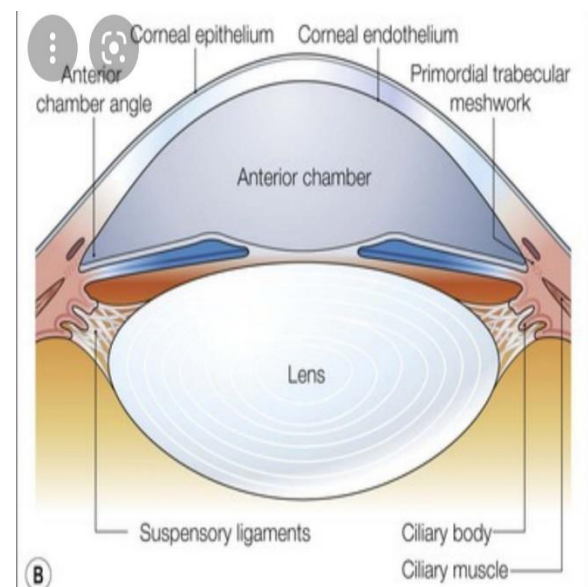


- Anterior chamber
- Anterior chamber angle
- Ciliary body
- Aqueous humour
- Intraocular pressure
- Glaucoma
- Anterior chamber is an angular space bounded anteriorly by the posterior (inner) surface of the cornea and posteriorly by the anterior surface of the iris and a part of ciliary body.
- Volume: 220 μ L.
- Depth: 3.15mm (2.6- 4.4mm)
- Chamber depth is shallower in the hypermetropic myopic
- Chamber depth is slightly diminished during accommodation

Anterior chamber angle

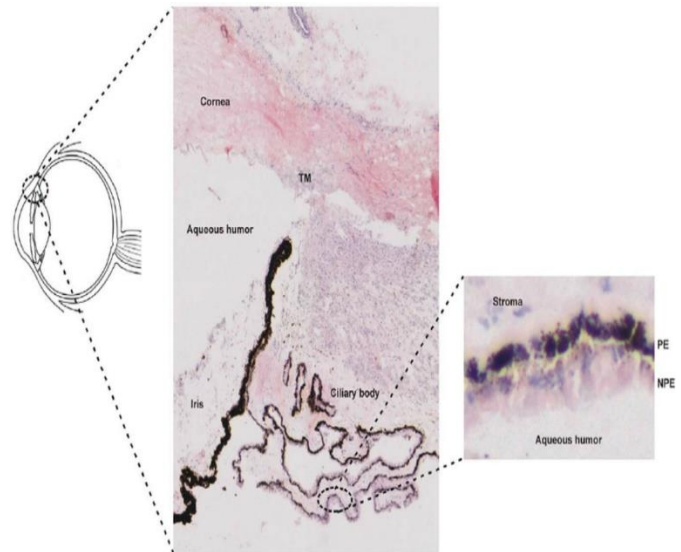
- The anterior chamber angle is a part of the eye located between the cornea and iris which contains the trabecular meshwork. The size of this angle is an important determinant of the rate aqueous humour flows out of the eye, and thus, the intraocular pressure. The anterior chamber angle is the structure which determines the anterior chamber depth. An extremely narrow anterior chamber angle is a feature of angle closure glaucoma



Ciliary body

- Gross anatomy
- • Ciliary body, iris and choroid comprise vascular uveal coat
- • Ciliary body: • 6 mm wide Triangular in cross section:
 - Ridged pars plicata (anterior 1/3) 2 mm /Pars plicata 70 ciliary processes
 - Smooth pars plana (posterior 2/3) 6 mm.

