Evaluation of Ptosis (Blepharoptosis)

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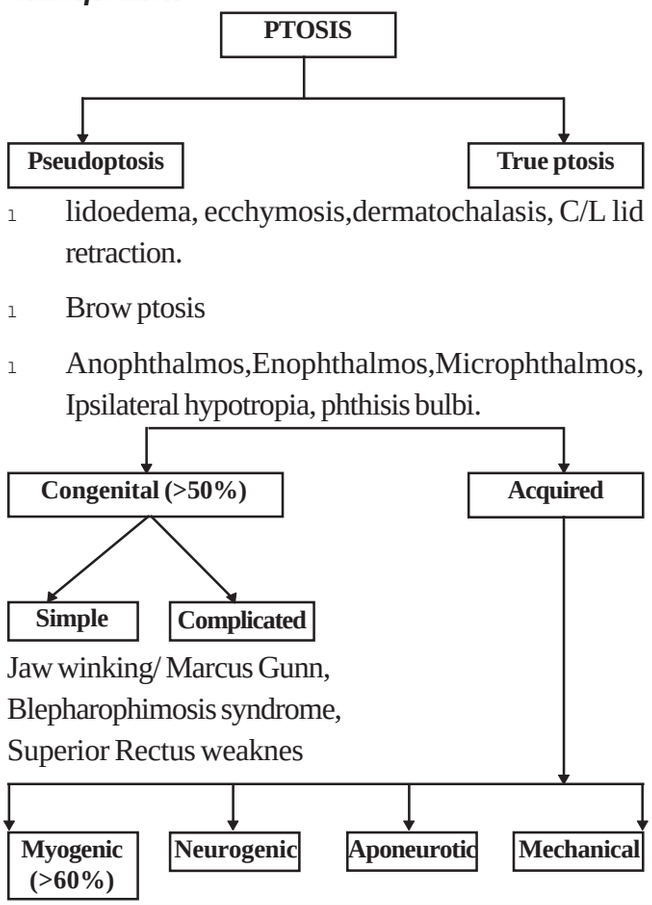
Defination :

Ptosis is an abnormally low position of the upperlid covering more than 2mm of superior cornea.

- Elevation of upper eye lid is mainly a function of levatorpalpebraesuperioris(LPS), along with Muller & Frontalis muscle.
- Ptosis is usually associated with paralysis or defective development of LPS.
- Lower eye lid is not capable of drooping; elevation of lower lid margin is termed as Upside down ptosis.

Classification :



- lidoedema, ecchymosis,dermatochalasis, C/L lid retraction.
- Brow ptosis
- Anophthalmos,Enophthalmos,Microphthalmos, Ipsilateral hypotropia, phthisis bulbi.

Jaw winking/ Marcus Gunn, Blepharophimosis syndrome, Superior Rectus weaknes

Myasthenia Gravis	3rd cranial nerve palsy	Senile (MC)	Tumor/ mass
Chronic progressive external ophthalmoplegia	Horner's syndrome	Inflammation	Scarring
Myotonic Dystrophy		Post Operative	Trauma

Other classifications:-i) Unilateral-75%,Bilateral-Congenital,MyastheniaGravis,CPEO,Myotonic Dsytrophy,Supranuclearlesion,Senile

ii)Complete - No action of LPS, Partial-Some action of LPS

Evaluation of PTOSIS:

1. History:

- Time of onset: congenital/acquired
- Mode of onset - i) Acute: Occularpalsy,trauma

ii) Gradual: CPEO, Myasthenia Gravis, senile ptosis

- Improvement since onset: neurogenic ptosis
- Diurnal variation in amount of ptosis: myasthenia gravis
- H/O trauma/ surgery :aponeurotic ptosis
- Review of pt. photographs : for temporal sequence of onset & progression

2. Examination of Face :

- chin elevation(B/L severe ptosis), head tilt(U/Lsevere ptosis)

3. Examination of Vision :

- congenital ptosis- associated with error of refraction & Pupil covering eye lid-amblyopia

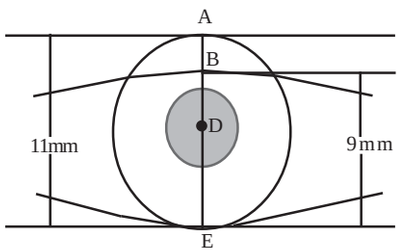
4. Examination of Eyelid :

- Prominence of lidcrease is directly proportional to the degree of levator function.
- Margin Crease Distance : distance between upperlid margin & lid crease.(nor.7-9mm)
- Higher MCD-Aponeurotic ptosis
- Absent lid crease - Congenital ptosis

5. Amount of PTOSIS :

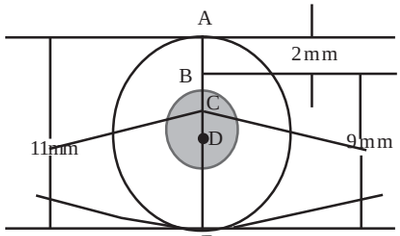
I. Estimation of grades of ptosis (by beard);

