

When radiology of the orbits does and doesn't help in the evaluation of horizontal strabismus

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Purpose

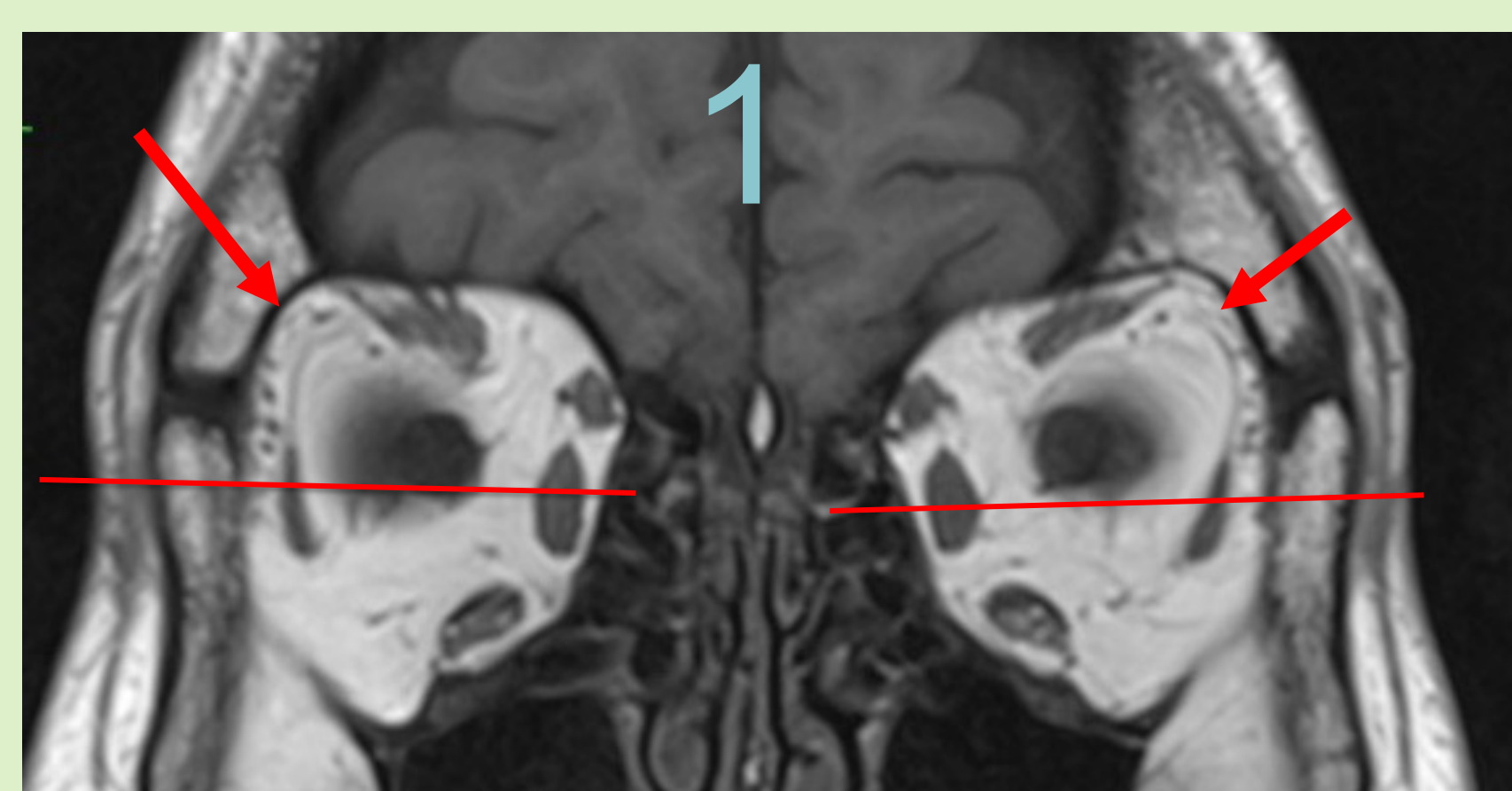
To describe conditions when radiology of the orbits is useful in evaluation of horizontal strabismus, and when it is unlikely to be of help.