- Blood supply • Arterial supply:ciliary arteries
- Venous drainage •vortex system
- Nerve supply • Main innervation from branches of long posterior ciliary and short ciliary nerves
 - Parasympathetic fibers Sympathetic fibers
- *Histologically*
- divided into three parts
 - 1 .Ciliary epithelium (double layer)Inner non pigmented epithelium (NPE)Direct contact with aqueous humor • Outer pigmented epithelium (PE) • Between NPE and stroma
 - 2 .Ciliary stroma
 - 3. Ciliary muscle:Longitudinal,radial & circumferential •
- **Aqueous humour** is produced by the ciliary epithelium of the ciliary body pars plicata, .
- Aqueous outflow Anatomy
 - The trabecular meshwork (trabeculum) is a sieve-like structure at the angle of the anterior chamber (AC) through which 90% of aqueous humour leaves the eye.
 - The Schlemm canal is a circumferential channel within the perilimbal sclera .contconnect directly or indirectly with episcleral veins“.
- The ciliary body is a triangular structure located at the junction between the anterior and posterior segment.” “Anatomically it is part of the uveal tract ”.
- Physiology Aqueous flows from the posterior chamber via the pupil into the AC, from where it exits the eye via three routes **Trabecular outflow%90)** aqueous flows through the trabeculum into the Schlemm canal and then the episcleral veins. This is a bulk flow pressure-sensitive route so that increasing IOP will increase outflow .
- **•Uveoscleral drainage %10)** aqueous passes across the face of the ciliary body into the suprachoroidal space and is drained by the venous circulation in the ciliary body, choroid and sclera
- **•.Iris** .some aqueous also drains via the iris.



- Aqueous Humor Properties •
- Clear fluid •
- Composition: • No cells and less than 1% of proteins
- Volume in AC and PC = 0.30 ml
- Rate of secretion = 3 ul/min (therefore takes 100 min to completely reform AC and PC)
- Three functions
 1. Maintains volume and IOP
 2. Nutrition for avascular ocular tissue (cornea, trabecular meshwork, lens, vitreous)
 3. Optical role

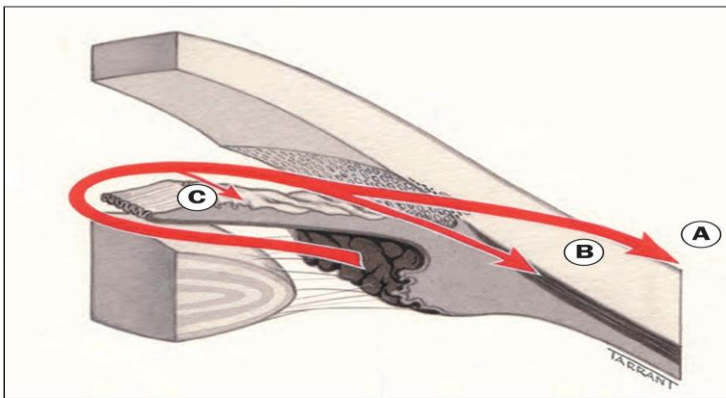
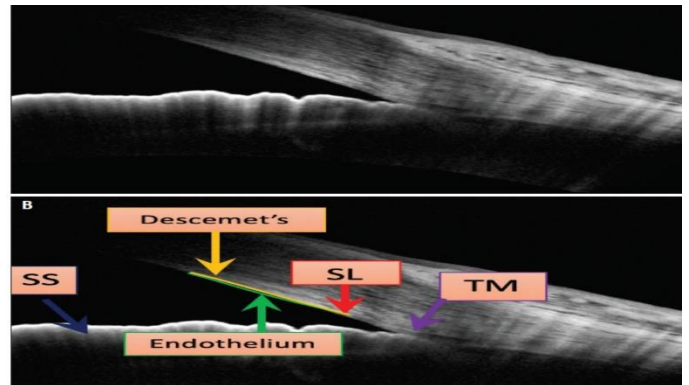
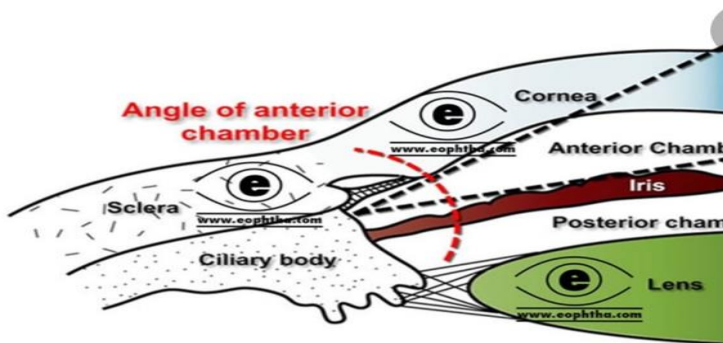
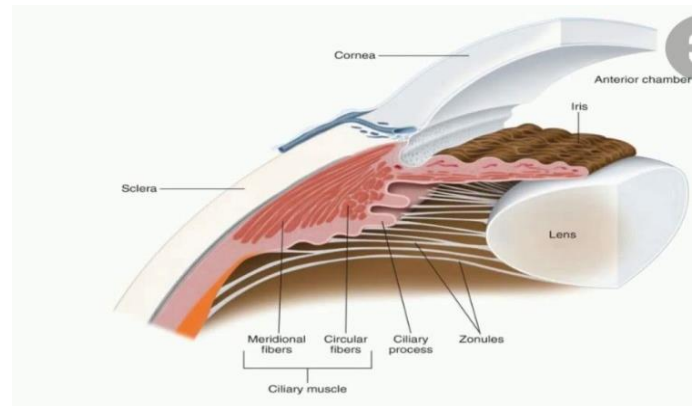
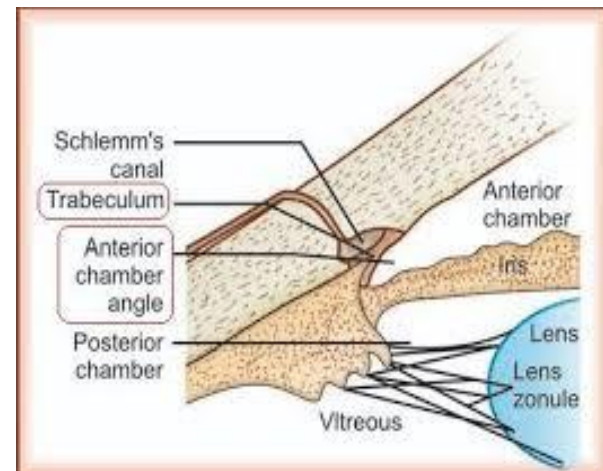


