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"Blepharoptosis is a more accurate term than ptosis alone"

Presentation layout

By the end of this presentation you should be able to know about the following aspects of PTOSIS

- Causes
- Types
- Evaluation
- Management

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What is Ptosis?

- The term is from Greek πτῶσις – "a fall, falling
- Normally upper lid covers about upper one sixth of the cornea i.e. about 2mm
- In ptosis it covers more than 2mm

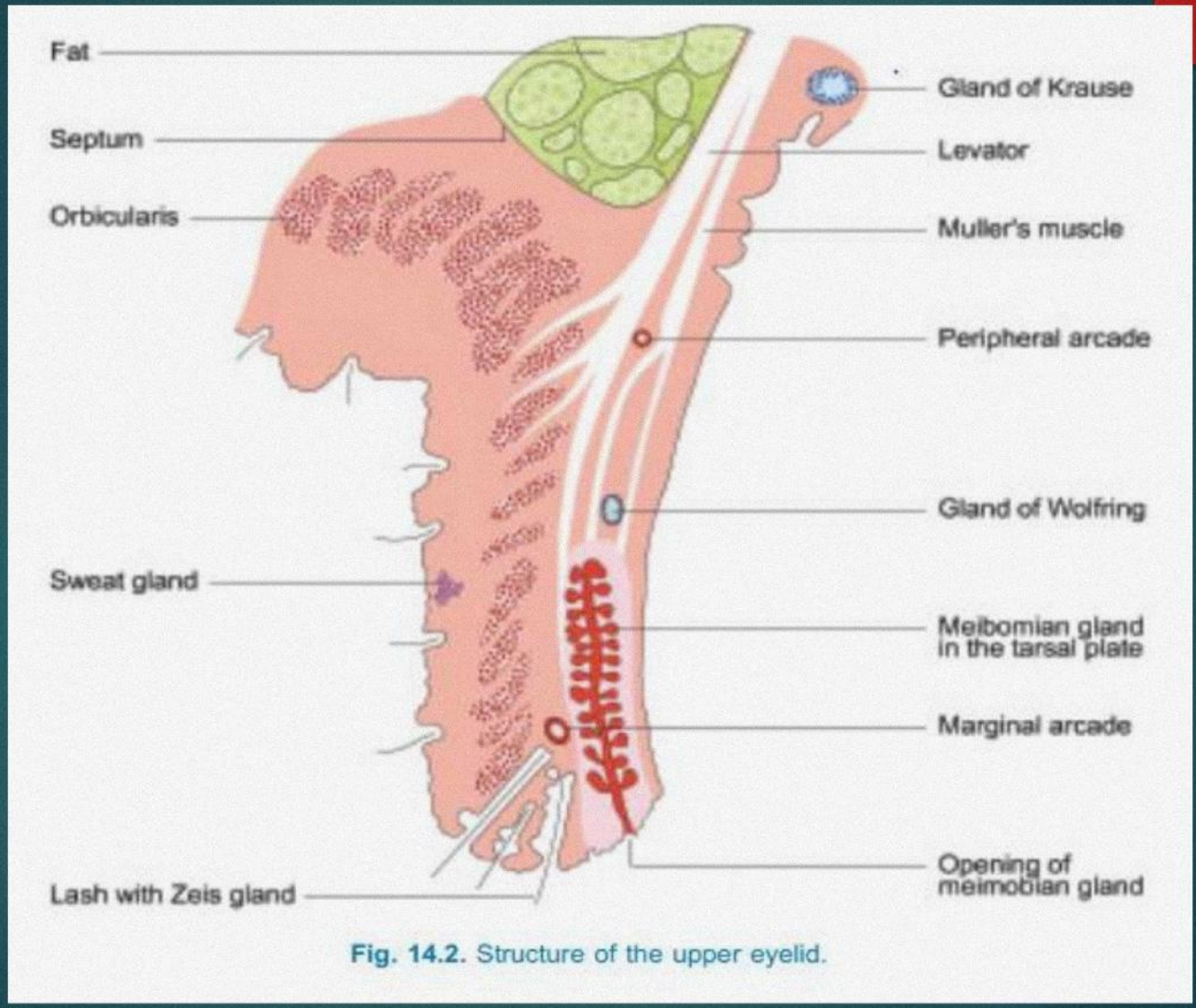
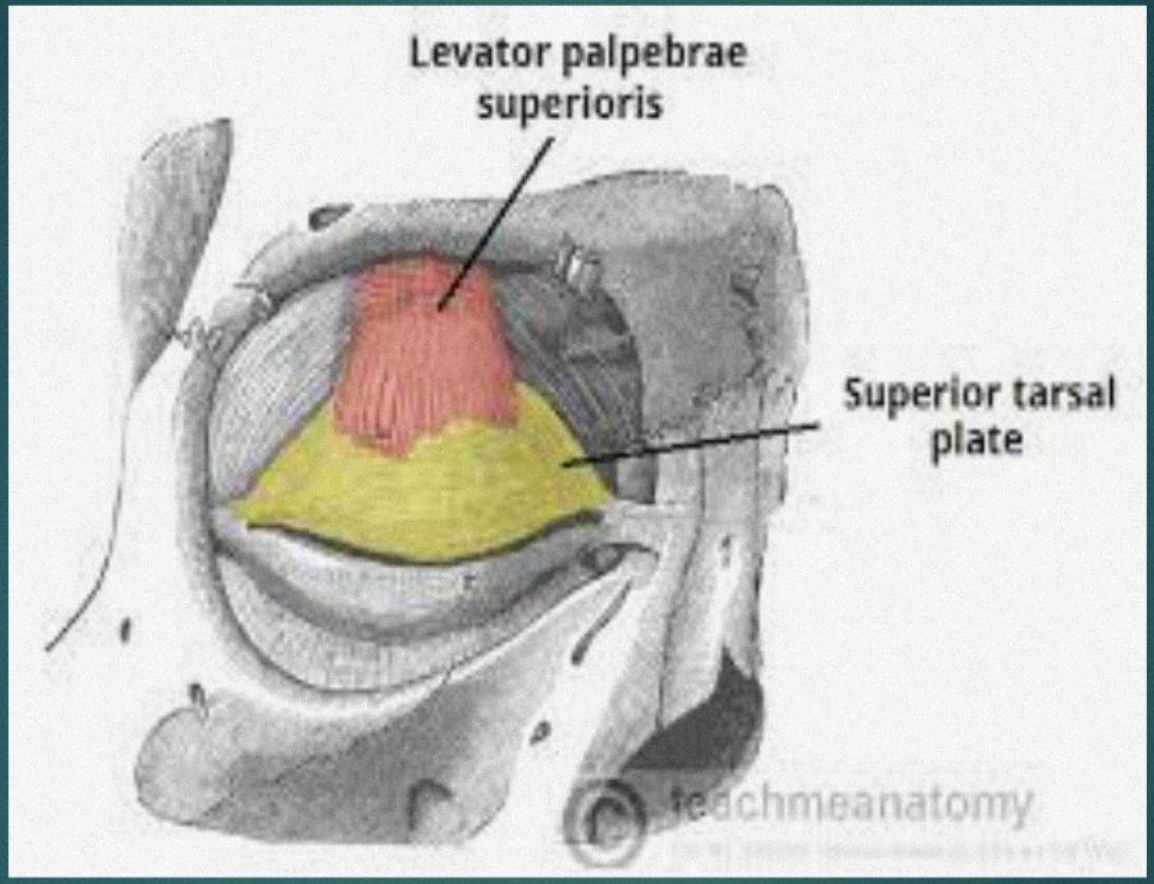


Fig. 14.2. Structure of the upper eyelid.



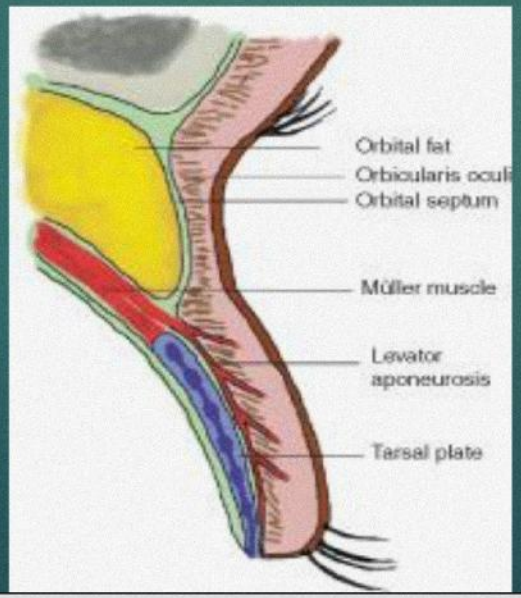
LPS

- Primary muscle responsible for lid elevation
- It arises from the back of the orbit and extends forwards over the cone of eye muscles
- It inserts into the eyelid and the tarsal plate, a fibrous semicircular structure which gives the upper eyelid its shape
- Supplied by the superior division of 3rd CN

Muller's muscles:

- The way that the LPS attaches to the tarsal plate is modified by the underlying Müller's muscle

- Involuntary muscle, with sympathetic innervation, has the capacity to 'tighten' the attachment and so raise the lid a few millimeters

