

Applied Anatomy Of Upper Eyelids & Pathology Of Ptosis

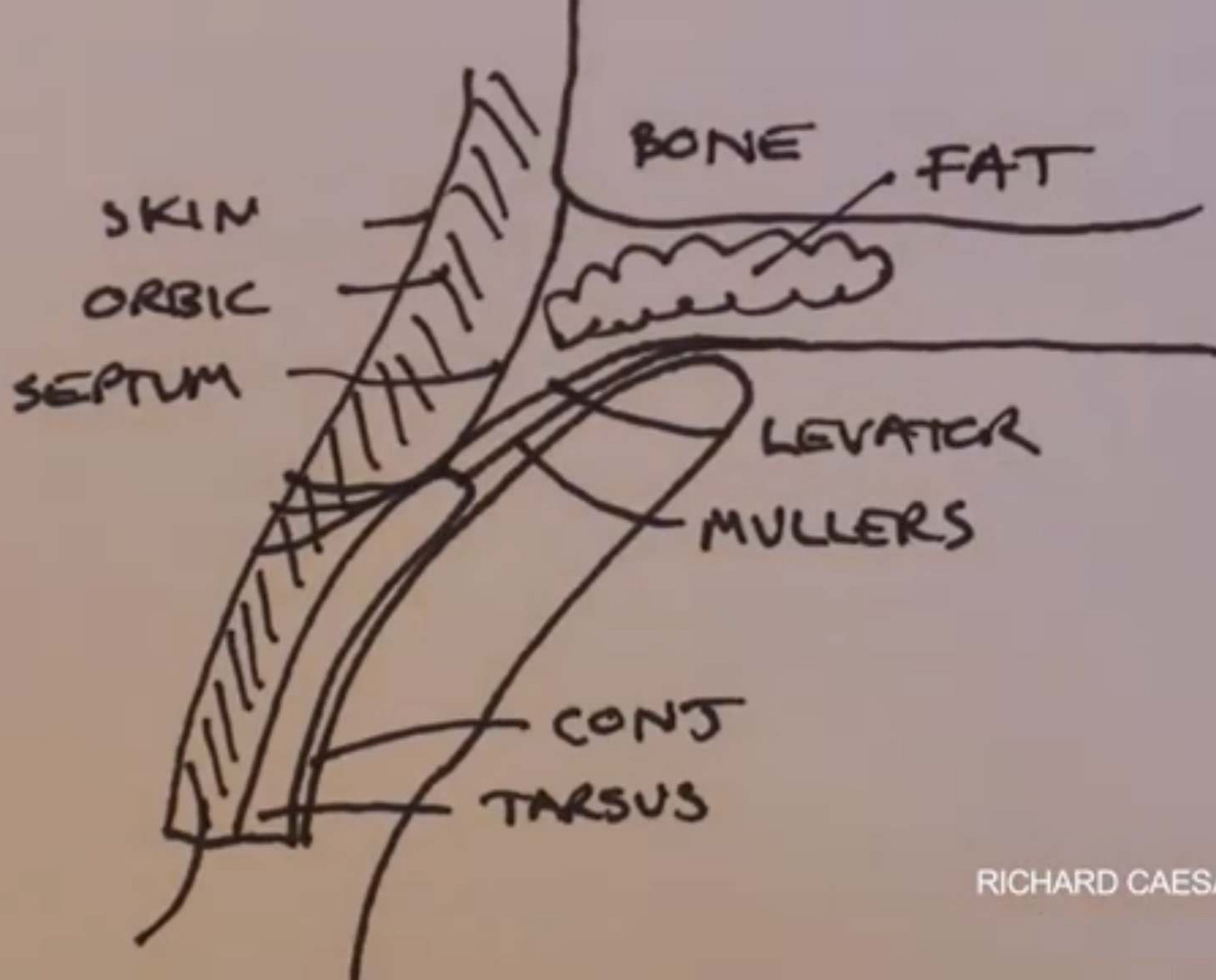
