Chapter 5
Skills 34-47

- Cornea
- Ophthalmic traumatology
- Crystalline Lens

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TS 34 : Cornea (Anatomy)

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

- Tear layer represents a functional element of the cornea
  - Innervation $\rightarrow$ 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
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
The endothelium

- Allows absorption of nutrients and $\text{H}_2\text{O}$
- Maintains water equilibrium
  - $\text{K}^+$/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 >12mm
- Remarkably thin cornea
- Normal IOP

**Buphthalmus**
- Progressive increase in diameter (>12mm)
- Opaque cornea
- IOP (>21mmHg)
- 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

**Ulc**er

- 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
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
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 keratitis
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
**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»
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
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**
  α) 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

7. http://www.revophth.com/content/d/plastic_pointers/i/1341/c/25686/
10. http://www.youtube.com/watch?v=jxhX0n0oJLE