

A modern approach to blepharoptosis

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- Disclaimer
 No financial disclosures

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- Frueh's classification of ptosis
 - Aponeurotic
 - Myogenic
 - Neurogenic
 - Mechanical

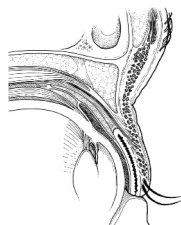
Frueh BR. The mechanistic classification of ptosis. *Ophthalmology*. 1980;87:1019-21.

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- What is ptosis?
 - A low upper lid, generally?
 - Then we have to include "pseudoptosis"
 - A low upper lid, specifically?
 - Retractor issue

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- I argue for the following
 - Retractor associated ptosis
 - Non-retractor associated ptosis



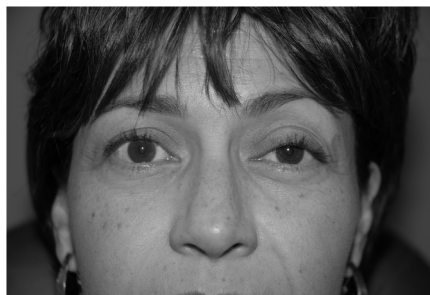
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- Retractor associated ptosis
 - Aponeurotic
 - Myogenic
 - Neurogenic
 - Neuro-muscular

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- Aponeurotic
 - Levator aponeurosis is stretched (controversial)
 - Normal levator function/strength
 - High lid crease
 - Worse on downgaze
- Examples
 - Involutional
 - Contact lens wear
 - Chronic lid manipulation
 - Iatrogenic
 - Surgery (?lid speculum)
 - Steroid injection

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- Treatment of aponeurotic ptosis
 - Levator advancement
 - Muller muscle - conjunctival resection (MMCR) in those responsive to phenylephrine

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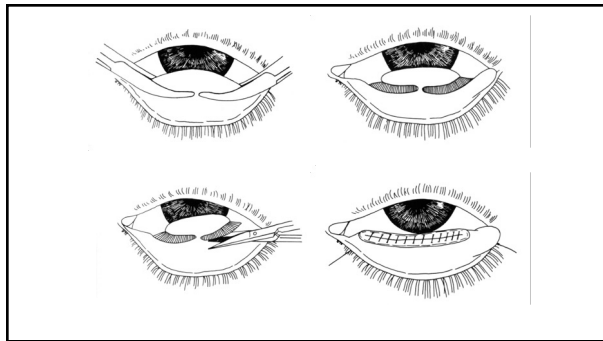


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- Posterior approach surgery
 - Fasanella and Servat (1961)
 - Excision of tarsus and conjunctiva
 - Muller muscle-conjunctival resection (1975)
 - Excision of conjunctiva and Muller's



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- Criticisms of posterior approach surgery
 - Potential damage to other structures
 - Meibomian glands
 - Goblet cells
 - Accessory lacrimal glands
 - Lacrimal gland ductules

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- Issues
 - Response to phenylephrine
 - Strength of phenylephrine
 - Normal levator strength
 - Compromised ocular surface
 - Blebs
 - Cornea transplants

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- Algorithms
 - If phenylephrine gives desired height, then resect 8.5 mm
 - One millimeter more or less is resected for every 0.5 mm of greater or lesser elevation desired
 - Total resection between 6.5 and 9.5 mm

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- History for aponeurotic ptosis should "make sense"
 - Elderly?
 - Drop use?
 - Hard contact lens wear?
 - Trauma?
 - Eyelid manipulation?
 - Previous ocular surgeries?
- If it doesn't "make sense", start thinking of other things

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- Myogenic ptosis
 - Chronic progressive external ophthalmoplegia (CPEO)
 - Myotonic dystrophy
 - Oculopharyngeal muscular dystrophy (OPMD)

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- Don't rely on levator function to drive you treatment
 - Think diagnosis
 - Think levator health
 - Think progressive disease

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- The fallacy of using levator function as a measure for surgical planning
- Levator function really is a description of position, rather than a movement
 - Distance between the eyelid position in downgaze and upgaze
 - i.e. the distance between two positions
 - Movement should have a component of time
 - Velocity, acceleration, jerk, jounce/snap

$$v = \frac{dr}{dt}$$

$$a = \frac{dv}{dt} = \frac{d^2r}{dt^2}$$

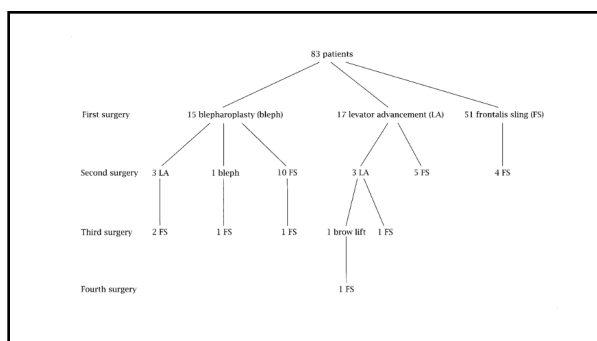
$$j = \frac{da}{dt} = \frac{d^3r}{dt^3} = \frac{d^3v}{dt^3}$$

$$s = \frac{dj}{dt} = \frac{d^4r}{dt^4} = \frac{d^4v}{dt^4}$$

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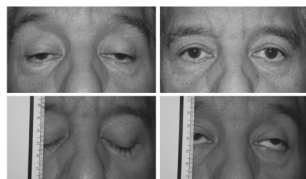
- The concept that levator function does not accurately reflect levator health is not a new one
 - Frueh BR, Musch DC. Evaluation of levator muscle integrity in ptosis with levator force measurement. Ophthalmology. 1996;103:244-50.
 - Neraid

27



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- 149 patients with OPMD who underwent eyelid surgery
 - 31 patients satisfied the following criteria
 - LF ≥ 10 mm
 - No previous eyelid surgery
 - Underwent bilateral silicone frontalis sling



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- Congenital ptosis
 - Isolated
 - Syndromic
 - “Mechanical”
 - Neurofibromatosis type 1
 - Infantile hemangioma

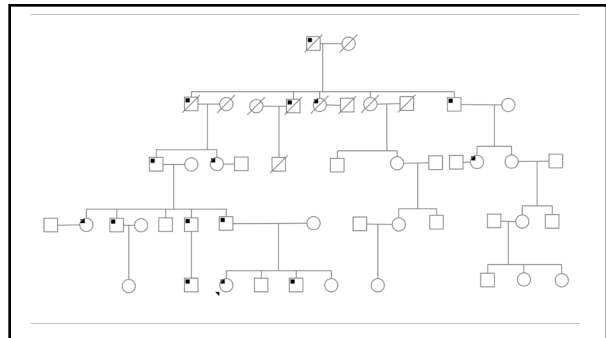
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- Syndromic congenital ptosis
 - Associated syndrome
 - Blepharophimosis epicanthus inversus syndrome (BPES)
 - Aberrant innervation/Congenital cranial dysinnervation disorders (CCDD)
 - Marcus Gunn jaw winking
 - Congenital fibrosis of the extraocular muscles (CFEOM)

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- BPES
 - Blepharophimosis, ptosis, epicanthus inversus, and lateral ectropion
 - Autosomal dominant; 3q22-q23
 - FOXL2: winged/forkhead transcription factor
 - Significant variability of expression
 - Type I: premature ovarian failure in females
 - Presents as primary or secondary amenorrhea
 - Female infertility
 - Type II: no premature ovarian failure

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- Isolated congenital ptosis
 - Static/non-progressive disease
 - Bilateral vs unilateral
 - Traditionally thought to be a “myogenic” ptosis
 - More likely dysinnervation (CCDD)
 - I would classify this as neurogenic

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- Timing of intervention
 - Presence of amblyopia?
- Evaluation by pediatric ophthalmology
 - Evaluate for other amblyogenic factors
- Penalization needed?
 - No – then delay surgery until after age 2 years, preferably before school
 - Yes –
 - Response to penalization – delay surgery
 - No response to penalization – proceed with surgery

37

- Very early intervention
 - Severe ptosis
 - Especially if unilateral

38

- Once intervention is needed, what do we do?
- This depends on
 - Amount of ptosis
 - Health of the levator
 - Bilateral vs unilateral disease
 - Presence of amblyopia
 - Age of the patient
 - Aberrant eyelid movement

39

- What clues of levator health do we have in congenital ptosis?
 - Lid crease
 - Amount of ptosis
 - 1 mm of ptosis with poor levator strength should not exist
 - Likewise, 3 mm of ptosis with good levator strength should not exist
 - Levator function can be difficult to determine
 - Intraoperative appearance of the muscle

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- Mild ptosis (0.5 – 2 mm)
- Treatment
 - Posterior approach
 - Levator resection

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- Phenylephrine testing
- MMCR if eyelid attains symmetry after phenylephrine
 - 9.0 mm
 - Less if phenylephrine over-corrects



Droopy Eyelid?
Unequal Pupils?
Are You Sure This
is a Big Deal?

