Strabismus for the anterior segment surgeon
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Five common scenarios: when the anterior segment surgeon might confront strabismus
• Sensory exotropia
• Anesthetic injections
• Tube-shunt surgeries
• Pterygium excisions
• Refractive surgery

Sensory exotropia

What should you do?
• Fix the cause of sensory vision loss?
• Fix the strabismus?
• Do nothing?
Central fusion disruption

- Pratt-Johnson described 24 patients with intractable diplopia following cataract extraction, correction of aphakia and correction of strabismus.
- Duration of dense cataract or aphakia = 2.5 to 40 years.
- The patients saw a second image nearly superimposed upon the first, but were unable to fuse.

Sensory exotropia

- If treatable, reverse the sensory vision loss
  - Remove cataract, perform PKP, etc.
  - Give the pt appropriate refractive correction
  - The longer the vision loss, the greater the likelihood for central fusion disruption
- Ideally, one would identify patients with central disruption first
  - If sensory vision loss is profound, pt cannot undergo examination to determine potential for fusion
    - Exception: prior to implanting a secondary IOL in an aphake with sensory XT
  - Counsel patient re: the remote possibility of central fusion disruption
- Refer to the strabismus surgeon after the sensory vision loss has been reversed
  - Reliable measurements of ocular alignment require the pt to see the target
  - The likelihood of regaining fusion after strabismus surgery is best when each eye has optimally corrected visual acuity.

Retrobulbar, peribulbar and subtenon’s anesthesia

- Cause diplopia by three mechanisms
  - PARESIS
    - Direct temporary effect of anesthetic
    - Longer-lasting injury to muscle or nerve
  - RESTRICTION
    - Inflammation and scarring due to injury to muscle and surrounding connective tissues
  - OVERACTION
    - Bupivicaine strengthens muscles
      - Hypertrophy
      - Segmental contracture
    - Antagonist to paretic muscle can become contractured and thus overactive

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How common is this problem?

- The incidence of diplopia due to motility problems after cataract surgery:
  - 0.5% (11/2122) after retro/peribulbar anesthesia
  - 0% (0/1420) after topical anesthesia

Retro/peri/subtenon’s injection

- IR most common
- Patient initially presents with hypertropia (due to immediate injury to the muscle from the anesthetic)
- Patient then develops hypotropia (due to hypertrophy from bupivacaine myotoxicity)

How to avoid

- Topical > subtenon’s > peribulbar and retrobulbar
- Don’t inject if you encounter resistance
- Stay away from inferior rectus (beware of left eye retrobulbar by right handed surgeon)
- Limit injection volume?
- Avoid bupivacaine for short cases

What to do if it happens?

- Prisms or monocular occlusion until stable
- Refer to strabismus specialist for surgical repair approximately six months later
Tube-shunt surgeries

Restrictive strabismus

- Mass effect of plate or of fibrous capsule
- Scarring between plate/capsule and extraocular muscle
- Fat adherence

Restriction can be in the field of gaze, or opposite the field of gaze, of the implant

Superotemporal Ahmed, left eye

Left hypertropia and exotropia

Superotemporal Ahmed, left eye

Limited depression and limited adduction of the left eye
• Tube shunts placed superonasally
  – Brown’s syndrome due to incorporation of superior oblique tendon

Tube-shunt surgeries
• Tube shunts placed superonasally
  – Brown’s syndrome due to incorporation of superior oblique tendon

Tube-shunt surgery: how to avoid strabismus in binocular patients
• Consider smaller plates
• Hook the superior rectus and lateral rectus insertions to identify the muscles and avoid them
• Direct bleb formation away from the EOMs?
• Avoid the superonasal quadrant

Pterygium excision

http://dro.hs.columbia.edu/ced4/pterygium2b.jpg
Pterygium excision

• Restrictive strabismus
  – incomitant esotropia increasing in abduction


Pterygium excision

• Restrictive strabismus
  – Treatment:
    • release of restriction by excision of scar tissue.
    • +/- ipsilateral medial rectus muscle recession using adjustable suture.
    • +/- mitomycin C to prevent scar tissue reformation


Refractive surgery

• Decompensation of a previously well-controlled phoria
  – Monovision
  – Multifocal IOLs
  – Don’t overminus
    • Especially in patients with a history of accommodative esotropia

Refractive surgery

• Fixation switch in patients with subnormal binocular vision
  – Adults with a history of strabismus since childhood may experience acquired diplopia if a change in their refractive error encourages fixation with their nondominant eye
  – Patients with a small DVD may become uncomfortable if fixation switch reveals a larger DVD in the contralateral eye
Refractive surgery

- Question patients about a history of strabismus or amblyopia
- Check for prism in spectacles
- Perform a cover test and alternate cover test

Summary

- Sensory XT – fix the cause of the sensory vision loss and refract the patient first
- Subtenons, peri and retrobulbar anesthesia – be aware and beware of bupivacaine myotoxicity
- Tube shunt surgery – consider smaller size plates, stay away from EOMs
- Pterygium surgery – identify the MR insertion in reops, avoid scarring
- Refractive surgery – identify patients with a history of strabismus or amblyopia preoperatively, and avoid monovision and multifocals

Summary

- But if you create strabismus, refer.

UCSF Adult Strabismus
(415) 353-2560
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