

Complications of Lateral Rectus Myopexy

Strabismus Society Meeting

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Spectrum of Lateral Rectus Heterotopy

- Abnormally positioned or directed lateral recti (demonstrated radiologically or intra-operatively) can cause or contribute to strabismus, including alphabet pattern strabismus.¹

Congenital LR Heterotopy	Acquired LR Heterotopy
<ul style="list-style-type: none">Isolated LR Heterotopy:<ul style="list-style-type: none">Normal orbitsNo other extraocular muscle heterotopyNot syndromic/No Craniosynostosis	<ul style="list-style-type: none">Heavy Eye syndrome:<ul style="list-style-type: none">High Myopia
<ul style="list-style-type: none">LR heterotopy with rotated orbits<ul style="list-style-type: none">+/- Heterotopy of other Extraocular musclesNot Syndromic/No Craniosynostosis	<ul style="list-style-type: none">Sagging Eye Syndrome<ul style="list-style-type: none">Disruption of LR-SR Band <p>[*Heavy Eye and Sagging Eye can co-exist in same patient]</p>
<ul style="list-style-type: none">LR Heterotopy as a feature of Syndromic features/Craniosynostosis/Plagiocephaly (or from it's corrective surgery eg: Frontal Orbital Advancement)	<ul style="list-style-type: none">Iatrogenic with inferior or superior transposition of lateral recti during strabismus surgery

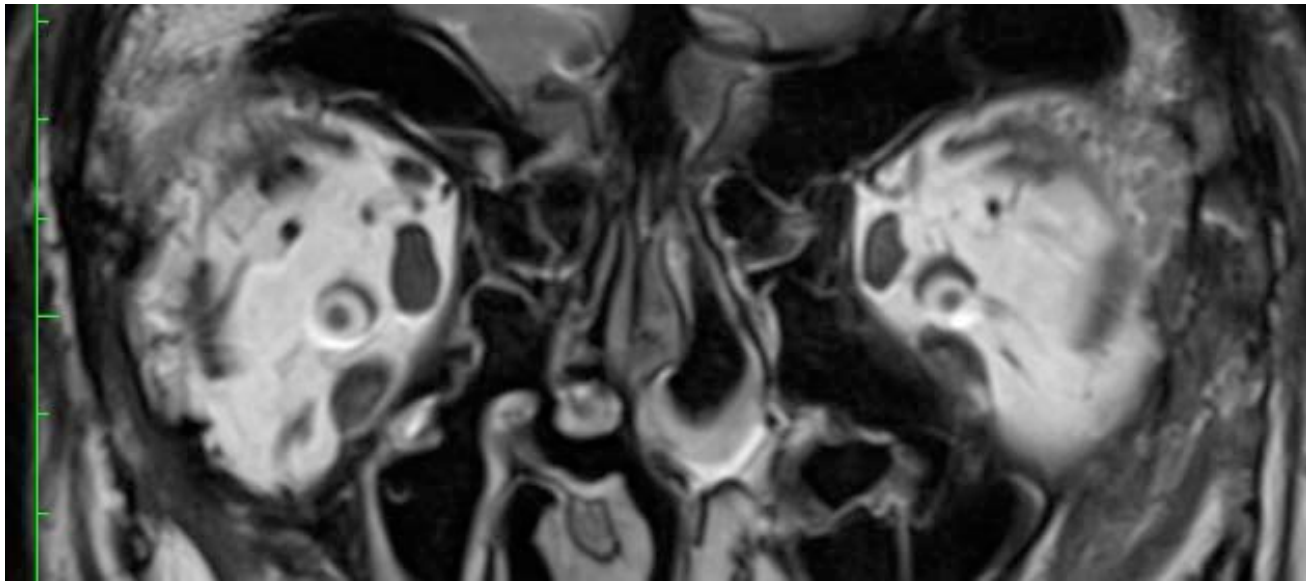
¹ Demer JL, Clark RA, Kono R, Wright W, Velez F, Rosenbaum AL. A 12-year, prospective study of extraocular muscle imaging in complex strabismus. J AAPOS 2002; 6(6): 337–347.

