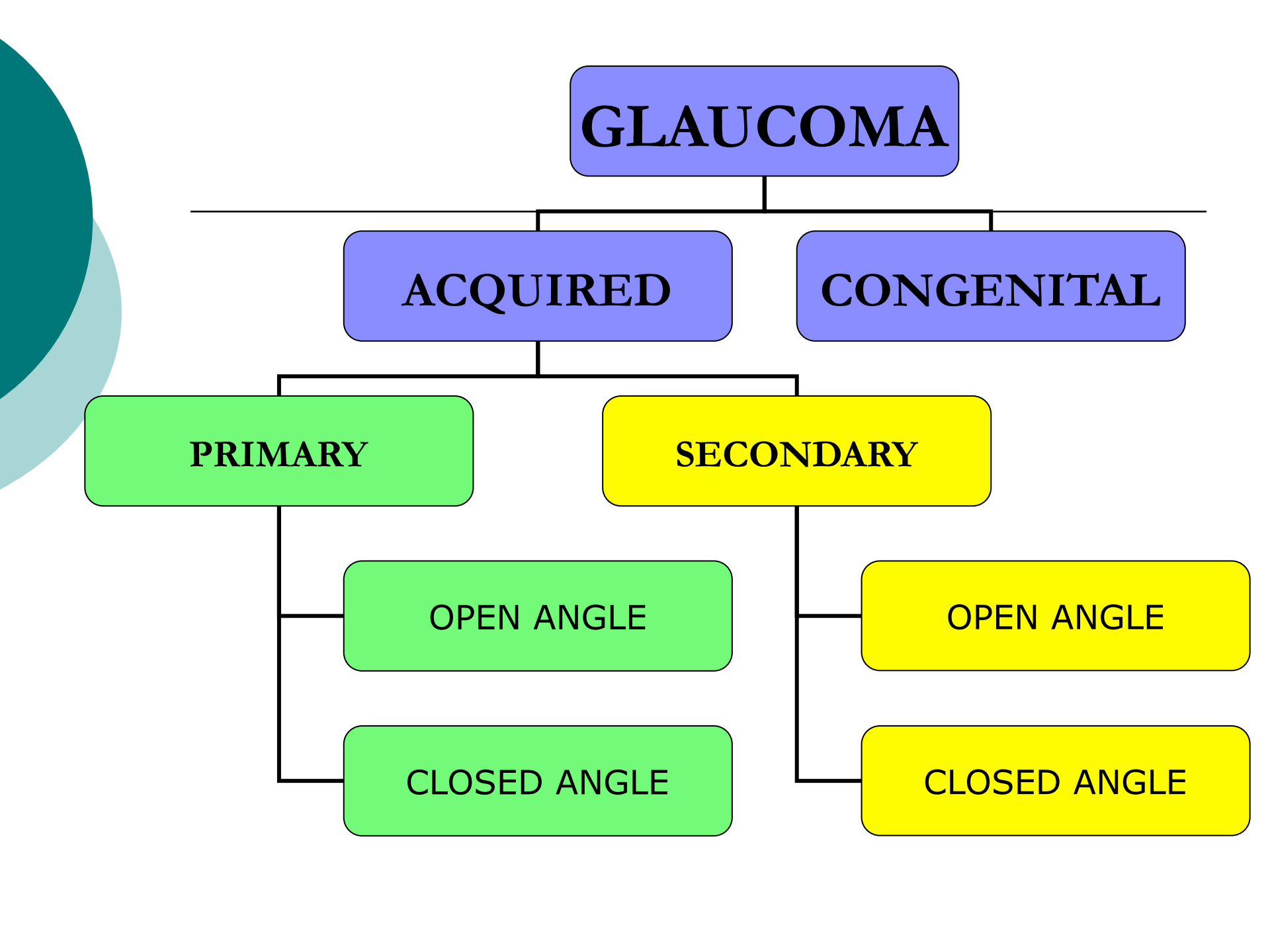
IOPs 10-21mmhg

Anatomy of Optic Nerve Head







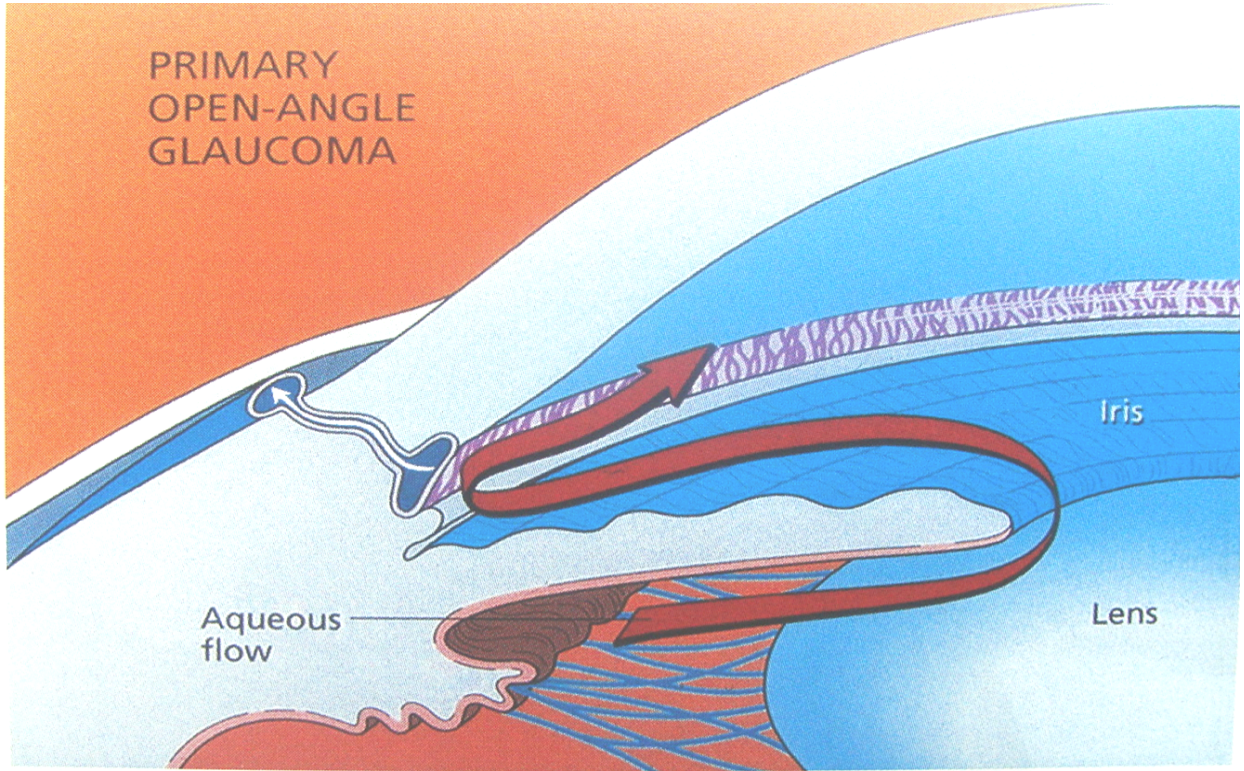

GLAUCOMA
ACQUIRED
CONGENITAL
PRIMARY
SECONDARY
OPEN ANGLE
CLOSED ANGLE
OPEN ANGLE
CLOSED ANGLE

Primary Glaucoma Definition

Glaucoma occurring in an eye with no other underlying ocular disease.

Primary Open angle Glaucoma

- Resistance to aqueous outflow through the trabecular meshwork-schlemm canal system



Characteristics POAG

- IOPs **>21mmhg**
- **Open angle** of normal apperance
- **ONH** damage
- **Visual Field loss**
- Patient usually **assymptomatic**
- **Insidous** onset, slow progression
- Bilateral, assymeteric

Normal Vision

Advanced Symptoms

Risk factors POAG

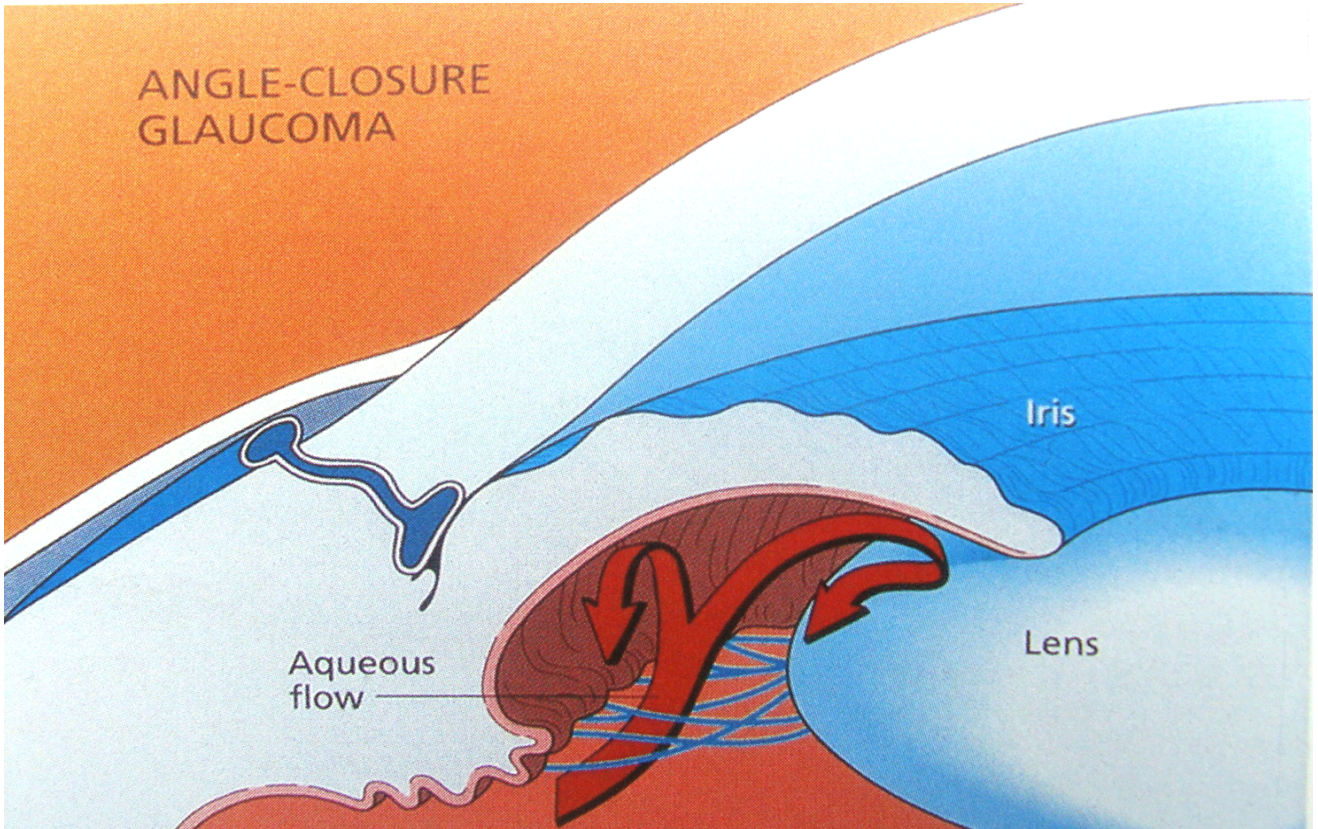
- Age (>40yrs)
- Race (commoner in blacks)
- Family history
- Myopia
- Diabetes Mellitus

