



DIAGNOSTIC & THERAPEUTIC APPROACHES IN OPHTHALMOLOGY

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Chapter 5

Skills 34-47

- Cornea
- Ophthalmic traumatology
- Crystalline Lens

TS 34 : Cornea (Anatomy)

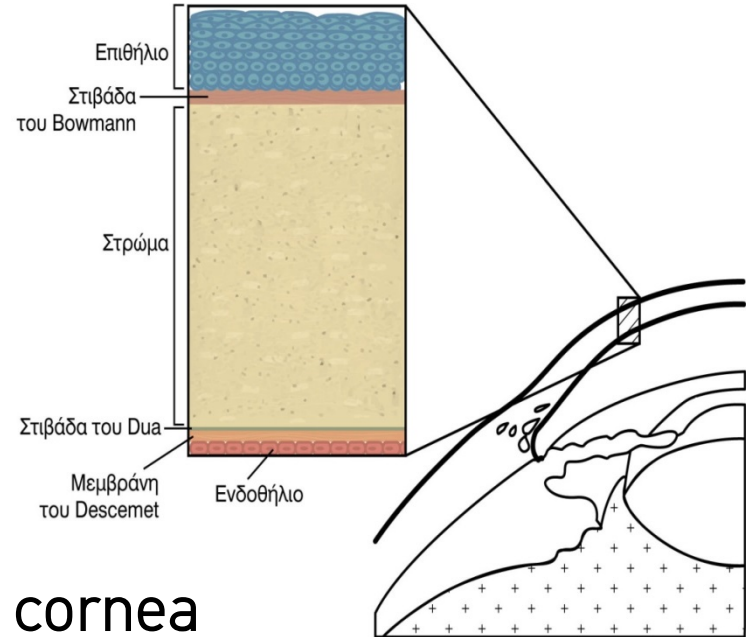
■ 6 Layers

- i. Epithelium
- ii. Bowmann's l.
- iii. Stroma
- iv. Dua's l. (2013)
- v. Descemet m.
- vi. Endothelium

- Tear layer represents a functional element of the cornea

- **Innervation** → V1 CN (ophthalmic n.)

- AVASCULAR TISSUE!



TS 34 : Epithelium - Function

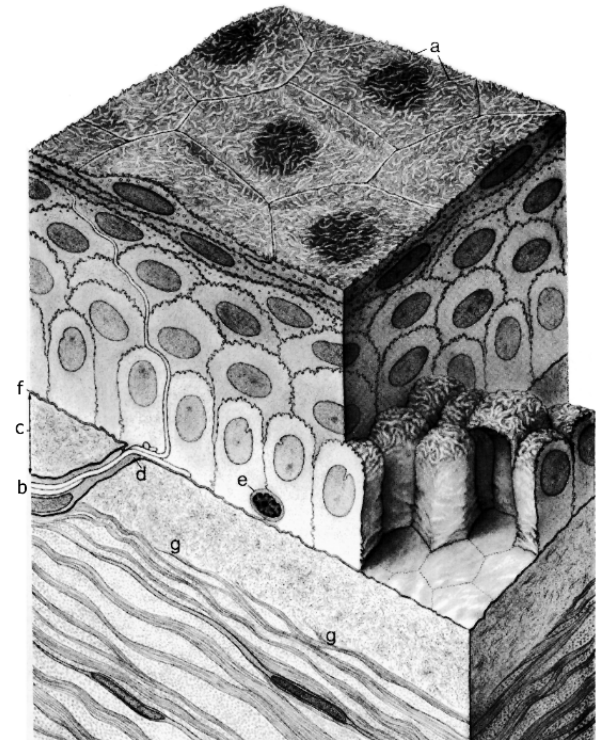
- The epithelium:

a) Binds the tear layer with cornea
(by reducing the liquid surface tension)

b) Makes corneal surface hydrophilic

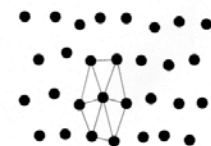
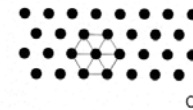
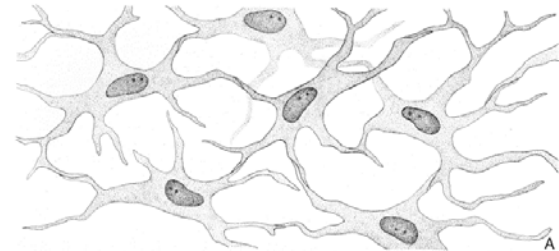
g) Takes essential part in corneal
metabolism