Mahmoud Deif

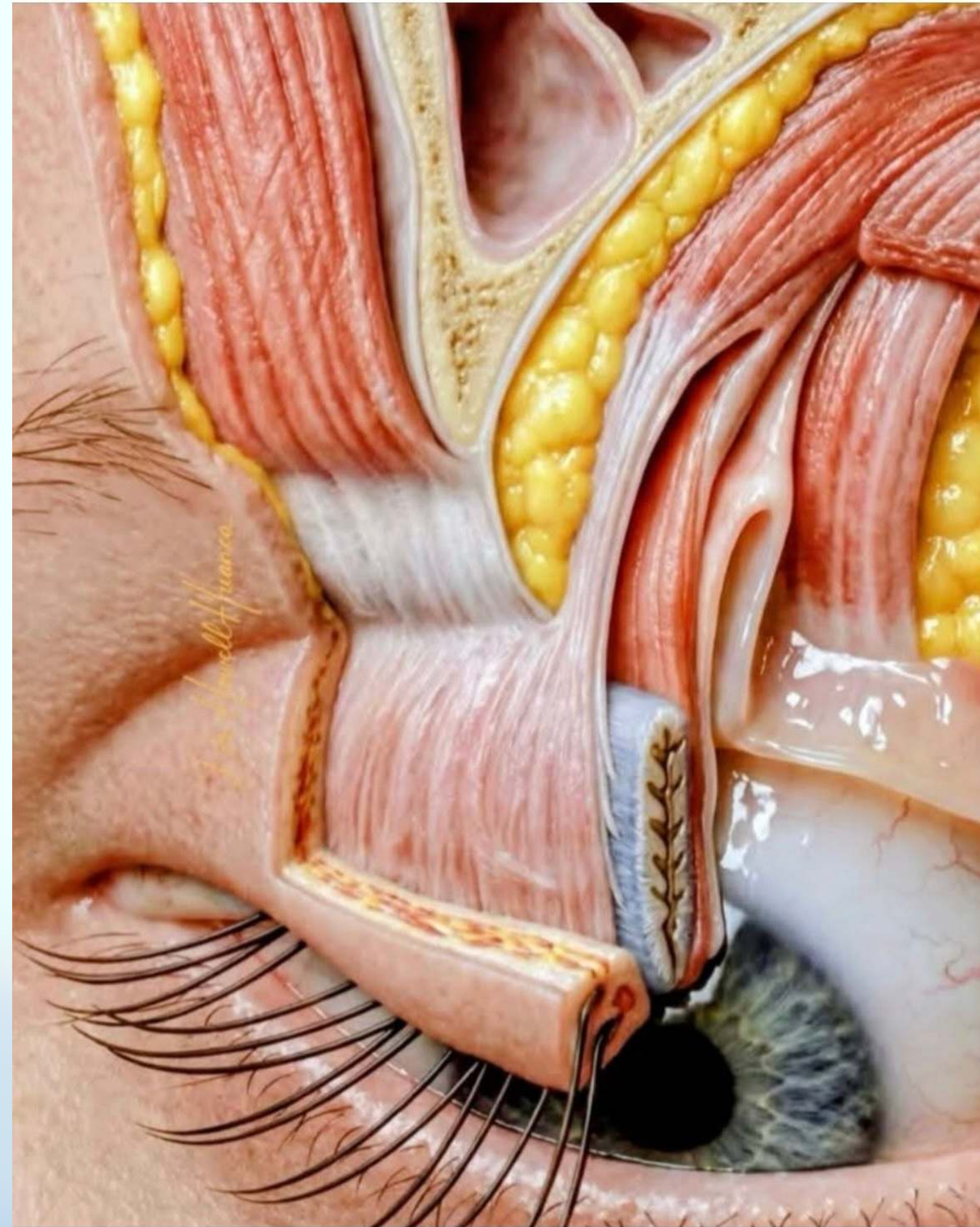
Occuloplastics fellow ,RIO

Conceptual organisation :

