

THE PROTECTION OF THE EYE *(eyelids)*

The protection of the eye is made of

- A. *Eyelids*
- B. Orbital cavity
- C. Conjunctiva
- D. Lacrimal apparatus
- E. Eye muscles

Eyelids (palpebrae, blepharon)

- Are thin structures which consist of skin, muscles, fibrous tissue, and mucous membrane
 - Protect the eye from external irritation
 - Limit the amount of light entering the eye
 - Distribute tears over the surface of the globe
 - Regular blinking (16 times per a minute)
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Anatomy

- Skin - thinnest in the body
- Muscles:
 - Orbicularis oculi (N VII)
 - Eyelid retractors
 - Levator superioris muscle (NIII)
 - Superior tarsal muscle (sympathetic)

Anatomy

- Fibrous tissue
- Septum orbitale
- Tarsus
 - consists of firm connective tissue
 - Contains sebaceous gland (MEIBOMIAN)
- Conjunctiva – palpebral part

Eyelid margin

- Is 2 mm thick and 30 mm long
- 5 mm from the medial angle of each eyelid there is small eminence - *papilla lacrimalis*
- The eyelashes (cilia)
 - Opening into the follicle of each cilium are the ducts of:
 - Sebaceous glands (Zeiss)
 - Sweat glands (Moll)

Lymphatic supply

- The eyelids are drained by two groups:

1. **Submandibular lymph nodes**

- Drains the medial two thirds of the lower eyelid and medial one third of the upper eyelid

2. **Preauricular lymph nodes**

- Drains the lateral one third of the lower eyelid and lateral two thirds of the upper eyelid

Examination Methods (direct inspection)

- slit lamp
- inspection of the eyelids includes the following aspects:

Eyelid position:

- Normally the margins of the eyelids are in contact with the eyeball and the puncta are submerged in the lacus lacrimalis

Examination Methods (direct inspection)

Width of the palpebral fissure:

- When the eye is open and looking straight ahead:
 - the upper lid should cover the superior margin of the cornea by about 2 mm
 - The width of the palpebral fissure is normally 6–10 mm
 - The distance between the lateral and medial angles of the eye is 28–30 mm

❖ *Varying widths of the gaps between the eyelids may be a sign of protrusion of the eyeball or enophthalmos*

Examination Methods (direct inspection)

Skin of the eyelid:

- is thin with only a slight amount of subcutaneous fatty tissue

Allergic reaction and inflammation

- can rapidly cause extensive edema and swelling

In older patients

- the skin of the upper eyelid may become increasingly flaccid (cutis laxa senilis)

Examination Methods (aspection)

The palpebral conjunctiva

- is examined by simple eversion of the upper eyelid
- Full eversion of the upper eyelid with a Desmarres eyelid retractor (allows examination of the superior fornix)
- The normal palpebral conjunctiva is smooth and shiny without any scar, strictures or papilliform projections

Possible causes of abnormal width of the palpebral fissure

Increased palpebral fissure

- Peripheral facial palsy (lagophthalmos)
- Grave's disease
- Buphthalmos
- High-grade myopia
- Retrobulbar tumor

Decreased palpebral fissure

- Congenital ptosis
- Ptosis in oculomotor nerve palsy
- Ptosis in myasthenia gravis
- Sympathetic ptosis (with Horner's syndrome,
- Progressive ophthalmoplegia (Graefe's sign)
- Microphthalmos
- Enophthalmos

Developmental anomalies

- **Ankyblepharon** – adhesion between margins of upper and lower eyelids
- **Coloboma** - unilateral triangular eyelid defect with its base at the margin of the eyelid occurring most often in the upper eyelid
- **Ablepharon** – absence of the eyelid
- **Epiblepharon** - extra fold of skin of lower eyelid
- **Epicantus** - extra fold of skin at medial eyelid
- **Symblepharon** – adhesions between eyelid and globe
- **Trichiasis** - misdirected eyelashes
- **Madarosis** - loss of eyelashes
- **Distichiasis** - accessory row of eyelashes

Abnormalities of the shape and position



Entropion

- *Entropion is characterized by inward rotation of the eyelid margin*
- The margin of the eyelid and eyelashes or even the outer skin of the eyelid are in contact with the globe instead of only the conjunctiva
- The lower eyelid is usually involved
- **Etiology:**
 - Congenital
 - Age-related (involuntional)
 - Cicatricial
 - Spastic

Entropion

- **Signs and symptoms:**
 - Tearing
 - Foreign body sensation
 - Blepharospasm
 - Conjunctival injection
 - Corneal epithelial defects
 - Secondary infection:
 - keratitis/conjunctivitis