Other variants

- Normal tension glaucoma/low tension glaucoma
- Ocular hypertension

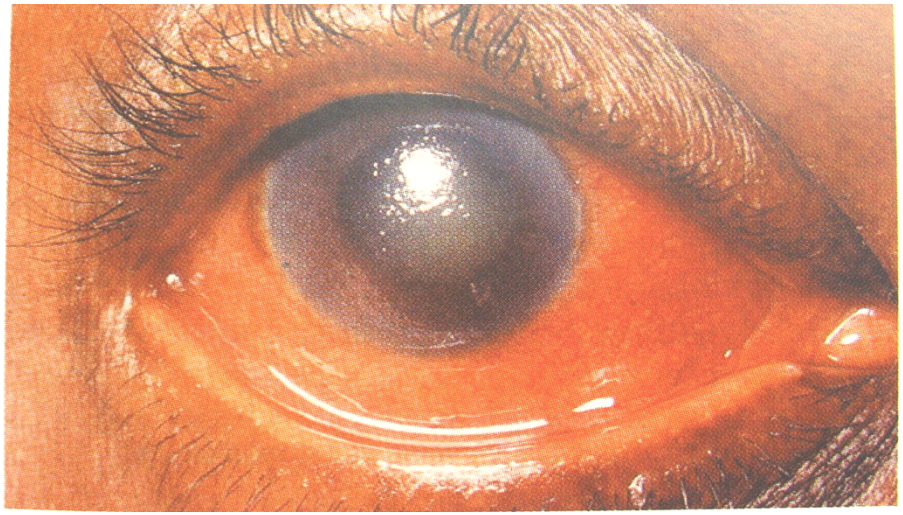
Primary Angle Closure Glaucoma

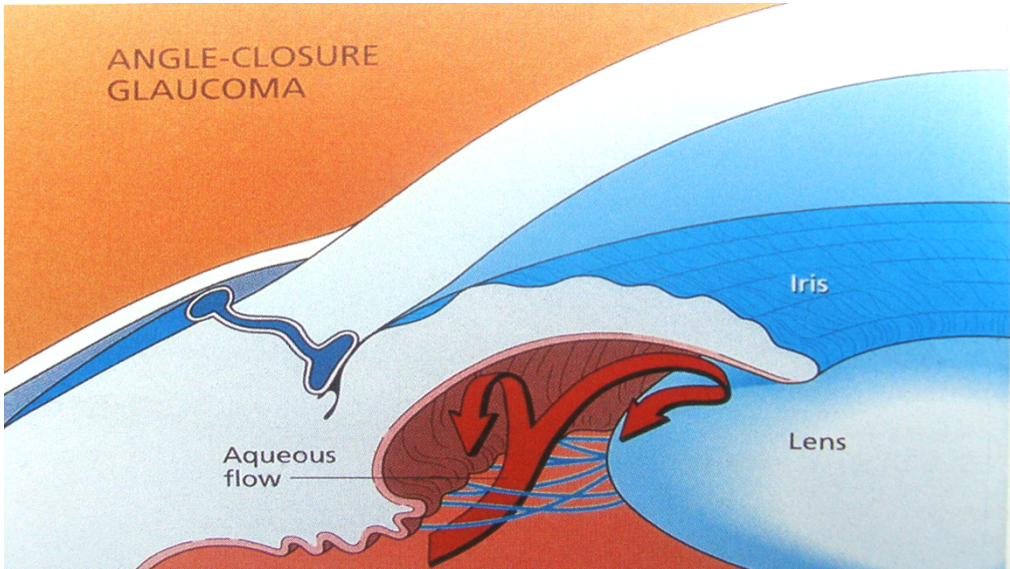
- Increased IOPs as a result of obstruction of the trabecular meshwork by **peripheral iris**



Characteristics Acute PACG

- IOPs >21mmhg
- **Angle closed** on gonioscopy
- Mid-dilated sluggish pupil
- Corneal oedema
- Conj injection





Acute cases cont.

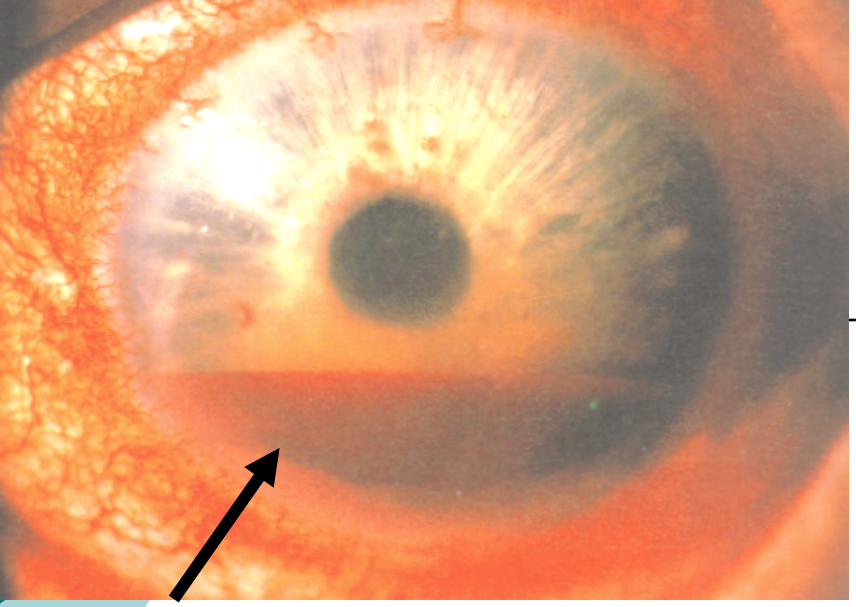
- Pain in the eye
- Frontal headache
- Loss of vision
- Nausea & vomiting
- Haloes

Risk factors PACG

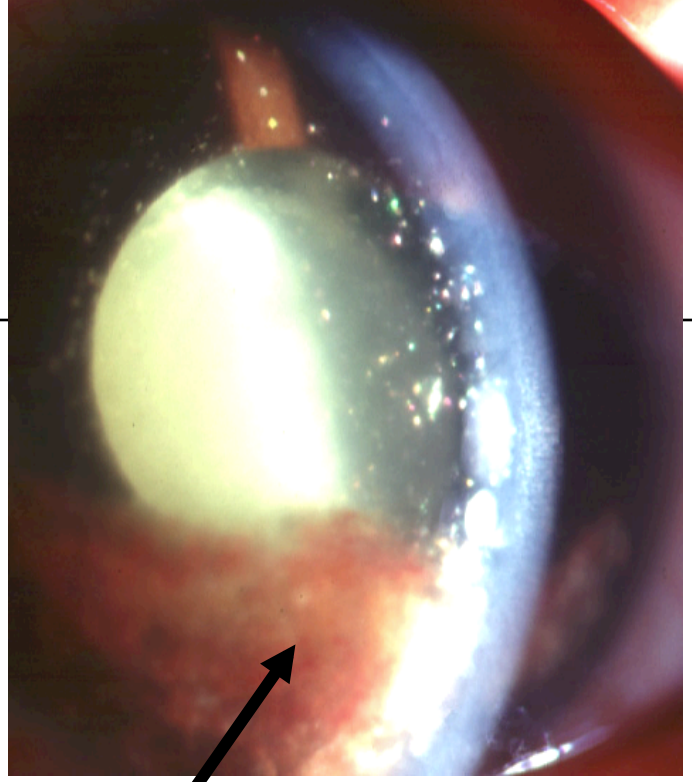
- Age (>60yrs)
- Gender (commoner in females)
- Race (Asians,chinese,eskimos
- Family history
- Hyperopia

Secondary Glaucoma Definition

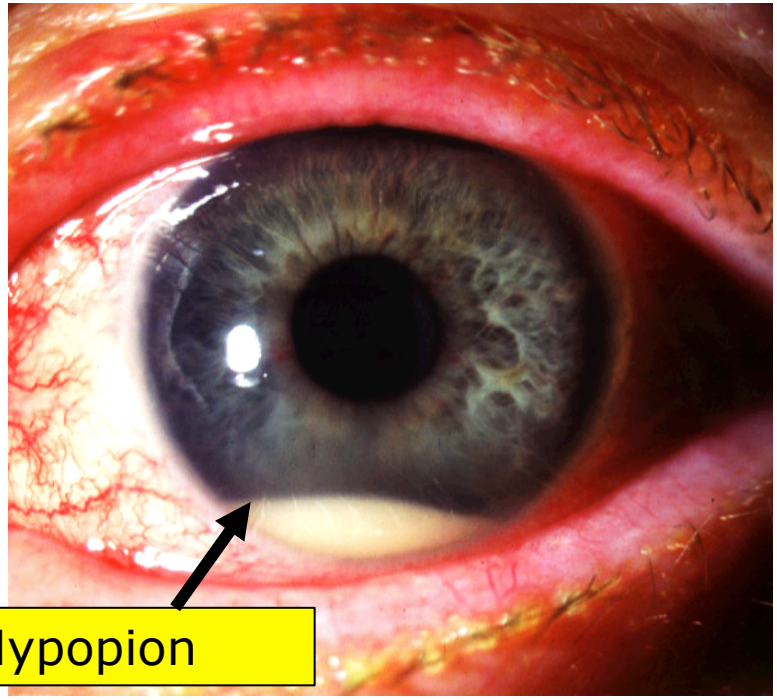
- Increased IOP as a result of an identifiable *abnormality* in the eye which contributes to the pathogenesis of Glaucoma.