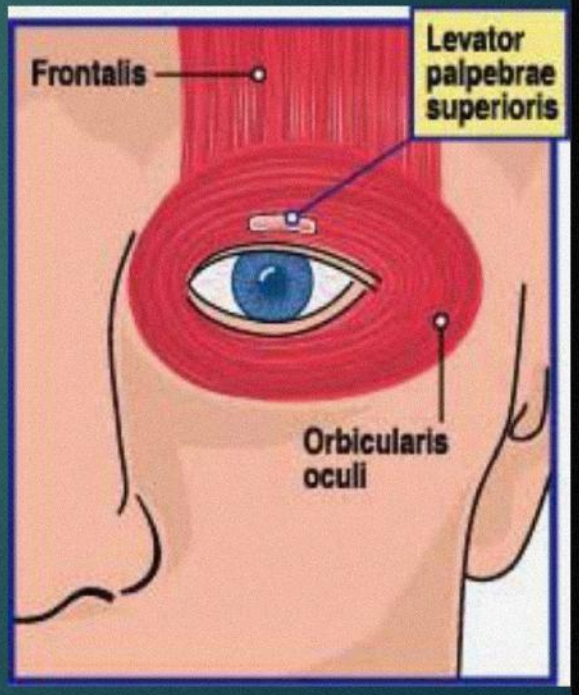


• Frontalis & Orbicularis Oculi

- Supplied by facial nerve

- Frontalis contraction helps to elevate the lid by acting indirectly on the surrounding soft tissues

- OO contraction depresses the eyelid



CLASSIFICATION OF PTOSIS

A. **Congenital**

B. **Acquired**
   1. Neurogenic
   2. Myogenic
   3. Aponeurotic
   4. Mechanical
   5. Neurotoxic

C. **Pseudo Ptosis**

Congenital Ptosis

1-Simple congenital Ptosis

2- Congenital ptosis with associated weakness of superior rectus muscle

3- Blepharophimosis syndrome

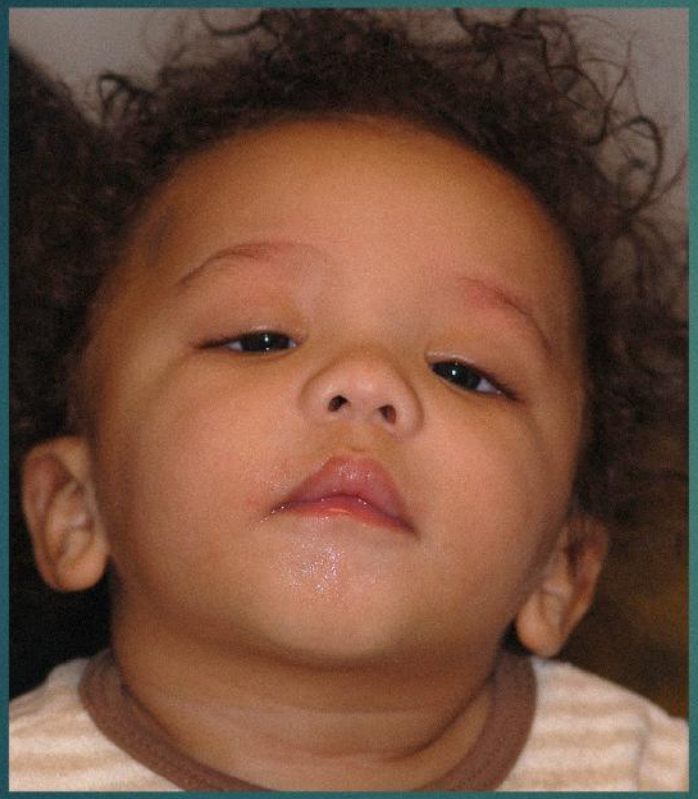
4- Congenital synkinetic Ptosis

(Marcus Gunn jaw winking ptosis)

Congenital Ptosis

- Maldevelopment of the levator palpebrae superioris (LPS)
- May be associated with SR weakness
- If visual axis is covered - risk of amblyopia
- Absent skin crease
- Upward position of ptotic lid in down gaze

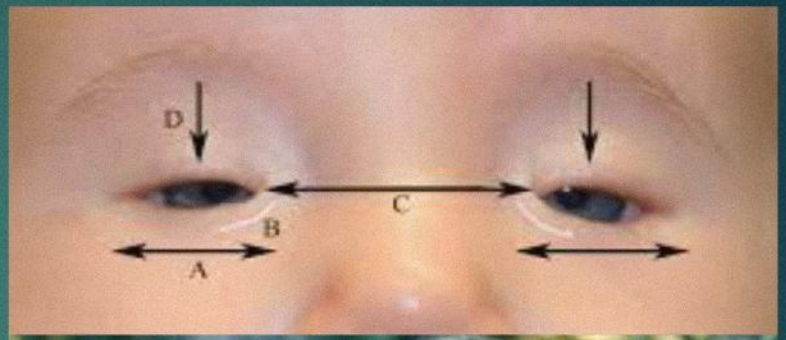
Congenital Ptosis

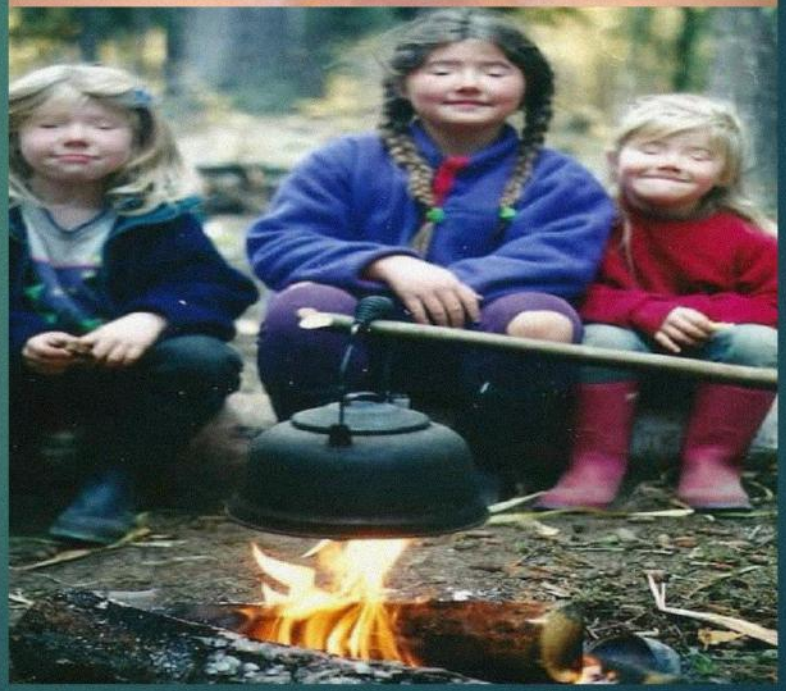


What do u see here?

Blepharophimosis syndrome

- Moderate to severe symmetrical ptosis
- Short horizontal palpebral aperture
- **Telecanthus** (lateral displacement of medial canthus)
- **Epicanthus inversus** (lower lid fold larger than upper)
- Poorly developed nasal bridge and hypoplasia of superior orbital rims





Type 1 : associated with primary ovarian failure
Type 2: no systemic association

- Mutation in FOXL2 gene
- Controls the production of the FOXL2 protein
- (involved in the development of the muscles in the eyelids as well as the growth and development of ovarian cells)
- Females should be referred to an endocrinologist or gynecologist to assess for primary ovarian insufficiency

Congenital Synkinetic ptosis

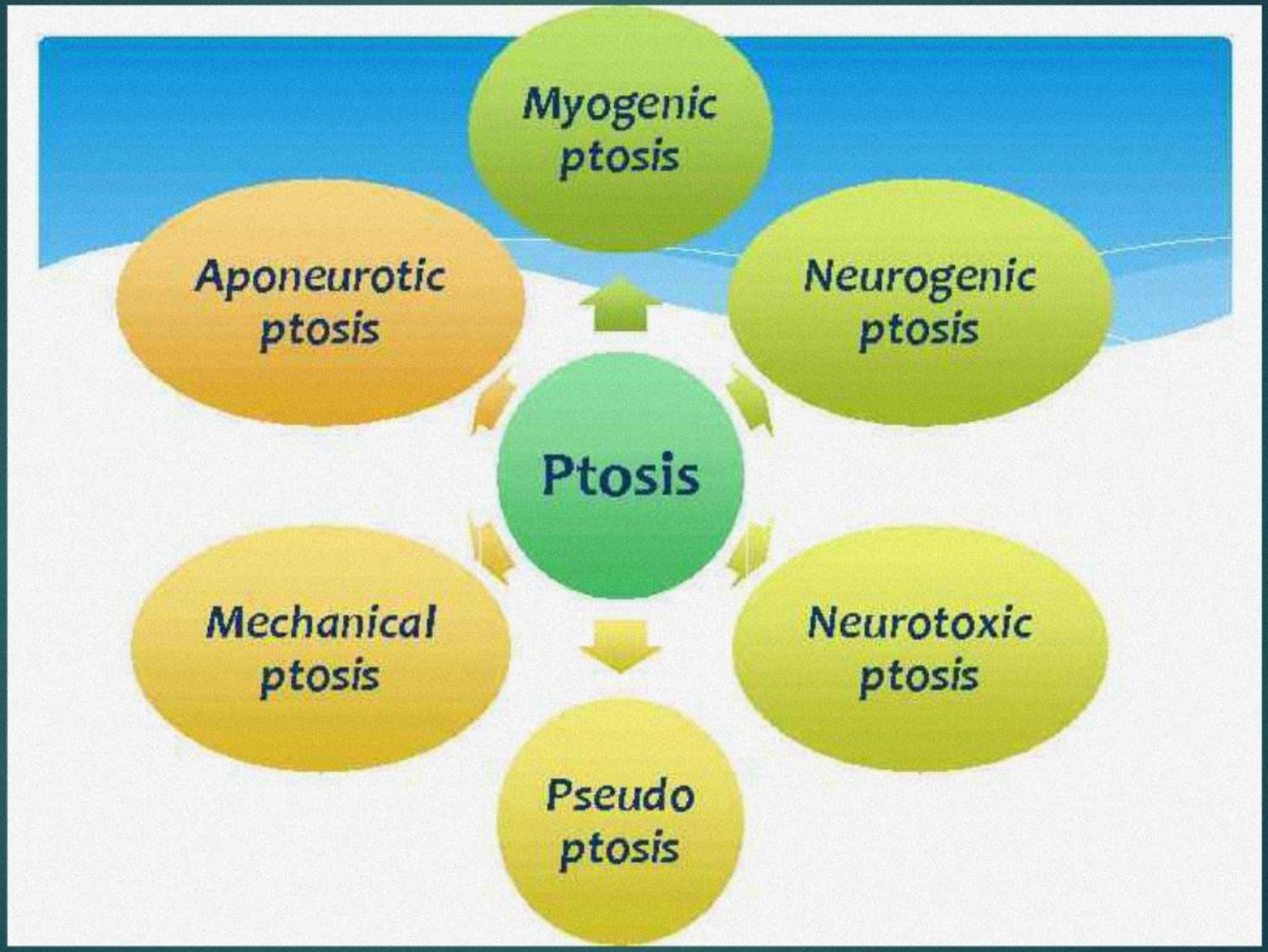
IN MARCUS GUNN PHENOMENON

- The stimulation of the trigeminal nerve by the contraction of the pterygoid muscles results in the excitation of the branch of the oculomotor nerve that innervates the LPS ipsilaterally, so the patient will have rhythmic upward jerking of their upper eyelid