d) Forms an external barrier
permeable to water and small
molecules only



TS 34 : Stroma - Function

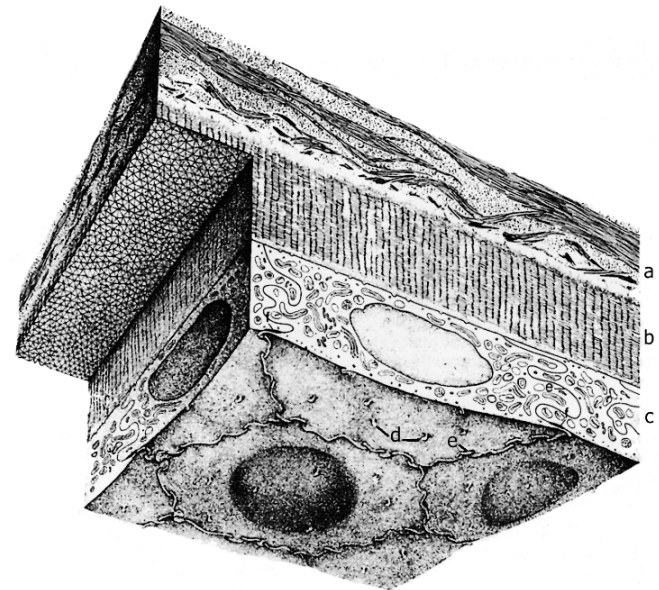
- The stroma
 - a. eliminates scattering of light (patterned collagen structure)
 - b. maintains its transparency due to relatively low amounts of water contained. Excess water → Corneal oedema → Opacity



D

TS 34 : Endothelium - Function

- The endothelium
 - Allows absorption of nutrients and H₂O
 - Maintains water equilibrium
K⁺/Na⁺ pumps



TS 35 : Neurotrophic keratitis

- Ophthalmic n. palsy (V1)
or frequent use of
anaesthetic drops



- Reduced corneal
sensitivity



- Epithelial brake down –
Ulcers



TS 35 : Exposure keratitis

- Facial n. palsy (VII)
↓
- Lagophthalmos
↓
- Corneal exposure
↓
- Infections-Thinning



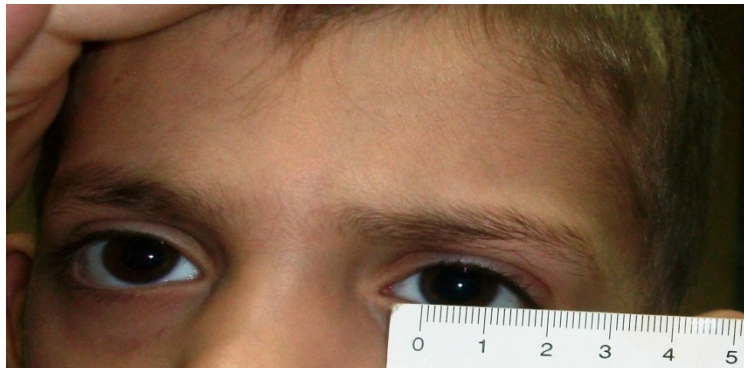
Management :

Artificial tears – Oints – Patching during sleep - Tarsorrhaphy

TS 36 : Congenital cornea disorders

Megalocornea

- Corneal diameter $>12\text{mm}$
- Remarkably thin cornea
- Normal IOP



Buphthalmus

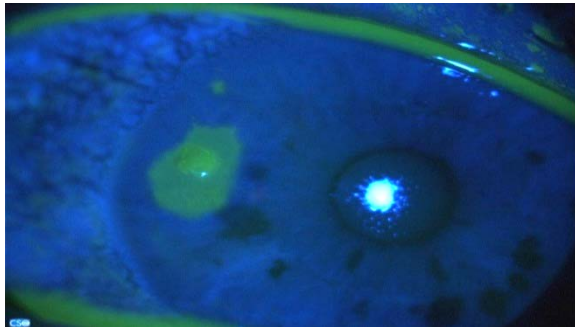
- Progressive increase in diameter ($>12\text{mm}$)
- Opaque cornea
- ↑ IOP ($>21\text{mmHg}$)
- Congenital glaucoma



