RANZCO 2016 Strabismus for the General Ophthalmologist

Lionel Kowal
RVEEH

Managing [apparent] 6th n palsy in the elderly

Lionel Kowal RVEEH

IF IT'S IN RED, THIS WOULD NOT BE IN A TALK GIVEN 10 YEARS AGO

חננו מאתך דעה בינה והשכל

[Apparent] 6th n palsy in the elderly

20th century conditions

- Real 6th n palsy – expect little/ no recovery

Worry about Tumour, but usually Vascular

- 6th n paresis – expect significant recovery

Worry about Tumour, but usually Vascular

21st century conditions [21st CC]

- **Lateral rectus heterotopy/sag = SAGGING EYE SYNDROME [sorry for the name]**
- **Superior compartment palsy / paresis**

Simulating conditions

- Occult Graves': usu euthyroid, abnormal radiology, abnormal antibodies
- **Vergence insufficiency:**

DI- vergence & CON- vergence insufficiency: think Parkinson's, PSP

IF IT'S IN RED, THIS WOULD NOT BE IN A TALK GIVEN 10 YEARS AGO

What's important

- **1. Good history**

'When all else fails, take a history'

1st/recurrent episode[s], associations, progressive, abn head posture,

- 2. Good exam
- 3. Good radiology
- 4. The right diagnosis
- 5. The right treatment

What's important

- 1. Good history
- **2. Good exam**

Is it just a 6th and nothing else?

Horner's? Gaze palsy? Ipsilateral deafness?

Is it a palsy or a paresis? Forceps testing

- 3. Good radiology
- 4. The right diagnosis
- 5. The right treatment

Good exam

Is it a partial / total 6th? Paresis/palsy?

It's important to know:

Treatment paradigms are different

Definitive diagnosis of palsy:

- **1. Atrophic 'shoelace' on axial scan**
- **2. No force generated with forceps testing**
- 3. Really slow saccade

Findings that don't help:

1. ABduction restricted to primary position is not a reliable way to diagnosis 6th palsy: this can be due to tight medial rectus from any cause [inc chronic 6th paresis]
2. Size of ET
3. Dist > Near: diagnostically helpful for small - medium angles

