Ophthalmology Block
The Red Eye

MBChB IV
2012

Prof Polla Roux
ETIOLOGY

• Conjunctivitis
• Blepharitis
• Pterygium
• Keratoconjunctivitis sicca
• Abrasion & FB
• Subconjunctival haemorrhage
• Thyroid Eye Disease
• Herpes simplex keratitis
• Iritis
• Episcleritis
• Acute angle closure glaucoma
• Abnormal lid function
• Conjunctival ca
DIAGNOSTIC STEP 1

• Visual acuity testing
  – R eye then L eye
DIAGNOSTIC STEP 2

- Type of redness
  - Diffuse
  - Subconjunctival haemorrhage
  - Ciliary flush
  - Focal
DIAGNOSTIC STEP 3

• Type of discharge
  – Watery (serous)
  – Purulent
  – Mucopurulent

Simple bacterial conjunctivitis

<table>
<thead>
<tr>
<th>Signs</th>
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<td>Crusted eyelids and conjunctival injection</td>
<td>Subacute onset of mucopurulent discharge</td>
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Treatment - broad-spectrum topical antibiotics
DIAGNOSTIC STEP 4

- Detect cornea opacities
  - Irregular surface
  - Leucoma
  - Ulcer
  - Keratic precipitates

Bacterial keratitis
Predisposing factors
- Contact lens wear
- Chronic ocular surface disease
- Corneal hypoesthesia

Expanding oval, yellow-white, dense stromal infiltrate
Stromal suppuration and hypopyon

Treatment - topical ciprofloxacin 0.3% or ofloxacin 0.3%
DIAGNOSTIC STEP 5

• Stain tear film with fluorescein
  – Look for disruption of epithelium

Herpes simplex epithelial keratitis

• Dendritic ulcer with terminal bulbs
• Stains with fluorescein
• May enlarge to become geographic

Treatment
• Aciclovir 3% ointment x 5 daily
• Trifluorothymidine 1% drops 2-hourly
• Debridement if non-compliant
DIAGNOSTIC STEP 6

- Examine AC
  - Depth
  - Hypopion (puss)
  - Hyphema (blood)

**Fungal keratitis**

Frequently preceded by ocular trauma with organic matter

Greyish-white ulcer which may be surrounded by feathery infiltrates

Slow progression and occasionally hypopyon

**Treatment**
- Topical antifungal agents
- Systemic therapy if severe
- Penetrating keratoplasty if unresponsive
Pupil reactions

- AACG

Acute congestive angle-closure glaucoma

- Severe corneal oedema
- Dilated, unreactive, vertically oval pupil
- Shallow anterior chamber
- Ciliary injection
- Complete angle closure (Shaffer grade 0)
DIAGNOSTIC STEP 8

• IOP
  – Schiotz tonometry
  • AACG
  – Applanation tonometry
  – Puff tonometry
DIAGNOSTIC STEP 9

- Orbit examination
  - TED
- Lid abnormality
  - Blepharitis
  - Hordeolum
  - Ectropion
  - Entropion
  - Trachoma

**Treatment of extensive ectropion**

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<th>Without marked excess skin</th>
<th>Horizontal lid shortening</th>
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**Diagram:**
- Illustrations of eye conditions and procedures.
ETIOLOGY

- Conjunctivitis
- Blepharitis
- Pingueculum
- Keratoconjunctivitis sicca
- Abrasion & FB
- Pterygium
- Subconjunctival haemorrhage
- Herpes simplex keratitis
- Iritis
- Episcleritis
- Acute angle closure glaucoma
- Abnormal lid function
- Conjunctival ca
CONJUNCTIVAL INFECTIONS

1. Bacterial
   • Simple bacterial conjunctivitis
   • Gonococcal keratoconjunctivitis

2. Viral
   • Adenoviral keratoconjunctivitis
   • Molluscum contagiosum conjunctivitis
   • Herpes simplex conjunctivitis

3. Chlamydial
   • Adult chlamydial keratoconjunctivitis
   • Neonatal chlamydial conjunctivitis
   • Trachoma
**Simple bacterial conjunctivitis**