TS 37 : Corneal inflammations

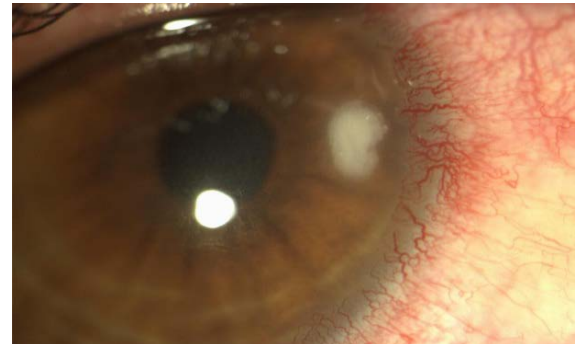
Epithelial erosion

- Traumatic cause
- Acute pain, photophobia, watery eye
- Fluorescein staining
- Prophylactic antibiotics and pressure bandage



Infiltration

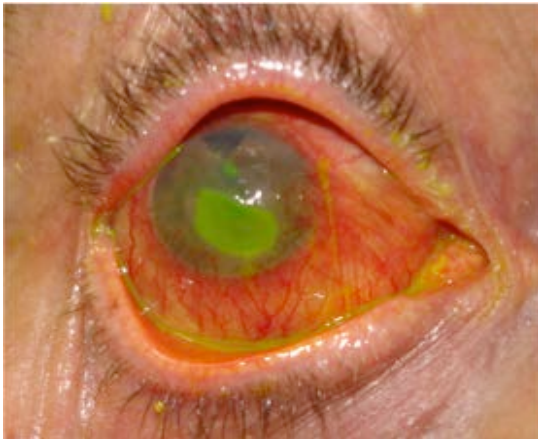
- Inflammatory migration of leukocytes and other inflammation products into the corneal stroma
- Intact epithelium
- Treatment according to the cause (mainly bacteria)



TS 37 : Corneal inflammations

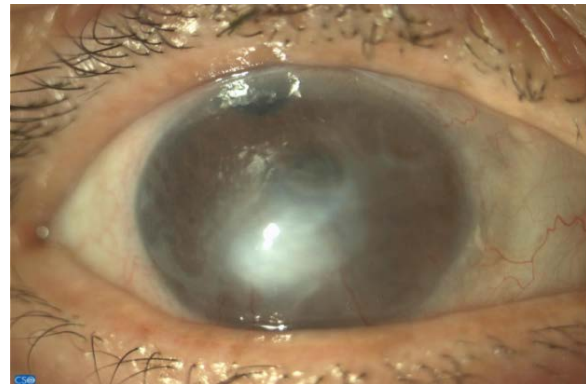
Ulcer

- Epithelial and stromal disruption due to inflammation
- Treatment according to the cause (mainly bacteria)
- Corneal scrapes



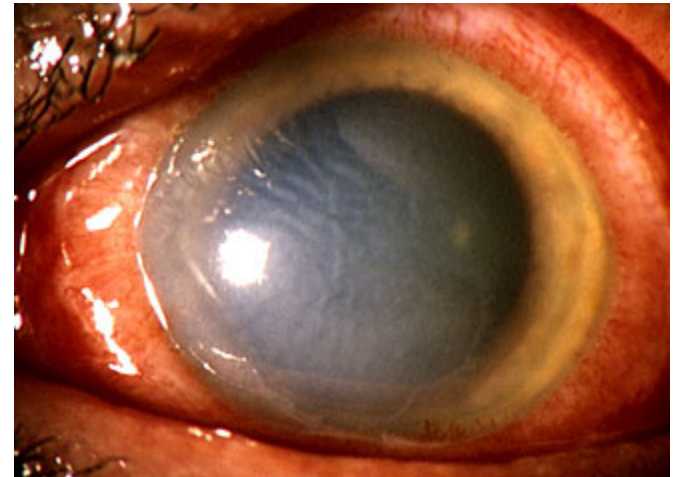
Scar

- Into the stroma, intact epithelium, no staining with Fluorescein
- Grey to white colour
- Burn, trauma, infection, congenital disorder