² Tan KP, Sargent MA, Poskitt KJ, Lyons CJ. Ocular overelevation in adduction in craniosynostosis: is it the result of excyclorotation of the extraocular muscles? J AAPOS 2005; 9(6): 550–557.

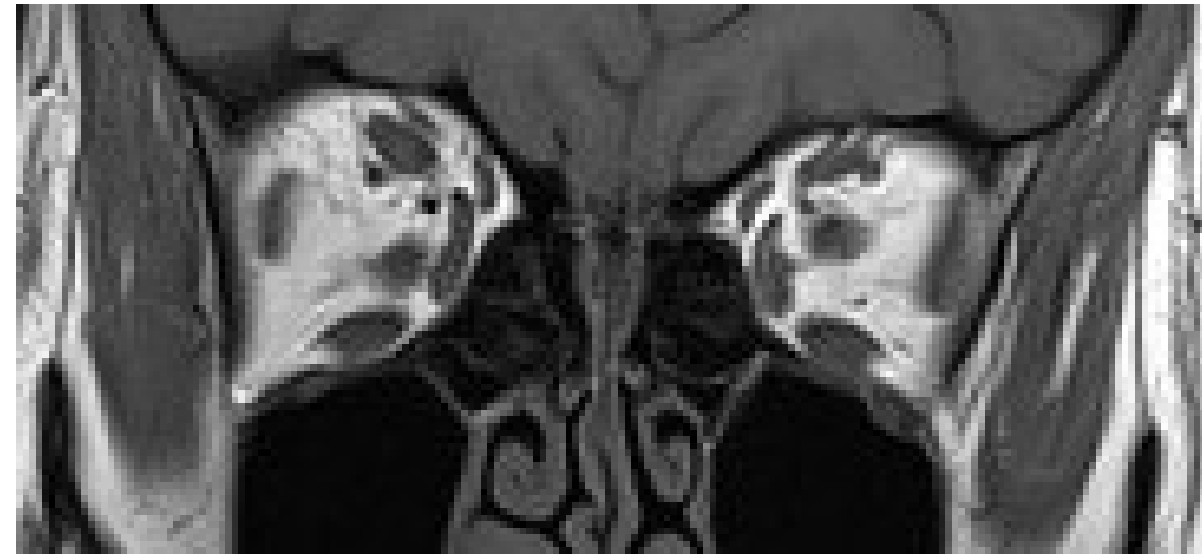
³ Chaudhuri Z, Demer JL. Sagging eye syndrome: Connective tissue involution as a cause of horizontal and vertical strabismus in older patients. JAMA Ophthalmology 2013;131(5): 619–625.

⁴ Tan RJ, Demer, JL. Heavy eye syndrome versus sagging eye syndrome in high myopia. J AAPOS 2015; 19(6): 500–506

