Orbital Disease

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Learning objectives

Knowledge of the anatomy of the normal nasolacrimal system
Understand the causes of epiphora
Identify common skin tumours
Recognise the signs of thyroid eye disease
Understand the diagnosis and management of preseptal and orbital cellulitis

Suggested reading

Clinical ophthalmology: a systematic approach. Jack Kanski Chapters 1, 2 and 17

• Walls of the orbit
• Optic canal (foramen)
  – Within the lesser wing of sphenoid
  – Transmits the optic nerve and ophthalmic artery.

Superior orbital fissure
  – Between lesser and greater wings of sphenoid.
  – Transmits nerves.
  – Superior and inferior division III nerve
  – Trochlear nerve (IV)
  – Lacrimal, Frontal, Nasociliary branches of Ophthalmic nerve (V1)
  – Abducens (VI)
  – Superior and Inferior ophthalmic vein
  – Sympathetic fibres from cavernous plexus

• Inferior orbital fissure
  – Greater wing of sphenoid and maxilla
  – Inferior Orbital Fissure
  – Maxillary division of trigeminal
  – Infraorbital groove
  – Infraorbital canal
- Infraorbital foramen

- **Paranasal sinuses** – LOCATION
  - Superior
    - Frontal air sinus
  - Inferior
    - Maxillary air sinus
  - Medial
    - Nasal cavity
    - Ethmoidal sinus, sphenoid sinus
    - Clinical Application

- **Orbit examination**
  - Visual acuity
  - Pupils – miosis, mydiasis, RAPD
  - Visual field
  - Extraocular movements
  - Exophthalmometer – axial/non-axial, look from above/below
  - Palpate orbit for masses
  - Lids – retraction, masses, scleral show
  - Optic nerve

- **Clinical signs**
  Position of the eyeball
    - proptosis
    - enophthalmus
    - shallow orbit
    - anophthalmic socket

- Anophthalmic socket

- **Aquired** – Blind, painful eye – CRVO rubeotic glaucoma
  - Trauma, Tumour
• Enucleation/Eviseration
• Orbital implant
  – Hydroxyapatite
  – Medpor
  – Acrylic
• Cosmetic shell
• **Long term problems**
  – Implant exposure, infection, PESS, unstable implant (shallow fornices)
• Exenteration
• **Thyroid Eye Disease**
• Autoimmune disease
• 8x increase risk in smokers
• Radioiodine can make it worse – steroid cover
• **Thyroid ophthalmopathy**
  – Lid retraction, proptosis, soft tissue involvement, myopathy, neuropathy
• **Treatment**
  – Lubricants
  – Steroids
  – Immunosuppressants – azathioprine
  – Iv methylprednisolone
  – Surgery
• **Orbital Cellulitis**
  – More common in children
  – Usually associated with sinusitis
  – Thin medial wall of orbit is a common route of infection from ethmoidal sinusitis

**Cellulitis - observations**

*Preseptal cellulitis:* normal eye movement, normal pupils, good general health
Orbital cellulitis: oedema, Redness, Pain, Fever, restricted extraocular movements, Proptosis, optic nerve compromise, subperiosteal abscess, orbital abscess, Orbital involvement

EPIPHORA

- Anatomy
- Tears from lacrimal gland and accessory glands
- Tears flow in upper and lower marginal strips and enter canaliculi by capillary action and suction
- 70-80% lower canaliculus
- Lacrimal pump suction into lacrimal sac through action of orbicularis during blink

CAUSES OF EPIPHORA

- Causes epiphora
- Hypersecretion – ocular inflammation surface disease
- Defective drainage - malposition, blockage
- Lacrimal pump failure – lower lid laxity, weakness orbicularis.