43

- If there is a phenylephrine response, but not complete
- Add tarsectomy 2:1 per mm under-correction
 - 1 mm for 0.5 mm under-correction
- Maximum of 2mm tarsectomy
- If you do this, you need to be responsible for the reoperation.
- Some difficulty in doing levator resections or frontalis slings on unstable tarsus

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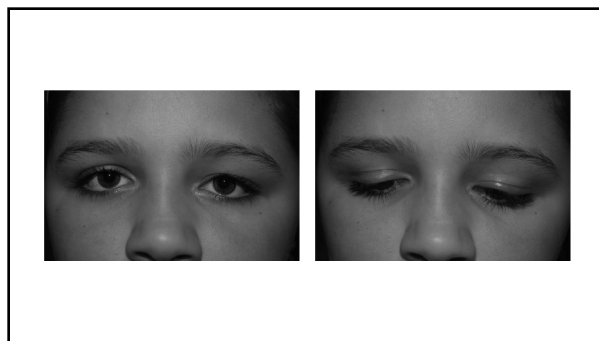
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- If no response to phenylephrine for mild (0.5-2 mm of ptosis)
- Levator resection

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- Health of the levator muscle
 - Should be fair or good
- Determine the amount of resection
 - Rarely ever less than 15
 - Usually at least 20
 - 25 or more for a poor muscle

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- 2-3 mm of ptosis
- Unilateral or bilateral?
- Will lean toward levator resection if unilateral
- Will lean toward frontalis suspension if bilateral



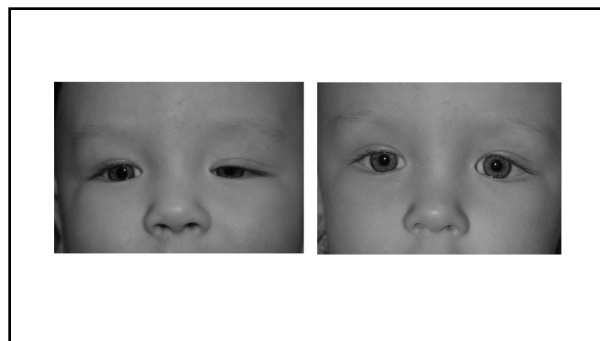
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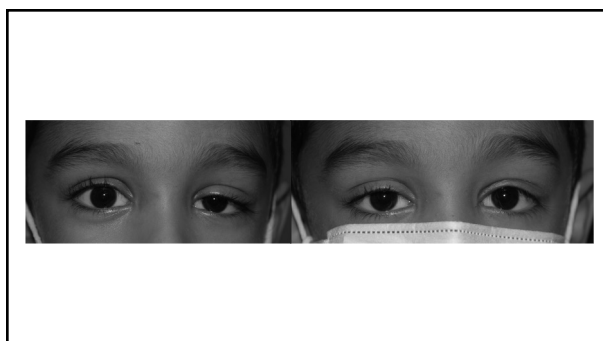
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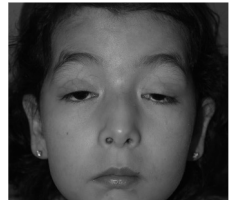


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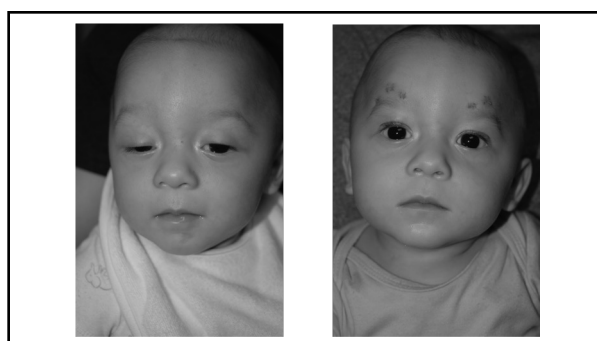
- Bilateral severe ptosis with poor levator function
 - Treatment: frontalis suspension
 - Sling or flap



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- Sling materials
 - Early
 - Supramid/Prolene
 - Silicone
 - Gore-Tex
 - Donor fascia
 - Plan for autogenous fascia at 4-5 years
 - Late
 - Autogenous fascia

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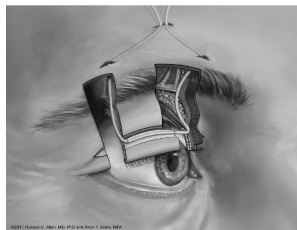
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- Five principles
 - Retroseptal sling
 - Tarsal fixation
 - Fat conservation
 - Skin conservation
 - Incorporation of aponeurosis into closure

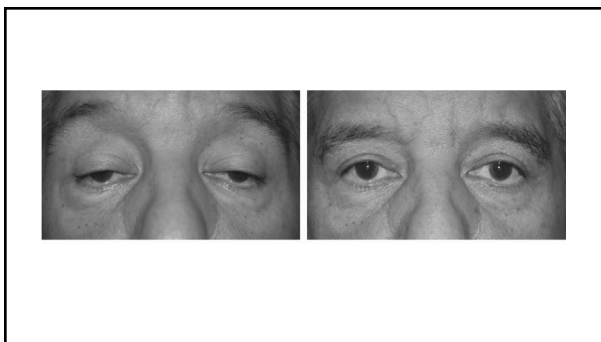


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- Lid crease formation
 - Cosmesis
 - Prevention of lash ptosis



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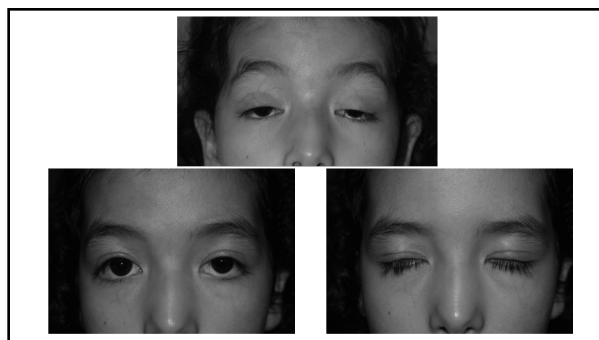
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- Go further than retro-septal
 - Retro-levator
 - Retro-Whitnall's

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- Foreign bodies
 - Infection risk
 - Ease of adjustment
- Fascia
 - Little if any infection risk
 - Leg incision
 - Time
 - Risk
 - Adjustment



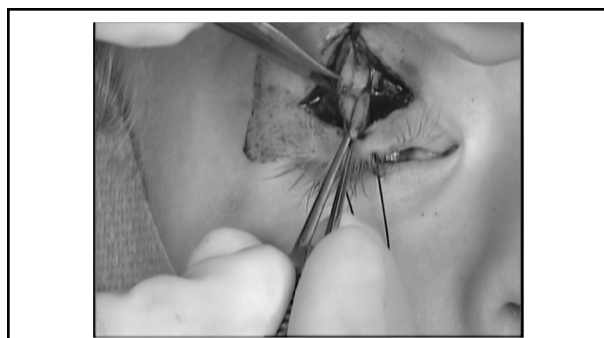
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Factor	P-Value
Age	0.50
Gender	0.38
Congenital syndrome	>0.99
Prior hospitalization	0.42
Prior antibiotic use	>0.99
Intra-operative antibiotics	0.03
Soaking in antibiotic solution	0.60
Post-operative antibiotics	0.60
Date of last follow-up visit	0.91

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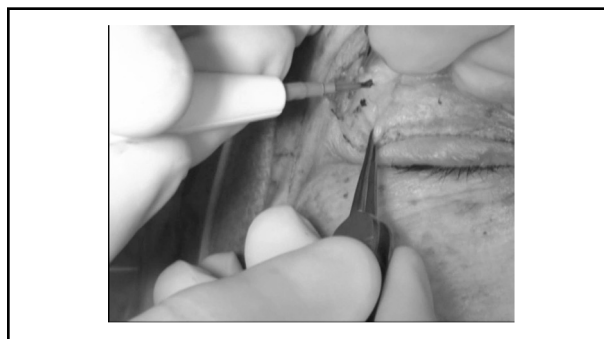
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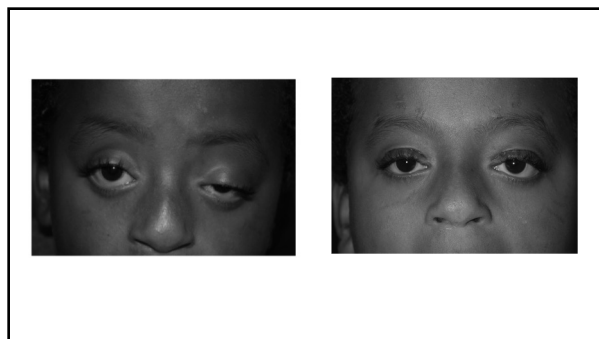
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- Trans-eyelid canthopexy at the time of sling in some patients

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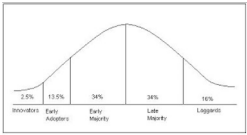


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- Frontalis flap
 - Obviates material issues
 - One incision
 - No donor site incision
 - No age limit?

73

- I was not an early adopter of the surgery
 - I have good results with frontalis suspension
 - I had questions of durability
 - I was worried about eyelid crease formation
 - I was worried about "lid pop"

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- The weak levator
 - "Bypassed" in frontalis suspension surgery
 - But, should we still pay attention to it?
- My argument to incorporate it
 - It provide a posterior vector of pull
 - Prevent lid pop
 - It can be incorporated into the lid crease incision closure
 - May not be strong enough to lid the lid, but is strong enough to pull a crease

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- My problem:
 - How do I apply these principles to frontalis flap surgery?

