Inferior oblique complications and reoperations

Introduction

To illustrate the complications from inferior oblique surgery and discuss their management.

Topics of Discussion

1. Complications
   - Persistent OAIO
   - Incomplete division of posterior fibres
   - DVD and not IO O/A
   - Antielevation syndrome (after bilateral IO anteriorization)
     - Patient develops apparent recurrent IO overaction in the contralateral eye with a Y or V pattern
     - Occurs due to limited elevation in abduction of the operated eye causing overaction of the contralateral elevator in adduction

2. Inferior oblique adherence syndrome
   - Hypotropia and restriction in elevation secondary to the rupture of tenons capsule
   - Disinsertion of rectus muscle
   - Haemorrhage

Persistent OAIO

- Stager et al 2004 Nasal myectomy for recurrent elevation in adduction
- 72 eyes 40 patients
- Nasal myectomy of the IO (NMIO)
- Inferior nasal conj incision
- IO is exposed and 5mm or IO nasal to the nasal border of the inferior rectus is excised.

- Stager et al 2004
- 72 eyes 40 patients
- 73% B/L ant positioning, 20% B/L IOc, 8% one in each eye
- 27 (68%) no IOOA
- 11 (27%) improvement in one case
- 2 (5%) no improvement
Inferior oblique complications and reoperations

**Persistent OAIO**

- Stager et al 2004
- 24% DVD was better
- 16% DVD improved
- 52% DVD no change

**Persistent OAIO**

- Stager et al 2004
- Not randomized and retrospective
- Can get interpretive bias
- Still demonstrates NMIO eliminates IOOA
- They felt the neurovascular bundle serves as an ancillary origin

**Persistent OAIO**

- Squirrell et al 2006 Reexploration and IOm temporal to the IR to treat persistent IOOA
- Re-exploration and IO myectomy near to the temporal border of the IR muscle to treat persistent IO over action
- Retrospective (FU 12/12)
  - 3 had IO myectomy
  - 5 had IO recession
- Pathology
  - 6 diplopia
  - 1 Infantile ET IOOA
  - 1 PA ET

**Persistent OAIO**

- Squirrell et al 2006
- OAIO was removed in three and reduced by one unit in each
- Version to affected side 23 to 7°
- PP 17 to 4°
- Version away from 7 to 1°
- They suggest re-exploration and myectomy ensuring IO retracts through tenon’s capsule

**Persistent OAIO**

- Squirrell et al 2006
  - They suggest their myectomy figures are better than Shipman et al eye 2004 (compared IOm with IOc), because they allowed retraction of the IO through tenon’s capsule

**Persistent OAIO**

- Elliot Nankin 1981 JPOS Anterior transposition of the inferior oblique
- IO anterior transposition
- None out of seven patient had OAIO after this procedure.
- 70% had -1 to -2 of elevation deficiency when performed unilaterally
Inferior oblique complications and reoperations

Persistent OAIO

- Noa Ela-Dalman et al JAAPOS 2006
- IO muscle fixation to the orbital wall
- Retrospective/small/controlled
- 4 SO palsy (no previous surgery)
- 2 VXT (one had previous surgery)
- 3 DVD (all had previous surgery)

Persistent OAIO

- Noa Ela-Dalman et al JAAPOS 2006
- 6 OAIO was removed
- 2 OAIO markedly reduced
- 3 OAIO remained
- Previously operated DVD patients. The IO improved in two, but both had persistence of the DVD.
- Conclusions: a profound effect and can be reversed

Anti elevation syndrome (AES)

- First coined by Kushner
- Occurs after anterior transposition of the inferior oblique muscle
- IO muscle is stimulated on supraduction preventing elevation of the eye. This antielevating force can overaction of the contralateral elevators in adduction. This mimics IOOA of the other eye.

Anti elevation syndrome

- Mims et al JAAPOS 1999 AES after B/L ATIO: incidence and prevention
- Study to AES
- 16 with AES from a group of 123 anterior transpositions. All IO muscles were 2mm anterior to the IR and spread 1-5mm laterally

Anti elevation syndrome

- Mims et al JAAPOS 1999
- Patients with anterior positioning of 2-4 mm, those with AES had significantly more spreading out of the new IO insertion.
- 9 of 14 Tx with nasal myectomy and all were successful
- 3 denervation - extirpation and 2 subsequently developed DVD.
- 2 untreated

Anti elevation syndrome

- Mims et al JAAPOS 1999
- Conclusions
- Attach posterior fibres no more than 2 mm lateral to the IR muscle insertion when undertaking anterior transposition
- If AES occurs do nasal myectomy
Inferior oblique complications and reoperations

Anti elevation syndrome
- Kushner 2001 JAPPOS
- Torsion as a contributing cause of anti-elevation syndrome
- 18 patients
- All B/L ATIO
- 8 AES
- AES had more excyclotorsion and one improved after surgery

Anti elevation syndrome
- Kushner 2001 JAPPOS
- Torsion explained to Kushner why patients with anti elevation (restriction of elevation in abduction) syndrome don’t get an A pattern.
- The extorsion alters the action of the SR

Inferior oblique adherence syndrome
- Parks 13%
- Toosi and Von Noorden didn’t see this in a 1000 cases

What This Means
- AES
- Attach posterior fibres no more than 2 mm lateral to the IR muscle insertion when undertaking anterior transposition
- If AES occurs do nasal myectomy

What This Means
- OAIO
- Re-exploration and IO myectomy near to the temporal border of the IR muscle to treat persistent IO over action (Squirrel)
- Nasal myectomy of the IO (Stager)