Example S



Exocyclorotated Orbits

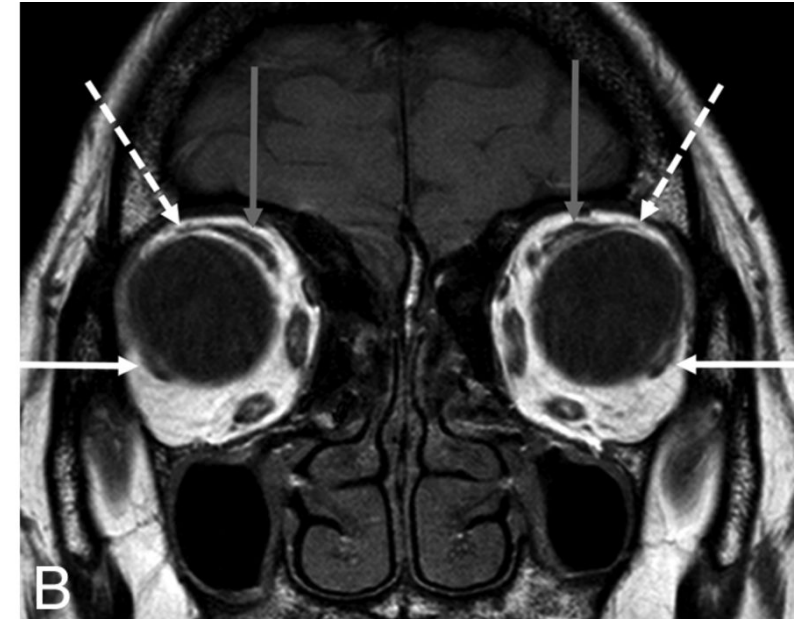
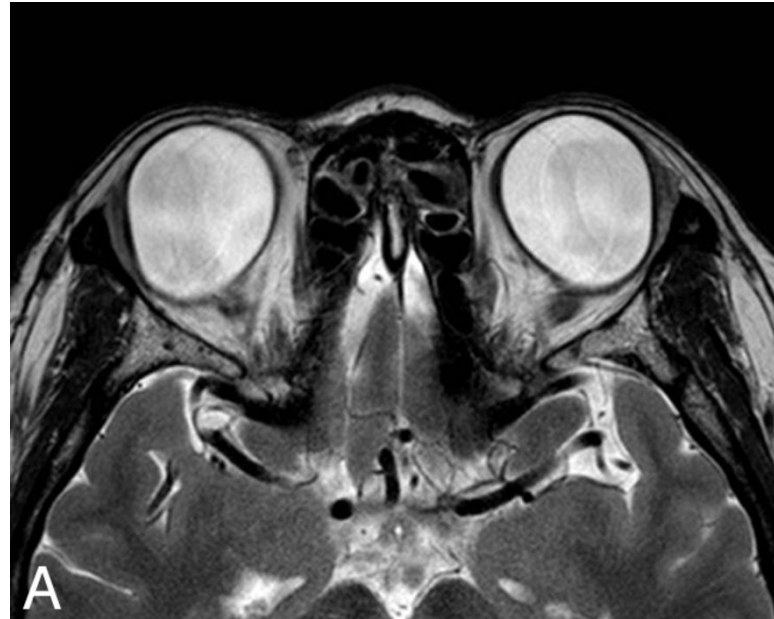


Incyclorotated Right Orbit

Examples



Sagging Eye Syndrome



Heavy Eye Syndrome

Surgical correction of an inferiorly displaced lateral rectus with equatorial myopexy

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Complications associated with equatorial myopexy of the lateral rectus

2 cases

Case 1

- 9 year old girl
- Best corrected visual acuity: 6/9 OU
- Refraction: OD -3.00 x 180 and OS +0.50/-1.50 x 165

