Oculoplastics Overview

Eyelids
Eyelids

Functions of Eyelids:

- **Protection:**
  - Light protection & regulation
  - Keep cornea moist
  - Mechanical protection of globe

- **Lacrimal pump**
Surface Anatomy

**Upper Lid [UL]** covers superior 2mm of cornea (10 – 2’o clock)

![Image of eyes showing upper and lower lids]

**Lower Lid [LL]** margin JUST touches inferior limbus
Surface Anatomy

Distance between UL margin & central pupillary reflex is margin reflex distance (MRD1) and normally, is 3.5 mm
Surface Anatomy

Space between UL & LL is palpebral fissure height (PFH) and normally, it is 9-12 mm.
Surface Anatomy

A puncta (one in each lid) lies in close apposition to globe
To Summarise:
Normal parameters for lid position evaluation:

- **A** = Skin Crease
  - 10 mm in females
  - 8-10 mm in males

- **B** = MRD1 – 3.5 – 4.0 mm

- **C** = PFH – 9 -12mm

- Inferior scleral show – Nil

- Lagophthalmos (inability to close eyes) – Nil

- Bell’s phenomenon (globe movement on eye closure)
  - Up and out
Eyelids: Internal Anatomy

(Anterior lamellae)
- Skin
- Orbicularis Oculi

(Posterior lamellae)
- Tarsus (meibomian glands)
- Conjunctiva

Orbital Septum
Orbital fat
Superioris (Aponeurosis)
Muller’s muscle
Outward direction of lashes
Two Halves - Lamellae

- **Septum**
- **Landmark** - Gray Line
  - Anatomical
  - Surgical
Orbital Septum

Thin sheet of fibrous tissue
Orbital Septum

Septum is a natural barrier between eyelid and orbit
Orbital Septum

Preseptal cellulitis

Orbital cellulitis
Muscles that Open the Eye

- Levator muscle
- Muller muscle
Eyelid Muscular and Nervous Control

**Eyelid Retractors:**
- Levator
  (3rd CN. **Parasymp**)
- Muller’s muscle (**Sym**)

**Eyelid Protractor:**
- Orbicularis Oculi (**VII N**)

**The University of Auckland - New Zealand**
Orbicularis Sling → Uplift
Oculoplastics Overview

Abnormal Upper Eyelid Position

Ptosis (Droopy Eyelid)
Levator Palpebrae superioris [LPS]

- LPS action – From extreme down gaze to extreme up gaze, by blocking the Frontalis
- Important while planning surgical management of ptosis

- LPA – <4mm – poor
  5-7mm – fair
  > 8 mm – good
Causes of Ptosis?
• **Congenital**

• **Acquired**
  - Involutional
  - Neurogenic
  - Myogenic
  - Mechanical
Aquired Ptosis

Involutional (Aponeurotic dehiscence)
- Most common type of ptosis
- Long term contact lens wear

Features:
- Good LPS action
- High lid crease
- No lid lag on down gaze (worse)

Frontalis overaction
(s/o visual axis obstruction by ptotic lid)
Aquired Ptosis

**Neurogenic:**
- Third Cranial nerve palsy

**Note:**
- Total ptosis
- Exotropia
- Hypotropia
- Mydriasis
Aquired Ptosis

**Neurogenic:**
- Horner’s syndrome

**Note:**
- subtle ptosis
- elevation of LL (apparent enophthalmos)
- miosis

sympathetic innervation to Muller’s & smooth muscle of lower lid affected

sympathetic innervation to Pupil (dilators) affected
Aquired Ptsosis:

