SURGERY OF THE INFERIOR OBLIQUE MUSCLE

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• “The treatment of superior oblique palsies is one of the more complicated problems in strabismology and it is more prudent to refer such a patient to a strabologist for management if it is possible.”

Pratt-Johnson in Management of Strabismus & Amblyopia, a practical guide.
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- “I emphasize the importance of technical competence in the performance of strabismus surgery.”

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• “There are no non-surgical alternatives in the treatment of inferior oblique overaction”

Gunther von Noorden
Surgical techniques: guidelines

• 1- Know the anatomy of all extra-ocular muscles & fascial planes.

• 2- Carry out sharp dissection carefully, avoid blunt dissection.

• 3- Respect the conjunctiva, especially the caruncle & the plica semilunaris.

• 4- Hemostasis.

• 5- Magnification & illumination.
Cause of inferior oblique overaction

1- Superior Oblique Palsy
2- Muscle anomaly:
   Lax tendon superior oblique
   Sagittalisation inferior oblique
3- Orbit anomaly
   Craniofacial dysostosis (Crouzon)
4- “Primary overaction”
“primary overaction”

- Only secondary deviations account for true overaction:
  - Paralysis ipsilateral antagonist: superior oblique
  - Paralysis contralateral yoke muscle: superior rectus
“primary overaction”

• True primary overaction of an oblique muscle has not been well understood, and whether it exists at all has become increasingly doubtful.
  
  Gunther von Noorden

• The true cause for this so-called primary inferior oblique overaction is unknown to me.

  Eugene Helveston
Vertical Strabismus: The Four Golden Rules (Pratt-Johnson)

1- A vertical strabismus is caused by a superior oblique palsy until proven otherwise.

2- A superior oblique palsy is congenital until proven otherwise.

3- A superior oblique palsy is traumatic if not congenital.

4- If not congenital or traumatic: neurologic consultation (intracranial neoplasm)
Indications for surgery

- 1- Inferior oblique overaction sine V
- 2- Inferior oblique overaction cum V
- 3- Dissociated Vertical Deviation
- 4- Superior Oblique palsy: asymmetric weakening
Aim of surgery

- Reduce / eliminate elevation in adduction
- Reduce / eliminate hypertropia in primary position
- Increase field of binocular vision
- Reduce torticollis
Surgical technique: anterotransposition of the inferior
Exposure of surgical site

- Inferotemporal quadrant of the globe
- Mosquito forceps at the limbus at 7.30 h.
Exposure of surgical site

- Fornix based conjunctival incision
- Opening Tenon’s capsule
Exposure of surgical site

- Visualisation of the body of the inferior oblique muscle
Isolating the muscle on a hook

- No blind sweep!: avoid vortex vein
- Avoid violation of orbital septum: orbital fat prolaps
Isolating the muscle on a hook

- 50% of the muscles double bellied! (cadaver study)
- White triangle: posterior part of Tenon’s capsule
Block the globe

- Jameson hook under the inferior rectus
Suture in the sclera

- Lateral & behind the insertion of the inferior rectus: at the equator of the globe.
Dissection from the sclera

- The anterior part from the muscle is cut adjacent to the sclera
Dissection from the sclera

- The posterior part is cut through the muscle: myotomy to avoid perforation / traumatizing the sclera (2 mm. from the macula!).
Dissection from the sclera

- Check the posterior part of the perimysium.
Suture the muscle

- Suture is put through the anterior tip of the muscle.
- The posterior part of the muscle can retract.
Anteroposition of the inferior oblique muscle

- The muscle is reattached at the equator of the globe, about 13 mm. from the limbus & halfway between the inferior and the lateral rectus muscle.
Cut the suture
Almost ready!
Ready!
Complications

• 1- operate the wrong muscle: blunder!
  inferior rectus muscle or lateral rectus muscle.
  Anatomy / check the muscles

• 2- residual inferior oblique overaction:
  posterior foot (check perimysium).
Complications

• 3- Fat adherence syndrome:
  • Progressive ipsilateral hypotropia
  • Restriction of upgaze
  • Positive forced duction test

Due to opening the orbital septum: intrusion of extraconal fat into the sub-Tenon’s or episcleral space during surgery leads to a fibrous scar.

Progressive strabismus with inhibition of movement
Complications

4- inferior oblique muscle underaction:

transient torsional diplopia

- Trauma to the nerve (inferior branch n. III) to the inferior oblique
- Spontaneous recovery in a few weeks
Complications

5- anti-elevation syndrome:

- restriction of upgaze in abduction

- oblique muscle becomes depressor instead of elevator: new insertion too anterior / lateral to the inferior rectus muscle
Complications

• 6- Macular damage:
  • Scleral perforation
  • Excessive diathermy

Posterior insertion of the inferior oblique muscle is 2 mm. from the macula.
Complications

• 7- Mydriasis: temporary or permanent

  • Due to excessive traction / trauma to the inferior oblique muscle.

  • Damage to the parasympathetic nerve of the ciliary ganglion
Surgery = teamwork

Thank you for your attention