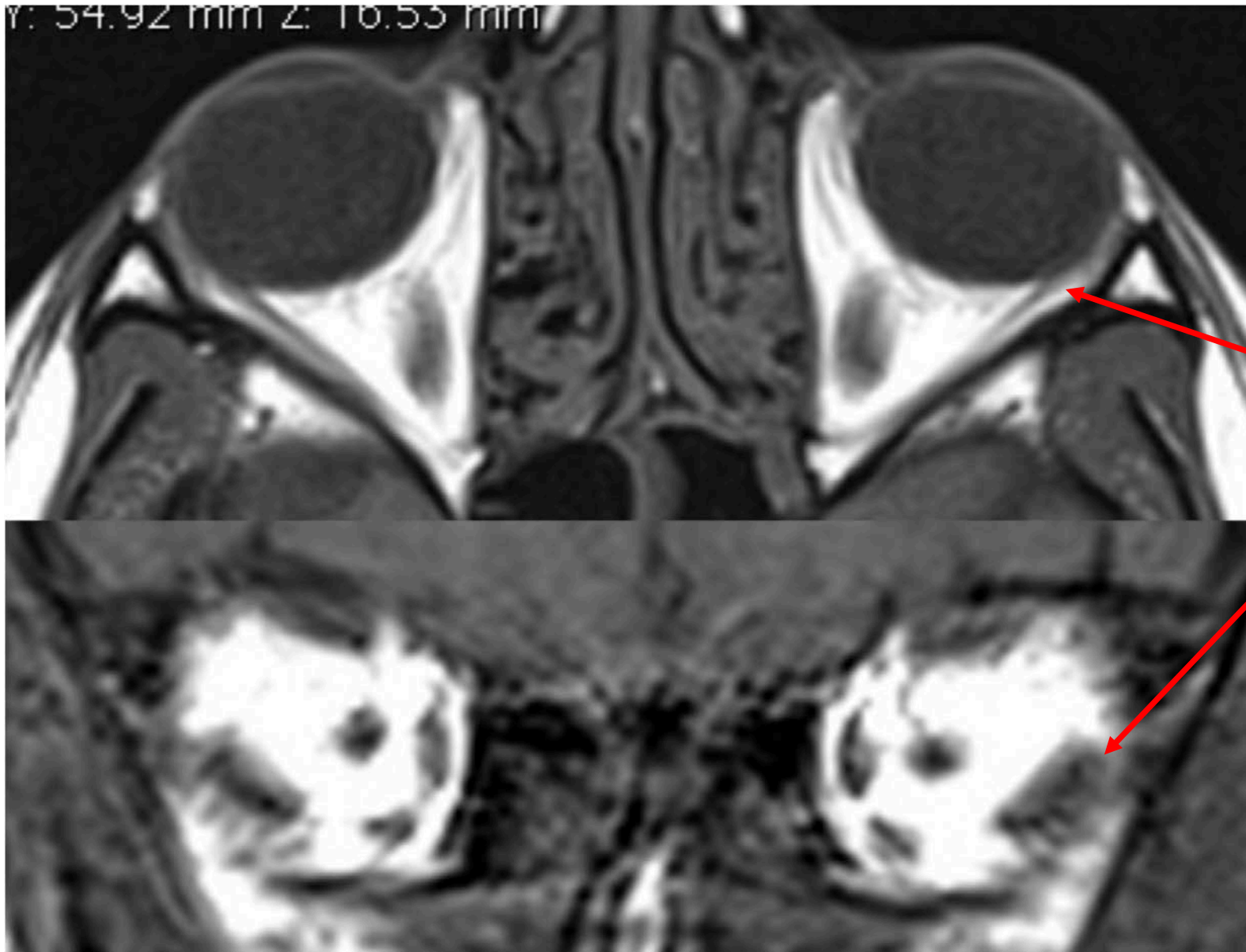
Past history:

- V-pattern exotropia operated elsewhere at age 7.
 - 5 mm bilateral lateral rectus recessions
 - bilateral inferior oblique recessions

Presenting Complaints:

- Persistent V-pattern exotropia.
 - Distance exotropia: 25Δ
 - Near exotropia: 30Δ
 - V-pattern of 18Δ

Case 1: MRI



LR Inferiorly displaced OU with
Nasal displacement of IR

Case 1: Surgery

- **Intra-operative findings:**

- Lateral recti were found recessed 13.5 mm from the limbus
- Infero-temporally directed posterior muscle path.

- **Surgery done:**

- Equatorial myopexy was performed on both lateral recti
 - Superior one-fourth of each lateral rectus was hitched to the sclera 5 mm superiorly with 6-0 Mersilene, 5 mm behind the new (recessed) insertion.
- Both medial recti were resected 5.5 mm with 6-0 Vicryl.

Case 1: Post-op

At 2 weeks:

- 2Δ exotropia for distance
- Developed **new** Right Hypertropia of 5Δ , diplopia, and limitation of depression of her right eye.

Re-surgery done at 4 weeks for diplopia:

- Left LR myopexy suture had come undone; Right one was preserved.
- FDT: Resistance to depression of the Right eye.
- The right myopexy suture was also removed; FDT: No further resistance to depression

Case 1: Post-op

At Final follow-up:

- Distance: 8Δ exotropia
- Near: 12Δ exotropia
- No diplopia

Case 1 conclusion

- Equatorial myopexy done for infero-temporally directed lateral rectus muscle paths in a patient in whom the lateral rectus has already been recessed **can cause induced vertical strabismus if one of the sutures comes undone.**
- It can also cause **limitation of depression of the eye** with resistance to forced duction.
- It may be anticipated that unilateral or asymmetrical equatorial myopexy can be expected to sometimes cause these problems, though we are not aware of any such reports

