

Mechanical and restrictive strabismus pathophysiology and plan for management

Dr. Elsayed Eltoukhi, MD

Professor and consultant of pediatric Ophthalmology and strabismus at the Research Institut of Ophthalmology
EOS March 2019

Abstract

- Strabismus caused by mechanical and restrictive causes is very challenging , famous example are Duane Syndrome, Brown Syndrome, Monocular elevation deficiencies and orbital blowout fractures.
- Management of these cases would entail minimal procedures as recession and resection . Moderate procedures as Innervational surgeries and Complex procedures as transposition surgeries

Introduction

- Restrictive and mechanical strabismus are amenable to surgeries but beware in mind if you are going to do complex procedures it will not work (Kenneth Chang personal communications) .
- In discussing the management of these cases we are going to take examples well known to strabologist:

Pittsburg children hospital





1- Duane's retraction syndrome

Case 1

Mild eso-Duane, moderate co-contraction, moderate up-shoot and a small face turn. Treated by Recession and Recession of the Duane's horizontal recti with posterior fixation sutures to the contralateral eye. Post operatively the eyes were properly aligned and the face turn disappeared.



Pre-operative mild esotropia and mild face turn surgery was confined to the left affected eye



The eyes were properly aligned after recession of both horizontal recti of the affected left eye

Case 2

Ortho Duane , mild face turn, secondary angle of deviation on attempted fixing by the affected eye , severe up-shoot and co-contraction and exotropia on contra-lateral gaze. It's treated by Recession and Recession of the Duane's horizontal recti and Y splitting of the lateral rectus of the Duane's eye . Posterior fixation sutures to the medial rectus of the other eye were done. Excellent post operative results and the face turn disappeared.



Pre-operative recession of both horizontal recti of the right eye in addition to Y splitting of the lateral rectus of the right eye posterior fixation sutures of the medial rectus of the left eye

2- Brown's syndrome

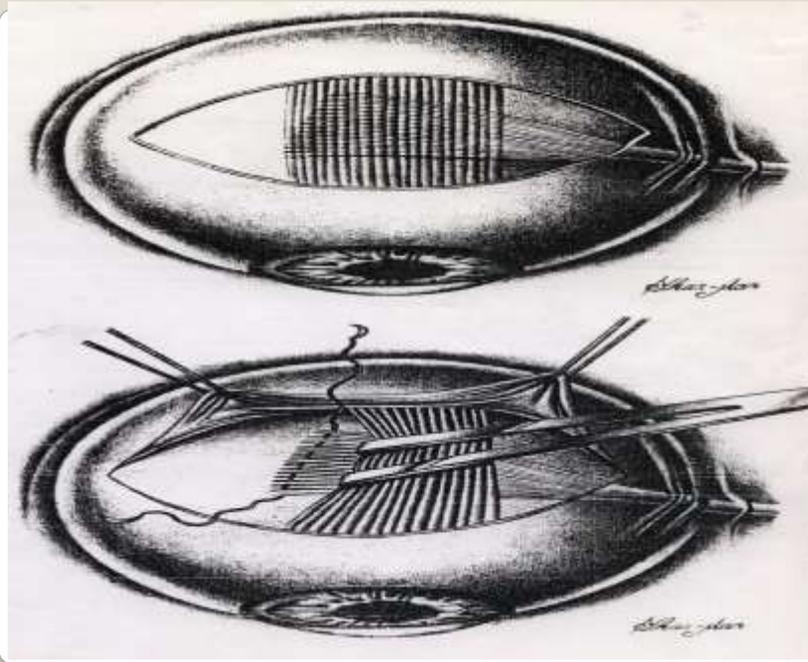
- Brown's Syndrome is a well recognized clinical disorder of ocular motility manifesting as a restriction of active and passive elevation in adduction.
- Grading of severity:
 - **Mild:** Restricted elevation in adduction no hypotropia ,or down short
 - **Moderate:** Restricted elevation and down short in adduction no hypotropia
 - **Severe:** Restricted elevation and marked down shoot there is Hypotropia