Methods

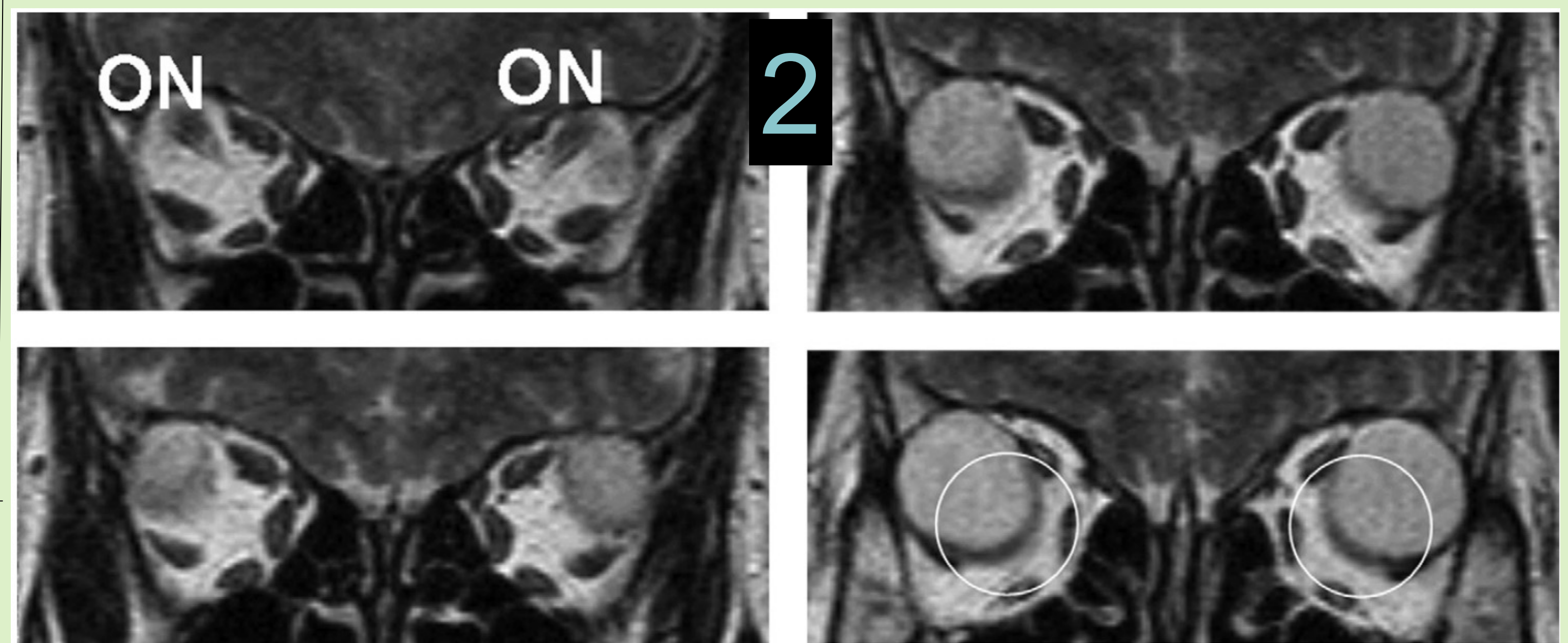
Literature was reviewed, in addition to the authors' clinical experience, for radiological changes described in imaging of orbits of patients with horizontal strabismus, where radiology co-related with the clinical findings or helped in diagnosis and management. Some illustrative cases are shown below.