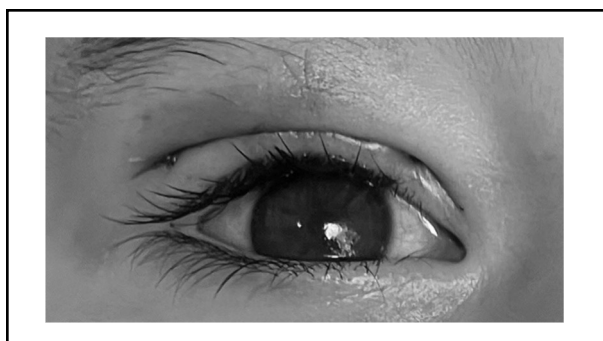
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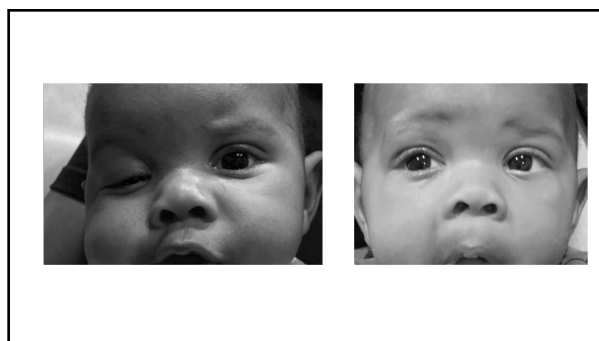
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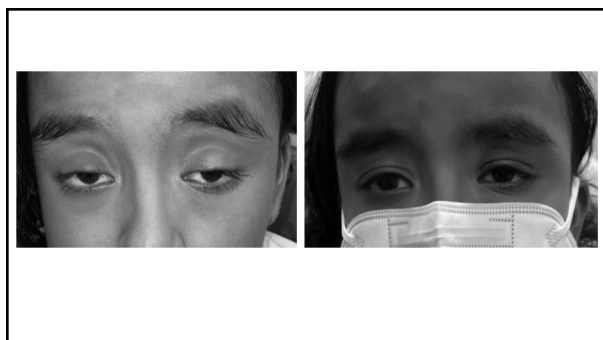
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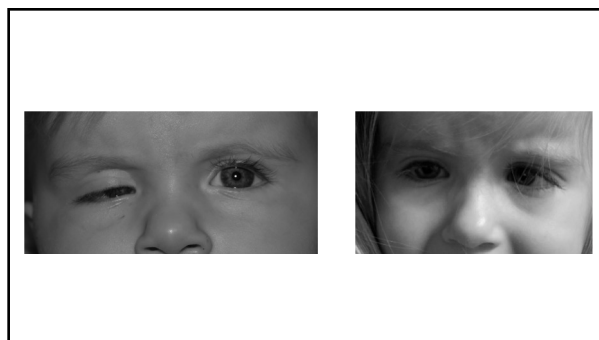
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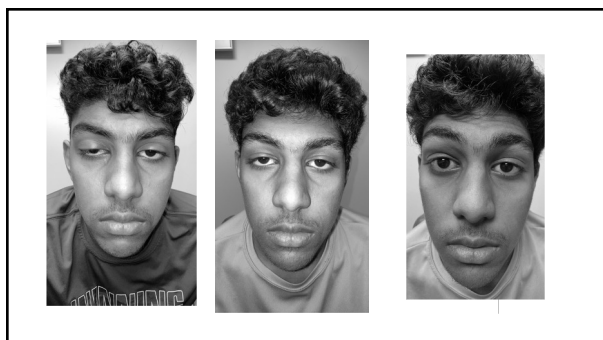
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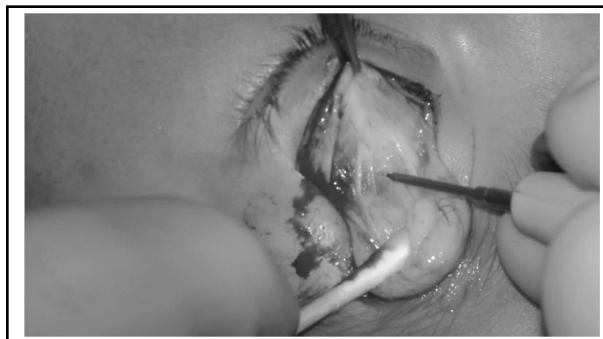
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• Much of my treatment now for unilateral congenital ptosis is an intraoperative decision

- Depending on health of the muscle
- Usually consent for both and plan for flap, but may resect levator depending on how it looks intraoperatively

• This has led to fewer undercorrections, but more overcorrections.

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- My decisions with regards to resection is dependent upon my subjective assessment of the muscle intraoperatively.
 - This has opened a can of worms.
- Patients who underwent previous frontalis suspension elsewhere, now present for reoperation
- Difficult to assess movement and LF in patients with previous slings.



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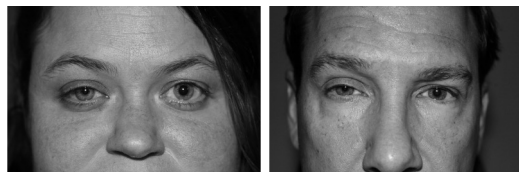
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Neurogenic ptosis

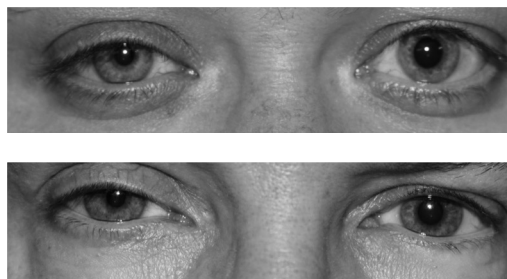
- Anisocoria – thank God for my technicians
 - Sympathetic
 - Parasympathetic



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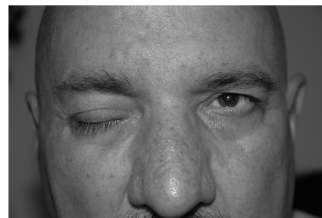


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- Motility deficit

- Neurogenic
 - 3rd nerve
- Myogenic
 - CPEO
- Neuro-muscular
- Orbital process

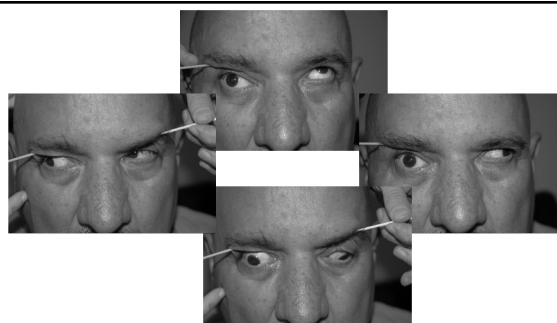
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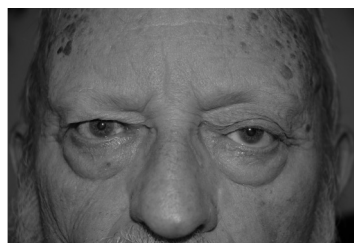


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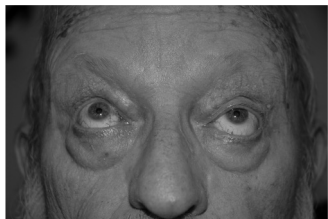
- Fatigability

- Myasthenia
- Remember new ptosis or motility deficit in your thyroid patients!

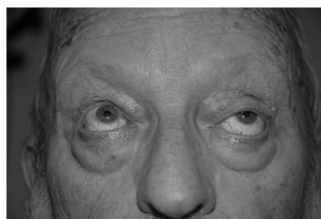
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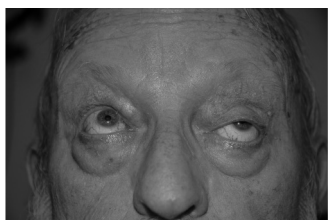
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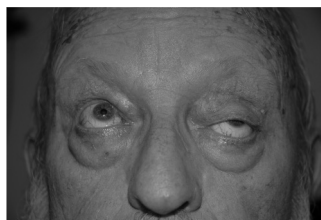
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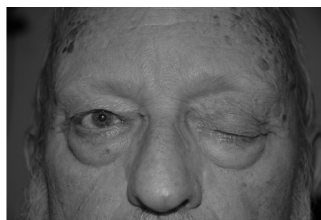
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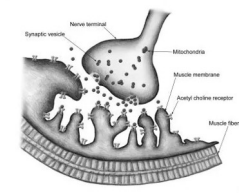


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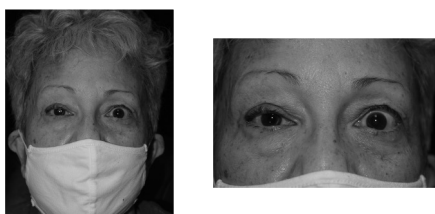
- I take myasthenia gravis seriously
- Potentially fatal disease



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- Non-retractor associated ptosis
- I hate the term "pseudoptosis"

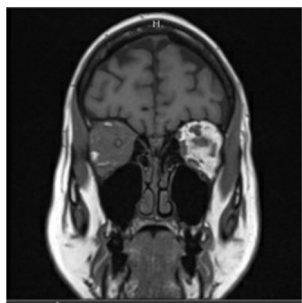
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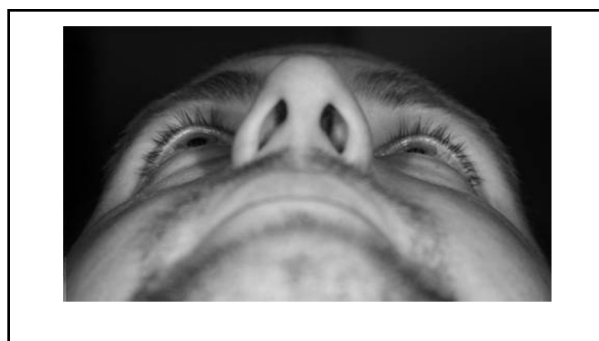
Diagnosis red flags

- Enophthalmos
- Facial nerve tonicity
 - Look at the entire face
 - Take off their mask
- Contralateral retraction

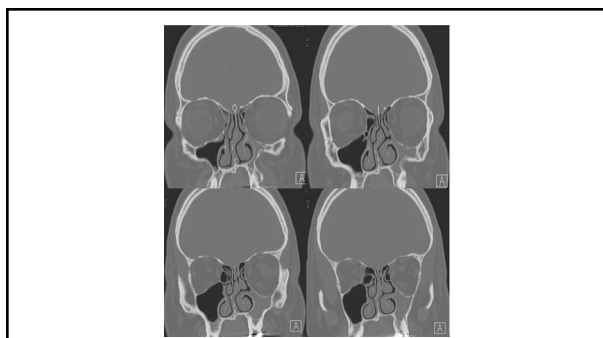
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- Contralateral retraction?
- Hyperglobus?
- Hypertropia?