Total palsy **can** have moderate aBduction

Diplopia 10+ yrs

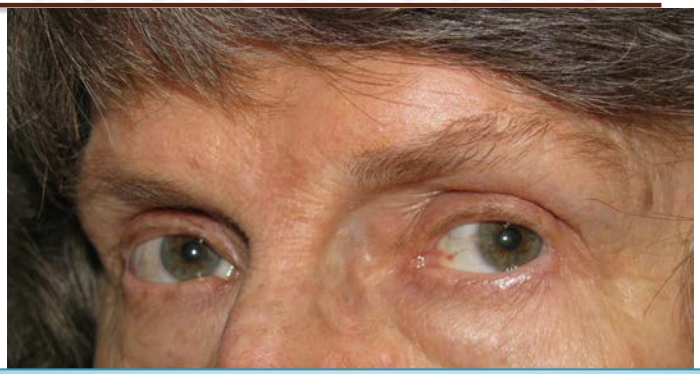
R 6th. No definite cause

? Old head injury

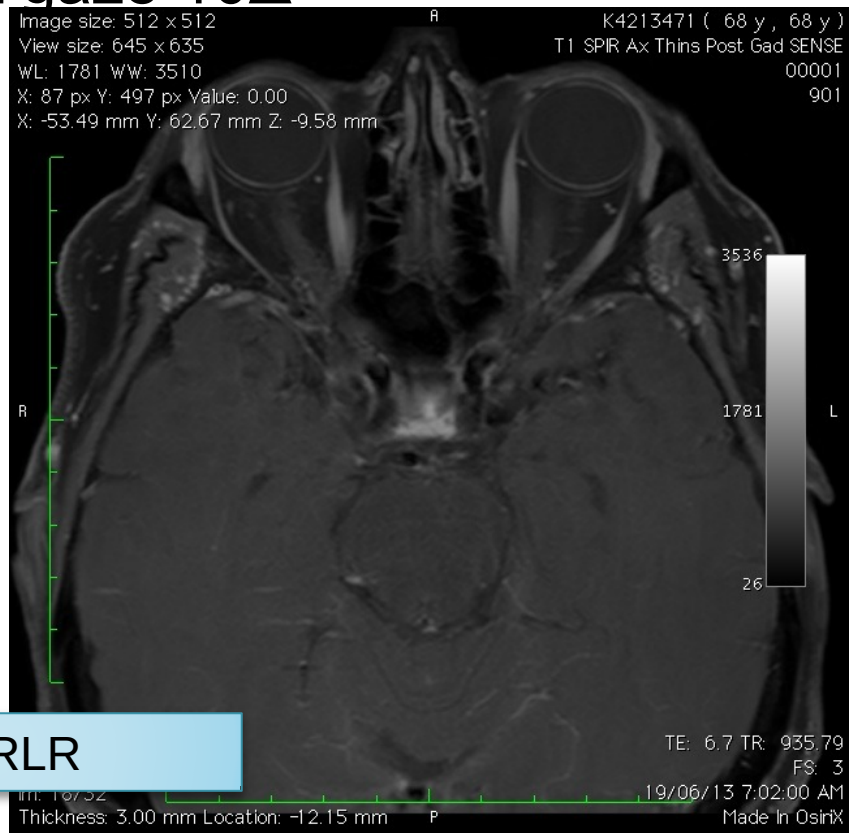
R gaze 45Δ ET,

Primary 30Δ [R fixation 45Δ] .

L gaze 10Δ



Abduction deficit (only) 2.5mm
Very slow RLR saccade
Force Generation test: Dead RLR



Shoe lace RLR

What's important

- 1. Good history
- 2. Good exam
- **3. Good radiology: when / how/ who?**

Unfortunately problematic…

- 4. The right diagnosis
- 5. The right treatment

Good radiology : When?

EBM: **Evidence** based medicine

EBM: **Eminence** based medicine

ABM: **Anecdote** based medicine

- EBM: **Isolated** 6th in the elderly likely to be microvascular. Don't need to image unless getting worse or not getting better in 6 weeks / 12 weeks…

- **ABM**:

I have seen too many 'presumed microvascular' 6ths that I would not have imaged, that were imaged by the referring Dr and showed significant pathology [usu tumour].

I now image all @ first presentation

Good radiology: who?

BIG problem

- **Few radiologists are aware of the 21st century conditions – you have to get to know who is good locally, educate them and directly refer**
- MRI reports by those without neuroradiology training can be wrong [selection bias]
- MRI radiographers sometimes don't image orbits for ***? Diplopia*** !

You have to specifically ask for BRAIN & ORBIT scans *… & in one hospital*

ORBITS inc anterior orbits [!!]