Hyphaema



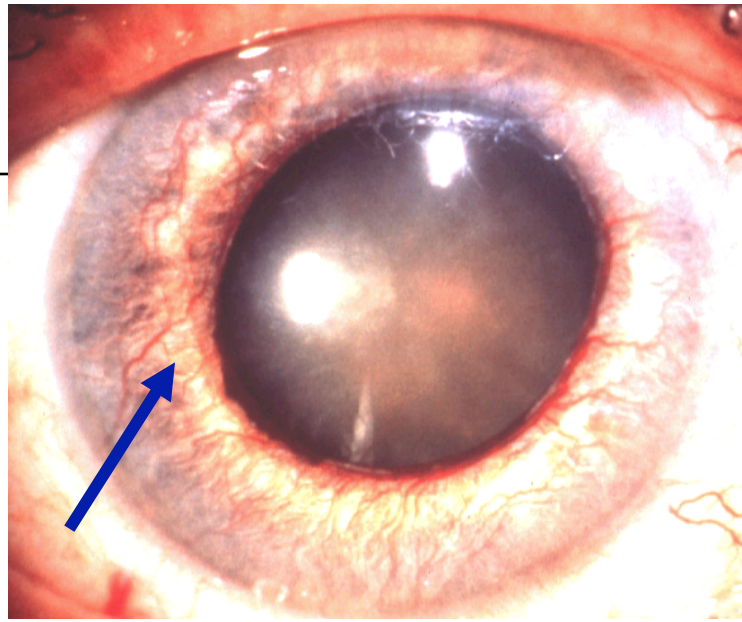
Traumatic cataract

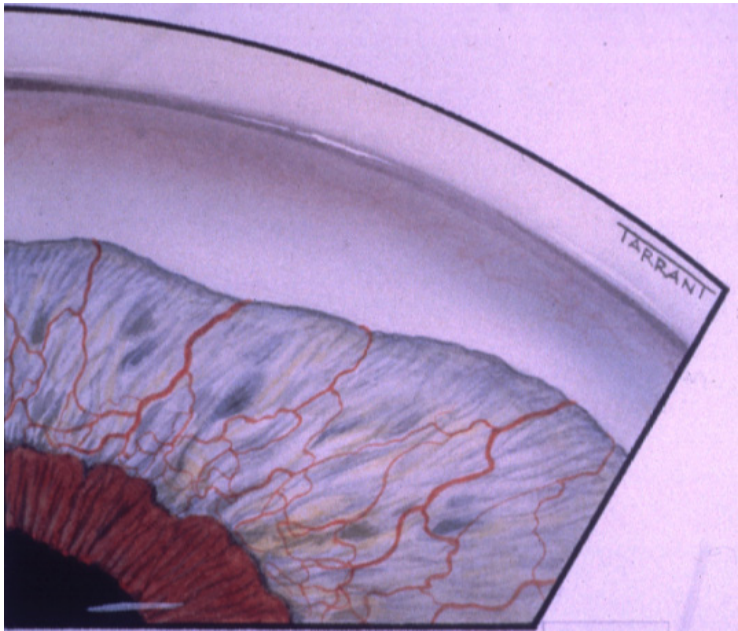


Hypopion

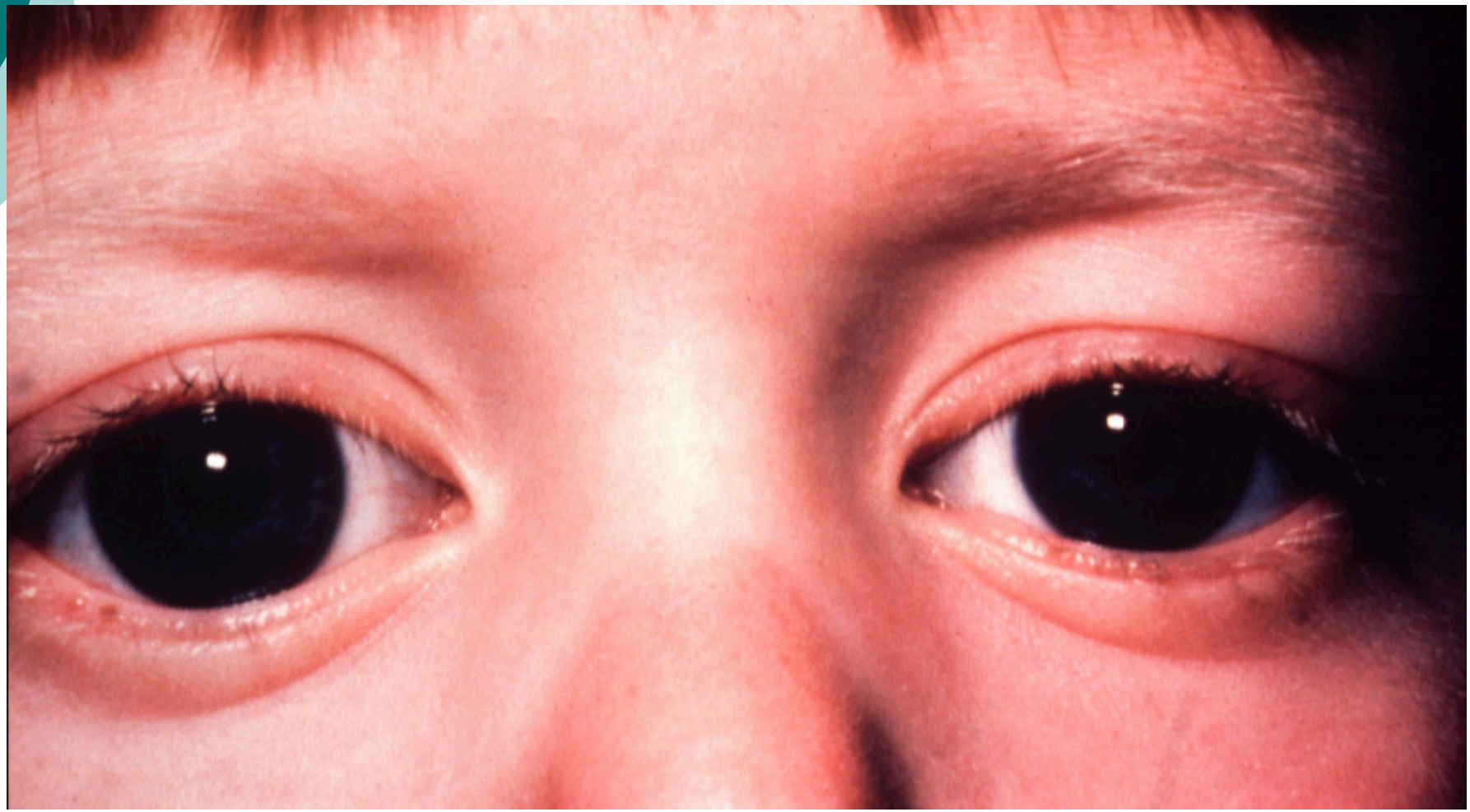
Neovascular glaucoma

- Caused by disorders that lead to retinal ischemia e.g DR, CRVO,
- Rubeosis iridis
- Blood vessels grow over TM, contraction – fibrovascular membrane



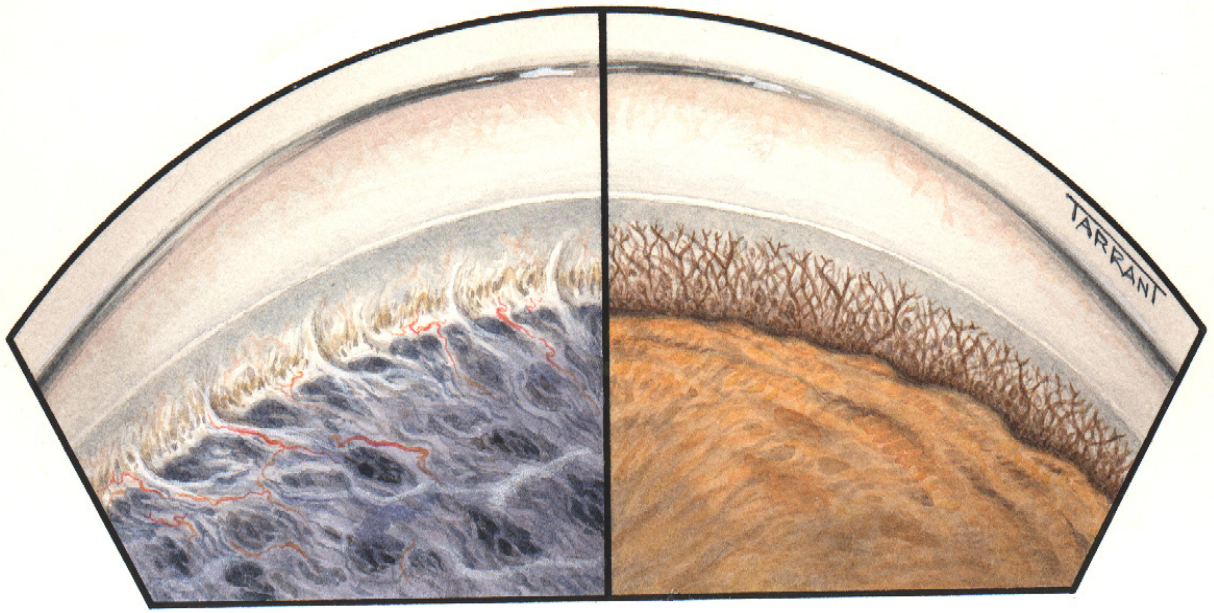


Primary congenital glaucoma



Primary congenital glaucoma

- Evident at birth or < 3 years
- Abnormalities in A/C angle development that obstruct aqueous outflow (trabeculodysgenesis)
- 1:10,000 births, 65% boys
- Bilateral in 75% but frequently asymmetrical



Clinical features

- Symptoms Triad:
  - *Epiphora*
  - *Photophobia*
  - *Blepharospasm*
- Buphthalmos (<3yrs)
- Increased corneal diameter (n=9.5-10.5mm)
- Corneal haziness

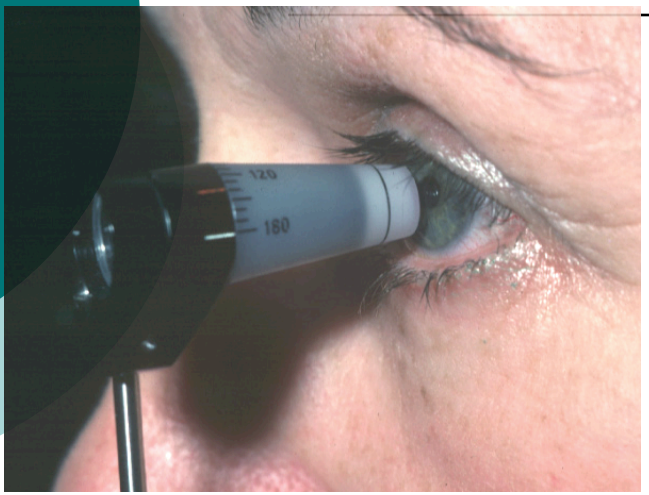
Diagnosis of Glaucoma

- Torch
- Tonometry
- Fundoscpy
- Gonioscopy
- Perimetry

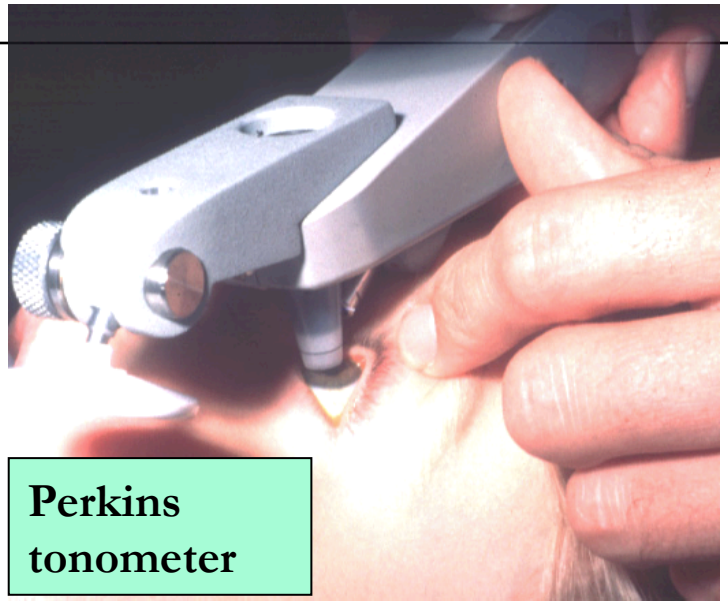
Torch

- Hazy cornea
- Conjuncitiva injection
- Fixed dilated pupil
- Eclipse Sign
- Big eyes