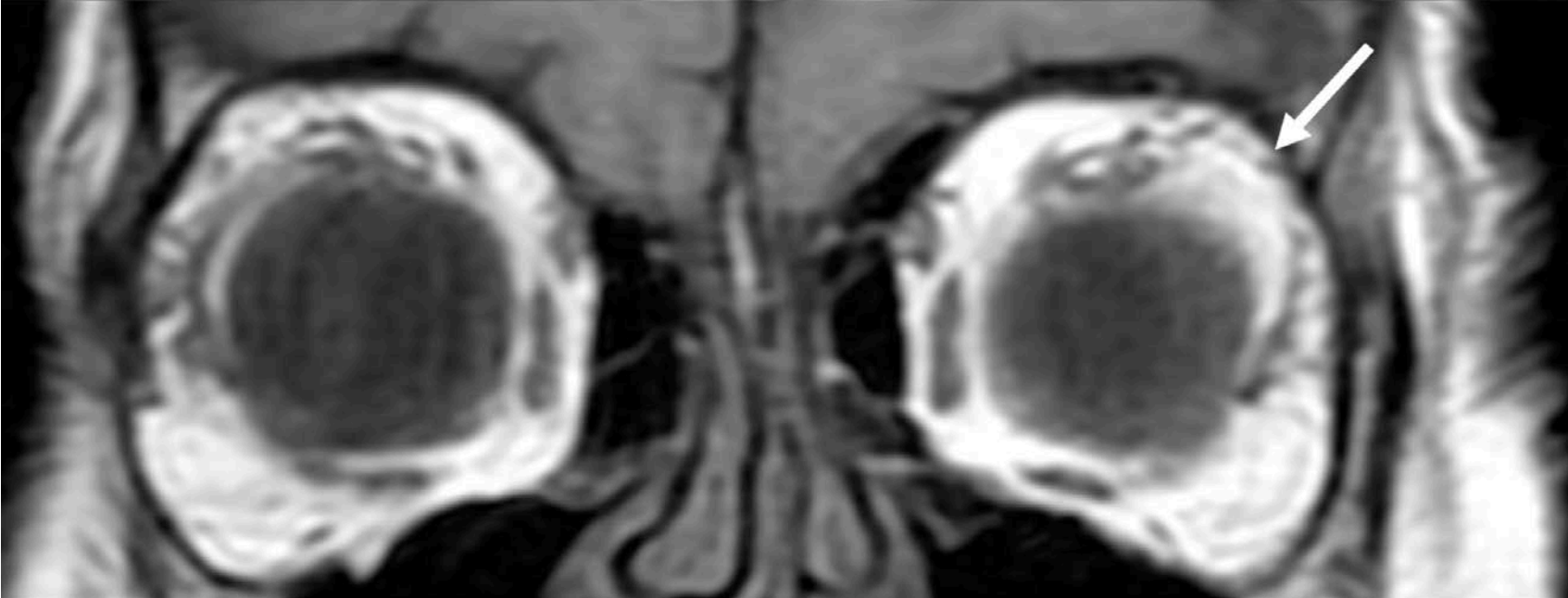
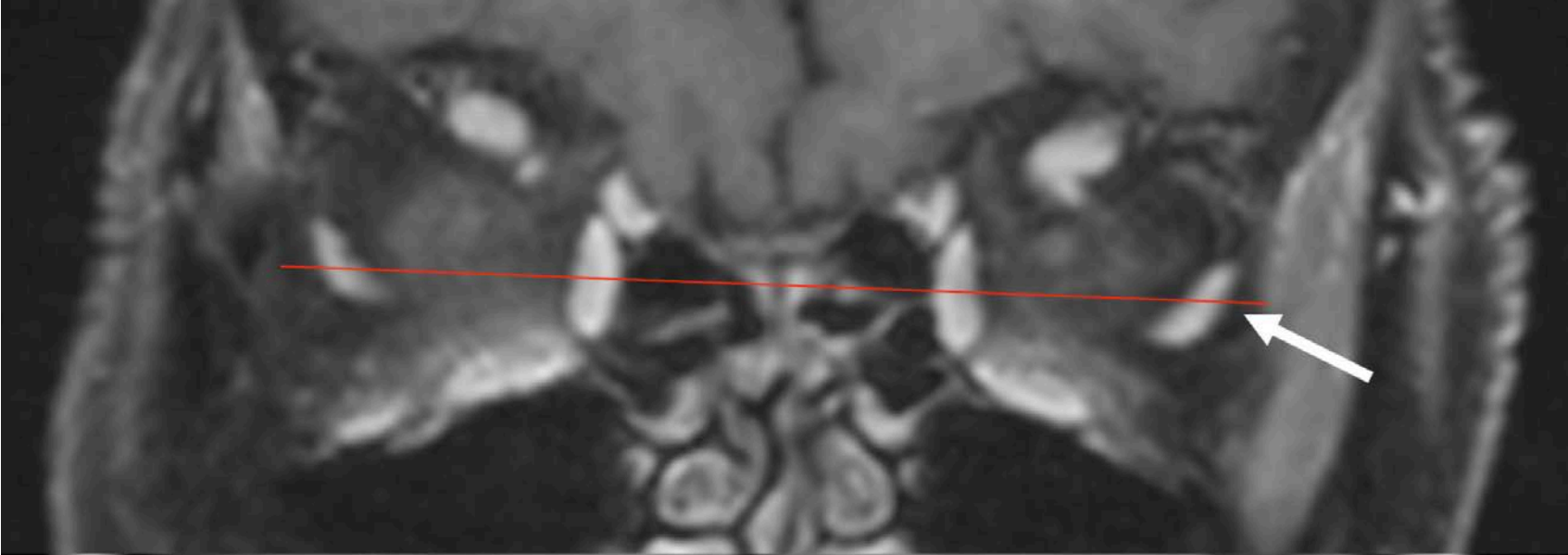
Case 2