Visible cornea (Nor -9mm)	Drooping(mm)	Grade
7	≤ 2	Mid Ptosis
6	= 3	Moderate Ptosis
5	≥ 4	Severe Ptosis



AE= 11.0mm diameter of cornea
AB= 2.0mm, distance of noraml upper lid from upper limbus
BE= Width of interpalapebral aperature
D= central corneal light reflex
BD= Distance between upper lid & conreal light reflex

NORMAL POSITION OF LED IN RELATION TO CORNEA



AB= 2mm, distance of normal Upper lid from upper limbus
D= central corneal light reflex
AC= Distance of drooping lid from upper limbus
CE= 7mm, width of palpebral apperature
AC- AB=2mm istosis

MEASUREMENT OF PTOSIS (MARGINAL LIMBUS DISTANCE)

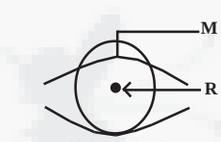
II. Measurement marginal reflex distance (MRD):

MRD I- ***Positive*** - Distance between corneal light reflex and centre of upper eye lid at primary position.(Normal: 4-4.5mm)

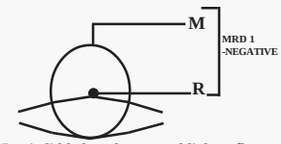
Netative : If the corneal reflex obstructed by drooping eye lid, note position of drooping Eyelid & elevate it until corneal light reflex isvisible.Measure the distance.

MRD II-Distance between corneal light reflexand lower lid at primary position.

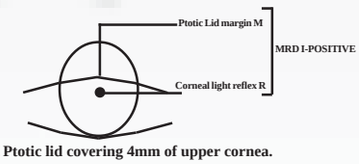
MRD III-Distance between corneal light reflex and upper lid at up gaze.



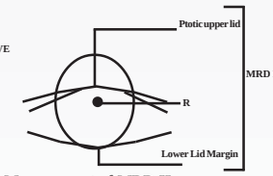
1.Normal lid covering 2mm of uper cornea.



3 Ptotic lid below the corneal light reflex.



2. Ptotic lid covering 4mm of upper cornea.



4. Measurement of MRD II

[NOTE-Measurement of MRD is for U/L Ptosis]

6. ASSESSMENT OF LPS FUNCTION:-

Difference between the level of upper lid in down & maximum up gaze with frontalis fixed with examiner's thumb above eyebrow.

Berke's Method:-

Normal	15mm
Good	8-12mm
Fair	5-7mm
Poor	≤4mm

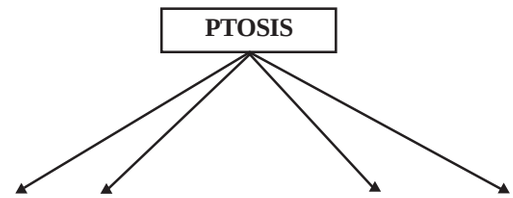
[NOTE-In young children ? 1yr iliff's sign(for LPS function) - Evert upper lid as child looks down, spontaneous eversion indicate good levator function.]

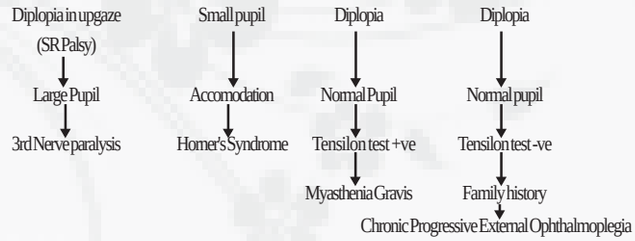
7. PALPEBRAL APPERATURE IN VARIOUS POSITION OF GAZE:-

- Congenital ptosis: Palpebral aperture in ptotic eye in down gaze is equal/large than C/L side.

  (failure of dystrophic muscle to relax, resulting in lid lag)
- Aponeurotic ptosis: Decrease palpebral aperture in down gaze than C/L side.

8. EXAMINATION OF PUPIL:-





9.EXAMINATION FOR ABNORMAL SYNKINETIC MOVEMENT:-

- Commonly associated with congenital ptosis.
- Suspected in presence of variable ptosis & levator action.
- Marcus-Gunn Jaw winking phenomenon is characterised by lid retraction on opening mouth or moving jaw to opposite side.
- Size of palpebral fissure is assessed while the patient is asked to look from side to side to detect presence of Duane's Retraction Syndrome.

Synkinesis can be graded as:

Mild (≤2mm)	Maximum elevation of the ptotic lid to the non ptotic position.
Moderate(3-4mm)	Maximum elevation upto the superior limbus
Severe(≥5mm)	Maximum elevation beyond the superior limbus with scleral show

10.FATIGABILITY:-

- Patient is asked to look up without blinking for 30secs,progressive drooping of one or both eyelid,or inability to maintain upward gaze is suggestive of myasthenia.
- Myasthenia ptosis may show an over shoot of upper lid on saccade from down gaze to primary position(Cogan twitch sign),or a 'hop' on side gaze.

