

Ophthalmology

Dr. Muataz Hasan

learning objectives:

By the end of this lecture the students would be able to:

- Review the clinical anatomy and physiology of eyelids and adenexia.
- Categorize eyelid diseases, correlate the common symptoms and signs of eyelid diseases with the underlying structural and functional disorders.
- Describe disorders of eyelids (infections, malposition, tumors and congenital conditions).

THE EYELIDS

Eyelids are thin movable curtains composed of skin on their anterior surface and mucus membrane (conjunctiva) on the posterior surface, they contain:

- 1- Smooth muscles (Müller's muscles).
- 2- Striated muscles (Orbicularis oculi and Levator palpebrae superioris "LPS").
- 3- Dense fibrous plates (Tarsal plates).
- 4- Glands.
- 5- Nerves and blood vessels.

The eyelids protect the eye from injury and excessive light. And prevent excessive dryness of the cornea and conjunctiva.

Macroscopic anatomy:

The eyelids are two movable mucocutaneous folds, which act as shutters. The upper lid extends above to the eyebrow while the lower lid passes without a line of demarcation into the skin of the cheek.

The palpebral fissure is the space enclosed between the two lid margins when the lids are open.

In adults the palpebral fissure is 30 mm in length and 15 mm in width.

Microscopic Anatomy:

The eyelid is formed of 6 layers:

1. **Skin:** very thin skin loosely attached to the underlying structures.
2. **Subcutaneous areolar layer:** loose connective tissue containing no fat.
3. **Muscular layer:** containing the levator palpebrae superioris, and Muller's muscle.
4. **Submuscular layer:** loose connective tissue containing the main blood vessels and nerves of the lid.
5. **Tarsus:** the tarsal plate is a condensed fibrous tissue resembling cartilage it acts as the skeleton of the lid.
6. **Palpebral conjunctiva:** The conjunctive is very thin, vascular, and firmly adherent to the tarsus by fibrous bands.

THE MUSCLES OF THE LID:

1-Orbicularis oculi muscle: the orbicularis muscle is the sphincter of the lid and has 3 portions.

1. Palpebral portion:
 - it is the central part of the muscle and may be divided into pre-septal and pre-tarsal parts.
 - Action: simple closure of the lids as in blinking. It supports the lower lid in its place.
2. Orbital portion:
 - Action: tight closure of the lids.
3. Horner's muscle (pars lacrimalis):

- Thin layer of muscle fibers arising from the posterior lacrimal crest and lacrimal fascia, when this muscle contracts it opens the lacrimal sac

❖ Nerve supply:

- The orbicularis muscle is supplied by the 7th cranial nerve (facial).

2-Levator palpebrae superioris muscle:

- Origin: the levator muscle arises from the lesser wing of the sphenoid bone at the apex of the orbit.
- Insertion: the muscle has several insertions
 - Skin of the upper lid at the upper palpebral sulcus.
 - Upper tarsus.
 - Upper fornix of conjunctiva.
- Nerve supply: 3rd cranial (oculomotor) nerve via its superior division
- Action: elevation of upper lid.
Paralysis of the levator muscle leads to ptosis

3- Superior palpebral muscle (Müller's muscle or superior tarsal muscle):

- It is a small sheet of smooth muscle originated from the under surface of the LPS muscle and inserted to the upper edge of the upper tarsal plate.
- Nerve supply: Sympathetic nerves.
- Function: Like LPS, is to keep the palpebral fissure open against gravity.

GLANDS IN THE EYELIDS:

1. Meibomian glands (Tarsal glands):

- Modified sebaceous gland located in the tarsal plate. The upper tarsus contains 30-40 glands, while the lower tarsus contains 20-30 glands.
- Function: It forms the outer lipid layer of the tear film.

2. Zeis glands:
 - Modified sebaceous gland opened with lash follicles.
3. Glands of Moll:
 - They are modified sweat gland whose ducts also open into lash follicle or directly in the anterior lid margin between the lashes.