From an occloplastic point of view , the upper eyelid is best understood as as three integrated functional units :

- * anterior lamellae : skin & orbicularis
- * Middle lamlellae : orbital septum & fat
- * Posterior lamellae : tarsus & conjunctiva





Skin & subcutaneous fat:

- Thinnest skin in the body
- No true subcutaneous fat
- Strong attachment to levator aponeurosis to form the upper lid crease

Orbicularis oculi muscle :

- Pretarsal : essential for lid globe apposition
- Preseptal
- Orbital

Innervation :

- Temporal and zygomatic branches of CN VII
- Excessive orbicularis stripping >> pretarsal weakness >> lagophthalmos post ptosis surgery

Orbital septum :

- Fibrous extension of the orbital rim periosteum
- Fuses with levator aponeurosis 3-5 mm above tarsal border

Septum fat relationship :

Preaponeurotic fat lies posterior to the septum

Identifying septum is a landmark during ptosis surgery

Septum must be opened above levator aponeurosis



Preaponeurotic fat :

Compartments

- Central fat pad
- Medial fat pad
 - More yellow
 - Contains trochlear nerve medially (surgical landmark)

Function

- Acts as a gliding interface for levator
- Excessive excision → deep sulcus deformity

Key concept

Ptosis surgery is levator surgery, not fat surgery.

Levator palpebrae superioris

Origin

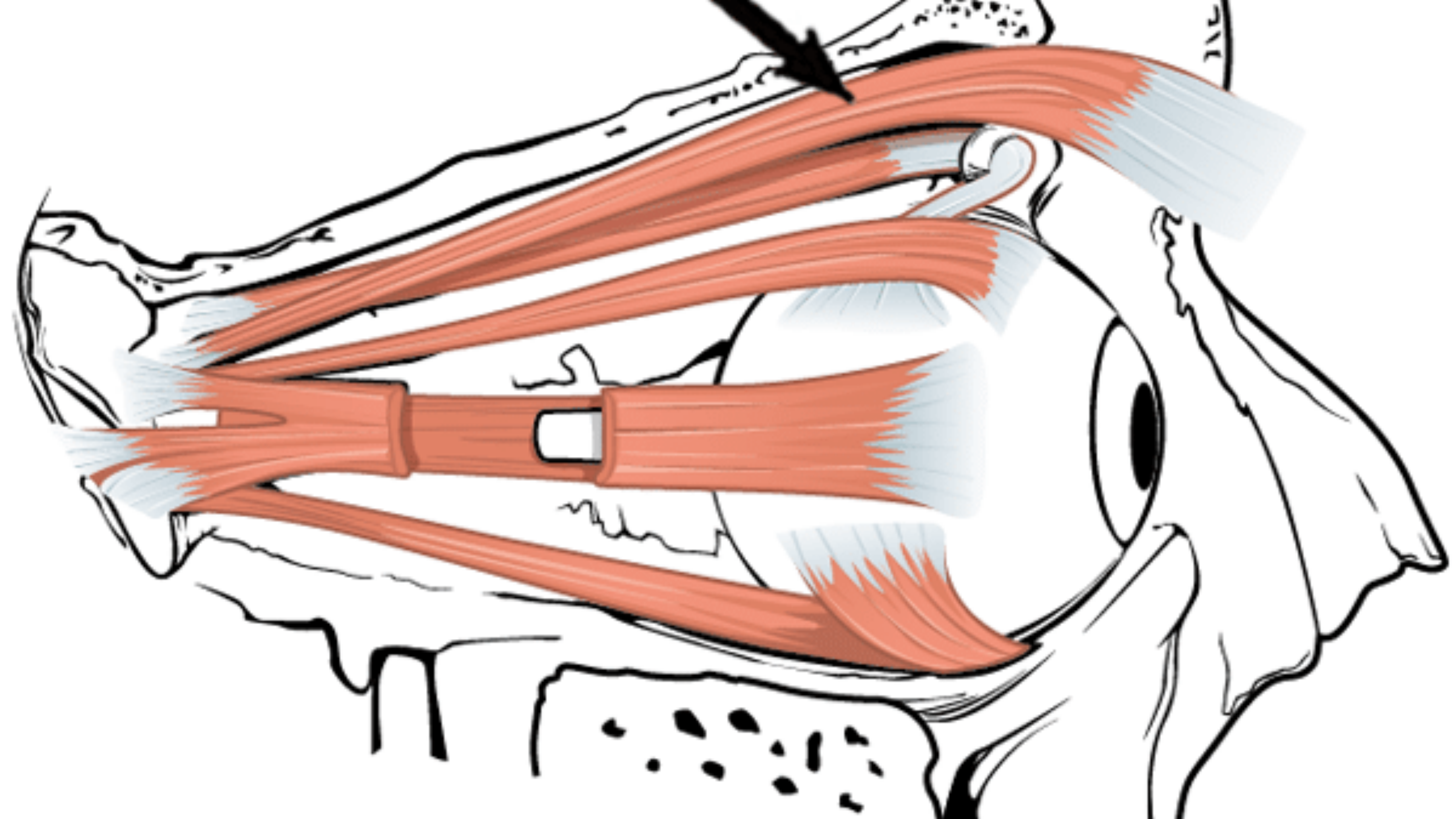
- Lesser wing of sphenoid
- Superior and anterior to optic canal