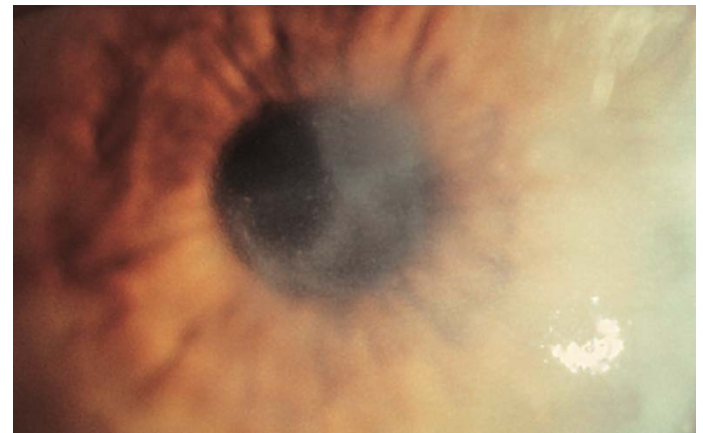
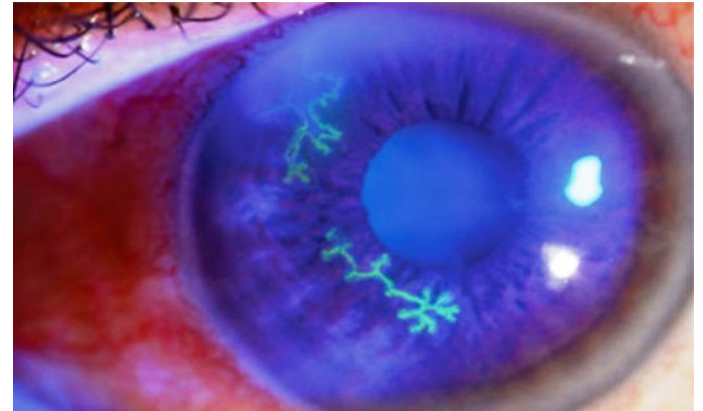
TS 38 : Ultraviolet keratitis

- Punctate epithelial keratitis manifesting 12 h after exposure to UV radiation
- Usually from the electric arc during welding
- Visual loss, watery eye, intense pain
- Treated with instillation (only once) of anesthetic eye drops, antibiotic eye ointment and pressure bandage



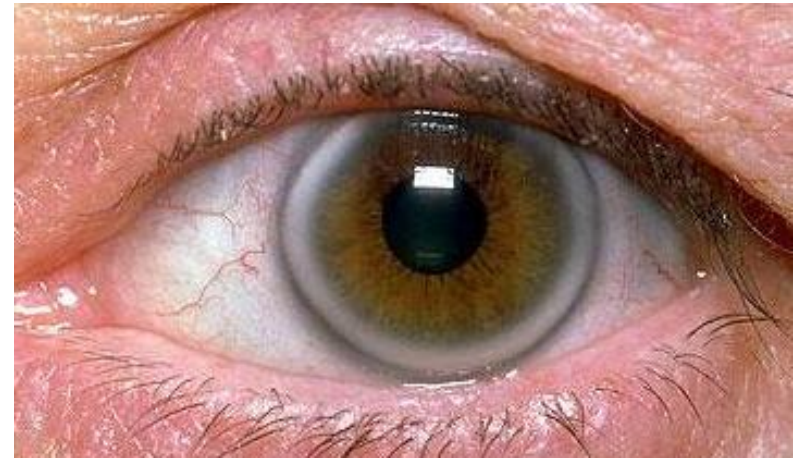
TS 39 : Herpetic keratitis

- The commonest ophthalmic manifestation of HSV
- Unilateral, Superficial, Recurrent keratitis with typical **dendritic ulcer** →
- Steroid prescription or failure to treat may lead to **disciform keratitis** →
- Treatment: antiviral drugs (acyclovir), topical and per os for at least 10 days



TS 40 : Arcus senilis/Arcus lipoides

- Whitish ring in the corneal periphery
- Cholesterol and lipid storage in the corneal stroma
- In young patients blood lipid control should be performed whilst in older patients it has no specific pathological meaning