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- Concerns in children
 - Lid mass
 - NF-1
 - S-shaped upper eyelid
 - Hemangioma
 - Acquired ptosis at 1-2 months of age

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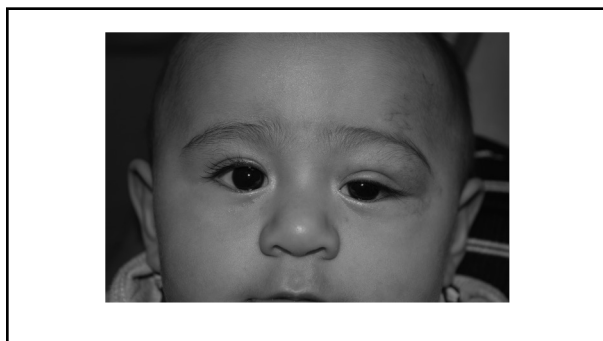
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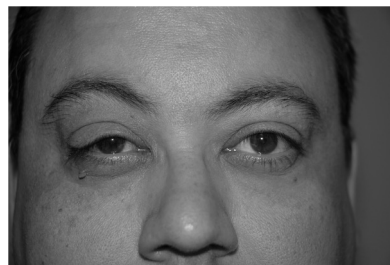
Diagnosis red flags

- Acquired ptosis in children
 - This gives me anxiety
 - I require proof that this was not previously present using old photographs
- Myasthenia
- Malignancy

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- Exam "subtle"
 - Superior sulcus
 - Enophthalmos
 - Floppy eyelids
 - Prostaglandin-associated periorbitopathy
 - Evert the lid

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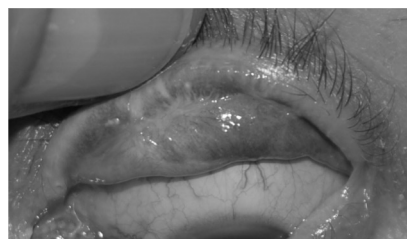
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- I would like to think we have come a long way!



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- Thank you!

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10 Tips for Upper Blepharoplasty

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No financial disclosures
 or conflicts of interest

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Objectives

To discuss **10 Tips** for achieving **surgical goals** in upper blepharoplasty

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10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

surgical goals


1. Patient **safety**
2. Patient **satisfaction**

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10 Tips

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1. Reviewing old photographs can be useful to customize goals **and** discuss expectations




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Kelsey A. Roelofs MD

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Kelsey A. Roelofs MD

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Kelsey A. Roelofs MD

10 Tips

- customize
- ptosis
- volume
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2. What is TPS ?

Upper eyelid complex = MRD1

10 Tips

- customize
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

2. What is TPS ?

Upper eyelid complex = MRD1 + TPS

10 Tips

- customize
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2. What is TPS ?

Upper eyelid complex = MRD1 + TPS + BFS

10 Tips

- customize
- ptosis
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2. Does TPS matter?

10 Tips

- customize
- ptosis
- volume
- contour
- brow
- sub-brow
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2. Does TPS matter?

10 Tips

- customize
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

2. Does TPS matter?

Similar improvements in contour

10 Tips

- customize
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

2. Does TPS matter?

Persistent asymmetry in BFS

10 Tips

- customize
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

2. Does TPS matter?

Bottom patient has MORE symmetric MRD1

10 Tips

- customize
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

2. Does TPS matter?

Significant residual asymmetry in TPS draws your attention

10 Tips

- customize
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

2. Focus on controlling TPS ...its the variable we notice most

Significant residual asymmetry in TPS draws your attention

10 Tips

- customize
- TPS
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

3. Address ptosis

10 Tips

- customize
- TPS
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

3. Address ptosis

Kelsey A. Roelofs MD

10 Tips

- customize
- TPS
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

3. Address ptosis & identify those with Herings

10 Tips

- customize
- TPS
- ptosis
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

4. Don't underestimate the value of volume

10 Tips

- customize
- TPS
- ptosis
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

4. Don't underestimate the value of volume

Bothered by perceived 'extra skin'

10 Tips

- customize
- TPS
- ptosis
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

4. Don't underestimate the value of volume

Bothered by perceived 'extra skin'

10 Tips

- customize
- TPS
- ptosis
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

4. Don't underestimate the value of volume

Most 'aged' feature is actually volume loss

10 Tips

- customize
- TPS
- ptosis
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

4. Don't underestimate the value of volume

Trial with saline at initial consult

10 Tips

- customize
- TPS
- ptosis
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

4. Don't underestimate the value of volume

10 Tips


- customize
- TPS
- ptosis
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

4. Don't underestimate the value of volume

10 Tips

4. Don't underestimate the value of volume

- customize
- TPS
- ptosis
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony



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10 Tips

4. Don't underestimate the value of volume

- customize
- TPS
- ptosis
- contour
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony

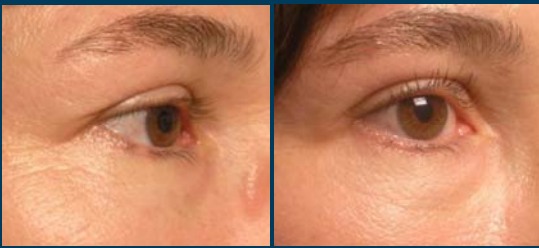


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10 Tips

5. Reposition tissues to optimise TPS contour

- customize
- TPS
- ptosis
- volume
- brow
- sub-brow
- skin quality
- neurotoxins
- harmony




Kelsey A. Roelofs MD

10 Tips

6. Identify cases that would benefit from simultaneous brow lifting

- customize
- TPS
- ptosis
- volume
- contour
- sub-brow
- skin quality
- neurotoxins
- harmony



Kelsey A. Roelofs MD

Endoscopic brow lift

10 Tips

6. Identify cases that would benefit from simultaneous brow lifting

- customize
- TPS
- ptosis
- volume
- contour
- sub-brow
- skin quality
- neurotoxins
- harmony



Kelsey A. Roelofs MD

Temple lift

10 Tips

6. Identify cases that would benefit from simultaneous brow lifting

- customize
- TPS
- ptosis
- volume
- contour
- sub-brow
- skin quality
- neurotoxins
- harmony




Kelsey A. Roelofs MD

Temple lift

10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- sub-brow
- skin quality
- neurotoxins
- harmony

6. Identify cases that would benefit from simultaneous brow lifting




Kelsey A. Roelofs MD

Direct brow lift

10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- brow
- skin quality
- neurotoxins
- harmony

7. Consider sub-brow incision placement




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10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- brow
- skin quality
- neurotoxins
- harmony

7. Consider sub-brow incision placement



1 months 3 months

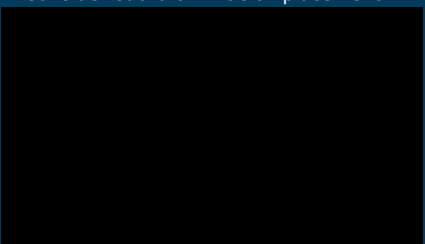
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Important to counsel about scar maturation

10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- brow
- skin quality
- neurotoxins
- harmony

7. Consider sub-brow incision placement




Dermal stacking technique may optimise volume & scar

10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- brow
- skin quality
- neurotoxins
- harmony

7. Consider sub-brow incision placement




Dermal stacking technique may optimise volume & scar

10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- brow
- sub-brow
- neurotoxins
- harmony

8. Optimise skin quality!





Skin care Peels Laser

10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality



9. Fine tune brow position and improve periocular rhytides with post-operative neurotoxins

10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins


10. Aim for pan-facial harmony


10 Tips

- customize
- TPS
- ptosis
- volume
- contour
- brow
- sub-brow
- skin quality
- neurotoxins


10. Aim for pan-facial harmony




Kelsey A. Roelofs MD



THANK YOU!



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What's Wrong Here? A Look at Periocular Asymmetry

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Financial Disclosures

- ▶ Consultant:
 - ▶ Allergan
 - ▶ Galderma
 - ▶ Evolus
 - ▶ Revance
 - ▶ RVL
 - ▶ Horizon
 - ▶ RoC
 - ▶ Tarsus
 - ▶ Novabay
 - ▶ Viridian

Everyone is Asymmetric

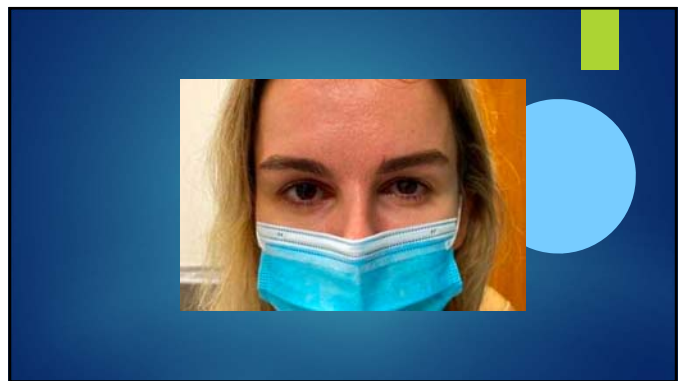
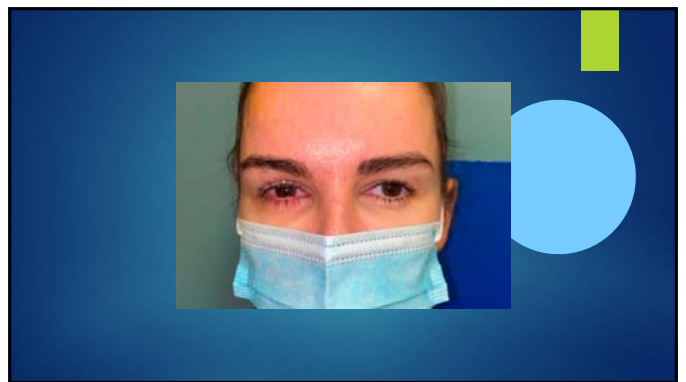
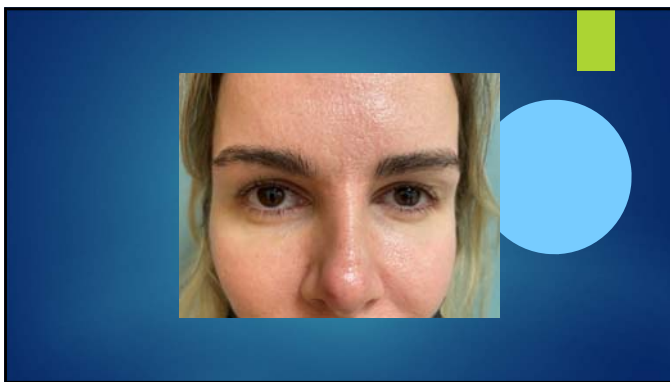
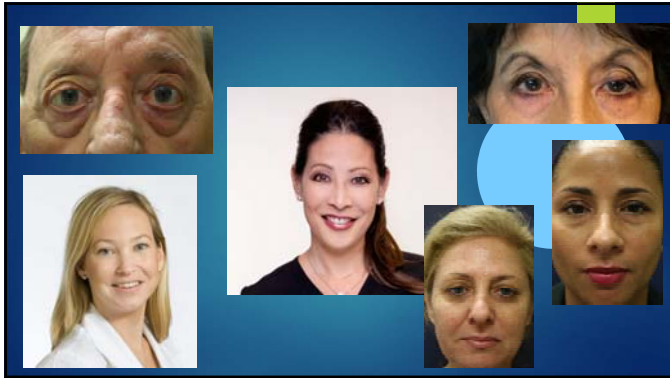