Course

- Travels anteriorly above superior rectus
- Transitions into aponeurosis near Whitnall's ligament

Innervation

- Superior division of CN III



Whitnall's ligament :

Anatomy

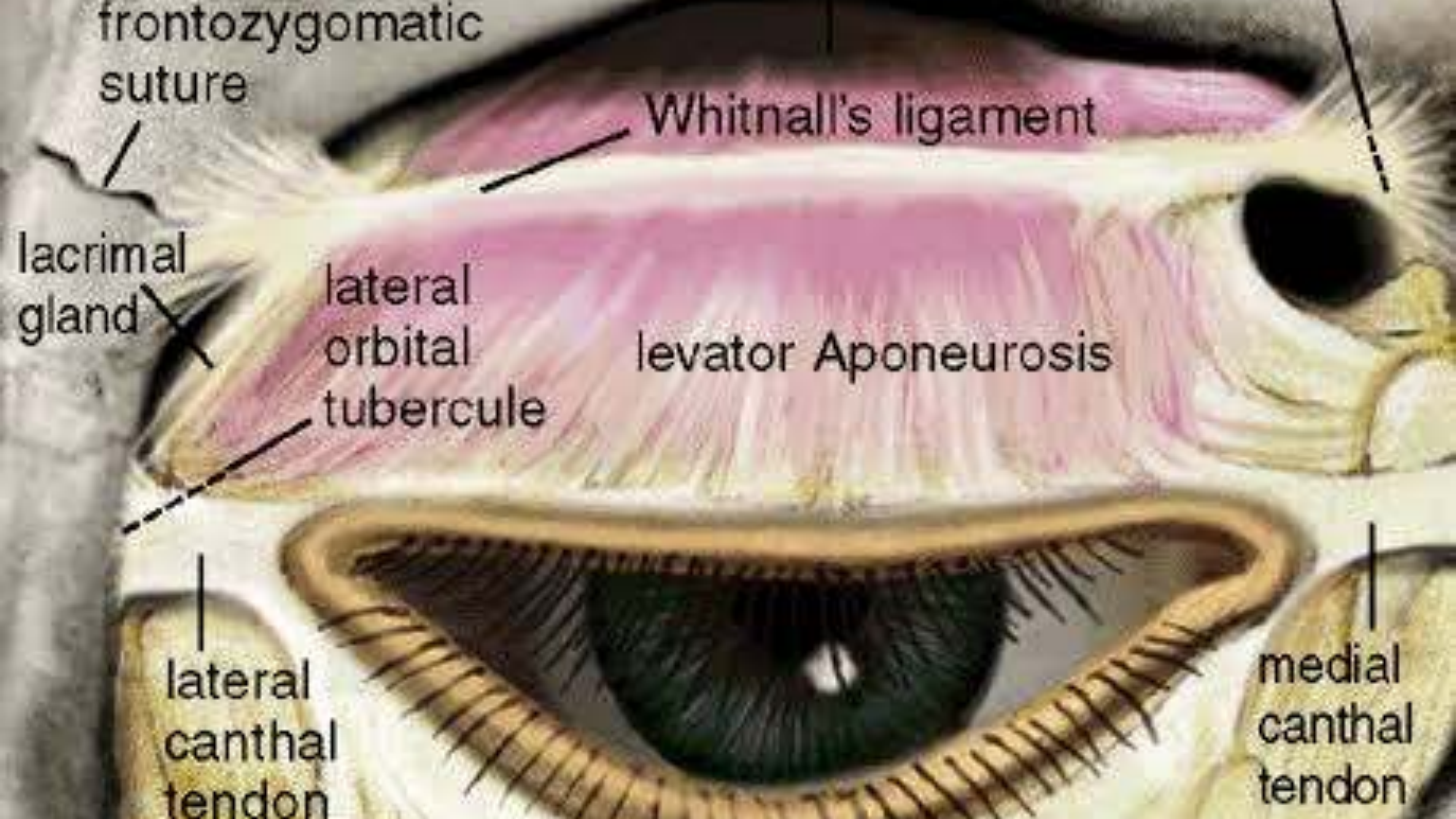
- Condensation of fascia at levator–aponeurosis junction
- Acts as a functional pulley
- Prevents posterior displacement of levator