Fig. 11.3 Routes of aqueous outflow. (A) Trabecular; (B) uveoscleral; (C) iris



- **Intraocular pressure (IOP)**
- Is determined by the balance between the rate of aqueous production and the rate of aqueous outflow.
- Concept of normal intraocular pressure The upper range of normal for adults is 21 mmHg on applanation tonometry



Glaucoma

- Glaucoma is the leading cause of blindness in many parts of the world. glaucomatous optic nerve damage is associated with a progressive loss of peripheral vision that can lead to total irreversible blindness.

Glaucoma is a group of diseases that share

- 1-increased IOP
- 2-optic nerve head damage
- 3-visual field loss

PRIMARY OPEN-ANGLE GLAUCOMA

Primary open-angle glaucoma (POAG) is a chronic ,progressive optic neuropathy of adult onset.

Risk factors

- 1.IOP. The higher the IOP, the greater the likelihood of glaucoma.
2. Age. POAG is more common in older individuals.
Age. POAG is more common in older individuals
3. Race. commoner in black individuals than in whites.
- 4.Family history of POAG. First-degree relatives of patients with POAG are at increased risk.
5. Diabetes mellitus

- **Symptoms** :it is bilateral with a very chronic course , there are usually no symptoms until the patient develops

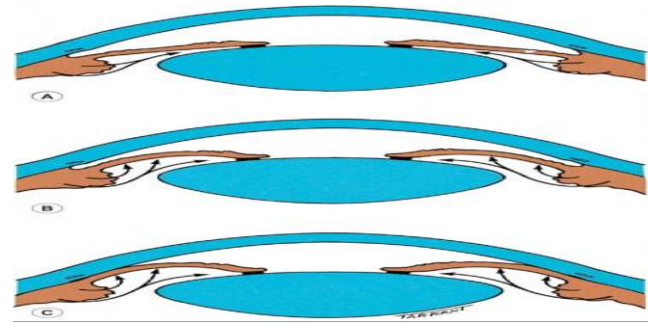
advanced visual field loss:

Sign

- Iop increase more than 21 mmHg
 - Optic nerve cupping
 - VF loss detected by perimetry
 - open angle on gonioscopy.
- **Treatment** :
 - the aim of treatment is to lower the IOP to the normal level in order to prevent further damage to the optic nerve
- 1.Medical RX
 - 2.laser trabeculoplasty
 - 3.filtration sx
 - 4.Shunt sx . -

