Duane Syndrome Treatment

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Duane Syndrome Treatment

- Refractive error correction
- Amblyopia treatment
- Accommodative component

- Surgery
Duane Syndrome Treatment

The surgery aims to:

- Reduce the compensatory head posture
- Reduce the angle of an esotropia (or less commonly an exotropia) in the primary position
- Eliminate any upshoots or downshoots
- Reduce the retraction of the globe
Duane Syndrome Treatment

Preoperative assessment

- Is fusion present, and if so where?
- Does the patient fix with the Duane or non-Duane eye?
- Perform cover testing (with and without a compensatory head posture) in the primary position, elevation, depression, and lateral gaze
- Examine ocular rotations
  - Degree of abduction
  - Increase of abduction in elevation or depression
  - Cocontraction of lateral rectus on attempted adduction
  - Upshoot or downshoot in adduction
  - Y-pattern
Unilateral Esotropic Duane

- Unilateral medial rectus recession
- Bilateral medial rectus recession
- Unilateral recession and resection
- Vertical rectus muscle transposition
- Superior rectus muscle transposition $\pm$ MRc
Unilateral Esotropic Duane

Unilateral MR recession

- Deviation $\leq 20^\Delta$ (primary position)
- Forced duction test (FDT) $\Rightarrow$ Contraction $\Rightarrow$ MR recession
- MR recession $\leq 6$mm
  - Iatrogenic adduction limitation
  - Diplopia
Unilateral Esotropic Duane

Bilateral MR recession
( Symmetric or asymmetric)

- Large angle esotropia
- Severe globe retraction
- Contracture of the affected MR muscle
  (create the fixation duress)

• Sachdeva V et al JAAPOS 2012
Unilateral Esotropic Duane

**Unilateral recession – resection**

- Esotropia in primary gaze at least $15^\Delta$
- Mild globe retraction in adduction ($<33\%$ narrowing)
- Clinically normal adduction
- Substantial limitation of abduction
- Minimal or no upshoot or downshoot phenomena
Unilateral Esotropic Duane

Vertical muscle transposition augmented with lateral fixation

- Cobin MH. Br J Ophthalmol 1974
- Foster RS JAAPOS 1997
Reoperations following vertical rectus muscle transposition

Residual esotropia

- Lack of abducting rector force and/or
- Excess tonus or contracture of the ipsilateral medial rectus muscle (length –tension curve)
- Large angle esotropia
- Greater restriction to abduction on intraoperative FDT

Exotropia (diplopia)

- Excess tension or restriction
- Weak ipsilateral medial rectus
- Ipsilateral lateral rectus stiffness

In cases of VRT + MRC

- Preop less esotropia or exotropia in adduction
- Unrecognized accommodative component
- Slipped MR muscle

- Morad Y et al JAAPOS 2001
- Velez FG et al JAAPOS 2012
Reoperations following VRT

**Induced vertical deviation (13-30%)**
(full tendon transposition)

- Intraoperative monitoring of torsion

• Holmes J. et al JAAPOS 2012
Superior rectus transposition (± MR Recession)

- Profound abduction limitation
- Simultaneous contraction of MR

Johnston SC et al. IOVS 2006
Unilateral Esotropic Duane

Plication augmentation of the modified Hummelsheim procedure

- Correction of very large esotropias
- Better preservation of the blood supply to the anterior segment

- Kinori M. et al. JAAPOS 2015
Unilateral Exotropic Duane

Associated with type II or III
(Tightness of the lateral rectus muscle)

• Ipsilateral lateral rectus recession (8mm) for deviation ≤ 20°
• Bilateral lateral rectus recession for deviation > 20°
Surgical treatment of globe retraction

Recession of both horizontal muscles

- Orthotropia in primary position
  ⇒ recess equally

- Esotropia in primary position
  ⇒ recess MR more

- Exotropia on primary position
  ⇒ reccees LR more only

Sprunger D. JAAPPOS 1997
Surgical treatment of upshoot and downshoot on adduction

- Y-splitting of the lateral rectus with or without recession
- Attachment of the lateral rectus muscle to lateral canthal tendon or fixation to the periosteum of the lateral orbital wall
Bilateral Duane Syndrome

Preffered surgical options

- Bilateral esotropic Duane (15%)
  ⇒ bilateral medial rectus resections

- Bilateral exotropic Duane
  ⇒ unilateral or bilateral lateral rectus recession

- Y-splitting may be necessary

- Bilateral vertical rectus transposition

Sachdeva V. et al JAAPOS 2012
Theodorou N. et al Eye 2013
“The surgical approach to patient with Duane syndrome must be individualized based on the amount of ocular deviation, abnormal head position, associated globe retraction and overshoots.”
Thank You