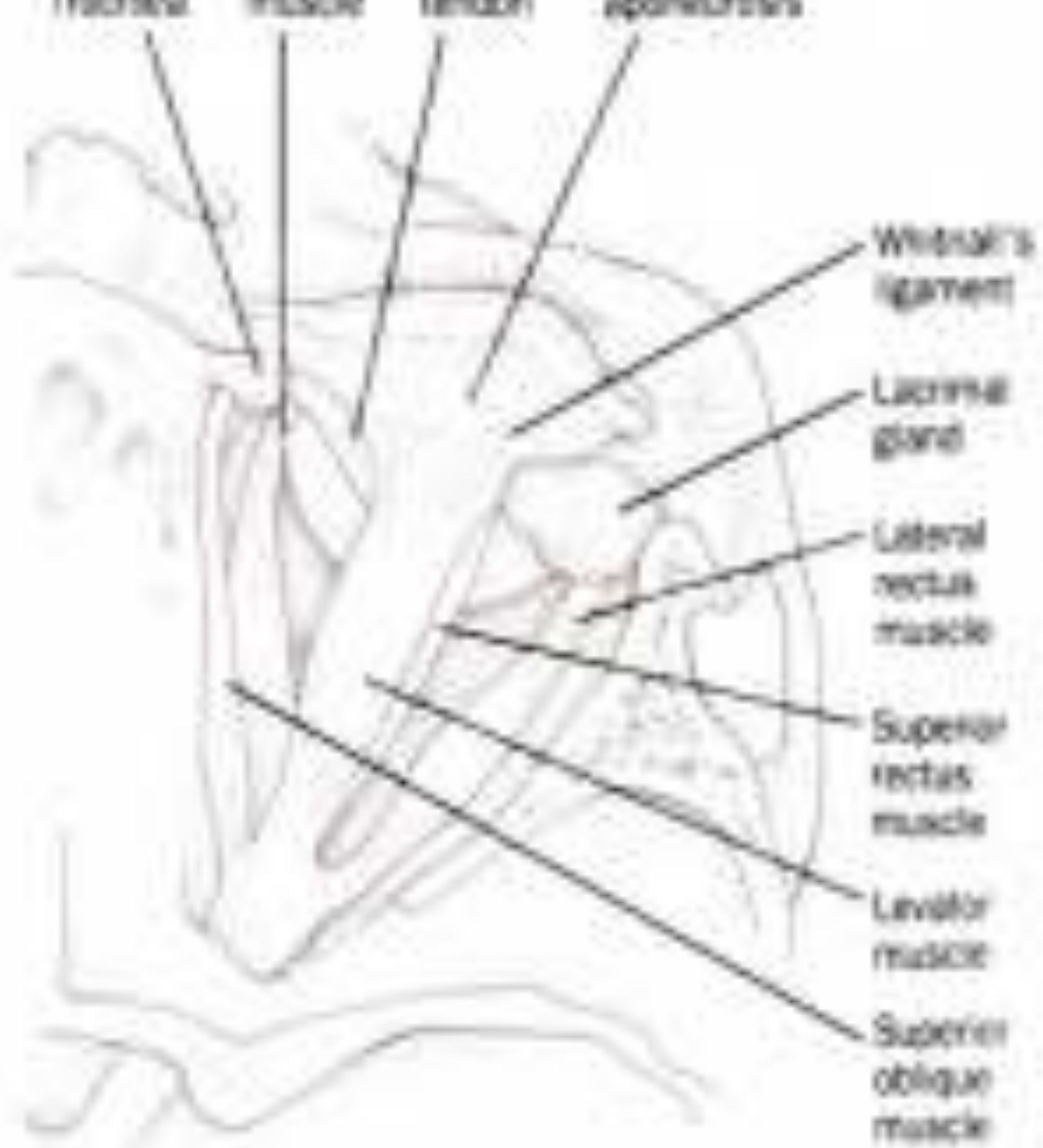
Attachments

- Medial orbital wall
- Lateral orbital wall
- Interdigitates with lacrimal gland fascia laterally

Clinical importance

- Defines:
 - Transition from muscle → aponeurosis
 - Surgical landmark in ptosis repair
- Weak or disrupted in congenital ptosis





Levator aponeurosis

Insertions

- Anterior surface of tarsal plate
- Skin (forming lid crease)
- Medial and lateral horns:
 - Lateral horn stronger → medial ptosis more common

Age-related changes

- Thinning
- Stretching
- Disinsertion → aponeurotic ptosis

Surgical relevance

- Reattachment restores both height and contour

Müller's muscle :