21st CC: Sagging Eye Syndrome SES

Lateral rectus sag: looks like small angle LLR paresis

+/- small hypo

Normal LR-SR band

Disrupted LR-SR band

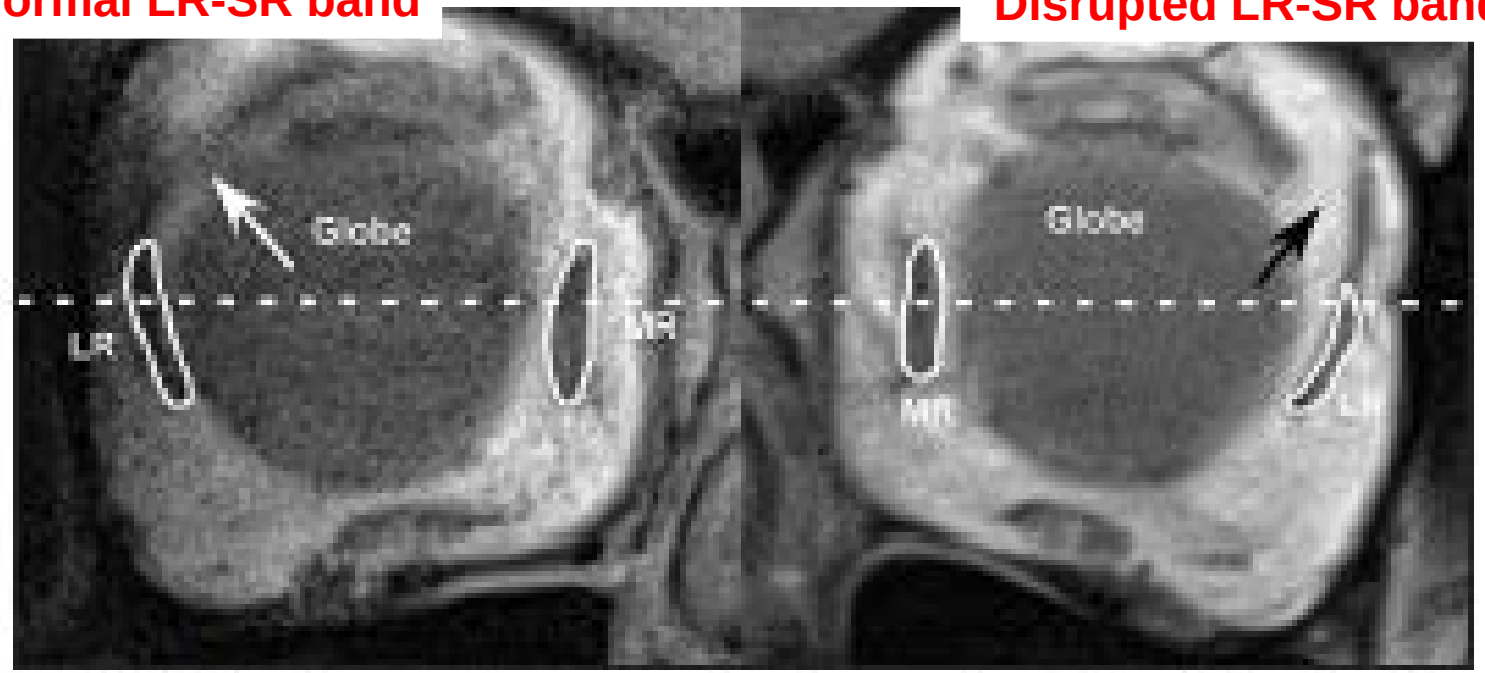


Figure 3: Coronal magnetic resonance imaging near the equator of the globe in an elderly patient with age-related divergence insufficiency esotropia shows an intact lateral rectus-superior rectus band in the right orbit (white arrow) with a normal lateral rectus pulley position and a dehisced lateral rectus-superior rectus band in the left orbit (black arrow) with an inferiorly displaced lateral rectus pulley. MR =

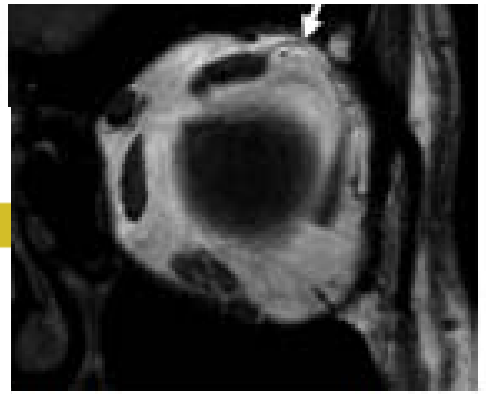
Only neuro-radiology report on LR sag AJNR 2014

Published April 24, 2014 as 10.3174/ajnr.A3943

ORIGINAL RESEARCH
HEAD & NECK

Imaging Appearance of the Lateral Rectus–Superior Rectus Band in 100 Consecutive Patients without Strabismus

S.H. Patel, M.E. Cunnane, A.F. Juliano, M.G. Vangel, M.A. Kazlas, and G. Moonis



SR band bowing in a 54-year-old woman. Coronal TI-

ABSTRACT

BACKGROUND AND PURPOSE: The lateral rectus–superior rectus band is an orbital connective tissue structure that has been implicated in a form of strabismus termed sagging eye syndrome. Our purpose was to define the normal MR imaging and CT appearance of this band in patients without strabismus.

MATERIALS AND METHODS: Orbital MR imaging and CT examinations in 100 consecutive patients without strabismus were evaluated. Readers graded the visibility of the lateral rectus–superior rectus band on coronal T1WI, coronal STIR, and coronal CT images. Readers determined whether the band demonstrated superotemporal bowing or any discontinuities and whether a distinct lateral levator aponeurosis was seen. Reader agreement was assessed by κ coefficients. Association between imaging metrics and patient age/sex was calculated by using the Fisher exact test.

