

# Inferior oblique complications and reoperations

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## Introduction

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

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## Topics of Discussion

- Complications
- Persistent OAIO
  - ◆ Incomplete division of posterior fibres
  - ◆ DVD and not IO O/A
- Antielevation syndrome ( after bilateral IO anteriorization)
  - ◆ Patient develops and 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

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## Topics of Discussion

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

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## 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.

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## Persistent OAIO

- 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

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### Persistent OAIO

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

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### 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

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### 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 (F/U 12/12)
  - ◆ 3 had IO myectomy
  - ◆ 5 had IO recession
- Pathology
  - ◆ 6 diplopia
  - ◆ 1 Infantile ET IOOA
  - ◆ 1 PA ET

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### 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<sup>Δ</sup>
- PP 17 to 4<sup>Δ</sup>
- Version away from 7 to 1<sup>Δ</sup>
- They suggest re-exploration and myectomy ensuring IO retracts through tenon's capsule

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### 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

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### 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

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## 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)

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## 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

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## 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.

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## 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

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## Anti elevation syndrome

- Mims et al JAPPOS 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

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## Anti elevation syndrome

- Mims et al JAPPOS 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

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## 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

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## 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

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## Inferior oblique adherence syndrome

- Parks 13%
- Toosi and Von Noorden didn't see this in a 1000 cases

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## 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)

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## 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

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