CONGENITAL ANOMALIES OF THE LIDS

1. Epicanthus:

- Definition: Semi- lunar fold of skin at the side of the nose.
 - Etiology:
 - Congenital.
 - Racial (Mongolians)
 - Familial.
 - **Clinical picture:**
 - Usually bilateral.
 - Semilunar fold of skin is seen covering the caruncle.
2. **Lid Coloboma** : notching of the lid margin (full thickness developmental defect)
 3. **Congenital Malposition:**
 - ❖ Ptosis
 - ❖ Entropion
 - ❖ Ectropion.
 4. **Distichiasis:** extra row of lashes.
 5. **Ankyloblepharon:** Imperfect separation of the eyelids
 - Treatment: Open the adhesion in between.
 6. **Blepharophimosis:** Narrowing of the palpebral fissure.
 - Treatment: Plastic surgery at pre-school age.

BLEPHARITIS

Blepharitis usually presents as a chronic blepharo-conjunctivitis and it is the most common external eye disorder in clinical practice.

Types:

1. Squamous Blepharitis:

It is low grade infection on top of abnormal secretions of the lid similar to seborrheic dermatitis.

Clinical picture:

- Small, white, scales are present between the lashes.
- Removal of the scales reveals a hyperemic lid margin without ulceration.

Treatment:

- General treatment of seborrhea.
- Remove scales with 3% sodium bicarbonate or diluted baby shampoo.
- Rub antibiotic ointment into the lid margin.
- The treatment must be prolonged 2 – 3 weeks.

2. Ulcerative Blepharitis:

Etiology:

Infection of the lid margin with staphylococcus aureus (sebaceous, sweat gland and hair follicles)

Signs:

- Yellow crusts glue the lashes together.
- Minute ulcers of the lid margin which bleed easily when crusts are removed.

Treatment:

- Lid hygiene
 - Frequent massage to evacuate meibomian secretions
 - Meticulous removal of scales by scrubbing the lid margins with baby shampoo or 3% sodium bicarbonate lotion.
- Elimination of infection

INFLAMMATION OF THE GLANDS OF THE LID

1. Stye (Hordeolum externum):

- Acute suppurative inflammation of Zeis gland and the lash follicle, forming a small abscess.

Etiology:

- ❖ Infection of a Zeis gland by staphylococcus aureus
- ❖ Predisposing factors: diabetes, poor general resistance, errors of refraction and ulcerative blepharitis.

Clinical picture:

Symptoms:

- Swelling of the lid
- Severe pain, first dull then throbbing.

Signs:

Diffuse red swelling

- Related to a lash
- Close to the lid margin.
- Points on the skin side.

Treatment:

- Hot fomentations.
- Local antibiotic drops and ointment.
- Systemic antibiotics.
- When pointing occurs. The pus must be evacuated by :
 - Epilation of the related lash
 - Horizontal incision

For recurrent cases: correct the underlying cause

2. Hordeolum internum

Acute suppurative inflammation of the meibomian gland caused by staphylococcus aureus. It may be primary or it may occur on top of a chronic inflammation of the meibomian gland (chalazion) Hordeolum internum should be differentiated from hordeolum externum(stye).

Chalazion (cyst)

It is a chronic non – specific inflammatory granuloma of meibomian gland.

Etiology:

- Etiology unknown.
- It is a granuloma produced by the retained contents of the gland following obstruction of its duct, or as a result of chronic irritation by a low virulence organism.

Clinical Picture:**Symptoms:**

- Painless swelling of a long duration felt under the lids.
- Pain occurs only when it become infected

Signs:

- Slowly growing painless swelling of the tarsus.
- If the lid everted, the conjunctiva is seen red over the nodule.

Treatment:

- a. Very small chalazion: Vitamin A, local antibiotic and steroid preparation.
- b. Marginal chalazion : scraping from lid margin followed by diathermy
- c. Moderate or large chalazion: vertical incision and scraping through the conjunctival side.
- d. Multiple chalazia: combined excision of tarsus and conjunctiva leaving the lower third of the tarsus (to avoid lid notching) with replacement by a mucous graft from the lip.
- e. Recurrent chalazion of the same gland: excision biopsy to exclude malignant tumor.