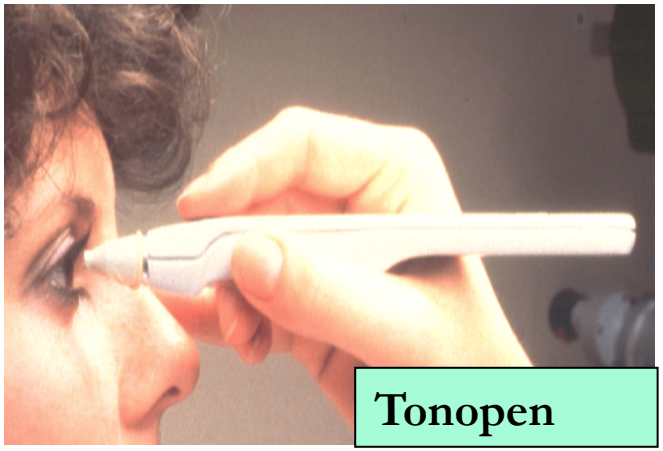
Tonometry



Goldman applanantion



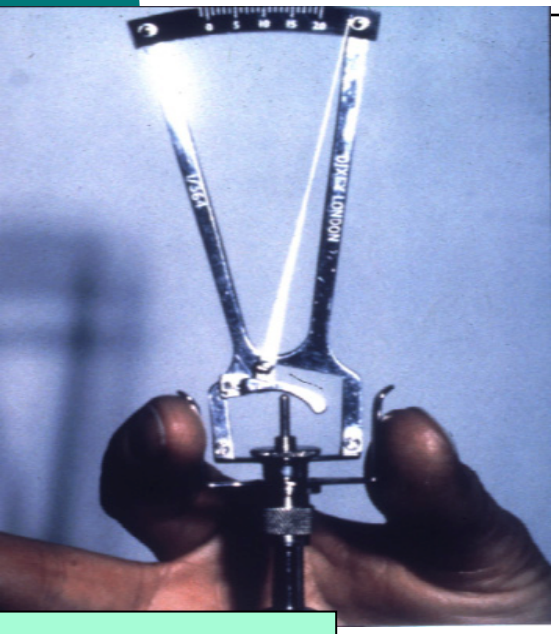
Perkins tonometer



Tonopen

Digital tonometry

Tonometry

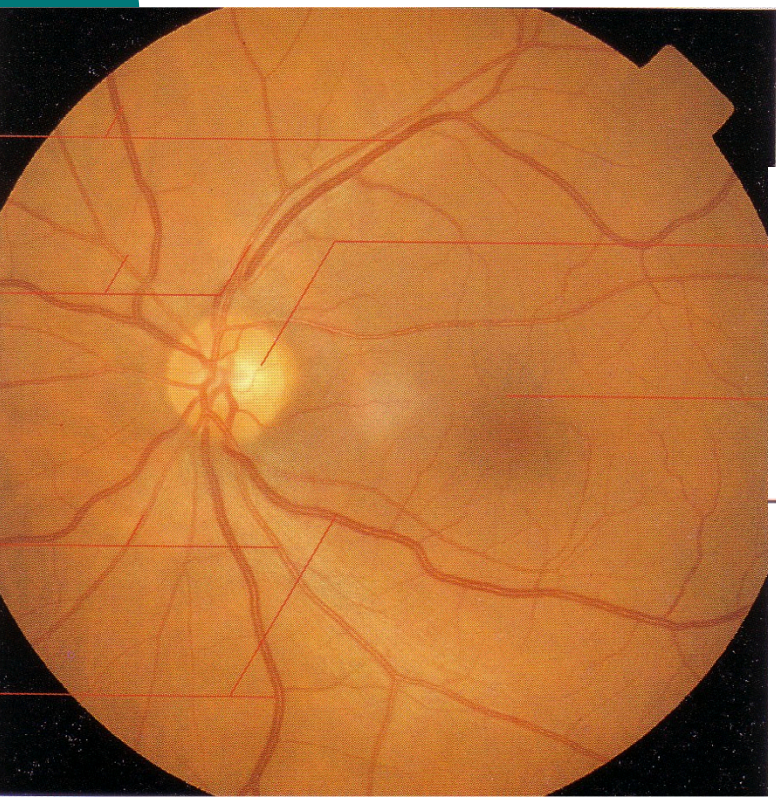


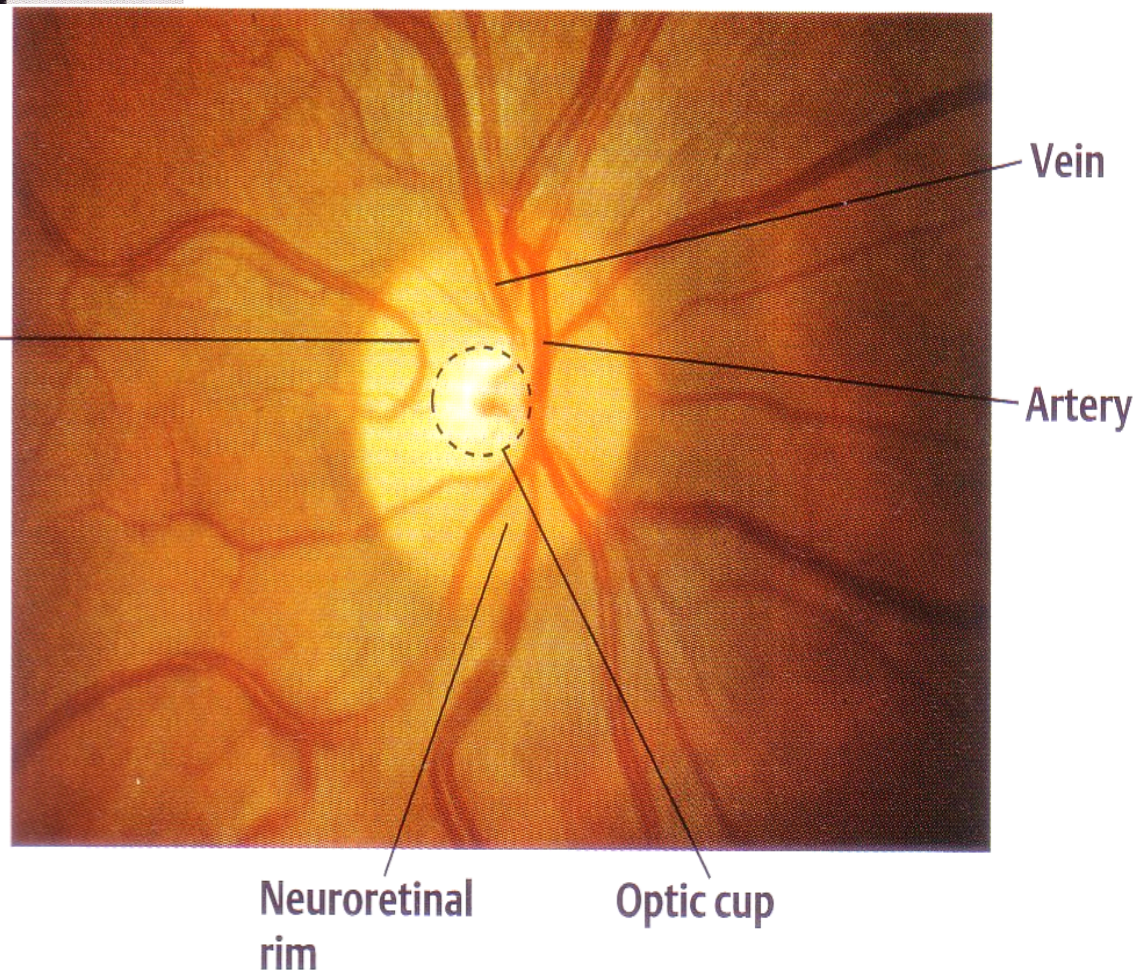
Schiotz

Air puff, non contact

I Care Tonometer