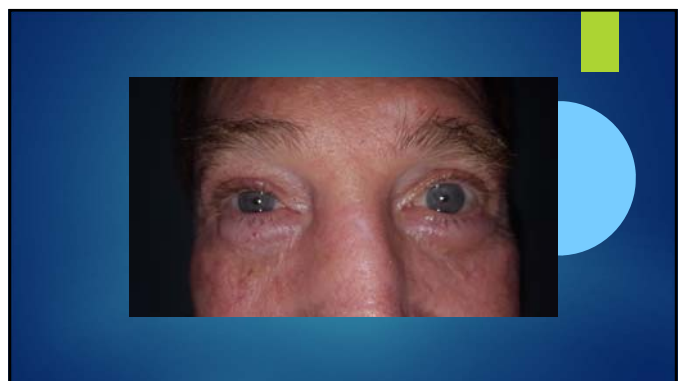
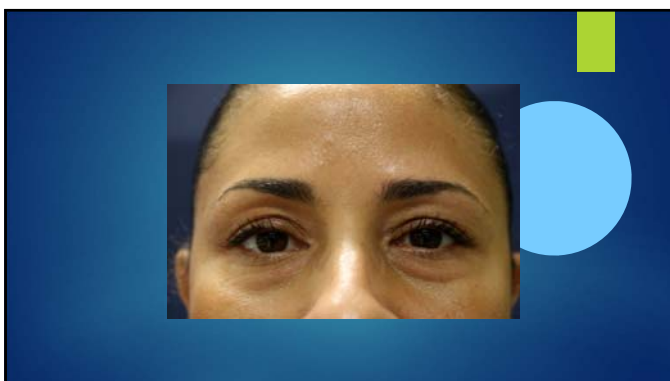
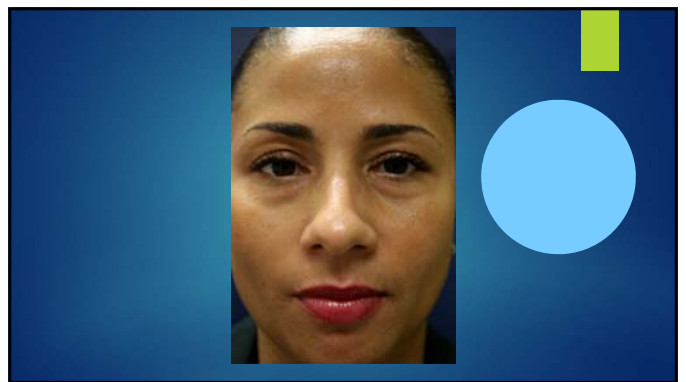
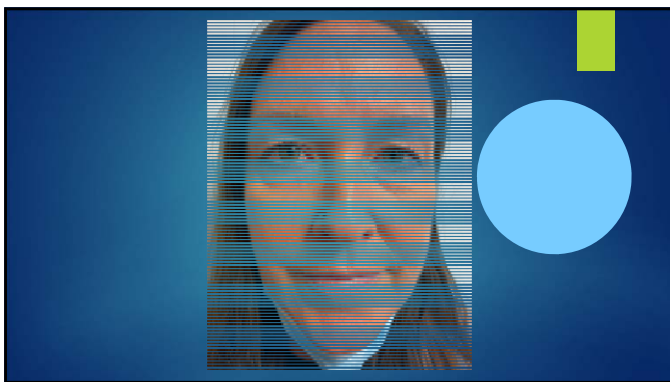
Everyone is Asymmetric

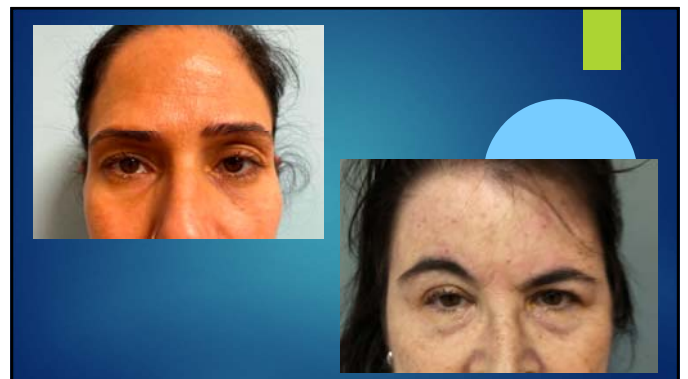
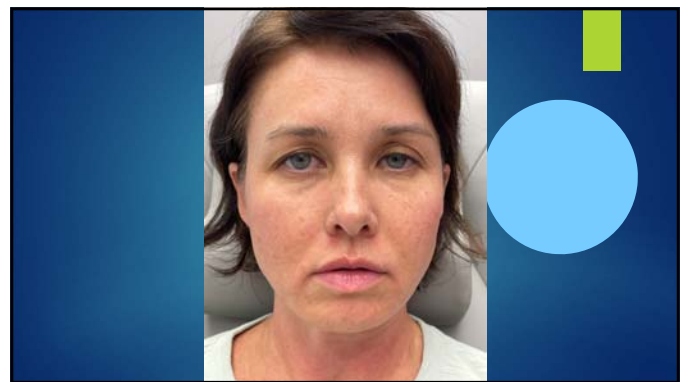
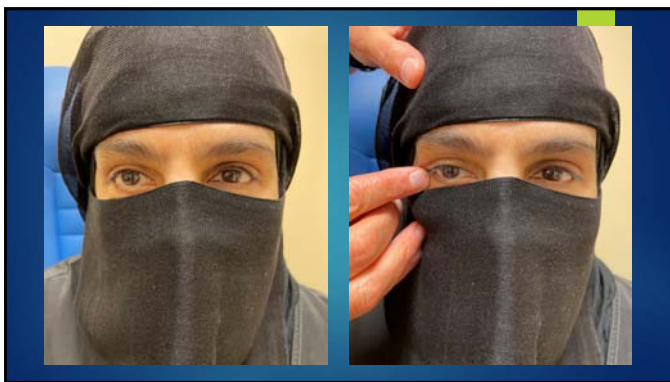
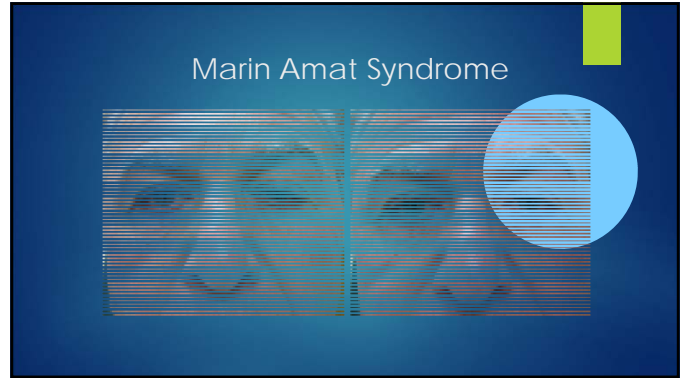
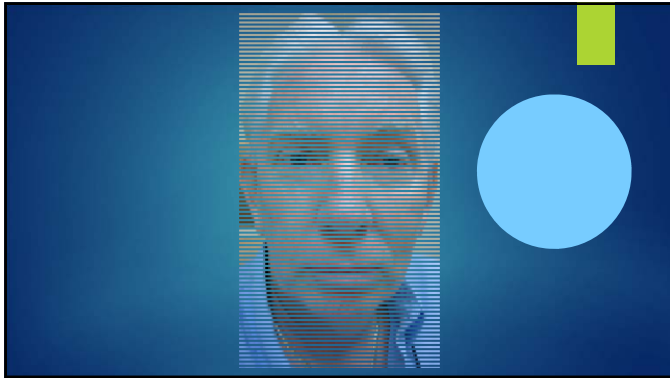


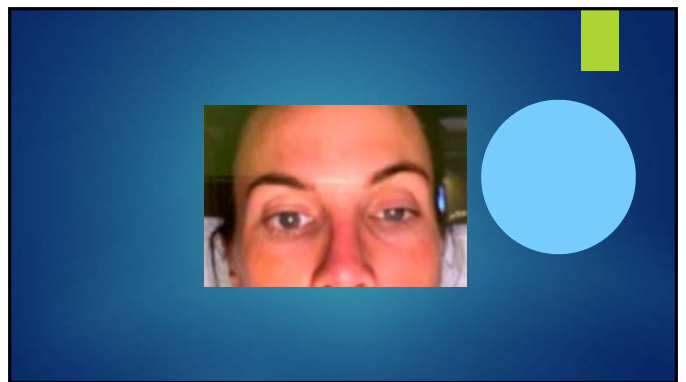
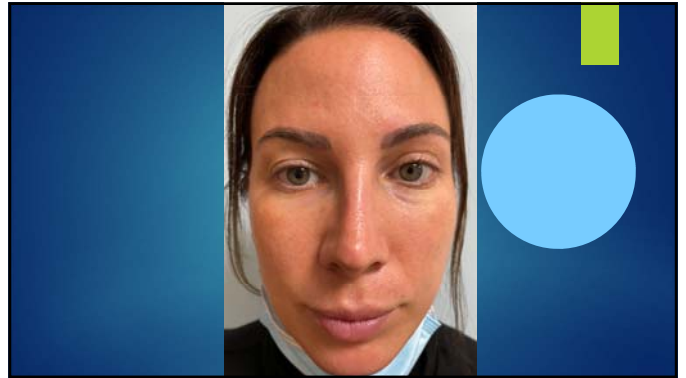
Everyone is Asymmetric