- Accounts for about 5% of all cases of congenital Ptosis

Marcus Gunn jaw-winking syndrome

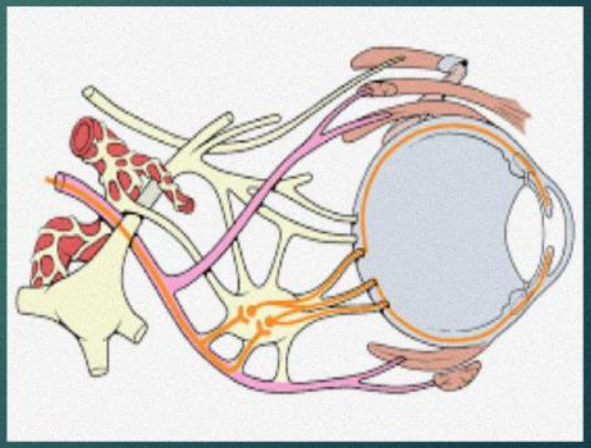
ACQUIRED PTOSIS



1-Neurogenic ptosis

- Third nerve palsy
- 3rd nerve misdirection
- Horner's syndrome
- Ophthalmoplegic migraine
- Cerebral ptosis
- Multiple sclerosis

Third nerve palsy

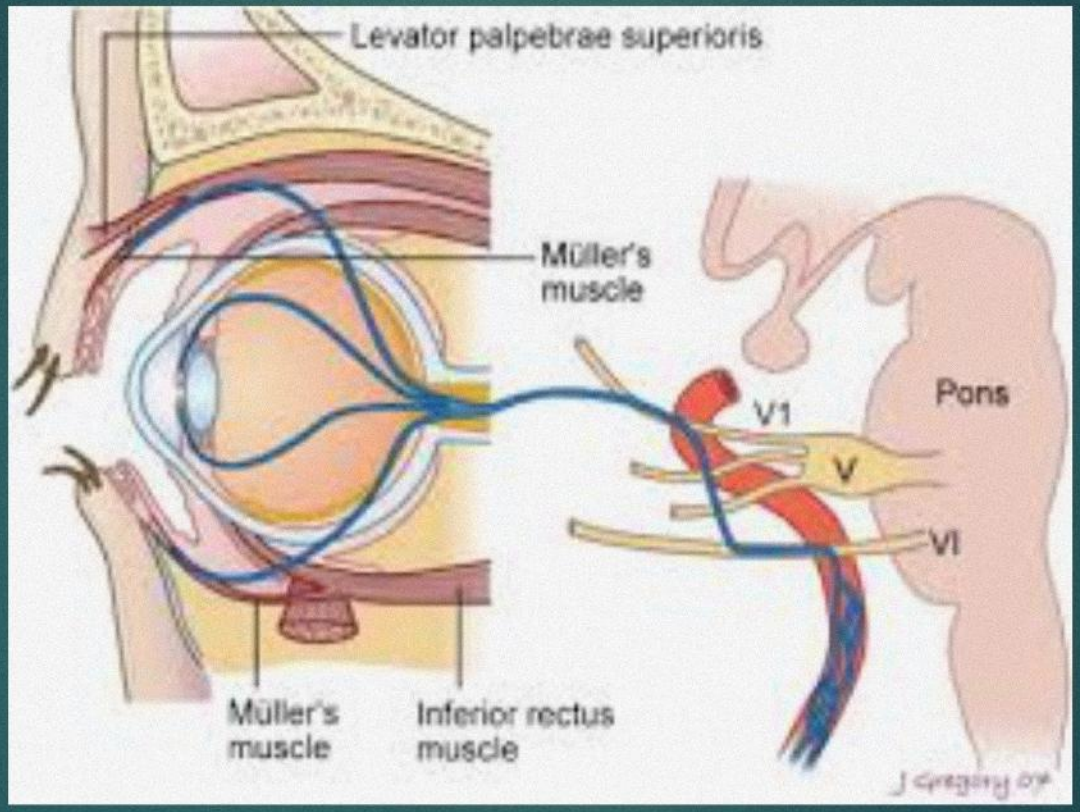


Right third nerve misdirection

- Aberrant regeneration following acquired third nerve palsy
- Pupil is occasionally involved
- Bizarre movements of upper lid accompany eye movements

Right ptosis in primary position	Worse on right gaze	Normal on left gaze

HORNER'S SYNDROME



HORNER'S SYNDROME

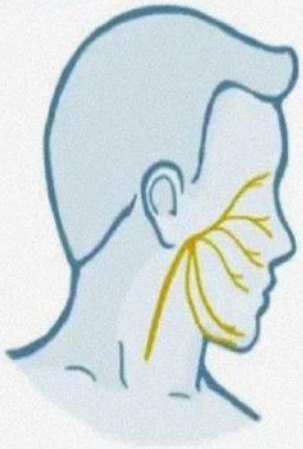
JOHANN FRIEDRICH HORNER

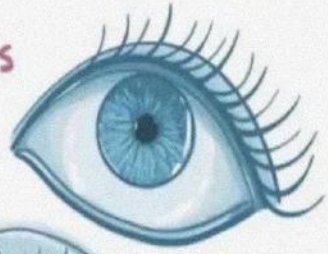
~PROBLEM WITH SYMPATHETIC NERVE SUPPLY TO ONE SIDE of FACE

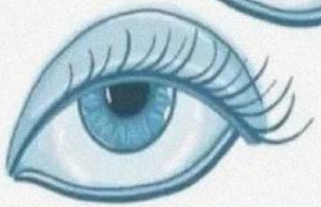
↓

RESULTS IN:

- MIOSIS ~ CONSTRICTED PUPILS
- PTOSIS ~ DROOPY EYELID
- ANHIDROSIS
  - FAILURE TO SWEAT

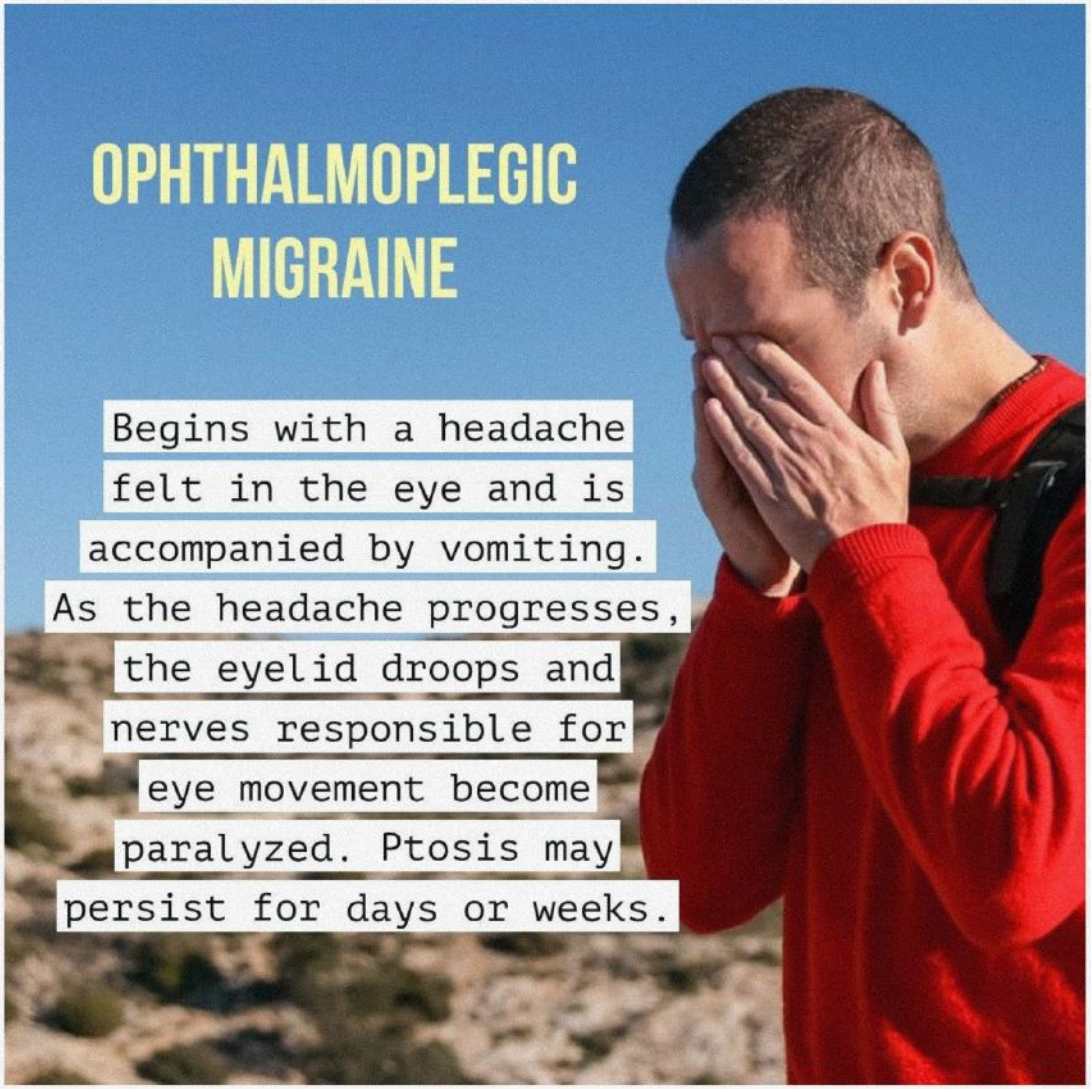






Horner's syndrome

OPHTHALMOPLEGIC MIGRAINE



Begins with a headache felt in the eye and is accompanied by vomiting. As the headache progresses, the eyelid droops and nerves responsible for eye movement become paralyzed. Ptosis may persist for days or weeks.

Cerebral ptosis

- Due to supranuclear lesions
- Unilateral cerebral ptosis occurs with lesions, usually ischemic, of the opposite hemisphere, and is more common with right hemisphere lesions
- Bilateral supranuclear ptosis may occur with unilateral or bilateral hemispheric lesions
- Ptosis has been reported in as many as 37.5% of patients with hemispheric strokes

2-MYOGENIC PTOSIS

- It is due to acquired disorders of the LPS muscle or of the myoneural junction

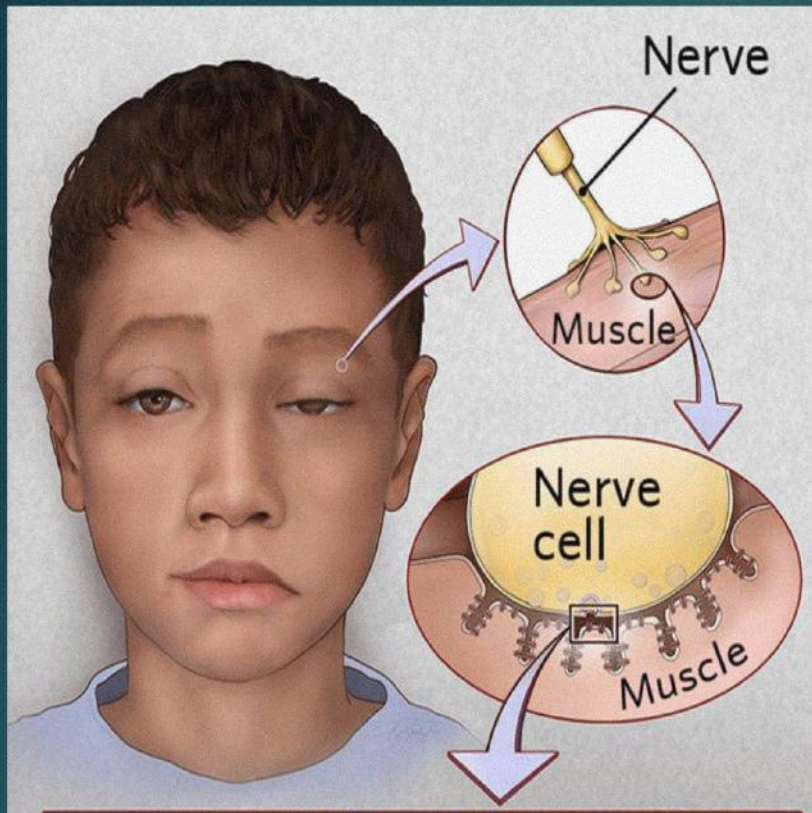
- **Myasthenia gravis**
- **Myotonic dystrophy**
- **Ocular myopathies**
- **Oculo-pharyngeal muscular dystrophy**
- **Following trauma to the LPS muscle**

Myasthenia Gravis

Disease of Neuromuscular Junction

Features

(1) Drooping of eyelids
(2) Weakness in arms legs
(3) Change of Voice
(4) Swalllowing Difficulty



Myotonic dystrophy

Release of grip difficult

- Muscle wasting
- Involvement of tongue and pharyngeal muscles
- Ophthalmoplegia – uncommon
- Hypogonadism
- Frontal baldness in males
- Intellectual deterioration
- Presenile stellate cataracts

Ocular myopathies

Clinical types

- Isolated
- Oculopharyngeal dystrophy
- Kearns-Sayre syndrome (pigmentary retinopathy)

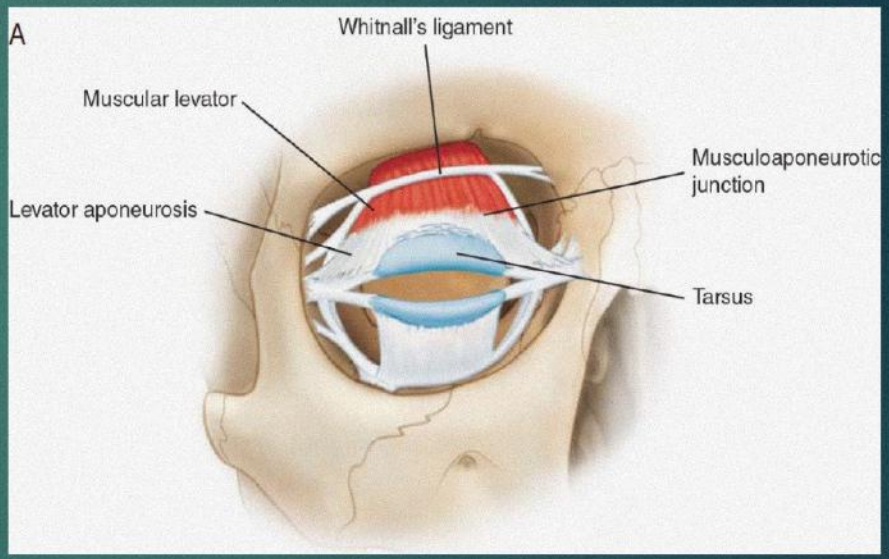
Ocular features

Ptosis – slow, progressive and symmetrical

Ophthalmoplegia slow, progressive and symmetrical no diplopia

3. APONEUROTIC PTOSIS

- It develops due to defects of the levator aponeurosis in the presence of a normal functioning muscle
- Involutional (senile) ptosis
- Post operative ptosis
- Posttraumatic dehiscence or disinsertion of the aponeurosis

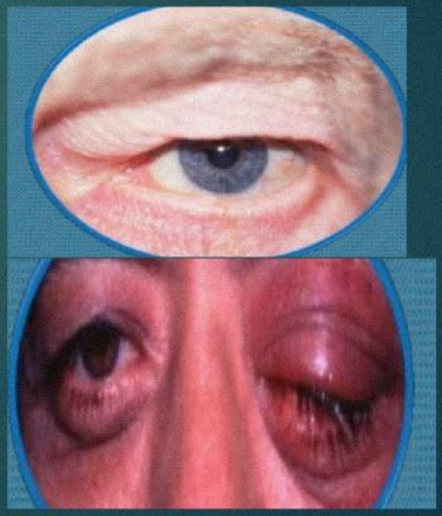


Involutional ptosis

- High upper lid crease
- Good levator function
- Absent upper lid crease
- Deep sulcus

4. Mechanical ptosis

- **Due to excessive weight** on the upper lid
  - lid tumors
  - Chalazion
  - lid edema
- **Cicatricial Ptosis**
  - Ocular pemphigoid
  - Trachoma



- Orbital tumors

- Chalazion

5. NEUROTOXIC PTOSIS

- Envenomation by elapids such as cobras, or kraits
- Bilateral ptosis is usually accompanied by diplopia, dysphagia and/or progressive muscular paralysis
- Neurotoxic ptosis is a precursor to respiratory failure and eventual suffocation caused by complete paralysis of the thoracic diaphragm
- Medical emergency

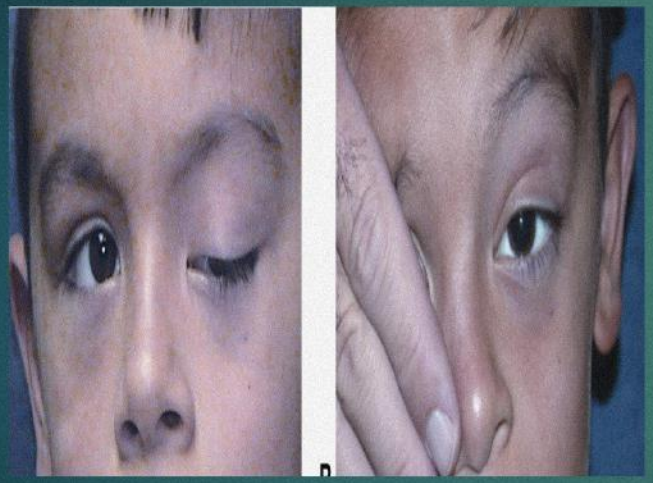
PSEUDOPTOSIS

- Pseudoptosis is the appearance of ptosis in the absence of LPS abnormality
- Exclude pseudoptosis (simulated ptosis) on inspection

- **Microphthalmia**
- **Anophthalmia**
- **Phthisis bulbi**
- **Blepharochlalasis**
- **Contralateral proptosis**
- **Hypotropia**

Pseudo ptosis

HYPOTROPIA



DERMATOCHALASIS

Pseudo ptosis

Anophthalmia

Contralateral lid retraction

EVALUATION OF PTOSIS

- Detailed History
- Ocular examination
- GPE
- Ptosis measurements
- Investigations
- Treatment plan

HISTORY

Ptosis

- Age of onset
- Duration — *SUDDEN ONSET MEANS EMEREGENCY*
- Trauma
- Diurnal variability
- Previous surgery
- Poisoning
- Allergy
- Malignancy /treatment
- Any reaction with anesthesia
- Bleeding tendency

Association with

- Jaw movements
- Abnormal ocular movements
- Abnormal head posture
- Diplopia
- Dysphagia /dysarthria
- Muscle weakness/neurological features

- Previous photographs may prove to be of great help
- Is there a family history of ptosis or of other muscle weakness?