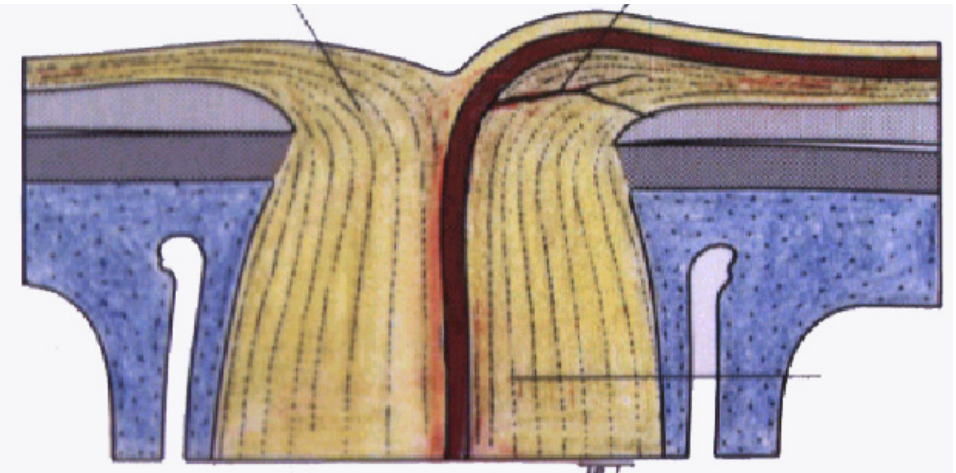
FUNDOSCOPY

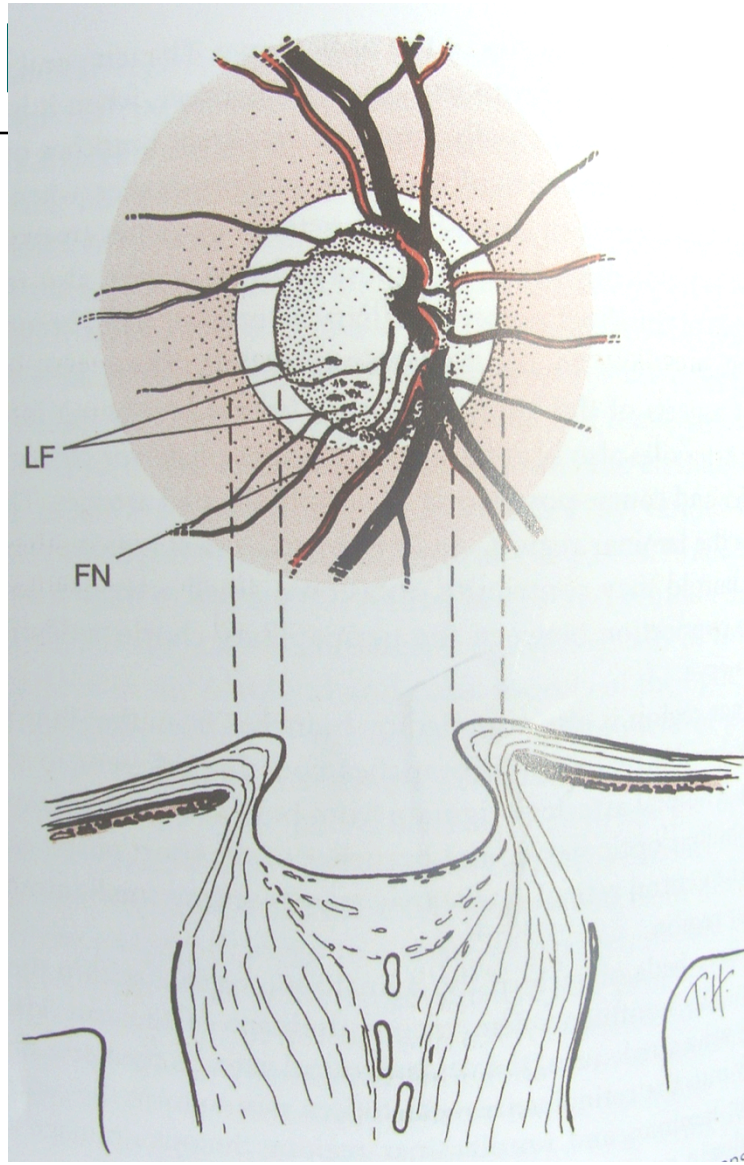




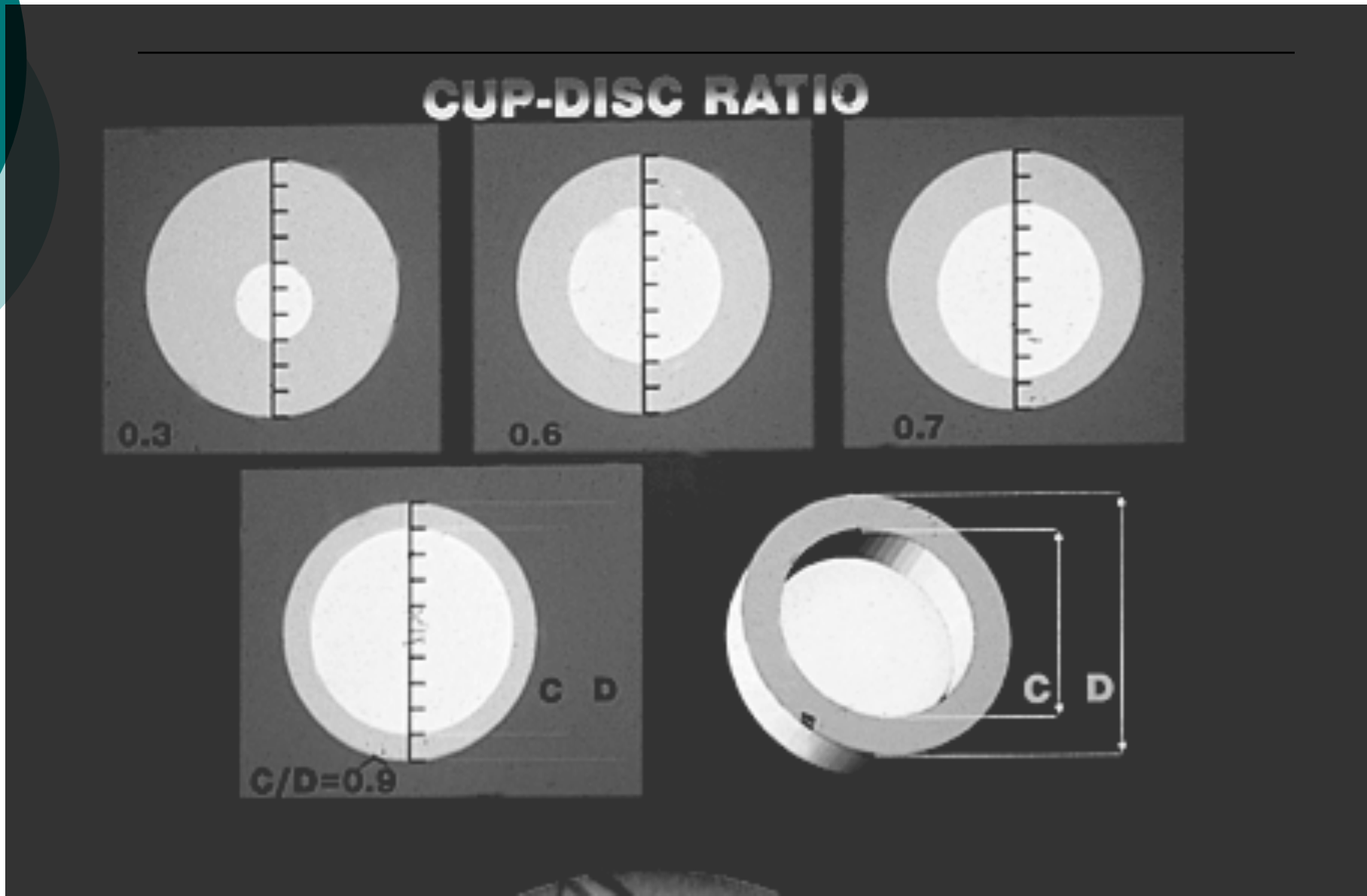
Glaucomatous cup

Thinning and undermining of neuro-retinal rim (bean pot)

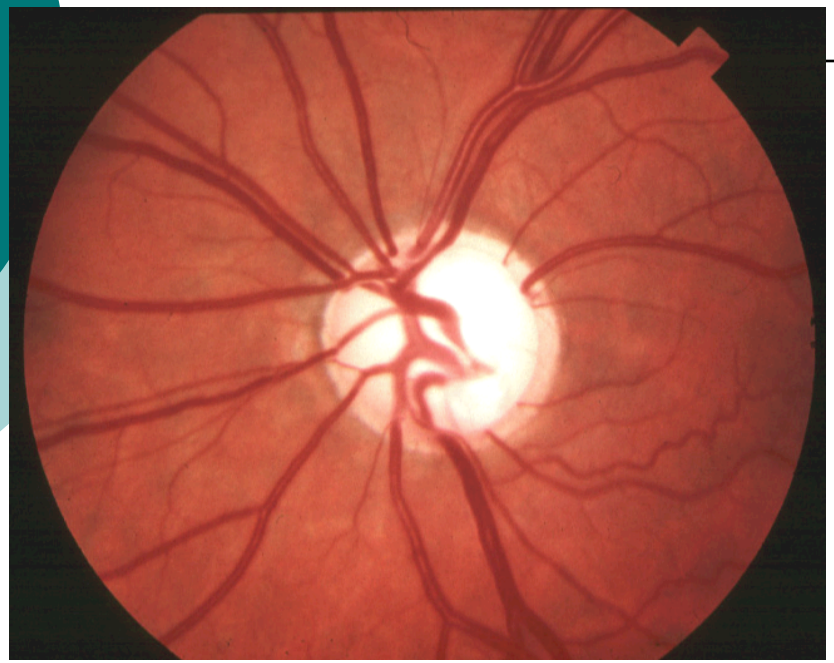


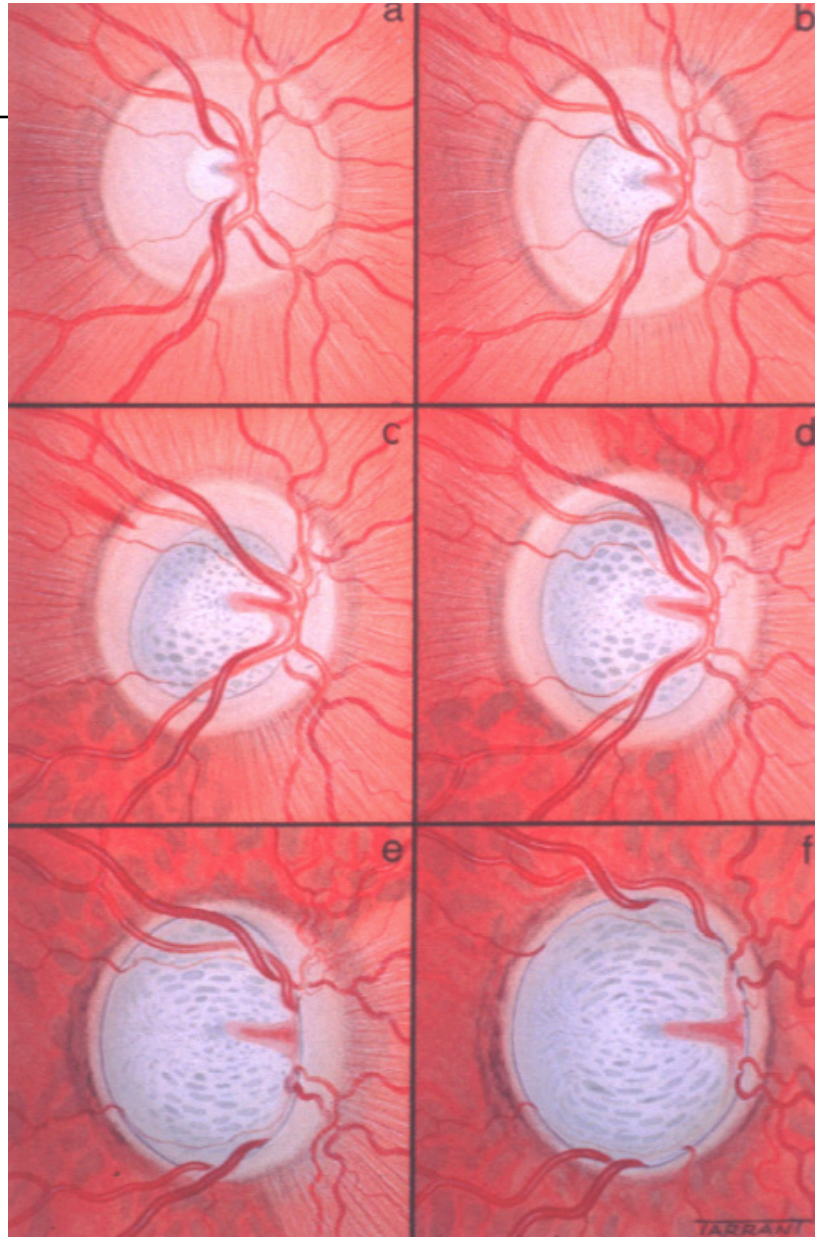


CUP-DISC RATIO (CDR)