Results

Orbital magnetic resonance imaging (MRI) can detect changes in shape, volume and position of extraocular muscles and/or their pulleys in patients with sixth nerve paresis, sixth nerve palsy (Case 3), superior compartment lateral rectus palsy (Case 5), sagging eye syndrome (Case 1), heavy eye syndrome (Case 2), thyroid eye disease [especially unsuspected thyroid eye disease], orbital fracture with entrapment of medial rectus and isolated extraocular muscle palsies (Case 4). No reports for clinical-radiological correlation was found for radiology of the orbits in patients with concomitant horizontal strabismus, Duane's syndrome or stretched scars following strabismus surgery. 5



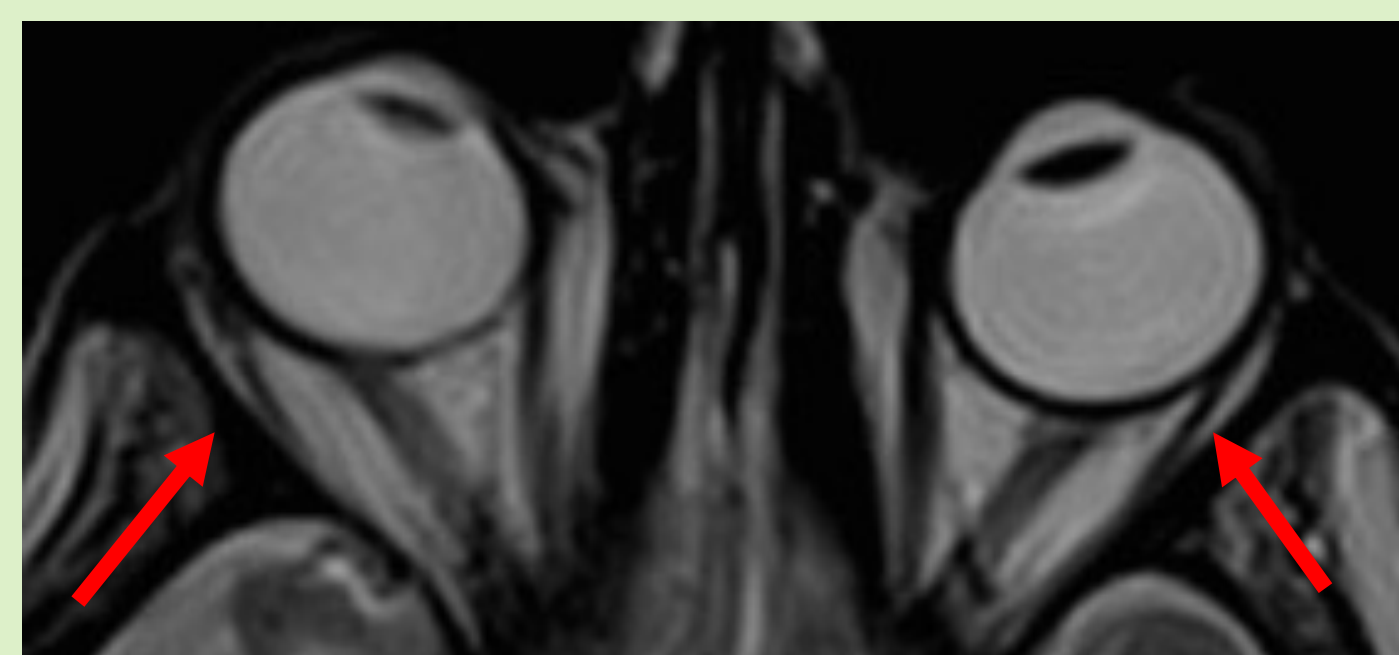
Sagging Eye Syndrome [SES] may be the commonest cause of small- moderate angle horizontal [+/- vertical] acquired diplopia in the healthy elderly. Coronal MRI shows that the LR's are lower than the MR's (red lines), due to dehiscence of the LR-SR band OU (red arrows)