Examination:

- Inspection of the patient as whole

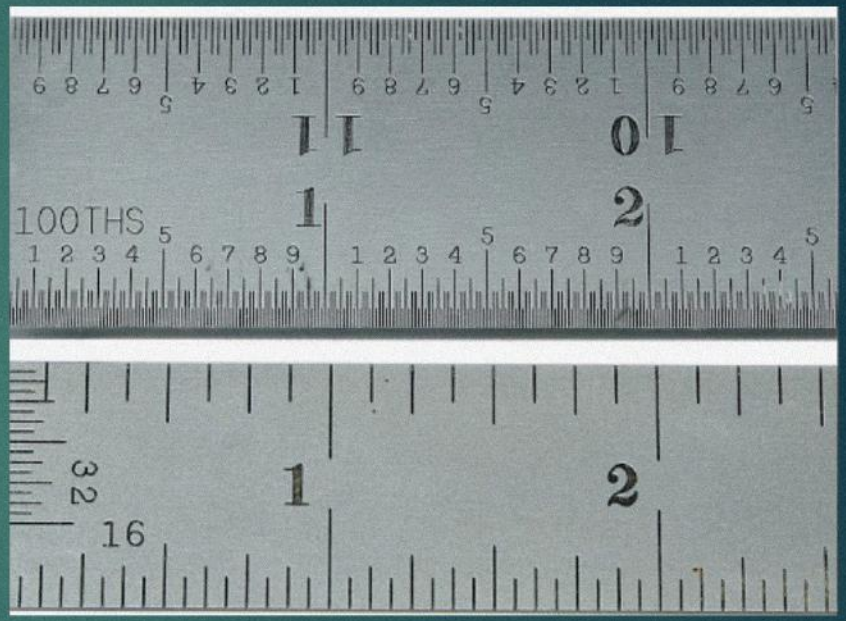
Face, chin position, head posture

The normal upper eyelid in primary position

- VA
- PUPILS
- EOM
- Squint assessment
- Dilated fundoscopy

Measurements

- Margin reflex distance
- Vertical fissure height
- LPS action
- Lid crease level

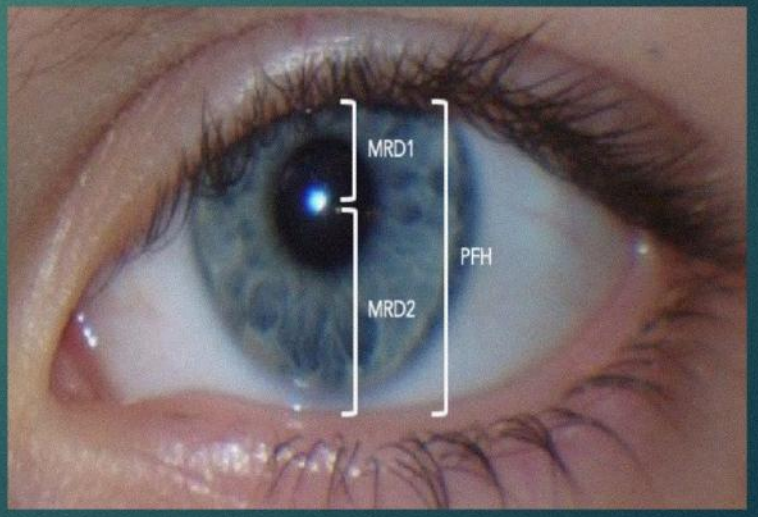


1. MARGIN REFLEX DISTANCE

- Margin-to-reflex distance 1 (MRD1)

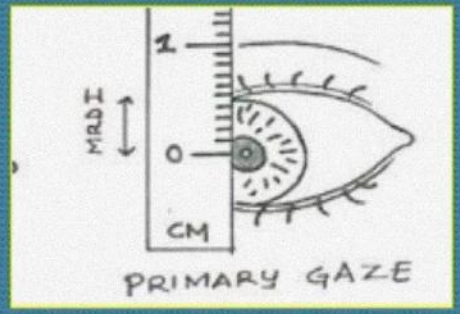
- When light is thrown on the cornea a reflection occurs the distance from the central pupillary light reflex to the upper eyelid margin with the eye in primary gaze

- NORMAL : 4 - 5 mm

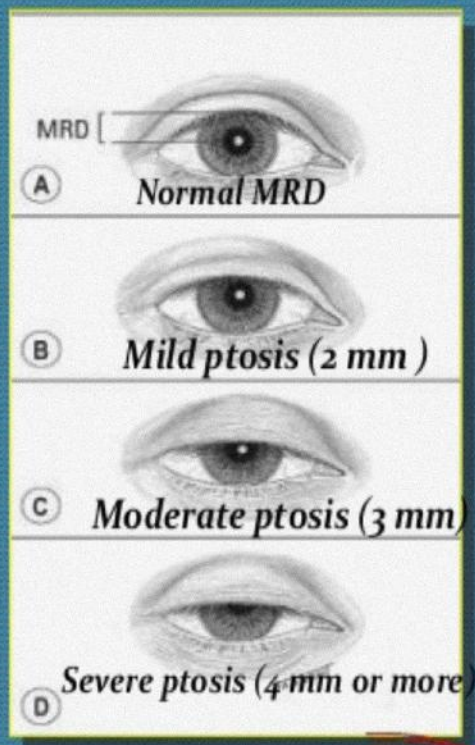


Measurements Of MRD

Margin-reflex distance (MRD).



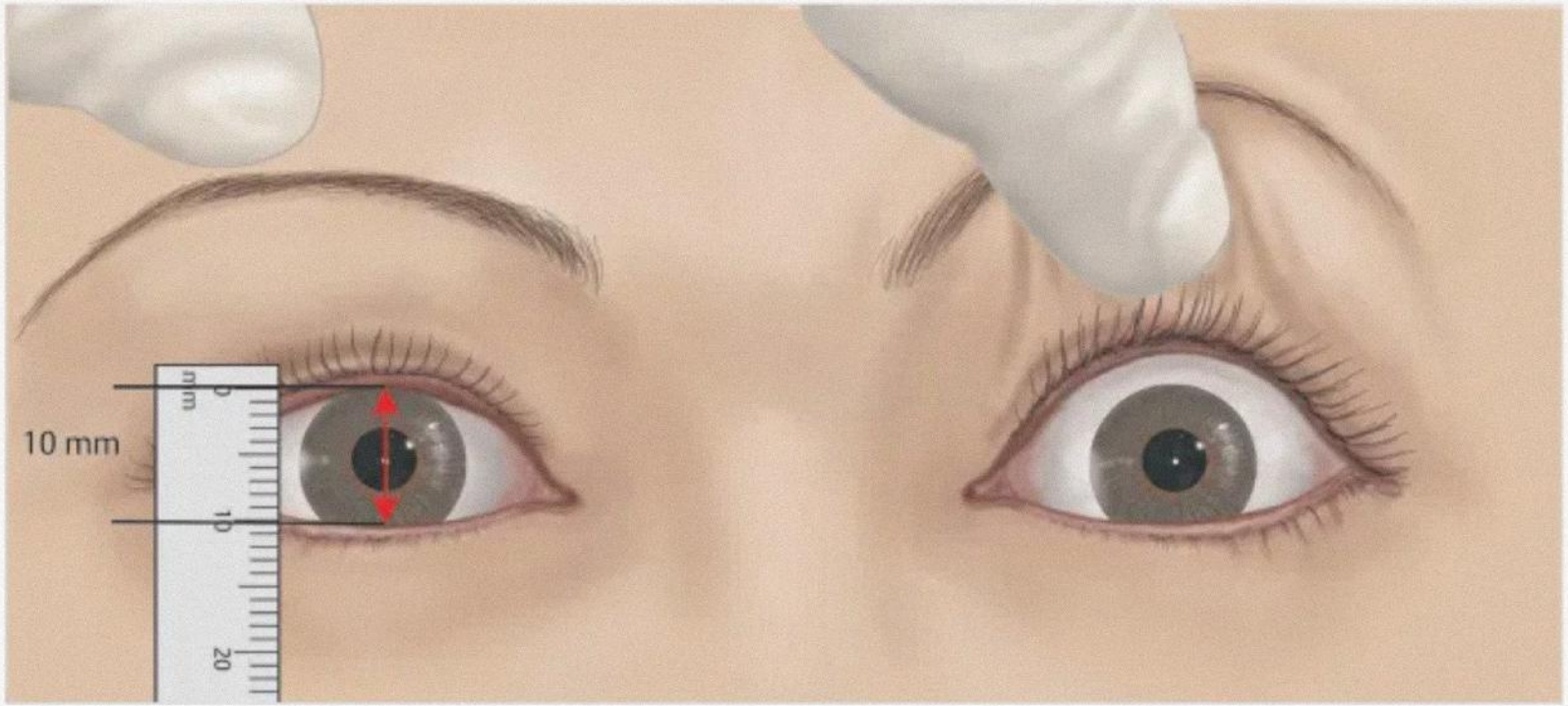
- **MRD1: distance between upper lid margin and CLR. N: 4-4.5 mm**
- **MRD2: distance between lower lid margin and CLR. N: 5-5.5 mm**