Glaucoma fundoscopy

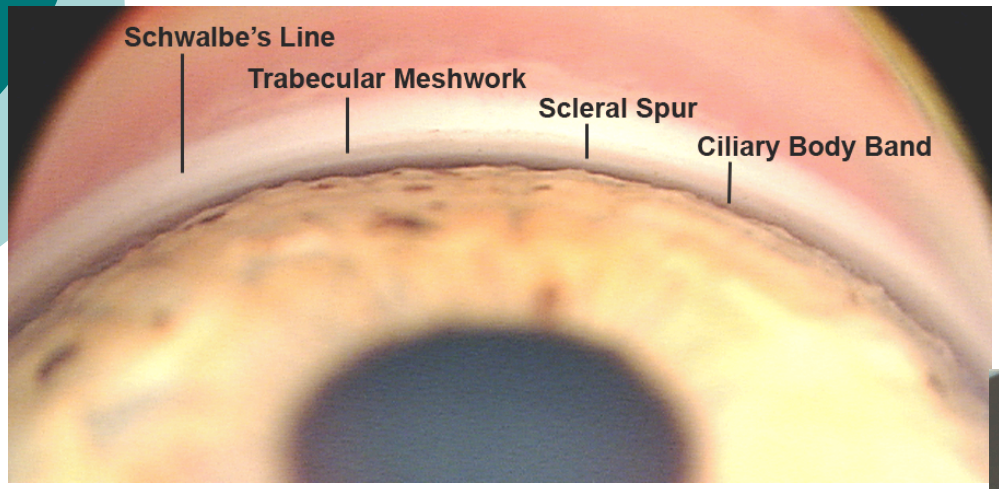




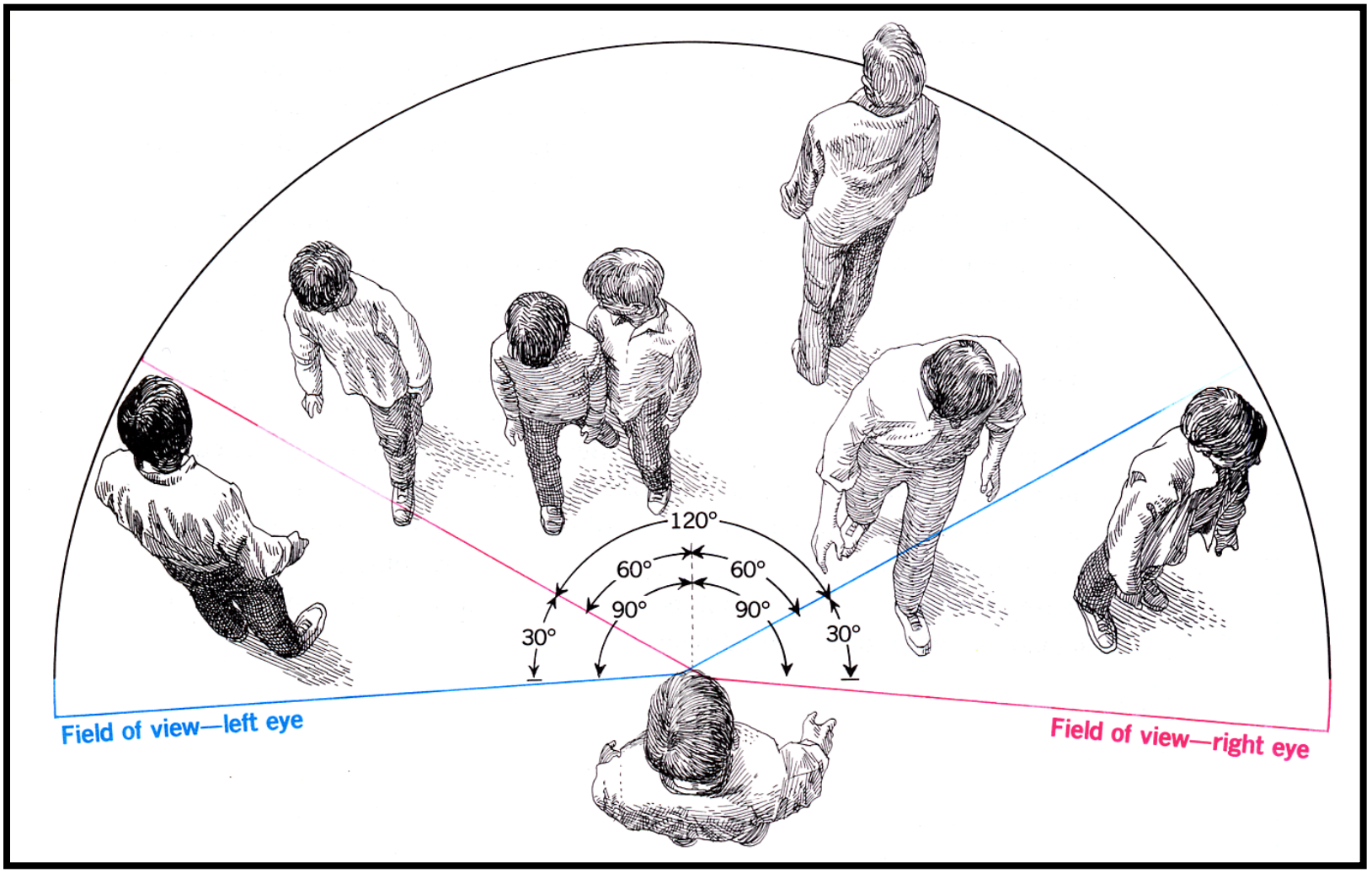
CDR, Nasal shifting, bayonetting, pallor

Gonioscopy (Assessment of A/C angle)

Normal angle - superior view

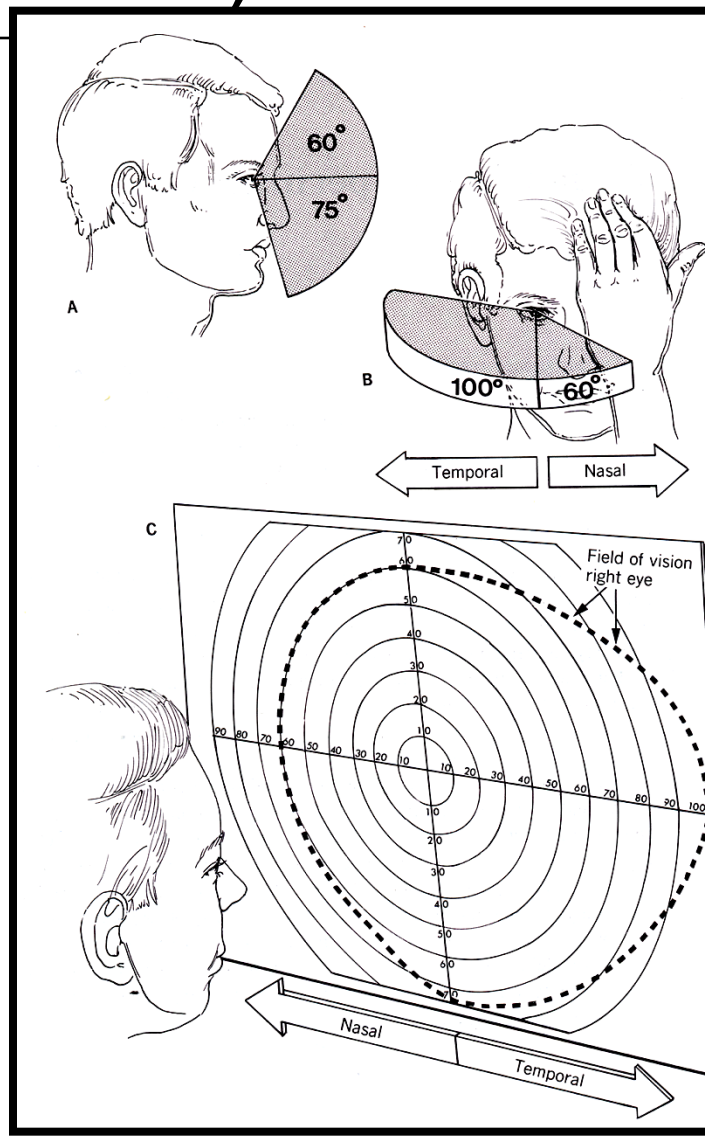


Visual Fields



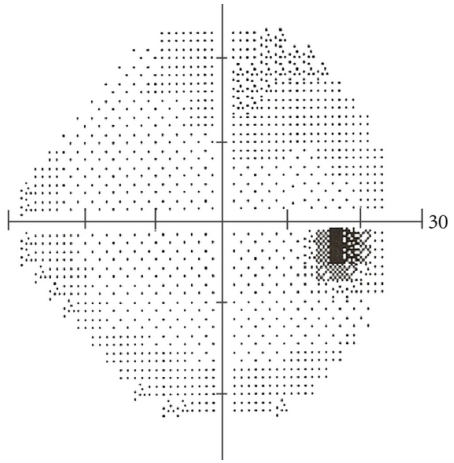
Perimetry (VF assessment)

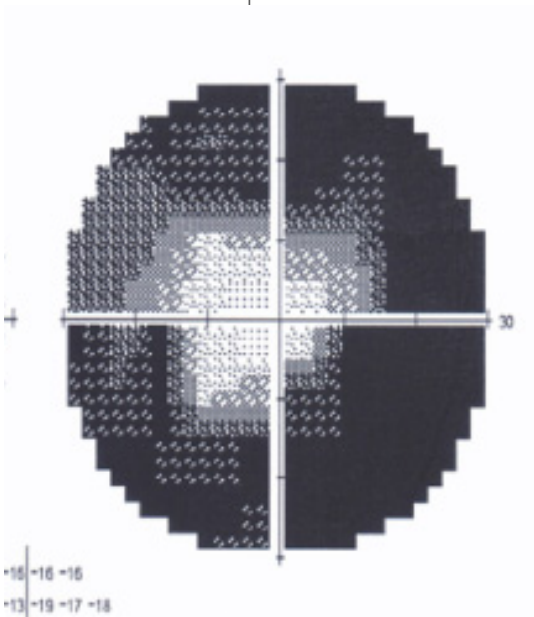
- Limits of the normal visual field:
  - 60 degrees superiorly
  - 75 degrees inferiorly
  - 110 degrees temporally
  - 60 degrees nasally.



The goal of perimetry is to measure visual function

Humphrey Visual Field Test





Visual Field testing

Confrontational testing: Gives rough idea of advanced visual field loss

Treatment of Glaucoma

- Medical treatment
- Surgical treatment

Medical Treatment

Beta adrenergic antagonists (B blockers)

- Timolol
- Betoxolol
- Levobunolol

Medical Treatment

Alpha Adrenergic agonists

- Alpraclonidine
- Brimonidine

Medical mngt. Cont.

- Cholinergic agonists (miotics)
  - Pilocarpine

Medical mngt. Cont.

Carbonic Anhydrase Inhibitors

Oral:

- Acetazolamide

Topical:

- Dorzolamide
- Brinzolamide

Medical mngt. Cont.