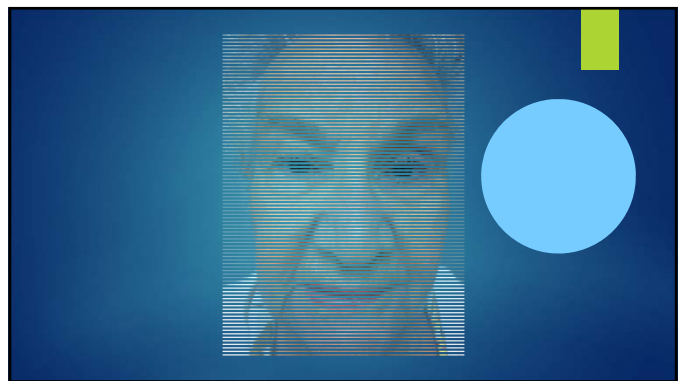
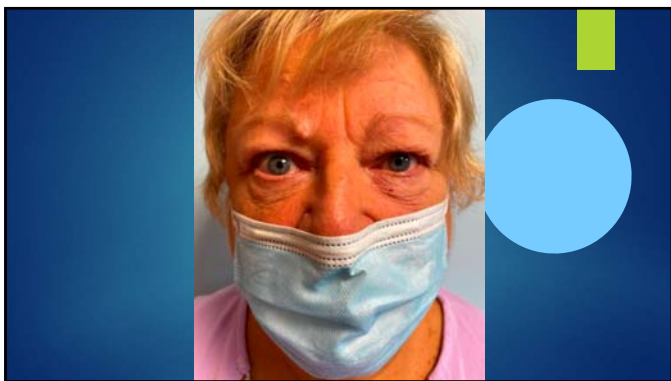
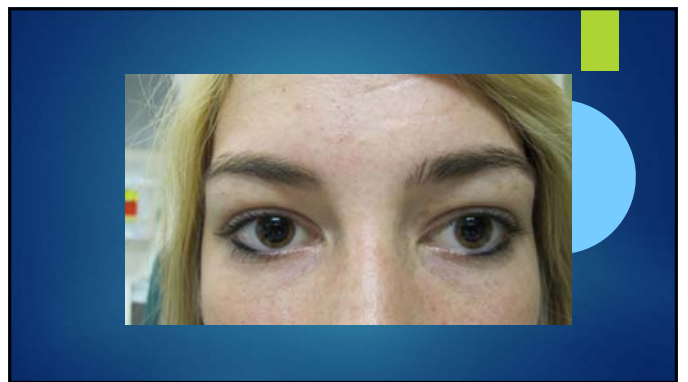
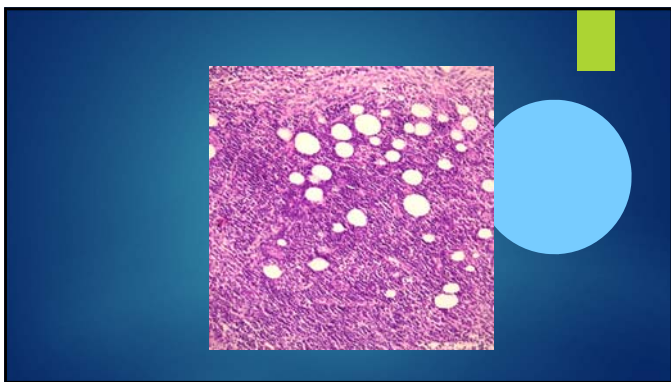
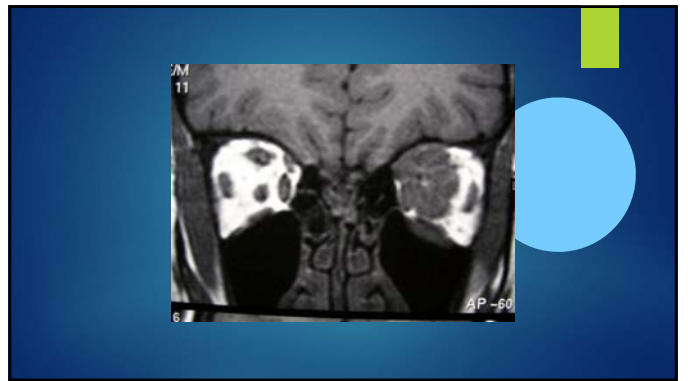
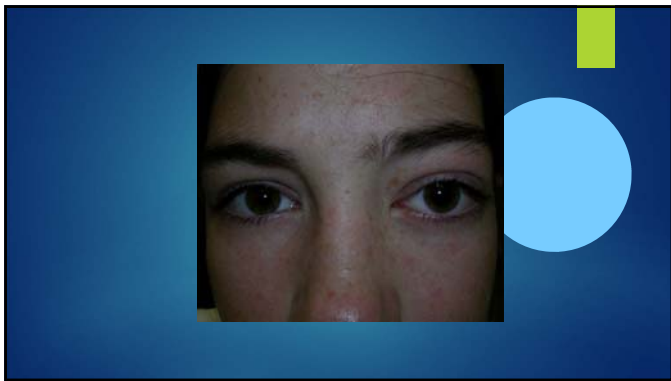




- ▶ s/p thyroidectomy and lymph node removal 10 mos prior to presentation
 - ▶ Thyroid papillary carcinoma and hashimotos
- ▶ Woke up with Horner's Syndrome

- ▶ Uses Upneeq with good results
- ▶ Can use toxin in right depressors
- ▶ Not in left frontalis because she needs this as compensatory mechanism for LUL ptosis
- ▶ Mild BUL dermatochalasis R > L due to brow asymmetry







Periocular Asymmetries

Summary

- ▶ Evaluate position of upper and lower eyelids in relation to the limbus
 - ▶ Upper lid 1mm below superior limbus
 - ▶ Lower lid at inferior limbus
- ▶ Lateral canthal tendon integrity
- ▶ Enophthalmos or exophthalmos?
 - ▶ Silent Sinus Syndrome?
 - ▶ Orbital Fracture?
 - ▶ Thyroid?
 - ▶ Orbital tumor?
- ▶ Eyebrow position
- ▶ Presence of ptosis
 - ▶ Look at pupils
 - ▶ Palpate lacrimal gland

Thank You

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Oculoplastic pathology with refractive implications

Practical tips for management

Kelsey A Roelofs MD FRCS
 Oculofacial Plastic Surgeon
 Assistant Professor
 Departments of Ophthalmology & Neurosurgery
 University of California, Los Angeles

UCLA Stein Eye Institute

Oculoplastic pathology with refractive implications

Practical tips for management

Kelsey A Roelofs MD FRCS
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 University of California, Los Angeles

No financial disclosures or conflicts of interest

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Objectives

To discuss common **Eyelid Lesions**, **Eyelid Malpositions**, **Orbital pathology**, and **Refractive implications**


To review practical tips for assessing, managing and referring patients with these conditions

Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Chalazia



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Eye lid Lesions *Eyelid Malpositions* *Orbital pathology*

Chalazia

Effects of chalazia on corneal astigmatism

Large-sized chalazia in middle upper eyelids compress the cornea and induce the corneal astigmatism

Ki Won Jin¹, Young Joo Shin^{1*}, and Joan Young Hyon^{2,3}

Result: Oblique astigmatism was greater in the chalazion group compared with the control group ($p < 0.05$). Astigmatism by simulated keratometry (simK), steep K by simK, total root mean square, second order aberration, oblique astigmatism, and vertical astigmatism were significantly greater in the upper eyelid group ($p < 0.05$). Astigmatism by simK, second order aberration, oblique astigmatism, and vertical astigmatism were significantly greater in the large-sized chalazion group ($p < 0.05$). Corneal wavefront aberration was the greatest in the upper eyelid chalazion group, whole area group, and large-sized chalazion group ($p < 0.05$).

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Eye lid Lesions *Eyelid Malpositions* *Orbital pathology*

Chalazia

Primarily induce oblique astigmatism

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Eye lid Lesions *Eyelid Malpositions* *Orbital pathology*

Chalazia

Effects of chalazia on corneal astigmatism

Primarily induce oblique astigmatism

Refractive implications are greatest for lesions located in the upper eyelid

Result: Oblique astigmatism was greater in the chalazion group compared with the control group ($p < 0.05$). Astigmatism by combined horizontally (H) and vertically (V) by each total root mean square, second order aberration, oblique astigmatism and vertical astigmatism was significantly greater in the upper eyelid group ($p < 0.05$). Astigmatism by both second order astigmatism, oblique astigmatism and vertical astigmatism were not significantly greater in the lower eyelid chalazion group ($p > 0.05$). Corneal astigmatism was the greatest in the upper eyelid chalazion group, which was then followed by the lower eyelid group ($p < 0.05$).

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Eye lid Lesions *Eyelid Malpositions* *Orbital pathology*

Chalazia

Effects of chalazia on corneal astigmatism

Primarily induce oblique astigmatism

Refractive implications are greatest for lesions located in the upper eyelid

Degree of refractive change correlates with size of chalazia

UCLA Stein Eye Institute

Eye lid Lesions *Eyelid Malpositions* *Orbital pathology*

Chalazia

Effects of chalazia on corneal astigmatism

Primarily induce oblique astigmatism

Refractive implications are greatest for lesions located in the upper eyelid

Degree of refractive change correlates with size of chalazia

Higher order aberrations can be induced by large upper eyelid chalazia

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Eye lid Lesions *Eyelid Malpositions* *Orbital pathology*

Chalazia — Pediatric considerations

Multivariate analysis of the effect of Chalazia on astigmatism in children

Lijuan Ouyang, Xinke Chen, Lianhong Pi and Ning Xi*

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Eye lid Lesions *Eyelid Malpositions* *Orbital pathology*

Chalazia — Pediatric considerations

Multivariate analysis of the effect of Chalazia on astigmatism in children

Lijuan Ouyang, Xinke Chen, Lianhong Pi and Ning Xi*

Greater refractive implications when:
Located in middle upper eyelid

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Chalazia — Pediatric considerations

Multivariate analysis of the effect of Chalazia on astigmatism in children
Lijuan Ouyang, Xike Chen, Lianhong Pi and Ning Ke*

Greater refractive implications when:

- Located in middle upper eyelid
- Size > 3mm

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Eye lid Lesions **Eyelid Malpositions** **Orbital pathology**

Chalazia — Pediatric considerations

Multivariate analysis of the effect of Chalazia on astigmatism in children
Lijuan Ouyang, Xike Chen, Lianhong Pi and Ning Ke*

Greater refractive implications when:

- Located in middle upper eyelid
- Size > 3mm
- Multiple lesions

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Chalazia — Pediatric considerations

Multivariate analysis of the effect of Chalazia on astigmatism in children
Lijuan Ouyang, Xike Chen, Lianhong Pi and Ning Ke*

Consider earlier intervention if in amblyopic age group

Greater refractive implications when:

- Located in middle upper eyelid
- Size > 3mm
- Multiple lesions

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Chalazia

The effects of chalazion excision on corneal surface aberrations
Young Min Park, Jong Soo Lee*

Refractive aberrations improve with treatment

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Chalazia

The effects of chalazion excision on corneal surface aberrations
Young Min Park, Jong Soo Lee*

Refractive aberrations improve with treatment

Does this improvement coincide with resolution of the mass?