**Neurogenic**
- Horner’s syndrome

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Table 23-1

**Most Common Causes of Horner Syndrome in Adults**

<table>
<thead>
<tr>
<th>Central (First Order)</th>
<th>Preganglionic (Second Order)</th>
<th>Postganglionic (Third Order)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothalamus</td>
<td>Cervical spine disease</td>
<td>Superior cervical ganglion</td>
</tr>
<tr>
<td>Stroke</td>
<td>Brachial plexus injury</td>
<td>Trauma</td>
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<tr>
<td>Tumor</td>
<td></td>
<td>Jugular venous ectasia</td>
</tr>
<tr>
<td>Brainstem</td>
<td>Pulmonary apical lesions</td>
<td>Iatrogenic (surgical neck</td>
</tr>
<tr>
<td>Stroke (lateral medullary infarction)</td>
<td>Apical lung tumor</td>
<td>dissection)</td>
</tr>
<tr>
<td>Demyelination</td>
<td>Mediastinal tumors</td>
<td>Superior cervical ganglion</td>
</tr>
<tr>
<td>Tumor</td>
<td>Cervical rib</td>
<td>Trauma</td>
</tr>
<tr>
<td></td>
<td>Trauma</td>
<td>Internal carotid artery</td>
</tr>
<tr>
<td></td>
<td>Iatrogenic (jugular cannulation, chest tube, thoracic surgery)</td>
<td>Dissection</td>
</tr>
<tr>
<td>Spinal cord (cervicothoracic)</td>
<td>Subclavian artery aneurysm</td>
<td>Trauma</td>
</tr>
<tr>
<td>Trauma</td>
<td>Thyroid tumors</td>
<td>Arteritis</td>
</tr>
<tr>
<td>Syringomyelia</td>
<td></td>
<td>Tumor</td>
</tr>
<tr>
<td>Tumor (intramedullary)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demyelination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myelitis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arteriovenous</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malformation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Skull base lesions (nasopharyngeal carcinoma, lymphoma)
- Cavernous sinus lesion
  - Tumors
  - Pituitary tumor
  - Inflammation
  - Thrombosis
  - Carotid aneurysm
  - Cluster headache
Aquired Ptosis:

**Neurogenic**
- Marcus Gunn Jaw wink
Aquired Ptosis

**Myogenic:**

- Chronic Progressive External Ophthalmoplegia [CPEO]
- Myasthenia gravis [diurnal variation]

*Ptosis is ONE component of these syndromes*
Aquired Ptosis

**Mechanical:**

- UL tumors
  - BCC, SCC, Sebaceous Cell Ca
  - Hemangioma
  - Lacrimal gland masses
- Lid oedema post-trauma/ surgery
Congenital Ptosis

**Features:**

- Fair to Poor LPS action
- Faint/ Absent lid crease
- Lid lag on down gaze
- +/- poor upgaze

**NB** Risk of amblyopia
Ptosis

Must assess:
- Pupils
- EOM, CN II
- Levator function
- Orbicularis power
- Bell’s reflex
- Evert UL
Oculoplastics Overview

Abnormal Upper Eyelid Position

Lid Retraction
Lid Retraction

Causes:

- Congenital
- Acquired
  - Thyroid Eye Disease
  - Midbrain lesions
  - Parinaud’s syndrome
Lower Lid Malpositions

- 2 Lower lid retractors
- Less role in opening eyelid
- Pull lower lid inferiorly and posteriorly in downgaze
- Structurally stabilises lid margin
Figure 1. Forces acting on the lower eyelid to maintain normal position.
Oculoplastics Overview

Abnormal Lower Eyelid Position

Ectropion

(eyelid margin is away from the globe)
Ectropion

**Causes:**
- Involutional
- Cicatricial
- Paralytic (VII CN palsy)
- Mechanical

*Prolonged ectropion leads to metaplastic changes in exposed conjunctiva*
Ectropion

Causes:

- Involutional
- Cicatricial
- Paralytic (VII CN palsy)
- Mechanical

Due to laxity of canthal tendons (structural support of lids at medial & lateral ends) with age
Ectropion

Causes:

- Involutional
- **Cicatricial**
  - Paralytic (VII CN palsy)
  - Mechanical

Traumatic scar at cheek pulling the lower lid down
Ectropion
Cicatricial ectropion
Ectropion

Causes:

- Involutional
- Cicatricial
- **Paralytic (VII CN palsy)**
- Mechanical

Facial nerve supplying Orbicularis Oculi is affected, as in Bell’s palsy, Parotid tumor excision, Acoustic Neuroma
Ectropian

**Causes:**
- Involutional
- Cicatricial
- Paralytic (VII CN palsy)
- **Mechanical**

*Lower eyelid edema causing mechanical ectropion*
Oculoplastics Overview

Abnormal Lower Eyelid Position

Entropion
(eyelid margin is rolled inwards)
Entropion

Causes:
- Involutional
- Trauma
- Cicatricial

Entropion leads to trichiasis (misdirection of lashes), which may cause punctate epitheliopathy of cornea to frank corneal ulcers.
Entropion

**Causes:**
- Involutional
- Trauma
- **Cicatricial**
  - Ocular Cicatricial Pemphigoid
  - Stevens Johnson syndrome
  - Trachoma (developing countries)
  - Chemical injury

Contraction and thus, shortening of posterior lamella of the eyelid: which pulls and rolls in the eyelid margin along with eyelashes.
Common Eyelid Lesions
The Glands of the Eyelid
The Glands of the Eyelid