### Signs

| Crusted eyelids and conjunctival injection | Subacute onset of mucopurulent discharge |

### Treatment

- Broad-spectrum topical antibiotics
### Gonococcal keratoconjunctivitis

#### Signs
- Acute, profuse, purulent discharge, hyperaemia and chemosis

#### Complications
- Corneal ulceration, perforation and endophthalmitis if severe

### Treatment
- Topical gentamicin and bacitracin
- Intravenous cefoxitin or cefotaxime
Adenoviral Keratoconjunctivitis

1. Pharyngoconjunctival fever
   - Adenovirus types 3 and 7
   - Typically affects children
   - Upper respiratory tract infection
   - Keratitis in 30% - usually mild

2. Epidemic keratoconjunctivitis
   - Adenovirus types 8 and 19
   - Very contagious
   - No systemic symptoms
   - Keratitis in 80% of cases - may be severe
Signs of conjunctivitis

Usually bilateral, acute watery discharge and follicles

Subconjunctival haemorrhages and pseudomembranes if severe

Treatment - symptomatic
Signs of keratitis

- Focal, epithelial keratitis
- Transient
- Focal, subepithelial keratitis
- May persist for months

Treatment - topical steroids if visual acuity diminished by subepithelial keratitis
**Molluscum contagiosum conjunctivitis**

**Signs**

<p>| | |</p>
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<tr>
<td>- Waxy, umbilicated eyelid nodule</td>
<td>- Ispilateral, chronic, mucoid discharge</td>
</tr>
<tr>
<td>- May be multiple</td>
<td>- Follicular conjuntivitis</td>
</tr>
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</table>

**Treatment** - destruction of eyelid lesion
Herpes simplex conjunctivitis

Signs

| Unilateral eyelid vesicles | Acute follicular conjunctivitis |

Treatment - topical antivirals to prevent keratitis
Adult chlamydial keratoconjunctivitis

- Infection with *Chlamydia trachomatis* serotypes D to K
- Concomitant genital infection is common

Subacute, mucopurulent follicular conjunctivitis

Variable peripheral keratitis

**Treatment** - topical tetracycline and oral tetracycline or erythromycin
Neonatal chlamydial conjunctivitis

- Presents between 5 and 19 days after birth
- May be associated with otitis, rhinitis and pneumonitis

Mucopurulent papillary conjunctivitis

Treatment - topical tetracycline and oral erythromycin
Trachoma

- Infection with serotypes A, B, Ba and C of *Chlamydia trachomatis*
- Fly is major vector in infection-reinfection cycle

Progression

<table>
<thead>
<tr>
<th>Acute follicular conjunctivitis</th>
<th>Conjunctival scarring (Arlt line)</th>
<th>Herbert pits</th>
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<tbody>
<tr>
<td>Pannus formation</td>
<td>Trichiasis</td>
<td>Cicatricial entropion</td>
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Treatment - systemic azithromycin
ALLERGIC CONJUNCTIVITIS

1. Allergic rhinoconjunctivitis

2. Vernal keratoconjunctivitis

3. Atopic keratoconjunctivitis
Allergic rhinoconjunctivitis

- Hypersensitivity reaction to specific airborne antigens
- Frequently associated nasal symptoms

May be seasonal or perennial

Transient conjunctival oedema

Transient eyelid oedema
Vernal keratoconjunctivitis

Frequently associated with atopy: asthma, hay fever and dermatitis

- Recurrent, bilateral
- Affects children and young adults
- More common in males and in warm climates
- Itching, mucoid discharge and lacrimation

Types
- Palpebral
- Limbal
- Mixed

Treatment
- Topical mast cell stabilizers
- Topical steroids
Progression of vernal conjunctivitis

Diffuse papillary hypertrophy, most marked on superior tarsus

Formation of cobblestone papillae

Rupture of septae - giant papillae
Progression of vernal keratopathy

- Punctate epitheliopathy
- Epithelial macroerosions
- Plaque formation (shield ulcer)
- Subepithelial scarring
Atopic keratoconjunctivitis