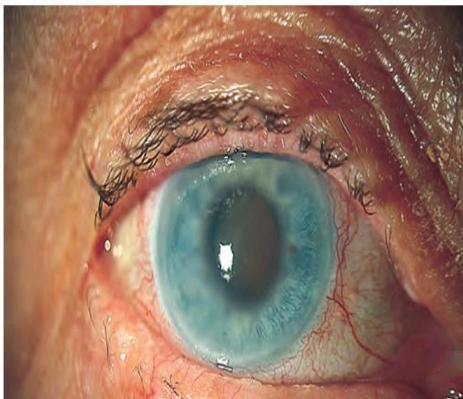
PRIMARY ANGLE-CLOSURE GLAUCOMA

- It is a condition in which the peripheral iris opposes the trabecular meshwork and obstructs aqueous outflow. patient at risk is usually an old person with hyperopia and a shallow anterior chamber.

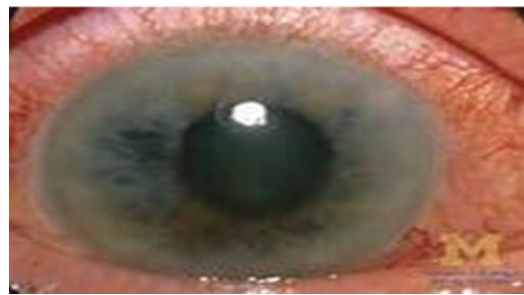


Stages:

- 1-subacute attack 2-acute angle closure 3-chronic angle closure
- Symptoms of acute attack:** severe eye pain, nausea, vomiting, and halos around lights.
- Signs:** ciliary congestion, corneal edema, fixed mid-dilated pupil, and IOP elevation (40-80 mmHg).
- Treatment:** acute attack is an emergency
- 1-reduction of IOP : start with systemic drugs e.g. acetazolamide diuretic as injections or intravenous mannitol infusion 20% in addition to topical beta blocker drops (timolol 0.5%)
- 2-relieve the angle closure by constricting the pupil by miotic drops (pilocarpine drop)
- 3-reduce inflammation by topical steroids
- 4-pain killers
- 5-laser peripheral iridotomy : after few days when the inflammation decreases.
- 6-prophylactic laser peripheral iridotomy for the other eye



PNAG (acute attack)



Laser peripheral iridectomy

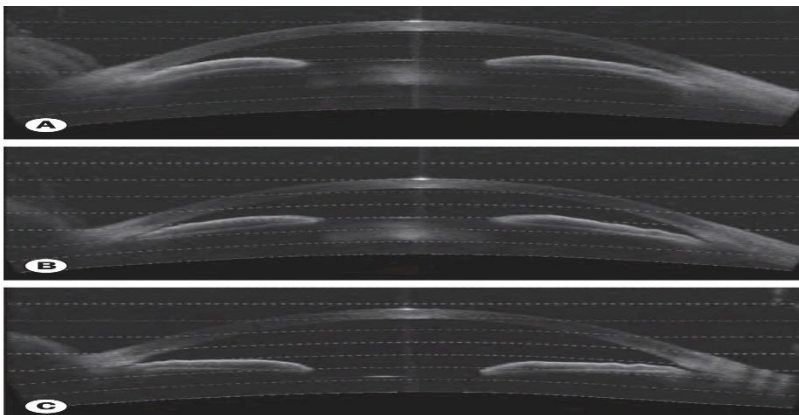
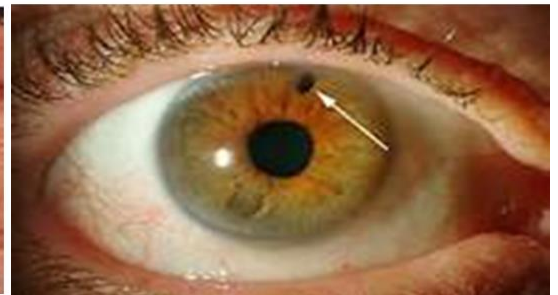


Fig. 11.39 OCT showing (A) configuration of Iris before laser PI; (B) after laser PI; (C) after lens extraction