- Prostaglandin analogues
  - Latanoprost
  - Travoprost
  - Bimatoprost

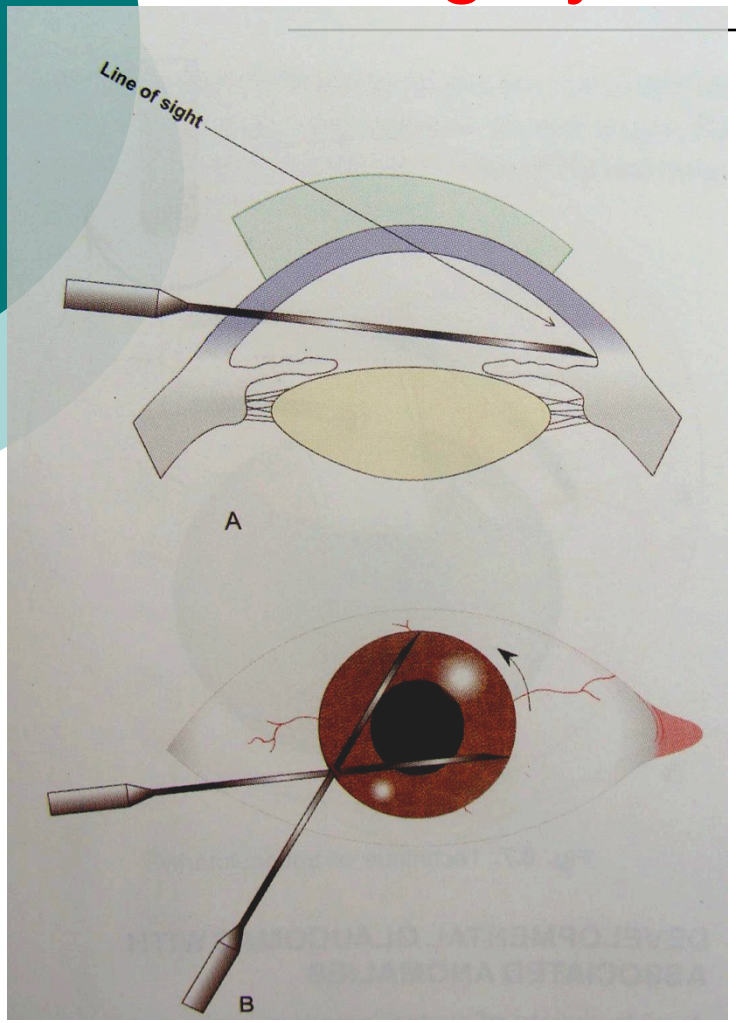
Medical mngt. Cont.

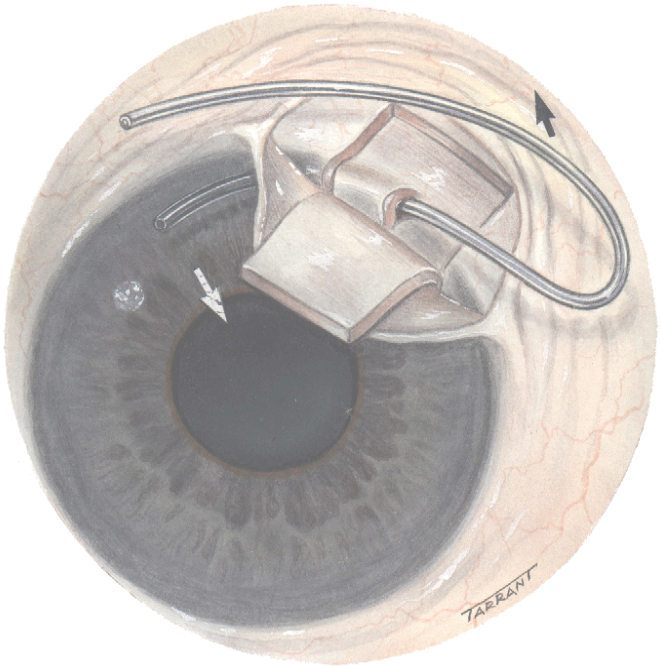
- Hyperosmotic agents
  - IV-mannitol
  - Oral-glycerin

Surgical mngt

- Goniotomy/ trabeculotomy
- Laser Trabeculoplasty (LTP)
- Nd:Yag laser iridotomy
- Trabeculectomy
- Artificial drainage shunts

Surgery for congenital glaucoma





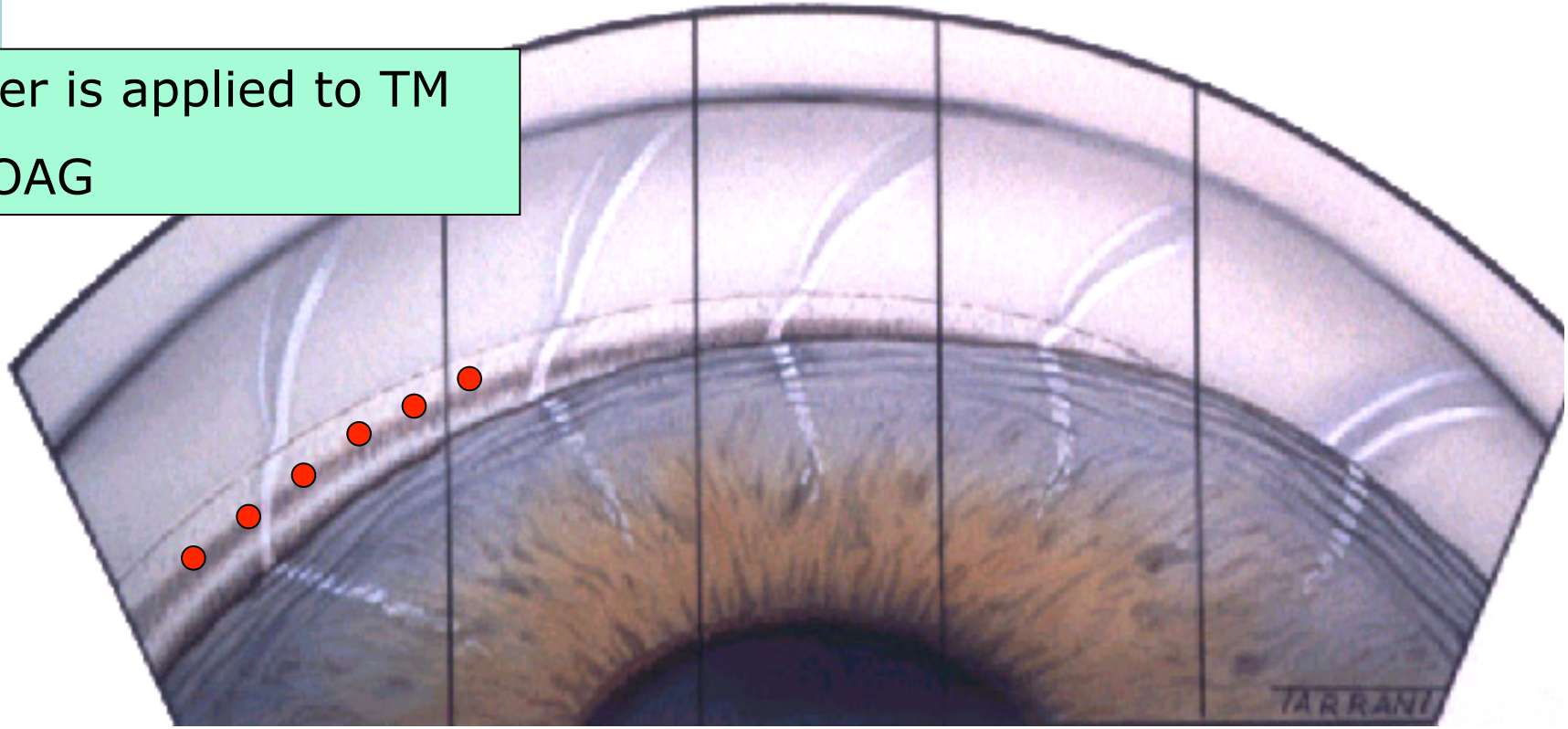
Trabeculotomy

Goniotomy

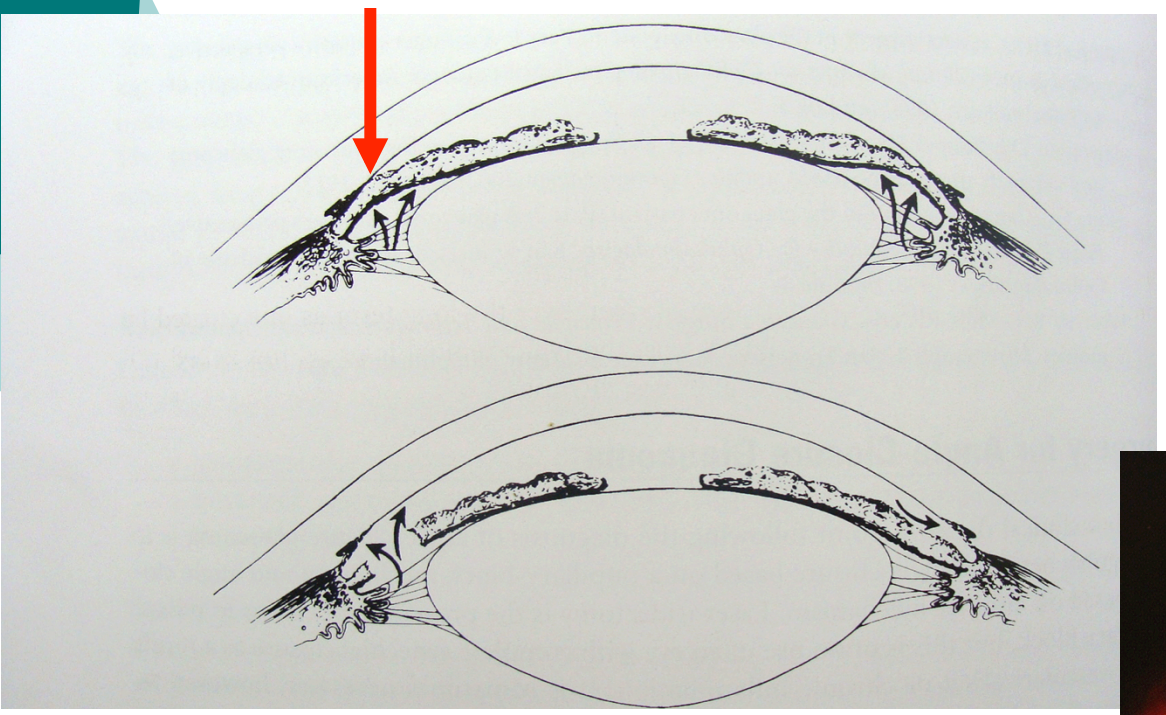
Laser Trabeculoplasty (ALTP)