Typically affects young patients with atopic dermatitis

Eyelids are red, thickened, macerated and fissured
Progression of atopic conjunctivitis

Infiltration of tarsal conjunctiva causing featureless appearance

Inferior forniceal papillae

Mild symblepharon formation
### Progression of atopic keratopathy

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<th>Punctate epitheliopathy</th>
<th>Persistent epithelial defects</th>
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<tbody>
<tr>
<td>Subepithelial scarring</td>
<td>Peripheral vascularization</td>
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CHRONIC MARGINAL BLEPHARITIS

1. Anterior
   - Staphylococcal
   - Seborrhoeic

2. Posterior
   - Meibomianitis
   - Meibomian seborrhoea

3. Treatment
• Hyperaemia and telangiectasia of anterior lid margin
• Scarring and hypertrophy if longstanding

• Chronic irritation worse in mornings
• Scales around base of lashes (collarettes)
Complications of staphylococcal blepharitis

- Recurrent styes
- Marginal keratitis
- Tear film instability
- Madarosis, poliosis
- Trichiasis
Seborrhoeic blepharitis

- Shiny anterior lid margin
- Hyperaemia of lid margin
- Greasy scales
- Lashes stuck together
Meibomianitis

Inflamed and blocked meibomian gland orifices from meibomian glands

Toothpaste-like plaques

Thickened posterior lid margin

Meibomian cyst formation
Meibomian seborrhoea

Oil globules over meibomian gland orifices

Oily and foamy tear film
Treatment of Chronic Blepharitis

1. Lid hygiene - with 25% baby shampoo

2. Tear substitutes - for associated tear film instability

3. Systemic tetracyclines - for severe posterior blepharitis

4. Warm compresses - to melt solidified sebum in posterior blepharitis
MALIGNANT EYELID TUMOURS

1. Basal cell carcinoma
2. Squamous cell carcinoma
3. Meibomian gland carcinoma
4. Melanoma
5. Kaposi sarcoma
6. Merkel cell carcinoma
7. Treatment
Frequency of location of basal cell carcinoma

- Lower lid - 70%
- Medial canthus - 15%
- Upper lid - 10%
- Lateral canthus - 5%
Basal Cell Carcinoma - Important Facts

1. Most common human malignancy
2. Usually affects the elderly
3. Slow-growing, locally invasive
4. Does not metastasize
5. 90% occur on head and neck
6. Of these 10% involve eyelids
7. Accounts for 90% of eyelid malignancies
# Squamous cell carcinoma

<table>
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<tr>
<th>Signs</th>
<th>Progression</th>
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</table>
| • Arises from intraepithelial neoplasia or *de novo*  
• Presents in late adulthood  
• Frequently juxtalimbal | • Slow-growing  
• May spread extensively  
• Rarely metastasizes |
Kaposi sarcoma

- Affects patients with AIDS
- Vascular, slow-growing tumour of low malignancy
- Very sensitive to radiotherapy
- Most frequently in inferior fornix
1. Pathogenesis
2. Classification
3. Intermittent
4. Acute congestive
5. Post congestive
6. Chronic
Anatomical predispositions

- Convex iris-lens diaphragm
- Shallow anterior chamber
- Narrow entrance to chamber angle
Pupil block

- Increase in physiological pupil block

- Dilatation of pupil renders peripheral iris more flaccid
  - Increased pressure in posterior chamber causes iris bombe

- Angle obstructed by peripheral iris and rise in IOP
Classification

1. **Latent** - asymptomatic
   - IOP may remain normal
   - May progress to subacute, acute or chronic angle closure

2. **Subacute** - intermittent angle closure
   - May develop acute or chronic angle closure

3. **Acute**
   - Congestive - sudden total angle closure
   - Postcongestive - follows acute attack

4. **Chronic** - ‘creeping or latent’ angle closure
   - Follows intermittent angle closure