11.BELL'S PHENOMENON:-

- Eye normally moves upward and outward on closure of eyelid,which is a protective brainstem Reflex.
- Bell's Phenomenon is elicited by lifting the upper eye lid to nonptotic position while the pt. forcibly attempt to close the lid.

Bell's phenomenon:

Good	>2/3rd of cornea disappears behind the elevated upper lid
Fair	If 1/3rd-2/3rd of cornea moves up behind upper lid
Poor	<1/3rd upward movement of cornea

[NOTE: Poor Bell's Phenomenon results in postoperative exposure keratopathy.]

12.Routine occular examination:-

Tear film,corneal sensation,refraction determines postoperative prognosis.

13.Drug Test:-

- Neostigmine/Edrophonium(tensilon)test: for screening of myasthenia.

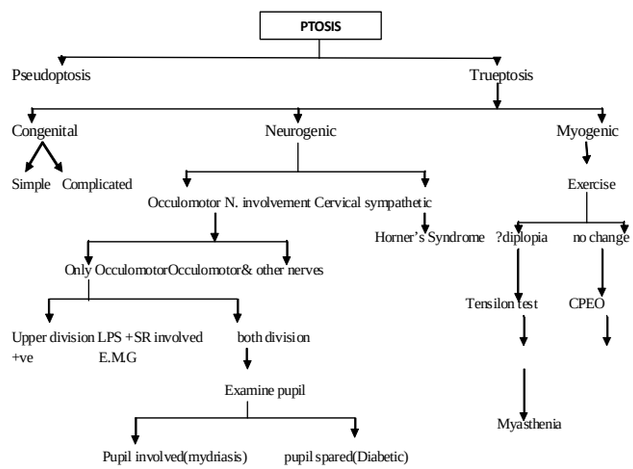
1. improvement of ptosis,?of diplopia,? of tropia confirms myasthenia.
2. Worsening of ptosis and tropia.

or

3. Reversal i.e; ptosis/tropia in other eye are seen in non myasthenia patient.

- Phenylephrine test: to diagnose ptosis in Horner's syndrome and to determine feasibility of FassanellaServatsurgery (Lid elevation of 2-3mm).

STEPS FOR EXAMINATION OF PTOSIS:-



MANAGEMENT OF PTOSIS : Points to be kept in mind before deciding time and type of surgery.

1. **Age :** For **congenital ptosis**, surgery is ideally performed after about 3yrs of age.

   Indications for early surgery : severe or B/L ptosis giving leading to abnormal head posture, Amblyopia-temporary tarso frontal sling followed by a permanent procedure.

2. **Laterality:** If U/L, level is adjusted to opposite normal eye,if B/L the worse lid is tried to bring to the height of the better lid to avoid 2nd surgery.

[NOTE: The better lid may come down postoperatively below the preoperative level because of reciprocal innervation requiring a 2nd surgery]

3. Etiology :

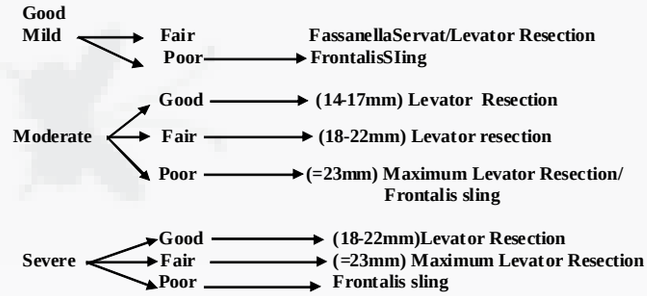
- In congenital ptosislevator resection gives less correction,chances of over

  Correction is minimal & associated with lid lag.
- In acquired cases it is viceversa.
- In Mechanical ptosis,cause is primarily managed,followed by levator resection if required.
- In Neurogenic ptosis,period of observation for 6-12 months for spontaneous recovery.
- In myogenic ptosis,medical management is the initial modality, ptosis correction May precipitate corneal complications/manifest diplopia.
- Crutch glasses are used in severe cases with high risk of exposure keratitis.
- Tarsofrontal sling with deliberate under correction can ? corneal complication.

4. Ptosis surgery :

Congenital ptosis(beard approach).

Grade of Ptosis LPS functionPtosis Surgery



- In adult LPS tucking is done depending on the position of the opposite Eye lid, an over correction of 1mm above the limbus is generally done.
- In Marcus Gunn Ptosis frontalis sling with levator disinsertion is done.
- In Blepharophimosis syndrome frontalis sling with V-Y plasty is done.

Complications of ptosis surgery :

1. Under correction(commonly in congenital)
2. Over correction(commonly in acquired myogenic)
3. Lidlag -lagophthalmos-keratitis.

Others- Entropion/Ectropion, Loss of lashes, Assymetrical lid contour, Fornix prolapse, Hemorrhage Oedema.

Conclusion :

"Defect of 1mm on the face is 1km in the heart and in the mind."

Therefore management of ptosis needs a thorough evaluation of etiology, severity and associated anomalies with proper choice of combination of surgeries.

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2. Parson's Diseases of the Eye 22nd edition, 28: pg-460-465.
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4. Ptosis surgery, Arnab Biswas.
5. Ptosis, Crowell Beard.