Characteristics

- Smooth muscle
- Sympathetic innervation
- Elevation: ~1.5–2 mm

Attachments

- Origin: undersurface of levator
- Insertion: superior tarsal border

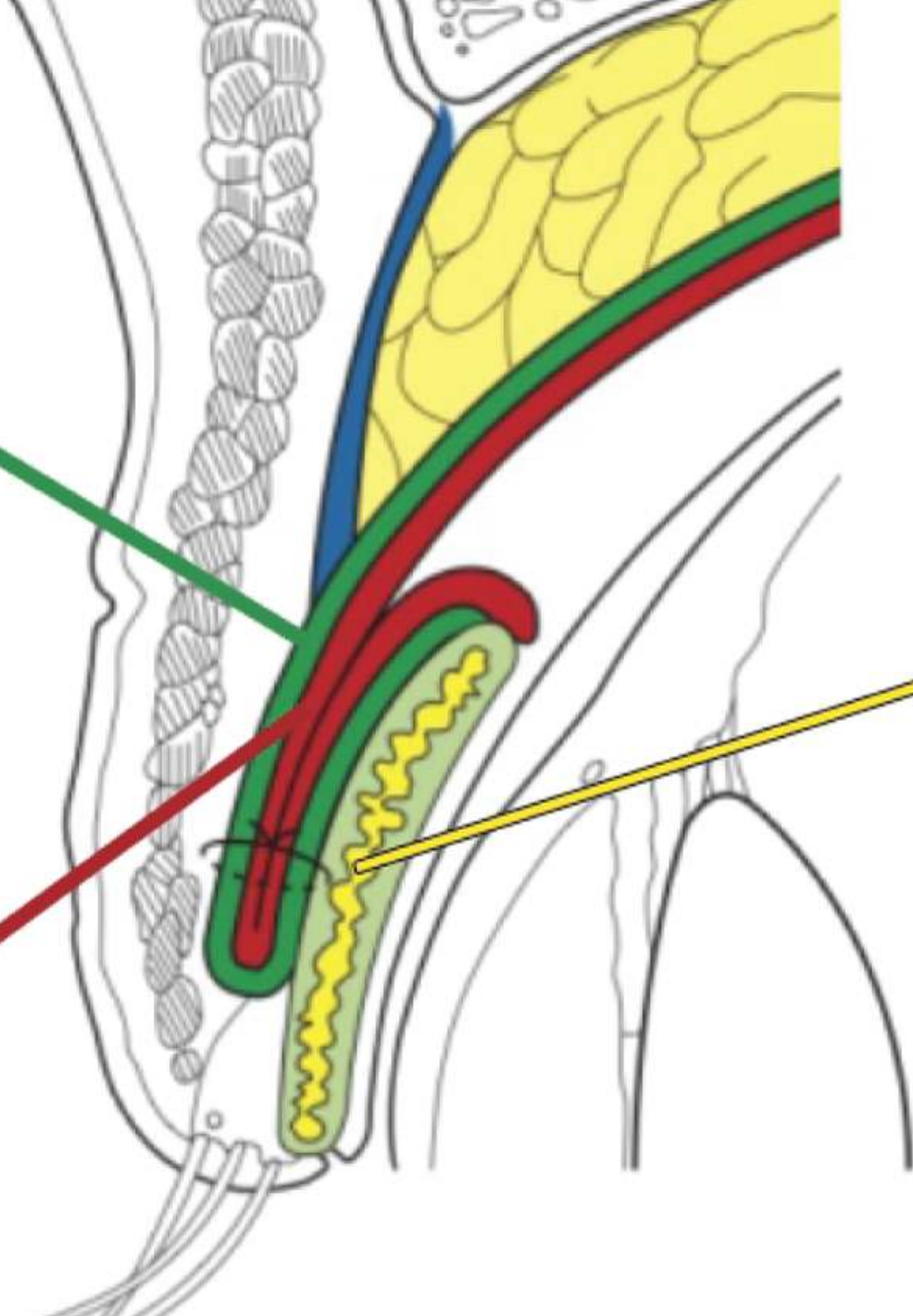
Clinical relevance

- Target in:
 - Müller muscle–conjunctival resection (MMCR)
- Dysfunction → Horner syndrome ptosis

**levator
aponeurosis**

Müller muscle

tarsus



Pathogenesis of ptosis , classification and mechanisms

True vs Pseudoptosis

- True ptosis: malfunction of elevator complex
- Pseudoptosis: apparent droop due to adjacent structural changes (e.g., brow ptosis, dermatochalasis)

Aponeurotic ptosis

- Most common acquired form
 - Mechanism: aponeurotic dehiscence, attenuation, or disinsertion
 - Lid crease is high or broadened
 - Often good levator function with lid droop due to reduced transmission

Neurogenic ptosis

- CN III palsy → loss of levator innervation; associated motility deficits
 - Horner's syndrome → sympathetic loss affecting Müller's muscle (~1–3 mm ptosis)

Myogenic ptosis

- Primary muscle disease (e.g., myasthenia gravis, CPEO)
 - Fatty atrophy, weakness in levator fibers

Mechanical ptosis

- Lid weight increased by tumor, scarring, cicatrization
 - Restricts upward movement

Traumatic ptosis

- Direct injury to levator, aponeurosis or surrounding fascia
 - Can recover or require surgical repair