TS 41 : Contact lenses complications

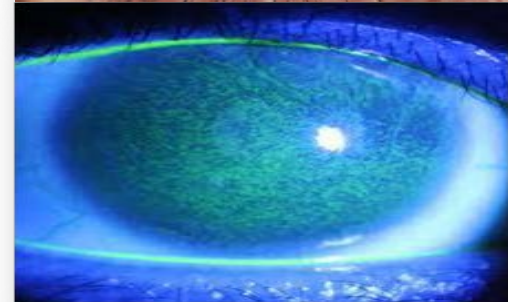
a) Giant papillary conjunctivitis

b) Punctate keratiti s

c) Subepithelial keratitis

d) Corneal neovascularization

e) Corneal ulcers

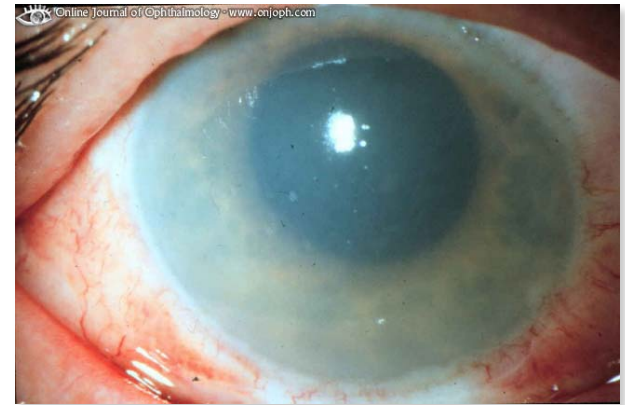


TS 42 : Chemical – Thermal burns

- Most dangerous → Alkali (due to greater penetration ability)
- Lead to permanent scars and symblepharon
- The ultimate ophthalmic emergency
- Urgent :
 - Anesthetic eye drops
 - Continuous water flushing
 - pH Evaluation
 - Removal of solid increments
 - Referral to Ophthalmologists



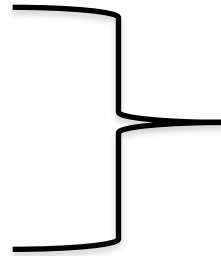
Alkali burn



Battery liquid burn

TS 43 : Eyelid lacerations

- Simple lacerations → **Repair** with 5/0 or 6/0 interrupted sutures
- Involvement of:
 - Lid margin
 - Lateral canthus
 - Lacrimal canaliculi



Immediate referral to
Ophthalmologist

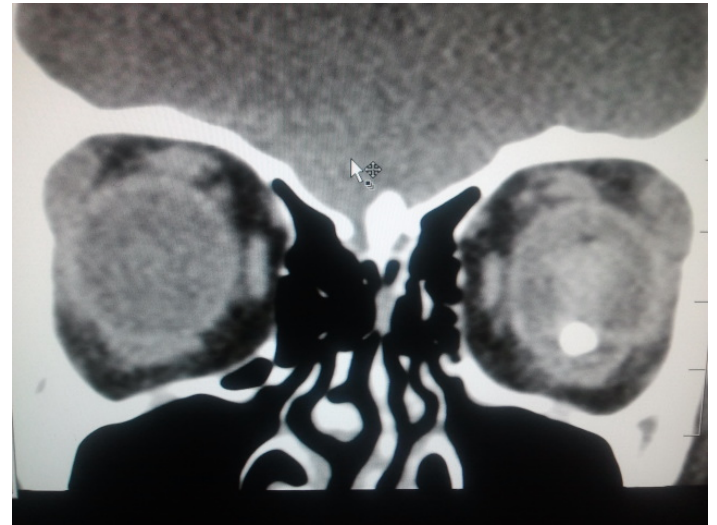


TS 44 : Penetrating eye injury

- Hx !!! (intraocular foreign body?)
- FB inspection using :
 - Rö X-rays (metal)
 - CT
- Soft eye
- Conjunctival chemosis
- Pupil distortion
- Leukokoria (traumatic cataract)
- Iris proptosis
- Subconjunctival pigment



✘ Manifestations of penetrating eye injury



TS 45 : Contusio bulbi

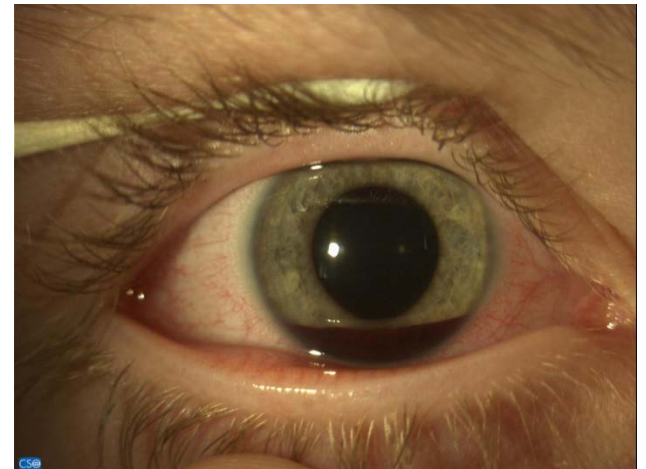
- Conjunctiva → Hyposphagma 

- Cornea → Hyphaema and iridoplegia
but also....