Entropion

- **Treatment**
- Ocular lubrication and tear preparations
- Eyelid hygiene
- Antibiotics
- Corticosteroids
- Small amounts of botulinum toxin (BOTOX®)
- Eyelid taping
- surgical procedures



Ectropion

- *Is condition in which the margin of the eyelid is turned away from the eyeball*
- This condition almost exclusively affects the lower eyelid
- **Etiology:**
 - Congenital
 - Age related (involuntional)
 - Paralytic
 - Cicatricial

Ectropion

- **Symptoms:**
 - the eversion of the punctum causes tears to flow down across the cheek instead of draining into the nose
 - Wiping away the tears increases the ectropion
 - Dry eye
 - Chronic conjunctivitis
 - Blepharitis
 - Ulceration

Ectropion

- **Treatment:**
- Artificial tears
- Gels
- Ointments
- Eyelid taping (during the sleep)
- Tarsoraphy
- Surgical

Blepharoptosis / Ptosis

- *Is abnormally low position of the upper lid*
- **Etiology:**
 - Congenital ptosis
 - Acquired ptosis:
 - Neurogenic (3rd nerve palsy, Horner sy.)
 - Myogenic (myasthenia gravis)
 - Aponeurotic (involuntional)
 - Traumatic (blow-out fracture)
 - Mechanical (scaring)
 - Pseudoptosis

Blepharoptosis

- **Symptoms**
- The drooping of the upper eyelid may be
 - *unilateral* (usually a sign of a *neurogenic* cause)
 - *bilateral* (usually a sign of a *myogenic* cause)
 - A characteristic feature of the *unilateral form* is that the patient attempts to increase the palpebral fissure by contracting the frontalis muscle
 - bedroom-eye appearance

Blepharoptosis

- **Acquired ptosis:**
 - Treatment depends on the cause
- **Congenital ptosis:**
 - This involves surgical retraction of the upper eyelid

Lagophthalmos

is defined as the inability to close the eyelids completely

Is abnormality in which inadequate closure of the eyelids results in exposure of the eye

paralytic lagophthalmos (damage of facial nerve)

N VII palsy : *Bell's palsy*

Cerebrovascular accidents

Trauma

Immune mediate infections: Lyme disease, chickenpox, mumps, polio

Tumors

congenital cranial dysinnervation syndromes

Post-operative lagophthalmos (after blepharoplasty)

Physiologic lagophthalmos (as in the case of nocturnal lagophthalmos)

Iatrogenic lagophthalmos (medications used for anesthesia)

Graves disease : *Exophthalmus*

Cicatricial lagophthalmos

Lagophthalmos

- **Symptoms and signs**
- Foreign body sensation
- Burning
- Increased tearing
- Intermittent blurry vision
- Pain
- Photophobia
- Dry eye
- Exposure keratopathy

Lagophthalmos

- **Treatment (is directed toward cause)**
 - Medical:
 - Artificial tears , gels, ointments
 - ATB drops, ointment
 - Eyelid taping
 - scleral contact lenses
 - Surgical:
 - Punctal plugs
 - temporary or permanent tarsorrhaphy
 - gold weight implantation



Blepharospasm

- Is an involuntary, tonic, spastic, bilateral contraction of the orbicularis oculi muscle that may last from several seconds to several minutes
- **Etiology:**
 - idiopathic
 - inflammation or irritation
 - extrapyramidal disease such as encephalitis or multiple sclerosis
 - Trigeminal neuralgia
 - psychogenic causes

Normal blinking

- eyelid closure is the result of activity and co-inhibition of 2 groups of muscles
- the protractors of the eyelids (ie, orbicularis oculi, corrugator superciliaris, procerus muscles)
- voluntary retractors of the eyelids (ie, levator palpebrae superioris, frontalis muscles)
- During the normal blink, the protractors and retractors have co-inhibition
- In patients with blepharospasm, this inhibition between the protractors and retractors is lost

Blepharospasm

- **Clinical symptoms :**
- spasmodically narrowed or closed palpebral fissures and lowered eyebrows
- photophobia
- vague ocular pain
- dry eye symptoms (eye irritation, photophobia)
- Unilateral / bilateral
- increased blink rate

Blepharospasm

- **Treatment:**
- depends on the cause of the disorder
- *Mild cases* can be controlled well with muscle relaxants
- *Severe cases* may require transection of the fibers of the facial nerve supplying the orbicularis oculi muscle
- The disorder may also be successfully treated with repeated local injections of botulinum toxin