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Chalazia

Are refractive implications solely due to direct mass effect?

Corneal Epithelial Remodeling as a Cause of Chalazion-Induced Hypermetropia
Hahn, Timothy MBBB Drexler G, MD / Coats, David MBBB Drexler G, PhD MD FRCO
https://doi.org/10.1093/eye/kfy088

Epithelial remodelling may also occur, inducing hypermetropia

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Chalazia

Are refractive implications solely due to direct mass effect?

Corneal Epithelial Remodeling as a Cause of Chalazion-Induced Hypermetropia
WALL, Timothy M.D., JONES, S. M.D., LAMB, David M.D., HERR, A. M.D., M.D.
 Author: Ophthalmology
 www.ucla.edu/ophth/ophthology/ophthology.html

Continued change over a **4 month period** following incision and drainage of chalazia

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

± 90%

Spontaneous resolution (weeks to months)

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

Treatment

Spontaneous resolution (weeks to months)

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

Treatment

Conservative (ie warm compress, lid hygiene, ? topical steroids and/or antibiotics)

Spontaneous resolution (weeks to months)

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

Treatment

Conservative (ie warm compress, lid hygiene, ? topical steroids and/or antibiotics)

Injection (triamcinolone +/- 5FU) ± 70%

Spontaneous resolution (weeks to months)

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

Spontaneous resolution (weeks to months)

Treatment

Conservative (ie warm compress, lid hygiene, ? topical steroids and/or antibiotics)

Injection (triamcinolone +/- 5FU) ± 70%

Incision and curettage ± 80%

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

Spontaneous resolution (weeks to months)

Treatment

?Prevention

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

Spontaneous resolution (weeks to months)

Treatment

?Prevention

Warm compresses

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

Spontaneous resolution (weeks to months)

Treatment

?Prevention

Warm compresses

Lid scrubs

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

Spontaneous resolution (weeks to months)

Treatment

?Prevention

Warm compresses

Lid scrubs

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Eyelid Lesions *Eyelid Malpositions* *Orbital pathology*

Practical Tips for Management of Chalazia

Development of chalazia

Spontaneous resolution (weeks to months)

Treatment

?Prevention

Warm compresses

Lid scrubs +/- tea tree oil

Demodex confirmed via microscopy in 20 - 60% of chalazia

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Practical Tips for Management of Chalazia

Development of chalazia

Spontaneous resolution (weeks to months)

Treatment

?Prevention

Warm compresses

Lid scrubs

?Doxycycline

Insufficient evidence for beneficial effect on blepharitis

Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Not all eyelid lesions are chalazia ...

Ulceration Madarosis Destruction of lid architecture Poliosis

Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis

Dermatochalasis

Entropion

Ectropion

Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis

Dermatochalasis

Entropion

Ectropion

Both congenital and involutional ptosis induce superior corneal steepening

Corneal Topographic Changes After Eyelid Ptosis Surgery

Does Frontalis Sling Surgery for Congenital Ptosis Change the Corneal Topography and Refractive Characteristics Postoperatively?

Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis

Dermatochalasis

Entropion

Ectropion

Both congenital and involutional ptosis induce superior corneal steepening

On average, approximately 0.25 D of astigmatism can be attributed to ptosis

Corneal Topographic Changes After Eyelid Ptosis Surgery

Results: After surgical ptosis repair, corneal topography demonstrated a reduction in average keratometry of 0.15 ± 0.47 diopters (D) and in ... Significant differences were found in apical keratometry front (-1.84 ± 1.76 D) and in best-corrected visual acuity (-0.18 ± 0.06 logMAR) in the postoperative examinations. Central corneal thickness did not show significant differences between preoperative and postoperative examinations. Postoperative topographic maps showed a reduction of symmetry index front (0.10 ± 0.64 D).

Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis

Dermatochalasis

Entropion

Ectropion

Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Effect of Upper Eyelid Surgery on Corneal Topography

Results: There were mean changes in total astigmatism of 0.25 diopter (D) after ptosis surgery ($P = .02$) and (P = .04) compared with 0.09 D in patients after skin-only blepharoplasty. In addition, there was a correlation between corneal thickness and change in astigmatism of more than 0.2 cylinders after ptosis surgery ($P < .05$). Postoperative astigmatic axis changes were not systematic.

Approximately 0.2 D change in astigmatism with blepharoplasty when fat is removed

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Effect of Upper Eyelid Surgery on Corneal Topography

Results: There were mean changes in total astigmatism of 0.25 diopter (D) after ptosis surgery ($P = .02$) and 0.21 D after blepharoplasty with reduction of large fat pads ($P = .04$) compared with 0.09 D in patients after skin-only blepharoplasty. In addition, there was a correlation between corneal thickness and change in astigmatism of more than 0.2 cylinders after ptosis surgery ($P < .05$). Postoperative astigmatic axis changes were not systematic.

Approximately 0.2 D change in astigmatism with blepharoplasty when fat is removed

**** Minimal effect if skin only (0.09D)**

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Effect of Upper Eyelid Surgery on Corneal Topography

Results: There were mean changes in total astigmatism of 0.25 diopter (D) after ptosis surgery ($P = .02$) and 0.21 D after blepharoplasty with reduction of large fat pads ($P = .04$) compared with 0.09 D in patients after skin-only blepharoplasty. In addition, there was a correlation between corneal thickness and change in astigmatism of more than 0.2 cylinders after ptosis surgery ($P < .05$). Postoperative astigmatic axis changes were not systematic.

Approximately 0.2 D change in astigmatism with blepharoplasty when fat is removed

**** Minimal effect if skin only (0.09D)**

Patients with thinner central corneal thickness experienced greater changes in astigmatism after ptosis surgery

UCLA Shaha Eye Institute

Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Effect of Upper Eyelid Surgery on Corneal Topography

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Patients with thinner central corneal thickness experienced greater changes in astigmatism after ptosis surgery

Changes in axis were generally <10 degrees but did not follow a predictable pattern

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Practical Tips for Management of Ptosis

1. Look for red flags that would suggest an alternate underlying etiology

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Practical Tips for Management of Ptosis

1. Look for red flags that would suggest an alternate underlying etiology

PUPILS

Horners

UCLA Shaha Eye Institute

Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**


Practical Tips for Management of Ptosis

Dermatochalasis
Entropion
Ectropion

1. Look for red flags that would suggest an alternate underlying etiology

PUPILS **MOTILITY**

Horners
3rd nerve palsy



Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**


Practical Tips for Management of Ptosis

Dermatochalasis
Entropion
Ectropion

1. Look for red flags that would suggest an alternate underlying etiology

PUPILS **MOTILITY**

Horners
3rd nerve palsy
Myogenic (CPEO)



Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**


Practical Tips for Management of Ptosis

Dermatochalasis
Entropion
Ectropion

1. Look for red flags that would suggest an alternate underlying etiology

PUPILS **MOTILITY** **FATIGABILITY**

Horners
3rd nerve palsy
Myogenic (CPEO)
Myasthenia



Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**


Practical Tips for Management of Ptosis

Dermatochalasis
Entropion
Ectropion

1. Look for red flags that would suggest an alternate underlying etiology

2. Assess for causes that may spontaneously improve

Traumatic



Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**


Practical Tips for Management of Ptosis

Dermatochalasis
Entropion
Ectropion

1. Look for red flags that would suggest an alternate underlying etiology

2. Assess for causes that may spontaneously improve

Traumatic
Post CEIOL



Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Practical Tips for Management of Ptosis Post CEIOL

Dermatochalasis
Entropion
Ectropion


An Objective Evaluation of the Upper Eyelid Position after Phacoemulsification Cataract Surgery
Victoria Margalo-Fernández¹, María García-Zamora¹, María Calvo-García¹, Cecilia Díaz-Montero², Silvana A. Schiller^{3,4}, Rajiv Khurshid⁵, and Alicia Galindo-Ibarra⁶

Lid height can improve throughout 6 month post op period

TABLE 1. Status of upper eyelid before and at different stages of follow up after phacoemulsification cataract surgery.

Variable	Preoperative	day	Day 1	30 days	90 days	180 days	Validation
Upper Lid crease	Number	102	107	94	73	88	Friedman P = .17
	Median	9.0	9.0	9.0	10.0	9.0	
	IQR	7.75-10.0	8.0-10.0	8.0-11.0	8.0-11.0	8.0-10.75	
Levator Function	Number	103	104	94	74	88	Friedman P = .001
	Median	15	14	15	15	15	
	IQR	14-17	12-16	14-17	14-17	14-17	
Marginal Reflex Distance 1 (MRD1)	Number	110	106	103	79	111	Friedman P < .001
	Median	3.0	2.45	2.7	2.9	3.1	
	IQR	2.4-3.5	1.8-3.3	2.0-3.5	2.2-3.7	2.4-3.7	

Friedman denotes the Friedman non-parametric statistical test. IQR denotes interquartile range. MRD1 denotes marginal reflex distance 1. P < .05 is statistically significant.