IIEI&H

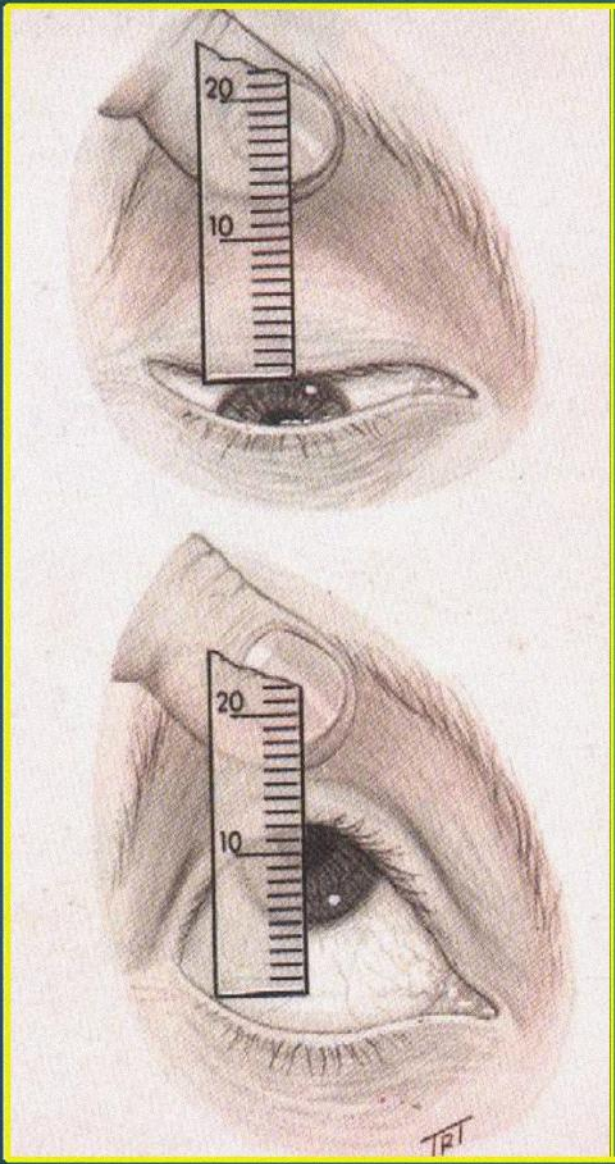
2. Palpebral fissure Height

- The distance between the upper and lower eyelid with the center of the pupil in primary gaze, with the patient's brow relaxed
- Normal – 9-10mm in primary gaze
- Amount of ptosis = difference in palpebral apertures in unilateral ptosis or Difference from normal in bilateral ptosis



3. Levator Function assessment

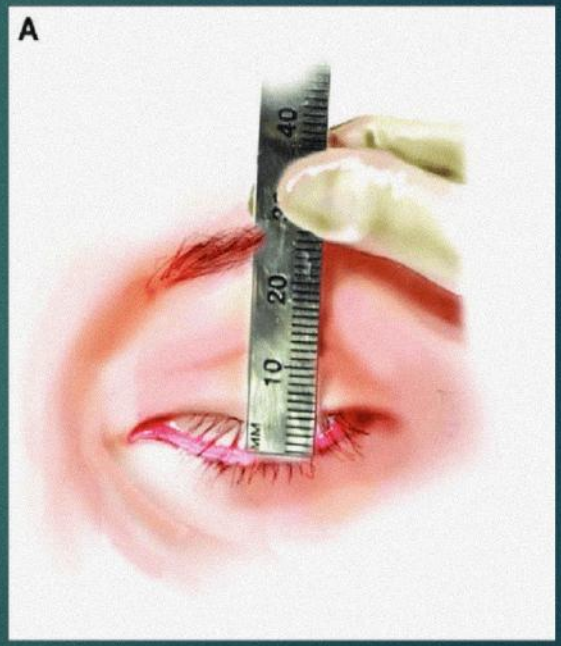
- It is determined by the lid excursion caused by LPS muscle (Burke's method)
- Patient looks down, and thumb is placed firmly against the eyebrow (to block the action of frontalis muscle)
- The patient looks up and the amount of upper lid excursion is measured with a ruler



- Reflects levator function
- Normal (15 mm or more)
- Good (8 mm or more)
- Fair (5-7 mm)
- Poor (4 mm or less)

Upper lid crease

- Distance between lid margin and lid crease in down-gaze
- Females 10 mm, males 8 mm
- Absence in congenital ptosis indicates poor levator function
- High crease suggests an aponeurotic defect



- Bells Phenomenon
- Jaw Winking and Lid Lag
- Fatigability
- Cogan twitch
- Corneal sensation
- Tear film
- Increased innervation

Should be noted

Normal values

Tests done for ptosis evaluation	Normal values
Palpebral fissure height	7-10mm(male) 8-12mm(female)
Margin reflex distance(MRD)1	4-5mm
Margin reflex distance(MRD)2	>5mm
Lid crease height	5-7mm(male) 8-10mm(female)
Levator function	13-17mm
Margin limbal distance	9mm
Bell's phenomenon	Upward rotation of eyeball with closure of eyelid

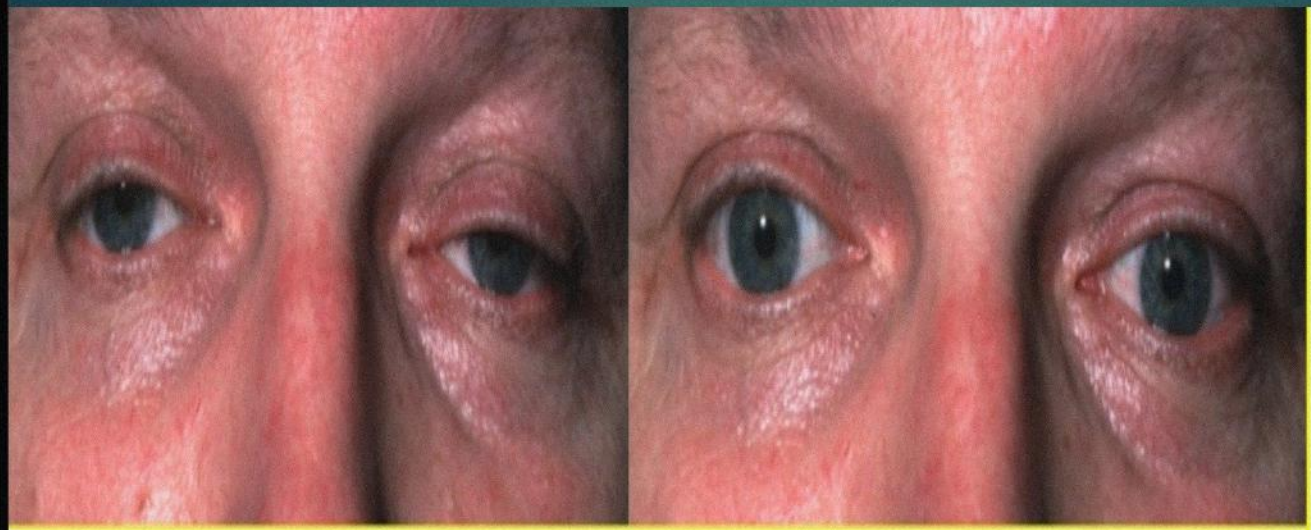
ICE Test

- Ice pack is applied on eyelid for five minutes
- Positive test is improvement of ptosis by 2mm or more
- Cold decreases the acetyl cholinesterase breakdown of acetyl choline

Investigation

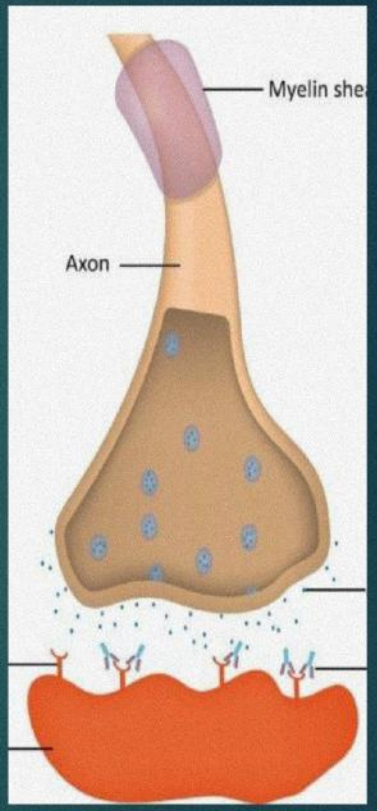
- Serum acetylcholine receptor assay
- Tensilon test
- EMG
- ECG
- T3, T4, TSH
- Imaging studies

TENSILON TEST



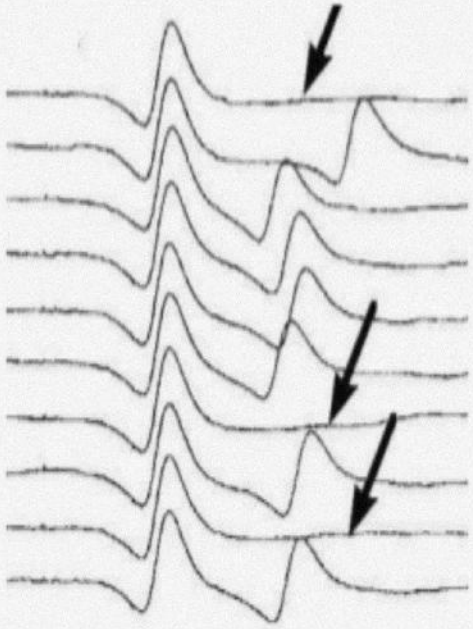
- Measure amount of ptosis or diplopia before injection
- Inject i.v. test dose of edrophonium
- Inject remaining dose if no hypersensitivity

MYASTHENIA GRAVIS(paradoxical reversal)



Single-fiber electromyography (EMG)

- It considered the most sensitive test for myasthenia gravis, detects impaired nerve-to-muscle transmission.