HISTORY

- History
- How often do the eyes water
- Where do they water from
- Discharge
- Any conditions make them worse
- Any irritation/pain
- How long congenital since birth
- Any associated infections
- How much of a problem is it?
- History sinus disease/trauma
- Bloody discharge

Examination
• Lids – ectropion, entropion, punctal stenosis, blepharitis, pouting punctum, placement of lid  
• Lacrimal sac – palpate, mucocoele  
• Mucocoele – painless swelling at inner canthus with mucopurulent discharge on palpation sac, due to obstruction  
• Conjunctivochalasis - excise  
• Marginal tear strip  
• 2% fluoresceine  
• Fluoresceine disappearance – most dye should have gone by 3 mins

**Blepharitis**

• Lid hygiene  
• Warm compresses  
• Chloramphenicol ointment  
• Doxycycline  
• Steroid drops

**Syringe and probe**

• Proxymetacaine  
• Dilate punctum if necessary  
• Blunt tipped cannula on 2ml syringe of saline  
• Follow anatomy of canalicular system  
• Feel for hard stop of lacrimal fossa  
• Soft stop tissue obstruction try to estimate level of obstruction  
• Saline flush taste in throat

**Punctal stenosis**

• Primary  
  – Chronic blepharitis  
  – Idiopathic  
  – HSV, HZV  
  – Irradiation
- Cicatrizring, trachoma
- Drugs – 5FU

- Secondary
  - Punctal eversion
  - Lost punctal plug

**Canaliculitis**

- Pouting punctum
- Often unilateral
- Yellow discharge/stones
- Pericanalicular inflammation
- Often due to actinomyces Israelii – anaerobic gram + bacilli
- Treat canaliculotomy/curettage of stones and penicillin washout, penicillin drops post-op

**Congenital NLD obstruction**

- Lower end NLD usually last to canalize soon after birth
- Exclude congenital glaucoma
- Affects 20% neonates
- Resolves in 96% by 1yr
- Massage
- Probing usually after 1yr 90% success
- Intubation
- DCR

**Dacryocoele**

- Congenital amniontoccoele
- Collection amniotic fluid/mucous in lacrimal sac caused by imperforate valve of hasner
- Tense Bluish swelling below MCT
- Epiphora
- Conservative initially then probing

**Dacryocystitis**
• Infection nasolacrimal sac usually secondary to NLD obstruction
• Often staph or strep
• Redness/pain/swelling at medial canthus
• Can cause preseptal/orbital cellulitis
• Oral antibiotics
• Incision and drainage
• DCR

Dacryocystorhinostomy
• Anastomosing lacrimal sac to nasal mucosa
• Endonasal DCR – not if canicular problem, cannot examine sac or canicular opening
• Canaliculo DCR – 6-8mm patent normal canaliculus
• Lester jones tube – canicular obstruction, tube through caruncle

Eyelid masses
• BENIGN
  • Chalazion
  • Papilloma
  • Molluscum contagiosum
  • Capillary haemangioma
  • Naevi
  • Xanthelasma
• MALIGNANT
  • Basal cell ca
  • Squamous cell ca
  • Sebaceous gland carcinoma
  • Malignant melanoma

• Orbital tumors
  
  Vascular tumors:
  – Capillary hemangioma
  – Cavernous hemangioma
  – Lymphangioma
  – Varices

  Lacrimal gland tumors:
- benign - pleomorphic adenoma
- malignant - adenocarcinoma

Other tumors:
- Rhabdomyosarcoma
- Lymphoproliferative
- Cystic lesions
- Neural
- Metastases

• **Trauma**
  - Serious cranial trauma
  - Clinical question
    - Michael, is a black belt in karate. During a competition, he is accidentally hit in the eye.
    - Michael receives a black eye.
    - During the next round of the competition, Michael notices that he has double vision.
  - Clinical Application
    - Trauma to orbit
      - Orbital margins very strong
      - Bones of the medial wall and the floor are the thinnest bones in the orbit, and commonest site of fracture.

Ptosis
  - Palpebral aperture
  - Skin crease
  - Levator function
  - EOM
  - Pupils
  - Bells reflex
  - Lagophthalmus
  - Cornea
• **Causes**
  • CONGENITAL
  • ACQUIRED
  • ACQUIRED
  • APONEUROTIC
  • MECHANICAL
  • NEUROGENIC
  • MYOGENIC