RESULTS: The lateral rectus–superior rectus band was visible in 95% of coronal T1WI, 68% of coronal STIR sequences, and 70% of coronal CT scans. Ninety-five percent of these bands were seen as a continuous, arc-like structure extending from the superior rectus/levator palpebrae muscle complex to the lateral rectus muscle; 24% demonstrated superotemporal bowing; and in 82% of orbits, a distinct lateral levator aponeurosis was visible. Increasing patient age was negatively associated with lateral rectus–superior rectus band visibility ($P = .03$), positively associated with lateral rectus–superior rectus band superotemporal bowing ($P = .03$), and positively associated with lateral levator aponeurosis visibility ($P = .01$).

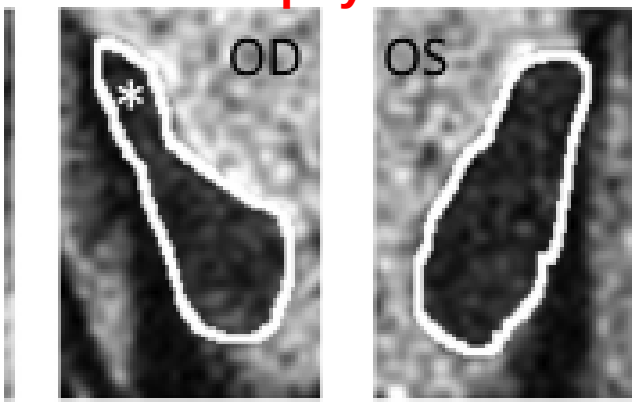
CONCLUSIONS: The lateral rectus–superior rectus band is visible in most patients without strabismus on coronal T1WI. The age effect with respect to its visibility and superotemporal bowing could represent age-related connective tissue degeneration.