- 71 year old lady

Presenting complaints and examination findings:

- Diplopia
- Acquired left esotropia
 - Distance: 14Δ
 - Near: orthotropia

Case 2 - MRI



Left Eye Sagging LR with
Disruption of LR-SR Band

Case 2: Surgery

Surgery done:

- Equatorial myopexy of the left LR
 - 6-0 Mersilene, 8 mm behind the insertion, to a meridian at the level of the upper pole of the lateral rectus insertion.
- 3 mm left medial rectus recession with adjustable sutures

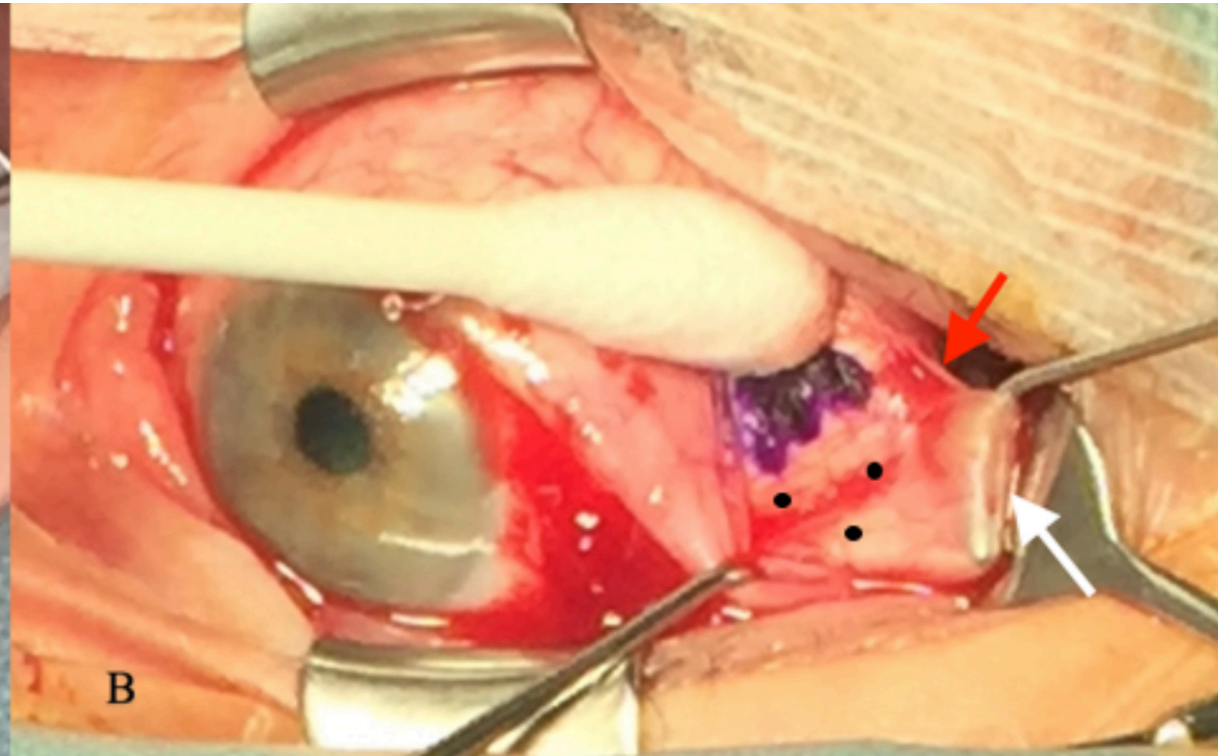
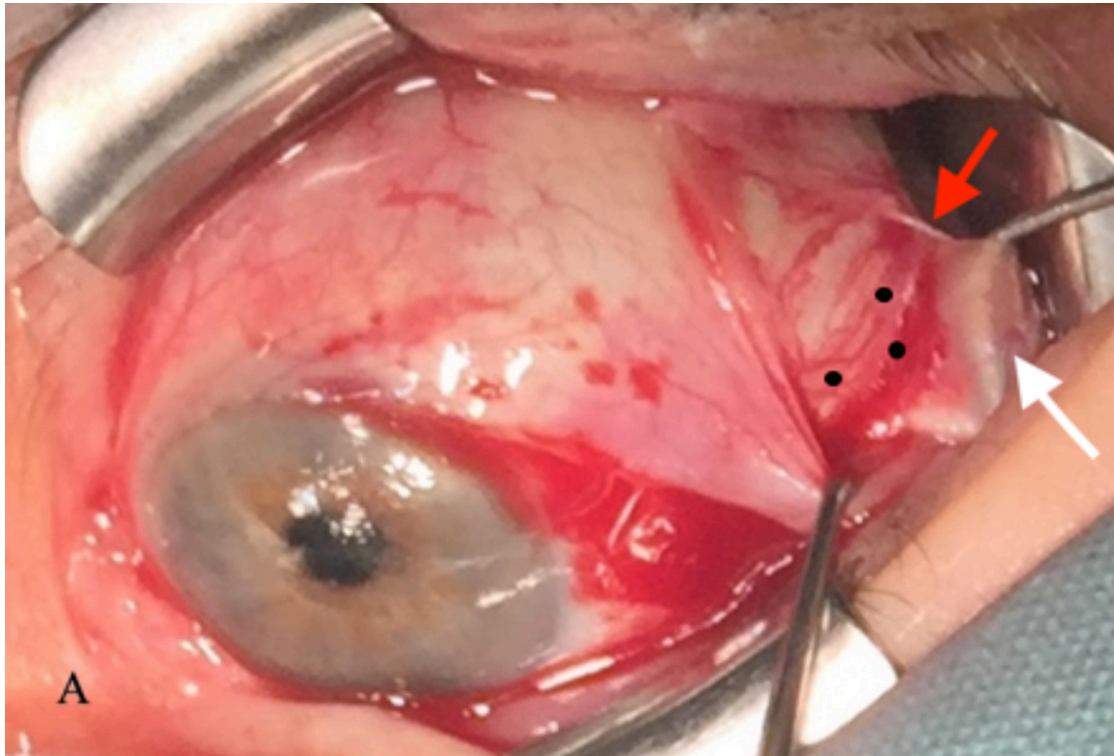
Post –Op 3 months:

- Developed a recurrent distance-only esotropia: 16 Δ
 - Persistent uncrossed diplopia.
 - She also had 0.75D of induced astigmatism post-operatively that eventually resolved.