Trichiasis

- *is defined as the misdirection of eyelashes toward the globe*
- **Etiology:**
 - Post-infectious
 - post-traumatic
 - Senile
 - Congenital

Trichiasis

- **Signs + symptoms:**

- permanent foreign-body sensation
- increased tear secretion
- chronic conjunctivitis
- Corneal ulcer

- **Treatment**

- artificial tears and ointments
- Contact lens
 - Removing eyelashes by epilation
 - Electrolysis of lashes
 - Cryosurgery of lashes
 - Radiofrequency ablation of lashes
 - laser ablation
 - Wedge resection

Inflammation

Blepharitis

- *inflammation of the eyelid margins*
- **Classification based on anatomy:**
 - Anterior
 - Posterior (meibomianitis)
- **Anterior blepharitis**
 - Seborrheic
 - Ulcerative

Anterior blepharitis

- **Etiology:**
- **Seborrheic (squamous)**
 - Seborrhea, rosacea
 - refractive anomalies
 - hypersecretion of the eyelid glands
 - dust, smoke, and dry air in air-conditioned rooms
- **Ulcerative**
 - secondary bacterial infection - STA of the seborrheic form

Anterior blepharitis

- **Signs and symptoms:**

- Seborrheic- hard brittle fibrinous scales that surround the cilia
- Ulcerative- matted hard crusts that encircle individual cilia, their removal discloses ulcers
- Dilatated blood vessels on margins
- White eyelashes – poliosis
- Loss of lashes – madarosis
- Trichiasis
- Thin, broken, small lashes

Anterior blepharitis

- **Treatment:**
 - depends on the cause of the disorder
 - eyelid margin hygiene
 - The scales and crusts can usually be softened with *warm olive oil* and then easily removed with a cotton-tipped applicator
 - artificial tear solutions, tear ointments
 - antibiotic drops, ointment
 - topical steroids

Meibomianitis (posterior blepharitis)

- affects the inner edge of the eyelid that comes in contact with the eyeball
- Meibomianitis is caused by a dysfunction and inflammation of the nearby oil glands of the eyelids
- This creates a favorable environment for bacterial growth- STA
- Meibomianitis is common with advancing age

Meibomianitis

- **Syptoms and signs:**
- gritty or burning sensation in the eyes
- redness and itching of the eyes
- excessive tearing
- White, frothy secretion on the eyelid margins
- Glands may be massaged to express an oily secretion
- Vertical yellowish streaks of glands - Ca deposit

Meibomianitis

- **Treatment:**
- Eyelid hygiene
- Massage of eyelids
- Removal of the secretion
- artificial tear solutions, tear ointments
- antibiotic drops, ointment
- topical steroids

Hordeolum ,, *sty* “

- *acute bacterial infection of the ZEISS/MOLL gland*
- **Etiology:** *Staphylococcus aureus*
- **Signs:**
 - Painful nodules with a central core of pus
 - chemosis
 - edema of the eyelid
 - preauricular adenopathy
- **Localization:** margin
- **Treatment:**
 - Antibiotic ointments and application of dry heat (red heat lamp) 15-20 min, 4xd, will rapidly heal the lesion

Chalazion

- *Chronic inflammatory lipogranuloma of meibomian gland*
- **Localization:** within the tarsus
- **Stage:** acute/chronic
- **Symptoms:**
 - **Acute**
 - Firm nodular bulb with signs of inflammation
 - **Chronic**
 - Gradual painless, swelling of the gland without other external signs of inflammation

Treatment:

- **Acute stage**

- Antibiotic ointments
- dry heat (red heat lamp)
- warm compresses
- lid hygiene

- **Chronic stage**

- Surgical removal of a chalazion
- After the chalazion clamp has been introduced and the lesion incised with a scalpel, the fatty contents are removed with a curet

Differential diagnosis of edema

Inflammatory edema- symptoms

- Swelling
- Reddening
- Sensation of heat
- Painful
- Usually unilateral

Noninflammatory edema- symptoms

- Swelling
- Pale skin
- Cool skin
- Painless
- Usually bilateral

Inflammatory edema-Possible causes

- Hordeolum
- Abscess
- Erysipelas
- Eczema
- Associated with:
 - paranasal sinus disorders
 - orbital cellulitis
 - dacryoadenitis

Noninflammatory edema- possible causes

- Systemic disorder:
 - heart
 - kidneys
 - thyroid gland
- Allergy such as Quincke's edema