- Glands of Zeis
- Glands of Moll
- Meibomian glands
Benign Eyelid Lesions

**Chalazion**
- Chronic, granulomatous inflammation of meibomian glands
- Involving posterior eyelid lamellae
*Treatment:*
- Warm compresses/ antibiotic ointment, if recent onset
- Incision & Curettage in resistant cases

**Stye**
- Tender, acute inflammation of sebaceous glands of Zeiss or sweat glands of Moll at the base of eyelashes in anterior eyelid lamellae
*Treatment:*
- Warm compresses, antibiotic ointment
- Expression of pus ± lash removal
Benign Eyelid Lesions

**Xanthelasmas**
- Yellowish, sessile plaques
- S/o hypercholesterolaemia

**Treatment:**
- Removal for cosmesis
Malignant Eyelid Lesions

**Basal cell cancer**
- Commonest lid malignancy (90%)
- Risk factors:
  - Fair skin & UV exposure

**Features:**
- Nodular/ulcerative with rolled edges
- Loss of lashes
- Telangiectatic blood vessels on surface

**Treatment:** Excision with wide margins ± Cryotherapy
Malignant Eyelid Lesions

Squamous cell cancer
- Fast growing skin cancer

Features:
- Nodular
- Hyperkeratotic surface

Treatment: Excision Biopsy with wide margins ± radiotherapy depending upon the depth of involvement
Orbit
General overview of Orbital bones
Frontal, Sphenoid
Zygomatic, Maxilla, Palatine
Maxilla, Lacrimal, Ethmoid, Sphenoid
• Optic Nerve
• Ophthalmic A
• Sympathetic N plexus
Annulus of Zinn
Orbital Examination

- Exophthalmometer – axial/non-axial, look from above/below
- Optic Nerve Function
- Pupils
- Extra-ocular movements, CN V
- Lids – ptosis, retraction, masses, scleral show
- Palpate – masses, pulsatile
- Lymph Nodes
- Auscultate ?Bruits
Common Orbital Disorders
Pre-septal cellulitis

**Aetiology:** Trauma, Insect bite, Stye

**Features:**
- Inflamed, oedematous lids
- Nil/ mild pain on eye movements
- Visual acuity good
- Normal Optic Nerve function
Orbital Cellulitis

**Aetiology:**
Sinusitis (commoner in children)
Trauma/ Tumour in adjoining sinuses

**Features:**
- Proptosis
- Inflamed pre-septal tissues
- Painful/ limited eye movements
- Reduced Visual acuity
- Compromised Optic Nerve function
Thyroid Eye Disease

- Proptosis
- Restrictive Myopathy
- Optic Neuropathy

**Lid signs:**
- lid lag, lid retraction,
- lid swelling, lagophthalmos

**Ocular surface Inflammation**
- esp. over horizontal recti muscles
- Dry eyes
- Exposure keratopathy
- Glaucoma
Thyroid Eye Disease - Pathogenesis

- Lymphocytic infiltration
- Muscle & fat oedema and expansion
- Deposition of hyaluronic acid & GAGs
Thyroid Eye Disease

CT scan features in Thyroid eye disease

Thick extra-ocular (recti) muscles
Maximum diameter of globe beyond lateral orbital rim
Tenting of optic nerve on right side ( )
Thyroid Eye Disease

Keep a close watch on:

- **Corneal exposure** – treat with lubricants/taping eyelids shut

- **Optic nerve** - functions due to its possible compression by enlarged extra-ocular muscles—might need urgent surgical intervention
Orbital Fracture

Classical Signs:

- Hypotropia
- Enophthalmos
- Restricted motility, esp. vertical gaze
- Infra-orbital anesthesia
Orbital Fracture

Orbital Floor fracture and prolapse of Inf. Rectus & soft tissues in maxillary sinus
Lacrimal Drainage System & Common Disorders
Anatomy of the Lacrimal Apparatus

Eyelid movement → lacrimal pump
Acute dacryocystitis

Complete block

Stagnant tears in sac

Recurrent infections
Where is the block? \(\rightarrow\) Syringe & Probe
Dacryocystorhinostomy (DCR)
Congenital Naso-lacrimal Duct Obstruction

- Symptoms start soon after birth
  - Watering ± discharge
- Fluorescein dye disappearance delayed
Congenital Naso-lacrimal Duct Obstruction

Treatment Options in order of preference:

a) Conservative [Lacrimal Massage ± Antibiotics]
b) Probing & Syringing
c) Intubation/ Balloon Dacryoplasty
d) Dacryocystorhinostomy

Nearly 95% resolve conservatively by the end of one year of age
The End

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