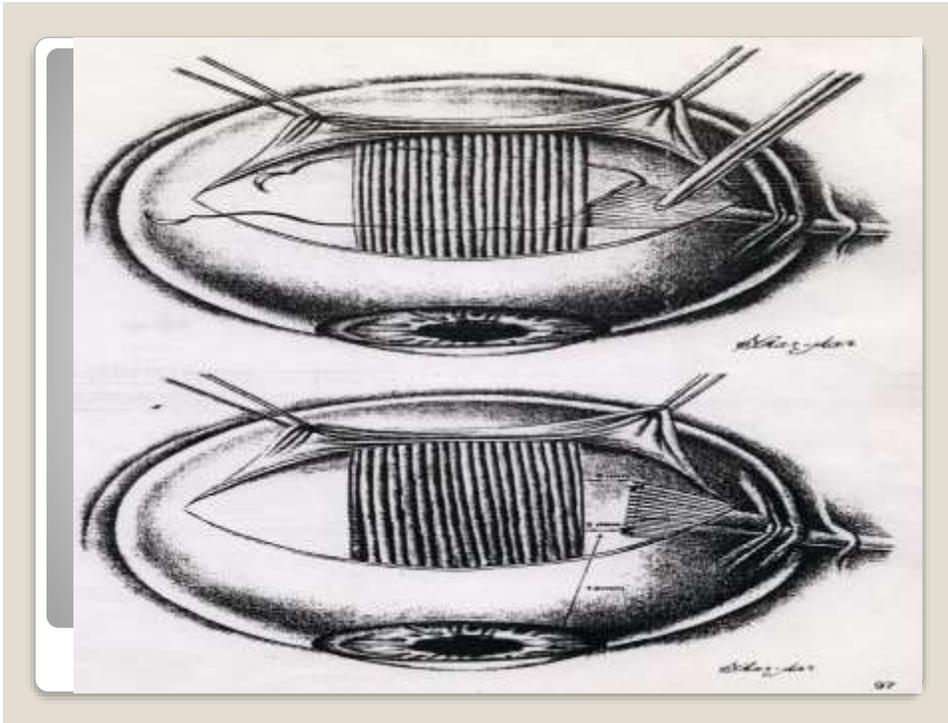




Management

- **Non Surgical**
- **Surgical:**
 - a) Tentomies
 - b) Expanders
 - c) Superior oblique ant-transposition

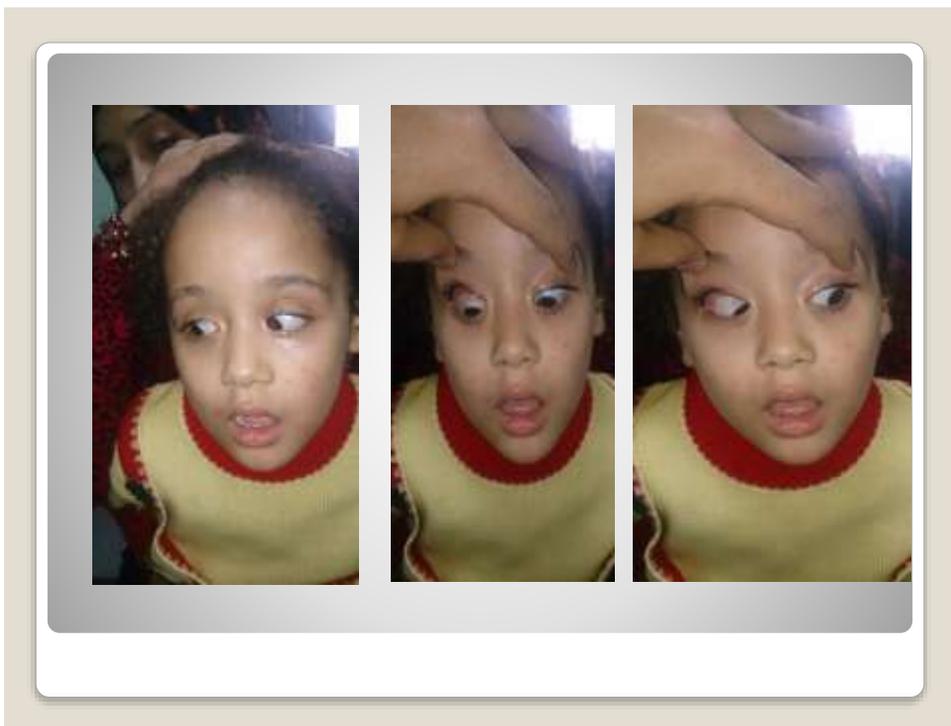




3- monocular elevation deficiency

- Innervational surgery in mild cases while severe cases can be managed by Knappe's procedures.







4- Orbital blow out fracture



- Planning surgery : 3 dimensional MRI is needed , Lancaster red and green screen, binocular field of vision . Transposition surgery offers it's best indication here while posterior fixation suture to the other eye to induce a similar mild restriction may be indicated.

Discussion

- The length and tension curves of muscles affected by restriction are not as the normal muscles , they are shifted to the left . Astut clinican as JamPolsky described clinical tests to assess the viability and elastic component of these muscles as the spring back balanced test of JamPolsky while Maurice Queré in France described the muscle elongation test which is a very important clincal test complementary to that of Jampolsky and using these two tests the clinician can be guided by the amount of mm to recess in order to achieve normal elongation.

Conclusion

- The clinician charged by treating complex strabismus cases as those due to mechanical and restrictive origin should never try to over complicate the plan of therapy the simpler it is the more favourable is the outcome.

Thank you