Neuro-imaging

- Sudden onset
- Vague history
- Post trauma
- Horner syndrome
- Associated neurological findings
- Third nerve palsy
- Tumors/ suspicion of malignancy

MANAGEMENT

MEDICAL PTOSIS

SURGICAL PTOSIS

Pediatrician/internist/
Anaesthetist

Ptosis Surgery

5 important Factors

1. Aetiology
2. Age
3. Levator function
4. Severity of ptosis
5. Bell's phenomenon

Absence- contraindication for ptosis surgery

Congenital ptosis

Indications for IMMEDIATE surgery

- Amblyopia
- Abnormal head posture
- Significant astigmatism
- Strabismus

NO → Wait until 4 y/o

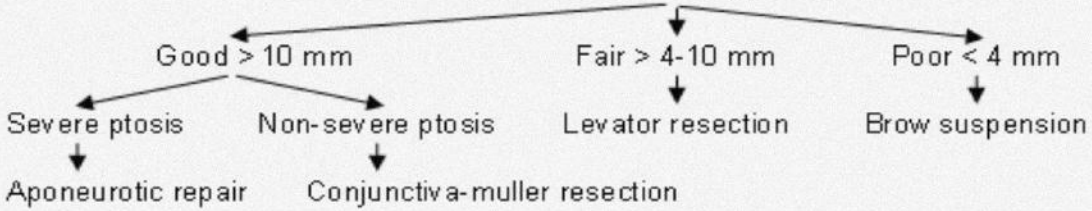
1. Accurate VA measurement
2. Accurate Ptosis assessment
3. Maturation of fascia lata
4. Normal facial development

YES

Order of Ptosis Surgery

1. Strabismus surgery
2. Lid margin abnormalities correction
3. Ptosis surgery

Levator function



Aponeurotic repair

Suturing of aponeurosis to the tarsal plate- through anterior / posterior approach

Conjunctiva-muller resection

Transconjunctival resection of Muller muscle together w underlying conjunctiva
Reattachment of resected end to the TARSAL plate
Maximum lid elevation- 3 mm

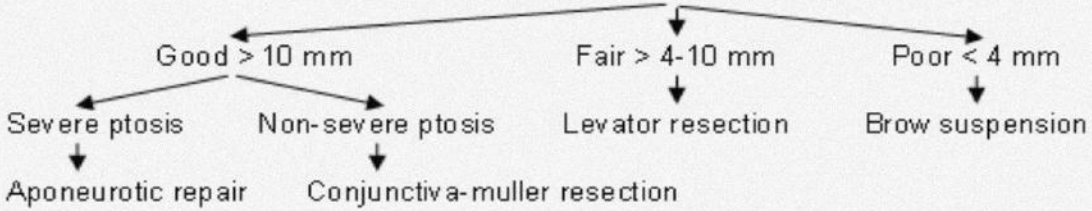
Levator resection

Shortening of levator complex- thro anterior / posterior approach

Brow suspension

Elevation of eyelid w Frontalis muscle via a sling

Levator function



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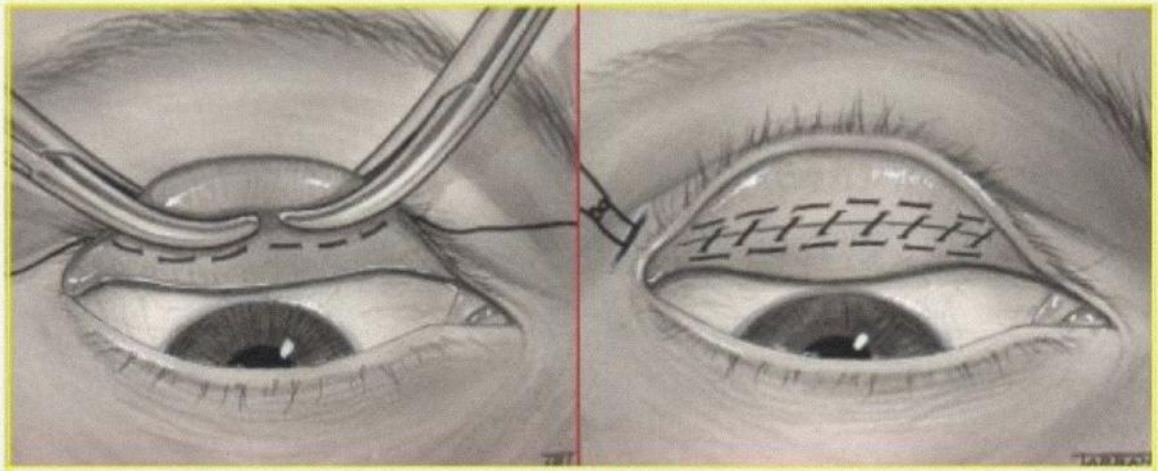
Fasanella-Servat procedure

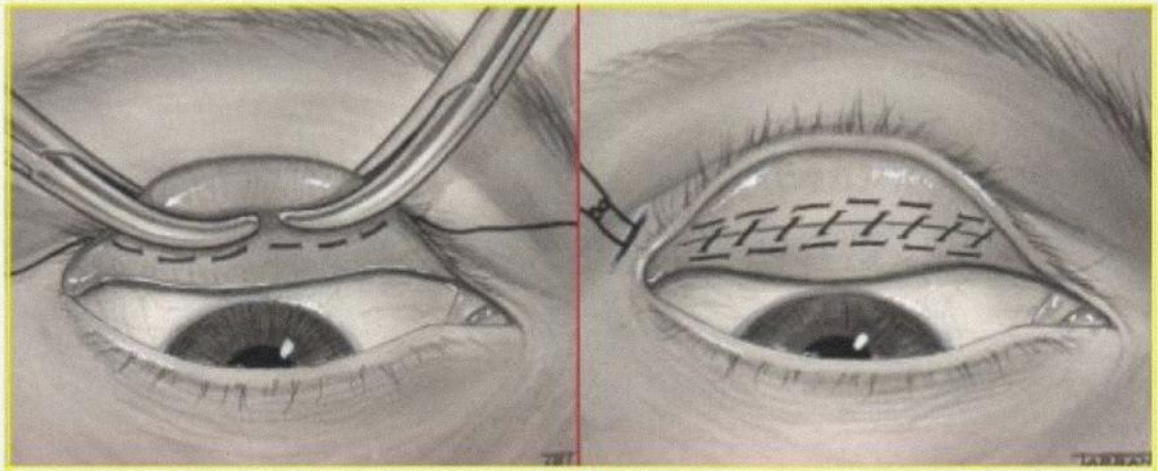
Indicated for mild ptosis(1.5-2mm) with good levator function



Excision of upper border of tarsus, lower border of Müller muscle and overlying conjunctiva

Fasanella-Servat procedure

Indicated for mild ptosis(1.5-2mm) with good levator function



Excision of upper border of tarsus, lower border of Müller muscle and overlying conjunctiva