DISORDERS OF EYELASHES

1. **Trichiasis:** Trichiasis is a condition where more than 4 lashes are rubbing against the cornea or conjunctiva.
2. **Rubbing lashes:** Rubbing is a term applied to the condition when 4 lashes or less are misdirected or rub against the cornea or conjunctiva.
3. **Madarosis:** permanent absence of eye lashes due to destruction of the lash follicles.
4. **Distichiasis:** An extra row of lashes situated in or near to the openings of the meibomian glands.
5. **poliosis:** whitening of the lashes.

MALPOSTION OF THE EYELID

Entropion

Entropion is the rolling inwards of the eyelid. The whole row of the lashes will be rubbing against the cornea and finally there will be a deformity of the tarsus.

Types:

- a. **Cicatricial (fibrotic) entropion:** Fibrosis of the palpebral conjunctiva due to trachoma, chemical burns, diphtheria and ocular cicatricial pemphigoid.
- b. **Spastic entropion:** due to spasm of orbicularis muscle in response to ocular irritation e.g inflammation, exposed sutures, operations following enucleation or enophthalmos.
- c. **Involucional (senile) entropion:** affects only the lower lid due to overriding of the preseptal portion of orbicularis muscle over the pretarsal portion.
- d. **Congenital entropion:** usually affecting the whole lower eyelid.

Ectropion

Ectropion is rolling outwards of the eyelid from the globe. It usually affects the lower lid as it stands against gravity.

Types:

- a. **Involucional (senile) ectropion:** due to senile weakness of the orbicularis muscle and relaxation of the palpebrall ligaments.
- b. **Cicatricial (fibrotic) ectropion:** due to scarring and contracture of the skin of the lower lids by burns, trauma or tumor.
- c. **Paralytic ectropion:** due to paralysis of orbicularis muscle in facial nerve palsy.
- d. **Mechanical ectropion:** due to increased weight of lower lid by e. g. multiple chalazia.
- e. **Congenital ectropion:** rare

Ptosis

Definition:

Ptosis is the drooping of the upper eyelid that normally covers the upper 1/6 of the cornea.

Etiology (types)

1. **Myogenic ptosis:** due to disorders of levator muscle.
 - a. Congenital ptosis: due to dystrophy of levator muscle.
 - b. Acquired ptosis: myasthenia gravis: due to a defect at the myoneural junction.
2. **Neurogenic ptosis:** due to a disorder of nerve supply.
 - a. Third nerve palsy: paralytic ptosis (diabetes, congenital, or traumatic)
 - b. Horner's syndrome: due to disorder of sympathetic nerve supply leading to Mullers muscle paralysis. (partial ptosis, miosis, anhydrosis and enophthalmos)
3. **Aponeurotic ptosis:** due to disorder of levator aponeurosis .
 - a. Involutional (senile) ptosis: degenerative process with age.
 - b. Postoperative ptosis: after cataract or retinal detachment surgery.
4. **Mechanical ptosis:**
 - a. Excess weight due to edema, trauma, tumor.
 - b. Conjunctival scarring.

Important clinical points:

1. Measurement of degree of ptosis:
 - a. Measure the vertical distance bet. Center of upper lid margin & lower limbus (VFH)
 - Normally: 9mm
 - Mild: dropping 1-2 mm

- Moderate: drooping 3 mm
- Severe: drooping 4mm or more.

b. Margin – reflex distance (MRD):

- Measure the distance between upper lid margin & corneal light reflex.
- Normally: 4 – 4.5 mm.

2. Determine the levator function:

- Correct head position & ask patient to look down to relax frontalis.
- Fix eye brow against supra- orbital margin using the thumb to prevent elevation by frontalis ms.
- Ask patient to look up.
- Measure elevation of lid margin in mm using ruler:
- Grades:

▪ normal	15mm
▪ Good	12- 15 mm
▪ Fair	5 - 11mm
▪ Poor	4 mm

3. Test of extra- ocular ms movement: to exclude 3rd n. palsy.

Treatment:

The treatment of all types is surgical *except in myasthenia gravis, where the treatment is medical*. Surgical procedures are:

a- Levator resection.

b- Frontalis brow suspension (Sling operation).

c- Tarso-conjunctival resection (Fasanella servate procedure).

- **Choice of one of these three types depends on:**

a- Aetiology of ptosis.

b- Severity of ptosis: Mild, moderate or severe.

c- Function of LPS: Good, fair or poor.