Laser is applied to TM

- POAG

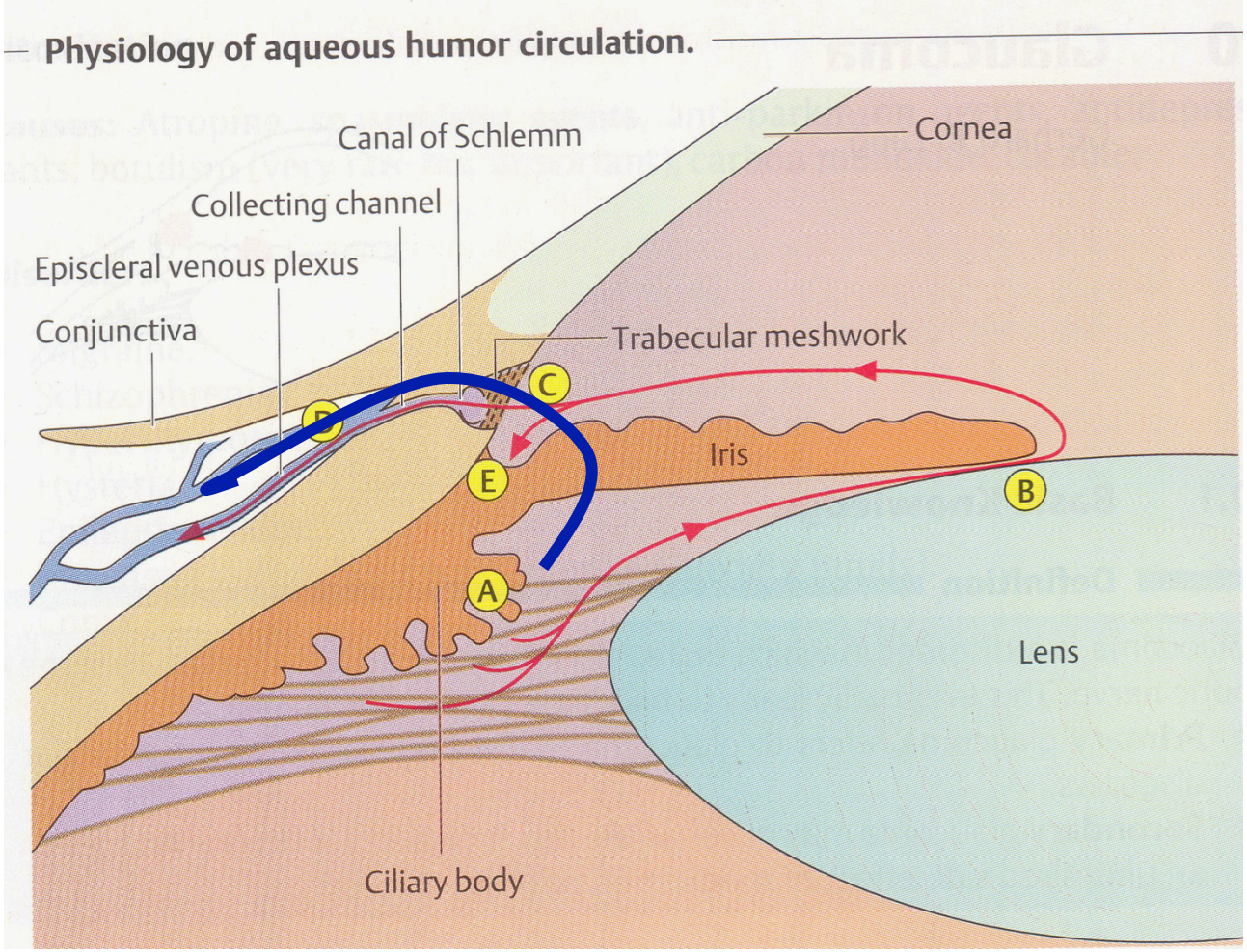


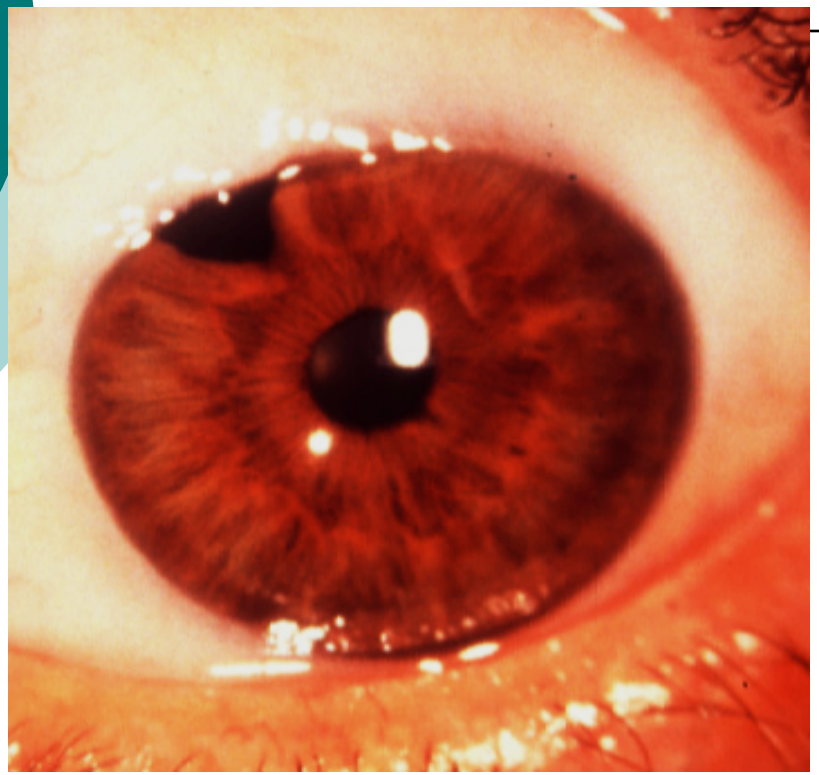
Nd-Yag iridotomy



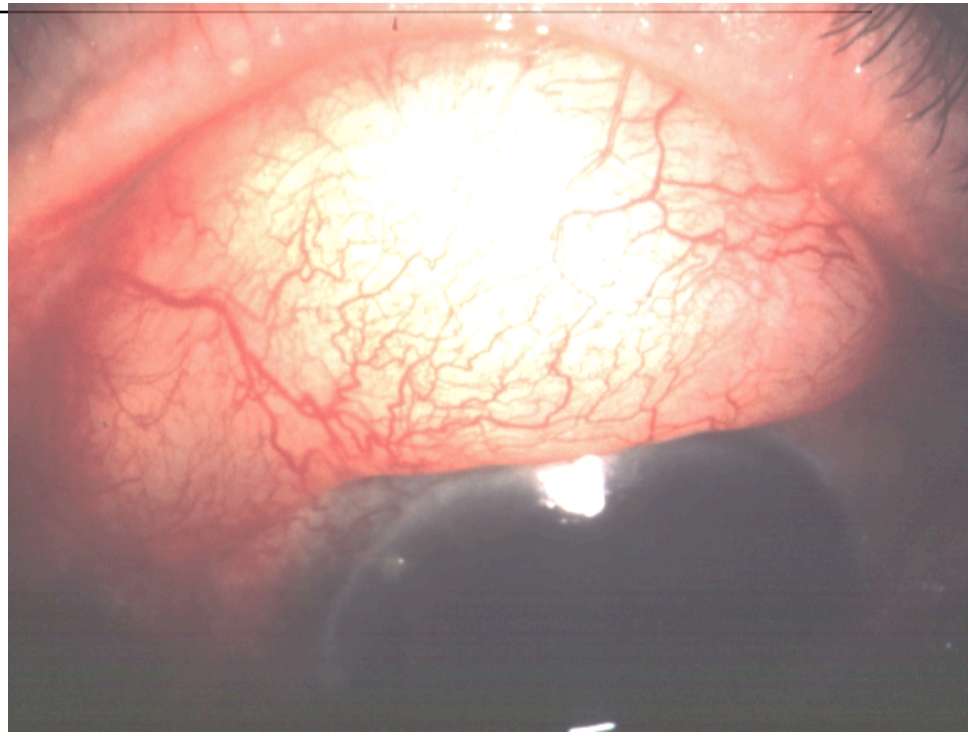
Yag Laser to create opening in the Iris

Trabeculectomy



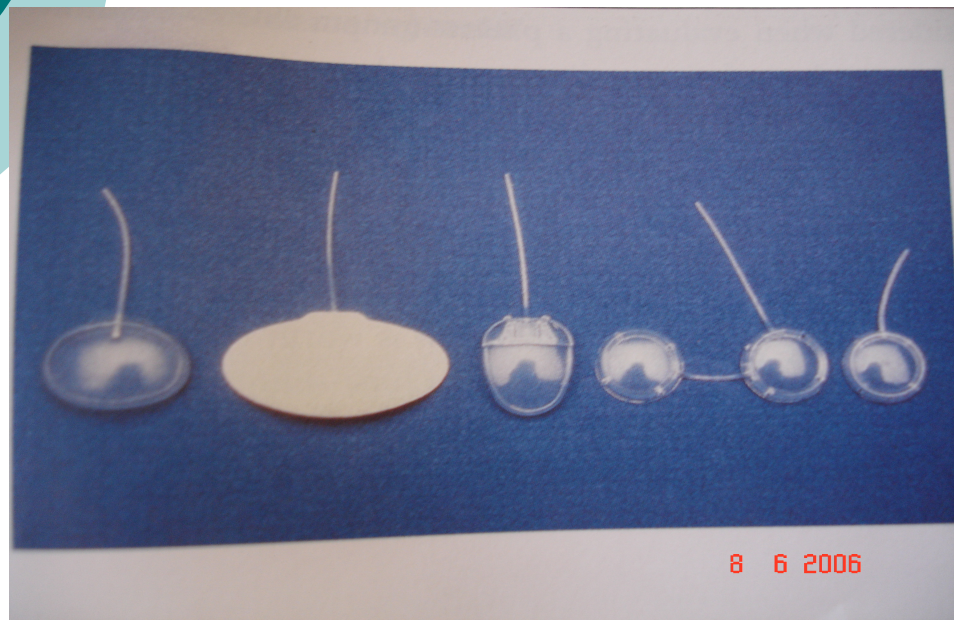


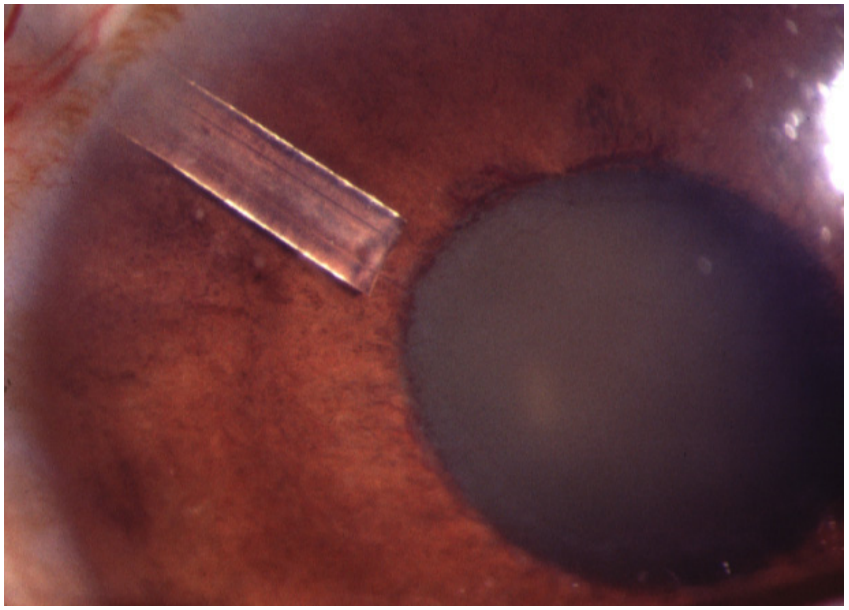
Peripheral iridectomy



Conjuctival bleb

Drainage shunts





Treatment Acute angle closure

- Ocular emergency
- Periorbital pain, headache, halos, blurred vision, vomiting, nausea
- Hx: Dim light, medications (anticholinergics, sympathomimetics)

Treatment Acute angle closure

- Analgesics
- Anti-emetics
- CAI
- B Bockers
- Osmotic diuretic (glycerol/iv mannitol)
- Pilocarpine every 15 mins (after IOP is lowered) and in fellow eye
- Laser Peripheral iridotomy 24-48hrs after IOP is controlled and in fellow eye