Levator Resection

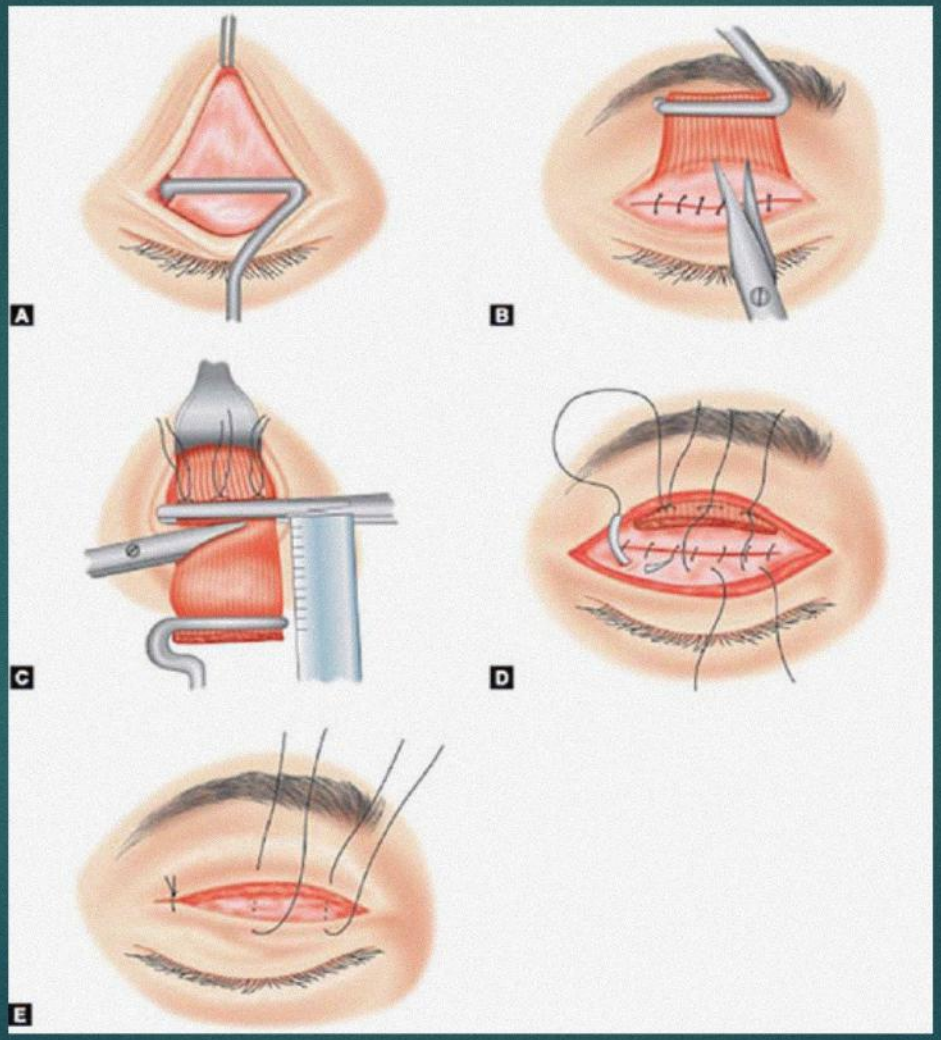
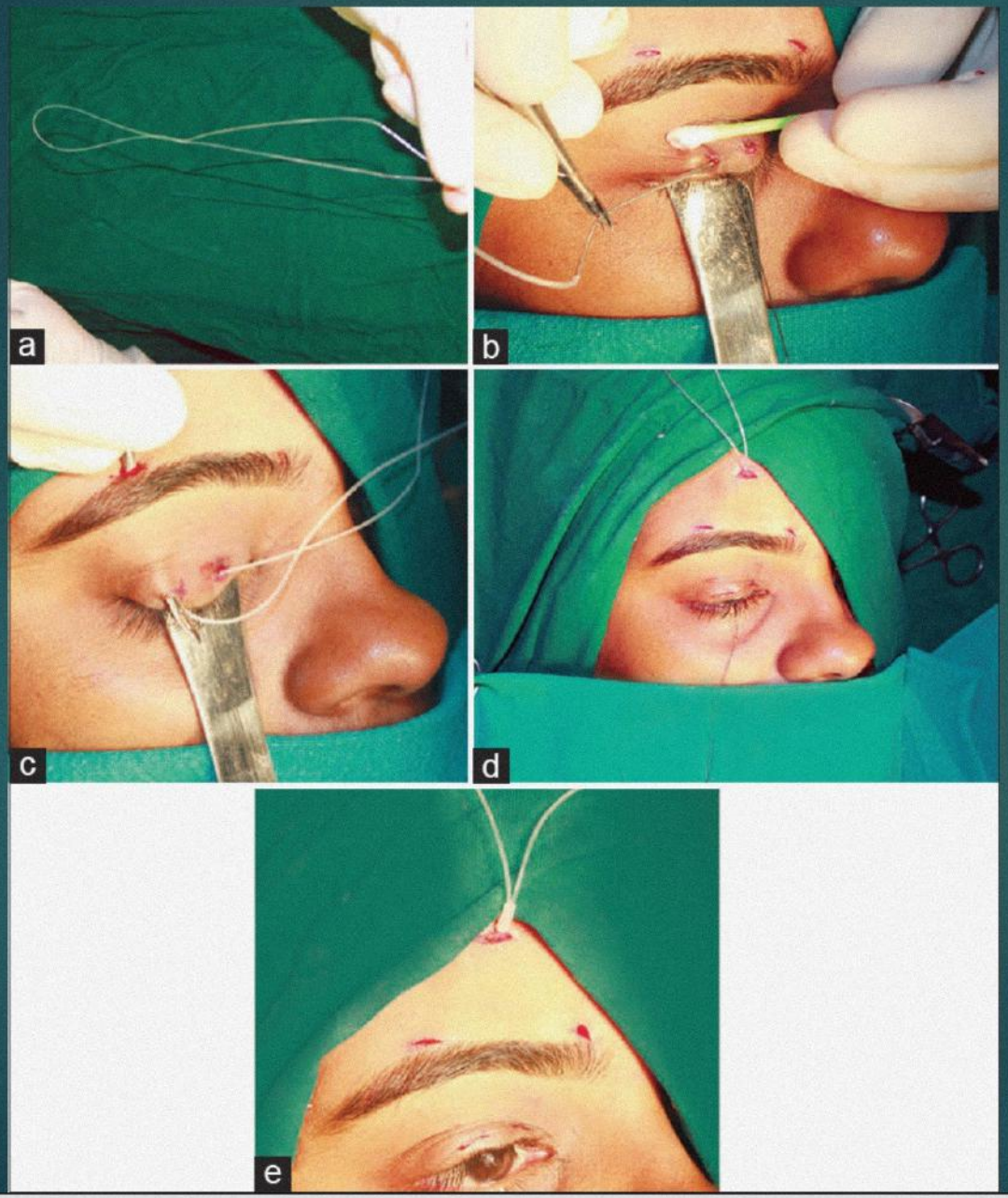


Table 3 Amount of levator resected based on LF

LF	Amount of resection
8–12 mm	10–13 mm
6–8 mm	16–18 mm
4–6 mm	22+ mm

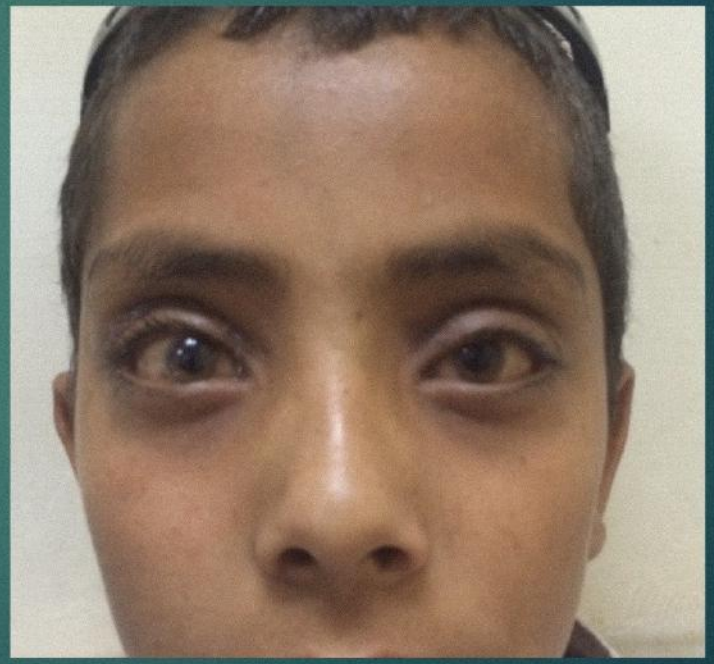
LF, levator function.


a
b
c
d
e

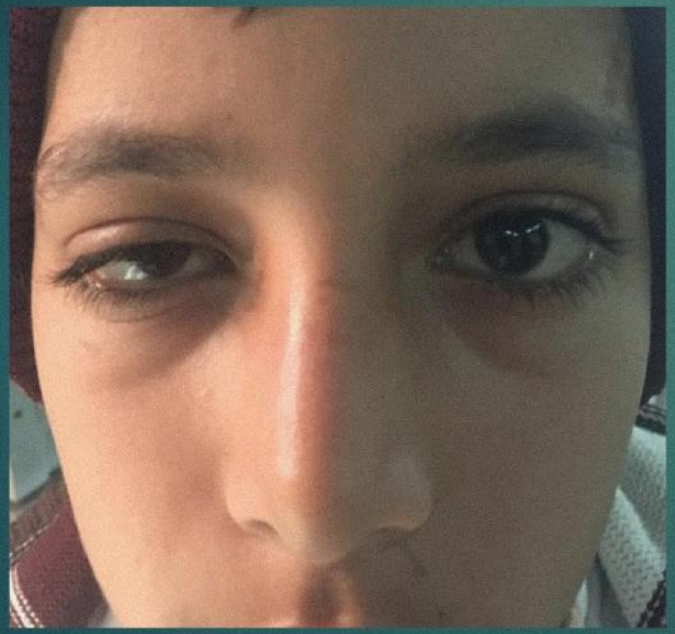
Ptosis props / crutches

Bilateral congenital Ptosis ALR

Bilateral congenital Ptosis
PLR



Unilateral Ptosis



Traumatic Ptosis

Bilateral FS (silicone)

Frontalis sling (Autologous fascia lata)

MCT shortening double Z Plasty FSS

- A 45 years old patient underwent cataract surgery. Surgery was complicated and prolonged. Patient developed ptosis postoperatively, was observed for 6 months but no improvement observed.

The procedure of choice in a patient with ptosis following cataract surgery who exhibits good levator function and a high upper eyelid crease is:

- Fasanella Servat procedure
- levator muscle resection
- Muller's muscle resection
- Reinsertion of levator aponeurosis
- Frontalis suspension

- An 82-year-old lady presents having had previous upper eyelid surgery in both eyes for involutional ptosis. She complains of left eye irritation and asymmetry of the lid appearance. On examination, she has 7mm of lid retraction on the left

What is the most suitable management?

- Aponeurosis recession
- Conservative treatment with lubricants
- Skin and hard palate graft to upper lid
- Mullerotomy

- A 38-year-old man presents with recurrent, unilateral, episodic temporal headache and periocular pain over 6 weeks. The pain lasts for up to an hour. His nose is congested during an attack. He has anisocoria and ptosis on the same side as the pain during an attack. He had a recent MRI head which was normal

- What is the most likely diagnosis?

- Central Horner's syndrome
- Hutchison's pupil
- Herpes zoster ophthalmicus
- Post-ganglionic Horner's
- Pre-ganglionic Horner's

- The history suggests cluster headache, which can cause a post-ganglionic Horner's syndrome