ABBREVIATIONS: LR-SR band = lateral rectus–superior rectus band

Lateral Rectus Superior Compartment Palsy

ROBERT A. CLARK AND JOSEPH L. DEMER

Sup compartment
RLR atrophy

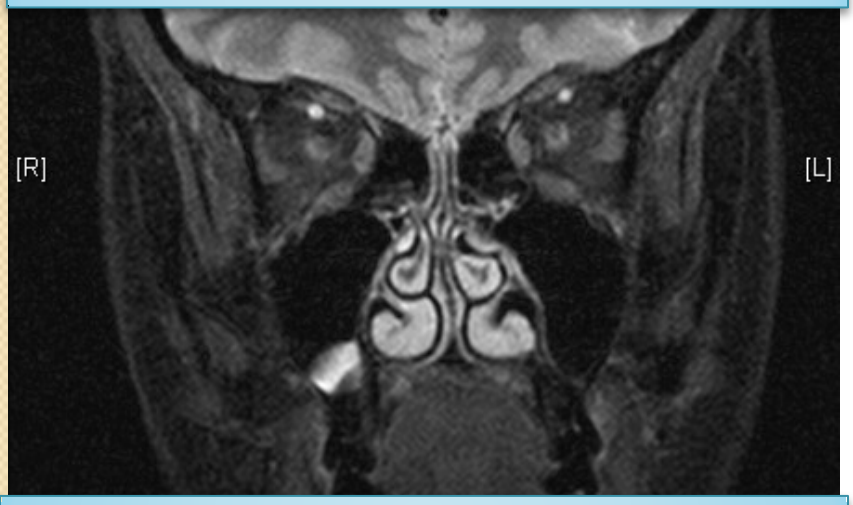


Upper/ lower halves of horizontal recti have separate innervation

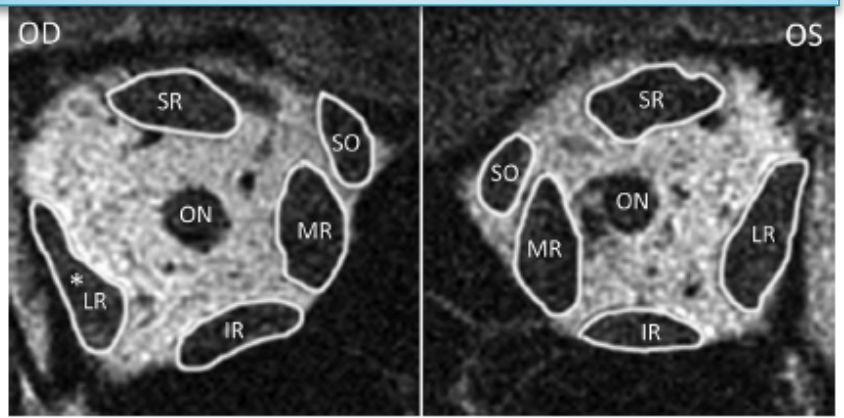
American Jnl Ophthalmol 2014

Superior compartment LR paresis

2012 MRI re-read.
RLR has a triangular appearance



Clark & Demer Lateral Rectus Sup compartment palsy..
Amer J Ophth 2014; 157: Fig 2 on page 481



9 years after first presentation and 3 years after the last MRI and the 3rd horizontal rectus surgery, the diagnosis is clearer

Apparent 6th in a myope

SES Sagging Eye Syndrome
HES Heavy Eye Syndrome
SMS So Many Syndromes
TMS Too Many Syndromes

SES more common in myopes & the elderly

SES can be confused with Heavy Eye Syndrome [ET with hypo]

Need good radiology

Look up:

Heavy Eye Syndrome versus Sagging Eye Syndrome

Tan & Demer JAAPOS 2015

What’s important

- 1. Good history
- 2. Good exam
- 3. Good radiology
- **4. The right diagnosis**
- 5. The right treatment

The right diagnosis

Apparent 6th n in the elderly

- 6th n paresis
- 6th n palsy
- 6th n paresis/ palsy.

If no obvious cause = no obvious cause
YET: *Keep looking for a cause* unless you have 100% recovery

- Recurrent 6th n paresis/ palsy.

Keep looking for a cause

- Sup compartment LR paresis
- Sagging LR / Sagging Eye Syndrome
- High myope: Sagging Eye, Heavy Eye
- Occult Graves'

What’s important

- 1. Good history
- 2. Good exam
- 3. Good radiology
- 4. The right diagnosis
- **5. The right treatment**

The treatment repertoire for paresis

- Prisms
- Botox BT
- Ipsilateral MR Rc / LR Rs [or plicate]
- Contralateral MR Rc with ipsilateral surgery [1 or 2 muscles]

The treatment repertoire for palsy

Transposition surgery

1. MR Rc & partial SR-IR transposition [Hummelsheim]
2. MR Rc & Nishida transposition
3. MR Botox & complete SR-IR transposition
4. +/- contralateral MR Rc or Faden
5. ***MR Rc & SR-only transposition***

MR Rc & SR-only transposition

Patil-Chhablani P, Kothamasu Vr K, Kekunnaya R, Sachdeva V, Warkad V.

Augmented superior rectus transposition with medial rectus recession in patients with abducens nerve palsy.

J AAPOS. Oct 2016

- *15 eyes of 13 pats….**trauma in 10 patients***
- *preop ET 55.4Δ ± 24Δ, postop 10Δ ±10Δ (P = 0.0000).*
- *9 patients (69%) success; 2 failures.*
- *1 patient each developed transient postop hypo and intorsion*

CONCLUSIONS: *Augmented SRT with MRc is effective for [LK: traumatic] 6th nerve palsy …*

SRT ± MR recess in 6ths

An interesting technique with some good results looking for a reliable niche to work

- There are not just 2 types of 6ths [paresis, palsy] – there is **a continuum of innervational & mechanical imbalance**, and so many subtypes of 6ths that we do not know how to classify
- **We need to sort out which procedure for which particular point on the continuum...**& that's when SRT will find its place
- So many variables….what's the best treatment for each subtype?

% recovery LR function	**MR tightness /5**	**Atrophy of Sup / Inf compartment**	**ABduction deficit mm**
75	**3**	**None**	**5**
50	3	superior	2
25	4	Both	4
5	4	Both	4+

Treatment for LR sag / heterotopy

- Prisms
- MR Rc/ LR Rs [or plicate] ipsilateral
- BMR : big doses
- Shuan Dai: unilateral LR resect ~4mm

Transposition surgery: superior myopexy LR

Clark TY, Clark RA

J AAPOS. 2016 Oct;20(5):446.

Surgical correction of an inferiorly displaced lateral rectus with equatorial myopexy.

- Thank you
- Good luck with your patients