Eyelid Lesions **Eyelid Malpositions** Orbital pathology

Practical Tips for Management of Ptosis

Dermatochalasis 1. Look for red flags that would suggest an alternate underlying etiology

Entropion

Ectropion 2. Assess for causes that may spontaneously improve

3. Options for medical management: pros and cons

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Eyelid Lesions **Eyelid Malpositions** Orbital pathology

Ptosis

Dermatochalasis

Entropion

Ectropion




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Eyelid Lesions **Eyelid Malpositions** Orbital pathology

Ptosis Practical Tips for Management of Entropion

Dermatochalasis 1. Surgery often required unless transient, reversible cause for spastic component

Ectropion



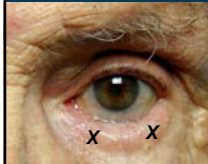
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Eyelid Lesions **Eyelid Malpositions** Orbital pathology

Ptosis Practical Tips for Management of Entropion

Dermatochalasis 1. Surgery often required unless transient, reversible cause for spastic component

Ectropion 2. Options for symptomatic control while awaiting surgery:
Botulinum toxin injection





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Eyelid Lesions **Eyelid Malpositions** Orbital pathology

Ptosis Practical Tips for Management of Entropion

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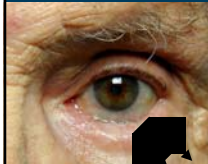

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Eyelid Lesions **Eyelid Malpositions** Orbital pathology

Ptosis Practical Tips for Management of Entropion

Dermatochalasis 1. Surgery often required unless transient, reversible cause for spastic component


Ectropion 2. Options for symptomatic control while awaiting surgery:
Botulinum toxin injection
Quicker suture
Tape

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis
Dermatochalasis
Entropion
Ectropion

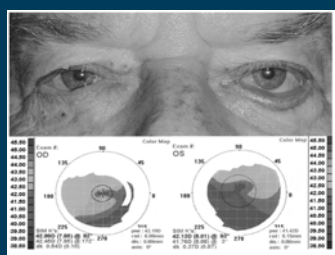


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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis
Dermatochalasis
Entropion
Ectropion

Corneal Topography in Involuntional Ectropion of the Lower Eyelid: Preoperative and Postoperative Evaluation
(Shawhan, F. J. Ophthalmol. 1993; 110: 148-150)



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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

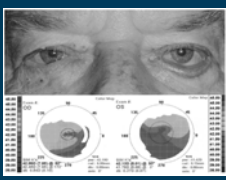
Ptosis
Dermatochalasis
Entropion
Ectropion

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TABLE 1. Topographic Parameters Evaluated in the Fellow Eyes and Operated Eyes (Preoperatively and Postoperatively) and Statistical Significance of Respective Differences (Paired t Test)

Topographic Parameter	Fellow Eyes	P Value	Operated Eyes Preoperatively (Mean ± SD)	P Value	Operated Eyes Postoperatively (Mean ± SD)
SRP	41.69 ± 1.99	0.31	42.02 ± 1.65	0.04	41.21 ± 0.53
FRP	40.57 ± 1.73	0.24	40.75 ± 2.07	0.16	39.69 ± 0.76
TA	1.93 ± 0.33	0.03	1.87 ± 0.40	0.14	1.41 ± 0.49
RA	1.07 ± 1.12	0.03	0.78 ± 0.09	0.03	1.26 ± 0.24

Total astigmatism may not be different



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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis
Dermatochalasis
Entropion
Ectropion

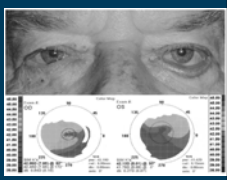
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Total astigmatism may not be different

Astigmatism was more irregular in eyes with ectropion vs fellow eyes



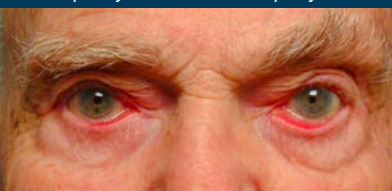
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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis
Dermatochalasis
Entropion
Ectropion

Practical Tips for Management of Ectropion

1. Surgery often required unless transient paralytic cause ie. Bells palsy



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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**


Ptosis
Dermatochalasis
Entropion
Ectropion

Practical Tips for Management of Ectropion

1. Surgery often required unless transient paralytic cause ie. Bells palsy

2. Options for symptomatic control:

Tape



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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis **Refractive Implications of Surgical Repair of Entropion & Ectropion**

Dermatochalasis

Vector analysis of changes in corneal astigmatism following lateral tarsal strip procedure in patients with involutional ectropion or entropion

Babram Eskrafi - Manmohar Jambhavan Tehrani - Karish Fakhari - Hossein Ali-Zamani - Zahra Fatoh Taji - Reza Ghaffari

Repair of entropion/ectropion can induce approx 0.5D astigmatism

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

Ptosis **Refractive Implications of Surgical Repair of Entropion & Ectropion**

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Repair of entropion/ectropion can induce approx 0.5D astigmatism

No great data regarding the persistence of this change

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

ID: 35 yo male
CC: blurry vision in his right eye

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

ID: 35 yo male
CC: blurry vision in his right eye
Pupils: 1+ right RAPD
VA: 20/30 OD 20/20 OS
Refraction: +2.0D OD plano OS

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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

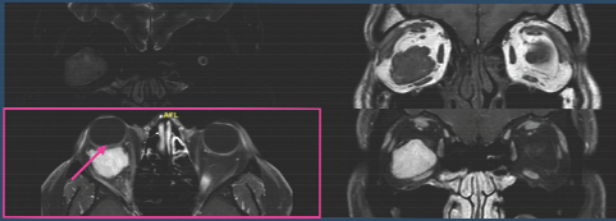
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Eyelid Lesions **Eyelid Malpositions** **Orbital pathology**

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Eyelid Lesions Eyelid Malpositions **Orbital pathology**




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Eyelid Lesions Eyelid Malpositions **Orbital pathology**

Practical Tips for Identifying Orbital Pathology

- Careful posterior segment exam




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Eyelid Lesions Eyelid Malpositions **Orbital pathology**

Practical Tips for Identifying Orbital Pathology

- Careful posterior segment exam
- Evaluate for RAPD, change in color vision, proptosis, resistance to retropulsion, motility limitation, sensory changes

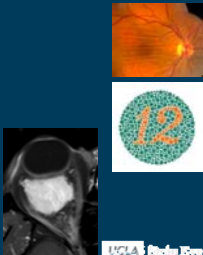


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Eyelid Lesions Eyelid Malpositions **Orbital pathology**

Practical Tips for Identifying Orbital Pathology

- Careful posterior segment exam
- Evaluate for RAPD, change in color vision, proptosis, resistance to retropulsion, motility limitation, sensory changes
- In most cases, MRI + contrast is the most helpful imaging modality



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TAKE HOME POINTS

Eyelid Lesions **REFRACTIVE IMPLICATION:** Eyelid masses can induce astigmatism which may persist several months post resolution of the lesion

Eyelid Malpositions

Orbital pathology

UCLA Stein Eye Institute

TAKE HOME POINTS

Eye lid Lesions **REFRACTIVE IMPLICATION:** Eyelid masses can induce astigmatism which may persist several months post resolution of the lesion

Eyelid Malpositions

Orbital pathology

PRACTICAL TIPS: Most chalazion will spontaneously resolve, injection of **K10 + 5FU** is a useful tool, no magic rx to prevent recurrence, **consider Demodex** if recalcitrant, always consider the **DDx**

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TAKE HOME POINTS

Eyelid Lesions

Eyelid Malpositions

REFRACTIVE IMPLICATIONS:

1. Ptosis & significant dermatochalasis increase WTR by $-0.25D$ (> if thin CCT).

Orbital pathology

TAKE HOME POINTS

Eyelid Lesions

Eyelid Malpositions

REFRACTIVE IMPLICATIONS:

1. Ptosis & significant dermatochalasis increase WTR by $-0.25D$ (> if thin CCT).
2. Repair of ectropion/entropion can induce $0.5D$ of astigmatism, can take ~ 6 months to resolve

Orbital pathology

TAKE HOME POINTS

Eyelid Lesions

Eyelid Malpositions

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PRACTICAL TIPS:

1. Look out for ptosis red flags

Orbital pathology

TAKE HOME POINTS

Eyelid Lesions

Eyelid Malpositions

REFRACTIVE IMPLICATIONS:

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PRACTICAL TIPS:

1. Look out for ptosis red flags
2. Many will need eyelid surgery \rightarrow consider referring early

Orbital pathology

TAKE HOME POINTS

Eyelid Lesions

Eyelid Malpositions

REFRACTIVE IMPLICATIONS:

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PRACTICAL TIPS:

1. Look out for ptosis red flags
2. Many will need eyelid surgery \rightarrow consider referring early
3. Temporizing measures for symptomatic relief ie botulinum toxin, tape, Quickert suture

Orbital pathology

TAKE HOME POINTS

Eyelid Lesions

Eyelid Malpositions

REFRACTIVE IMPLICATIONS:

1. Hyperopic shift

Orbital pathology

TAKE HOME POINTS

Eyelid Lesions

Eyelid Malpositions


Orbital pathology

REFRACTIVE IMPLICATIONS:

1. Hyperopic shift

PRACTICAL TIPS:

1. Dynamic posterior segment exam
—>choroidal folds



TAKE HOME POINTS

Eyelid Lesions

Eyelid Malpositions

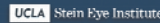
Orbital pathology

REFRACTIVE IMPLICATIONS:

1. Hyperopic shift

PRACTICAL TIPS:

1. Dynamic posterior segment exam
—>choroidal folds
2. Complete orbital exam



TAKE HOME POINTS

Eyelid Lesions

Eyelid Malpositions


Orbital pathology

REFRACTIVE IMPLICATIONS:

1. Hyperopic shift

PRACTICAL TIPS:

1. Dynamic posterior segment exam
—>choroidal folds
2. Complete orbital exam
3. MRI w contrast often most helpful modality



THANK YOU!



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