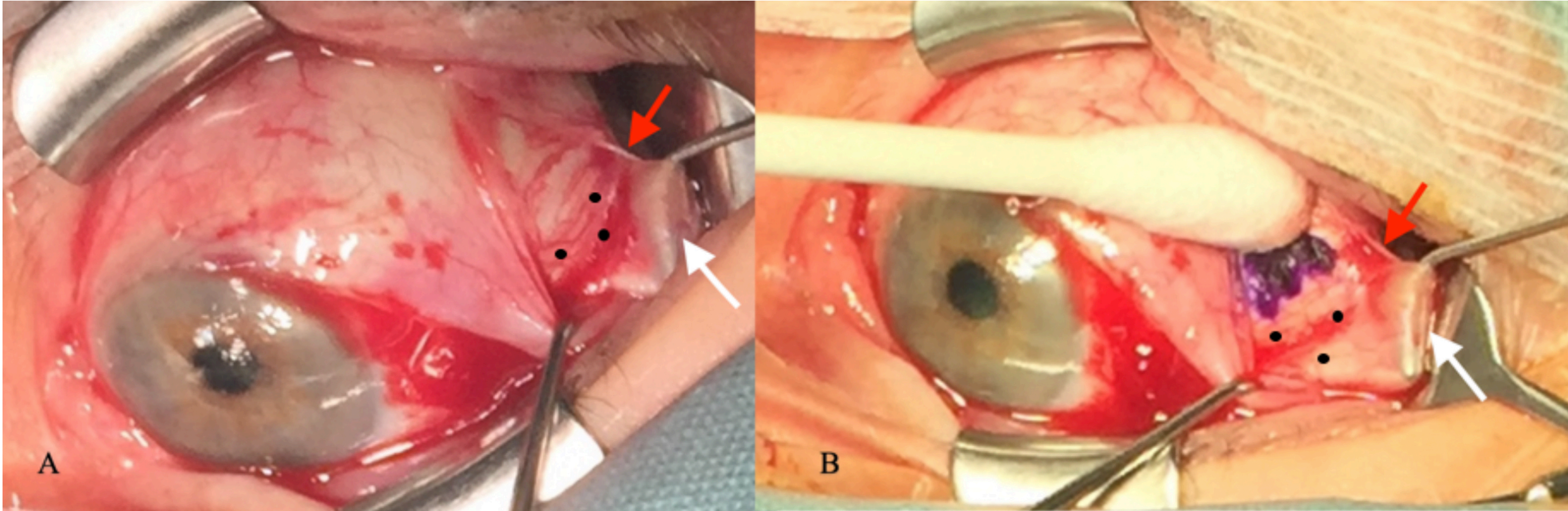
Case 2: Re- Surgery

Intra-operative findings:

- The lateral rectus muscle fibres posterior to the myopexy had been pulled up to the myopexy as expected. Sloping antero-inferiorly from the myopexy to the insertion was thinned muscle and tendon tightly 'glued' to the sclera.



Case 2: Re- Surgery



- Red Arrow: Myopexy Suture
- White Arrow: Healthy Muscle Fibres posterior to Myopexy Suture
- Black Dots: Thinned, Abnormal Glued muscle anterior to the myopexy suture

Case 2: Re- Surgery

Surgery done:

- Left MR muscle was re-recessed 3 mm on an adjustable, and this improved her esotropia.

Post-op followup:

- At 1 month: Orthotropic with no diplopia.
- At 3 months:
 - Primary position ET: 6Δ
 - Left Gaze ET 18Δ ,
 - Right Gaze: XT 8Δ

Case 2 conclusion

- Myopexy can alter the integrity of the muscle and tendon anterior to it causing it to be irreversibly 'glued' to the sclera, interfering with its action by producing an unplanned effective recession of the muscle to the point of the myopexy.
- This change in muscle anterior to the suture has been described previously in Faden.

1. Alio JL, Chacon M, Faci A, et al. Muscular structural changes following faden operation. J POS 1984; 21(3): 102–109.

2. Prieto-Díaz J, Souza Dias C. Strabismus. 4th ed: Butterworth-Heinemann; 2000: page 476

Thank
You