- i. Raise of intraocular pressure
- ii. Corneal blood staining
- iii. Vitreous haemorrhage
- iv. Retinal tears

- Late complications:

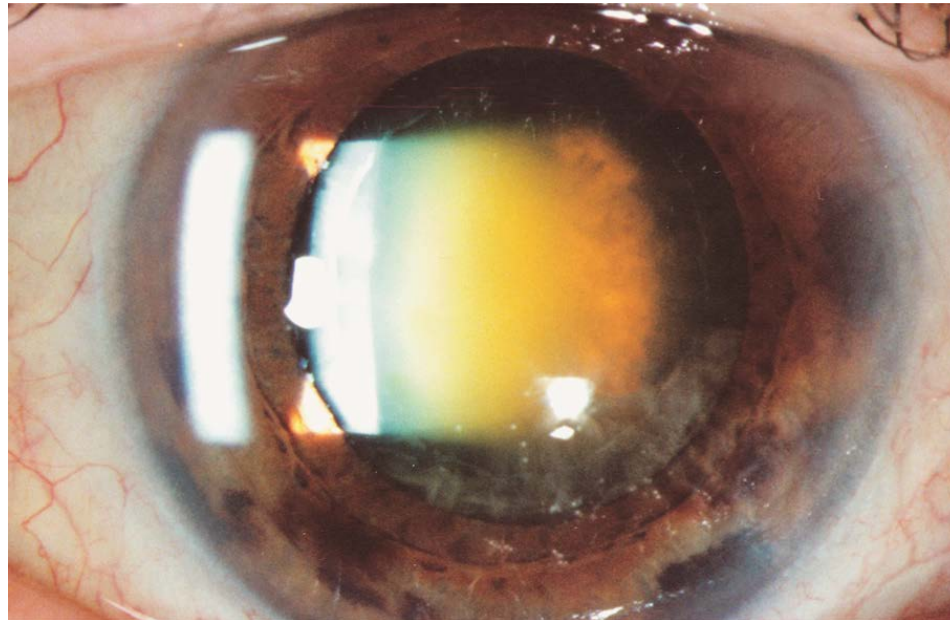
Secondary glaucoma
Retinal detachment
Cataract
Phthisis bulbi



TS 46 : Cataract

What is cataract?

«Clouding of the Crystalline Lens»



TS 46 : Cataract - Types

- Cataract can be classified according to the:

a) cause

Senile, secondary, traumatic

b) patient age

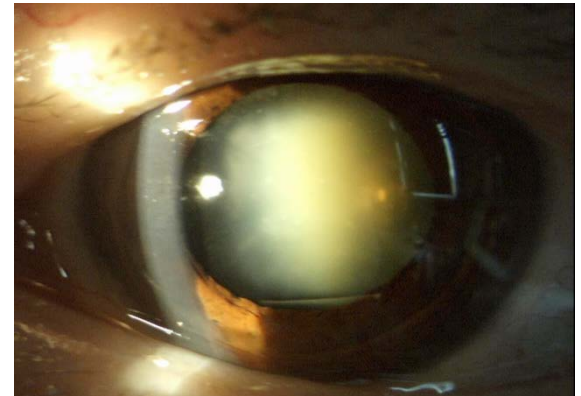
Congenital, pediatric, juvenile, senile

c) intensity

Incipiens, progressive, mature, hypermature

d) localization

Nuclear, cortical, subcapsular, polar



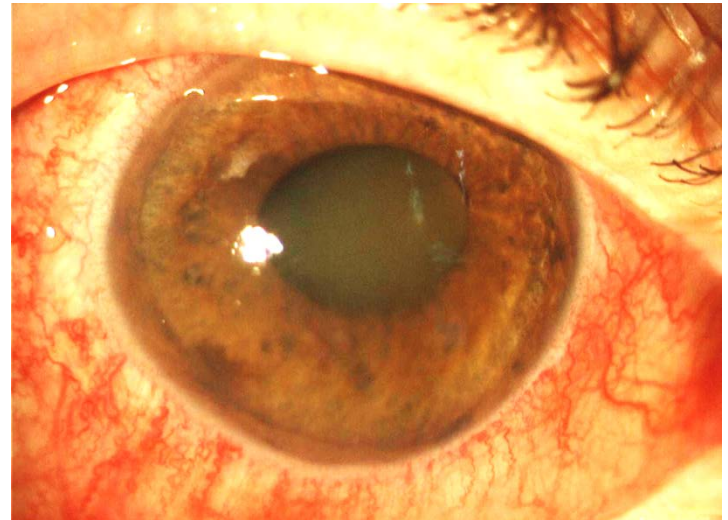
Nuclear cataract



Mature cataract

TS 46 : Lens induced glaucoma

- Complication of lens hypermaturation
- Phacotopic, phacolytic, phacoanaphylactic, lens particle
- Surgical lens removal
- Conservative treatment for
 - High Intraocular Pressure
 - Inflammation



TS 47 : Cataract surgery

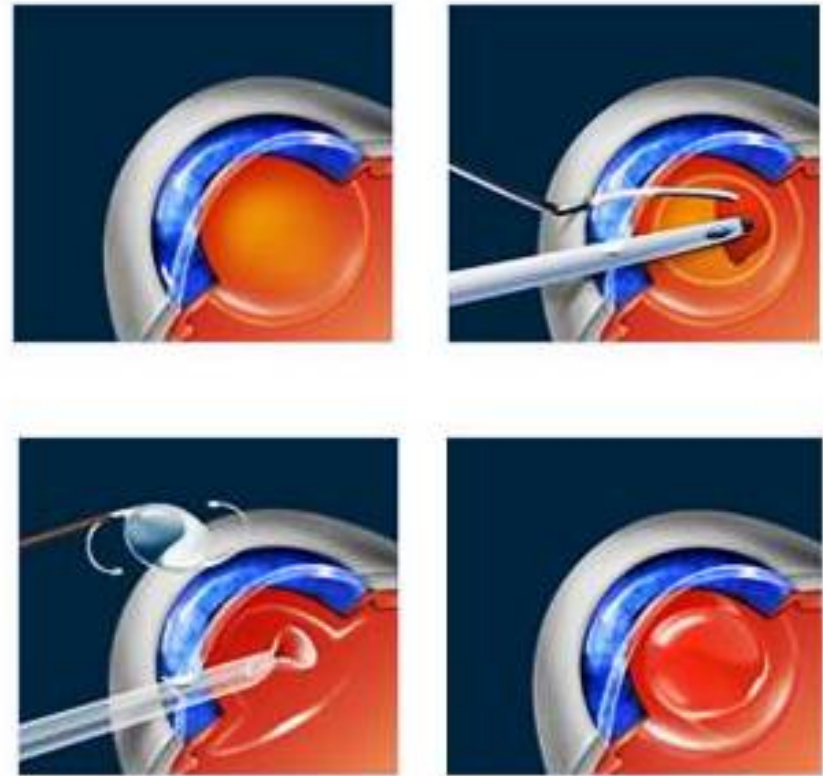
- Absolute indication →
 - i. Lens induced glaucoma
 - ii. Congenital
- In **senile cataract** indication is relevant and depends on patient's needs
 - Main symptoms
 - a) Blurry distance vision
 - β) Reduced contrast sensitivity
 - γ) Photophobia - Halos



TS 47 : Cataract surgery

Phacoemulsification

- Anesthetic eye drops
- Corneal incision 2,5 mm
- Capsulorrhexis
- Emulsification of the lens nucleus
- Aspiration of lens material
- Intraocular lens implantation



Electronic Referrals – 5th Chapter

1. <http://emedicine.medscape.com/article/798100-overview>
2. http://www.optometry.co.uk/uploads/articles/586d7b2b81d5c23cb892cbef09ce9a6e_Bailey1990604.pdf
3. <http://emedicine.medscape.com/article/799025-overview>
4. <http://emedicine.medscape.com/article/1215950-overview>
5. <http://www.slideshare.net/drwreckloose/penetrating-ocular-injuries>
6. <http://emedicine.medscape.com/article/798223-overview>
7. http://www.revophth.com/content/d/plastic_pointers/i/1341/c/25686/
8. <http://emedicine.medscape.com/article/1210914-overview>
9. <http://www.cataracteye.com/simulation.html>
10. <http://www.youtube.com/watch?v=jxhX0nOoJLE>