5. **Absolute**
   - No PL following acute attack
Intermittent angle-closure glaucoma

<table>
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<th>Signs</th>
<th>Treatment</th>
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<tr>
<td>• Epithelial oedema and closed angle during attack</td>
<td>• Treatment - bilateral YAG laser iridotomy</td>
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Acute congestive angle-closure glaucoma

**Signs**

- Severe corneal oedema
- Dilated, unreactive, vertically oval pupil
- Ciliary injection
- Shallow anterior chamber
- Complete angle closure (Shaffer grade 0)
Treatment of Acute Congestive Angle-Closure Glaucoma

1. Acetazolamide 500 mg i.v.

2. Hyperosmotic agents - if appropriate
   - Oral glycerol 1-1.5 g/kg of 50% solution in lemon juice
   - Intravenous mannitol 2g/kg of 20% solution

3. Topical therapy
   - Pilocarpine 2% to both eyes
   - Beta-blockers
   - Steroids

4. YAG laser iridotomy
   - To both eyes when cornea is clear
Signs of postcongestive angle-closure glaucoma

- Folds in Descemet membrane
- Stromal iris atrophy with spiral-like configuration
- Posterior synechiae
- Fixed dilated pupil
- Fine pigment on iris
- Glaukomflecken
Chronic angle-closure glaucoma

**Signs**

- Similar to POAG with cupping and field loss
- Easily missed unless routine gonioscopy performed
- Variable amount of angle closure
EPISCLERITIS AND SCLERITIS

1. Episcleritis
   - Simple
   - Nodular

2. Anterior scleritis
   - Non-necrotizing diffuse
   - Non-necrotizing nodular
   - Necrotizing with inflammation
   - Necrotizing without inflammation
     (scleromalacia perforans)

3. Posterior scleritis
# Applied anatomy of vascular coats

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<tr>
<th>Normal</th>
<th>Episcleritis</th>
<th>Scleritis</th>
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| • Radial superficial episcleral vessels  
• Deep vascular plexus adjacent to sclera | • Maximal congestion of episcleral vessels | • Maximal congestion of deep vascular plexus  
• Slight congestion of episcleral vessels |
Simple episcleritis

- Common, benign, self-limiting but frequently recurrent
- Typically affects young adults
- Seldom associated with a systemic disorder

Treatment
- Topical steroids
- Systemic flurbiprofen 400 mg tid if unresponsive
Nodular episcleritis

- Less common than simple episcleritis
- May take longer to resolve
- Treatment - similar to simple episcleritis

Localized nodule which can be moved over sclera

Deep scleral part of slit-beam not displaced
Causes and Systemic Associations of Scleritis

1. Rheumatoid arthritis

2. Connective tissue disorders
   - Wegener granulomatosis
   - Polyarteritis nodosa
   - Systemic lupus erythematosus

3. Miscellaneous
   - Relapsing polychondritis
   - Herpes zoster ophthalmicus
   - Surgically induced
Diffuse anterior non-necrotizing scleritis

- Widespread scleral and episcleral injection
- Relatively benign - does not progress to necrosis

Treatment
- Oral NSAIDs
- Oral steroids if unresponsive
ECTROPION AND ENTROPION

1. Ectropion
   - Involutional
   - Cicatricial
   - Paralytic
   - Mechanical

2. Entropion
   - Involutional
   - Cicatricial
   - Congenital
   - Epiblepharon
Involutional

- Affects lower lid of elderly patients
- May cause chronic conjunctival inflammation and thickening
## Treatment of extensive ectropion

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**Involutional entropion**

| Affects lower lid because upper lid has wider tarsus and is more stable | If longstanding may result in corneal ulceration |
Treatment options for involutional entropion

- Transverse everting sutures (temporary)
- Weis procedure (permanent)
- Jones procedure (for recurrences)
End

Thank you
Memorandum is Ophthalmology an Illustrated colour text

• Basic principles
  – anat, histo, phys and pharms

• Diseases
  – Acute visual loss causes
  – Red eye causes
  – Chronic visual loss causes