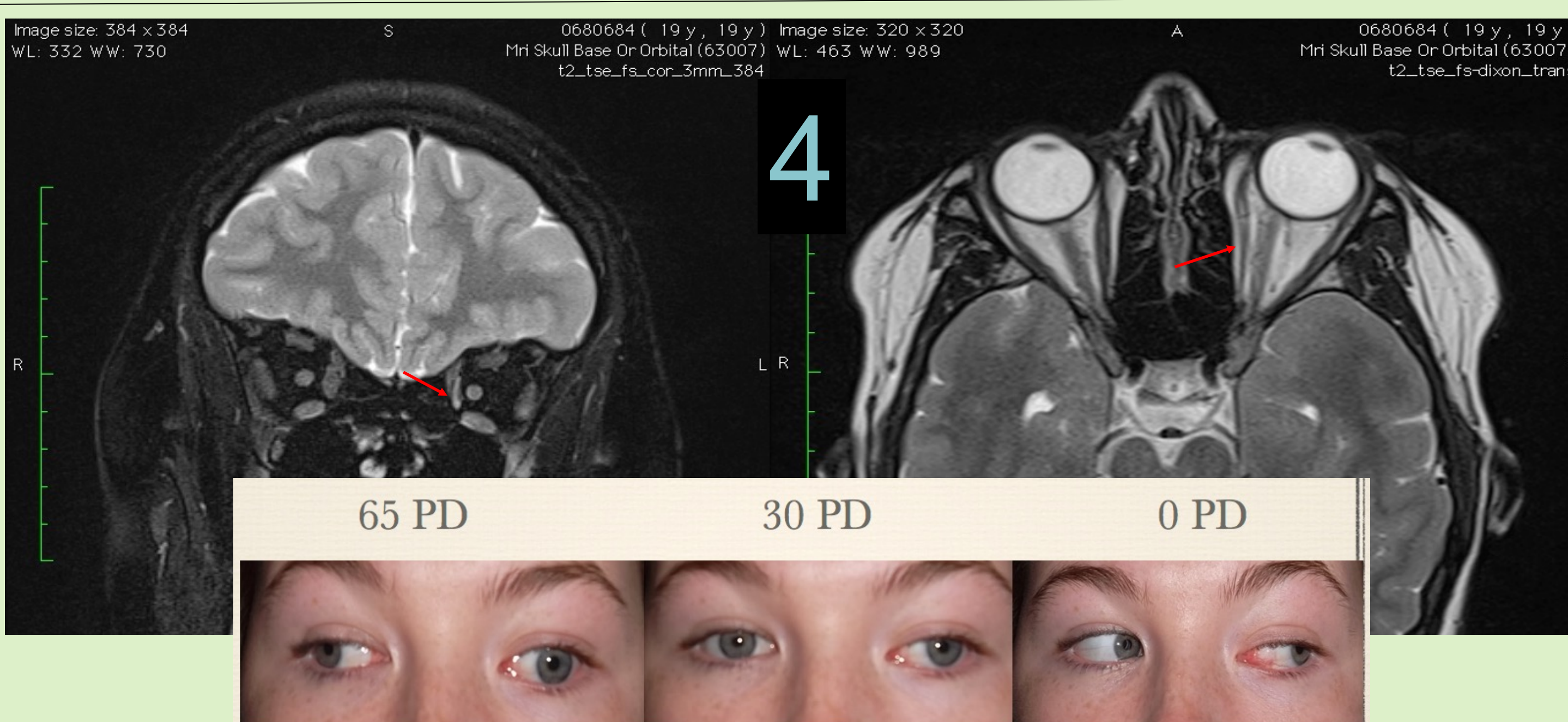
Coronal MRI scans of the orbit in a patient with bilateral highly myopic strabismus in both eyes.

(Top left) The junction of the optic nerve (ON) and the globe is seen in this slice. **(Bottom right)** Circles indicate cross-sections of the muscle cones. The globe is herniated superolaterally between the Superior Rectus and Lateral Rectus muscles – **Heavy Eye Syndrome**

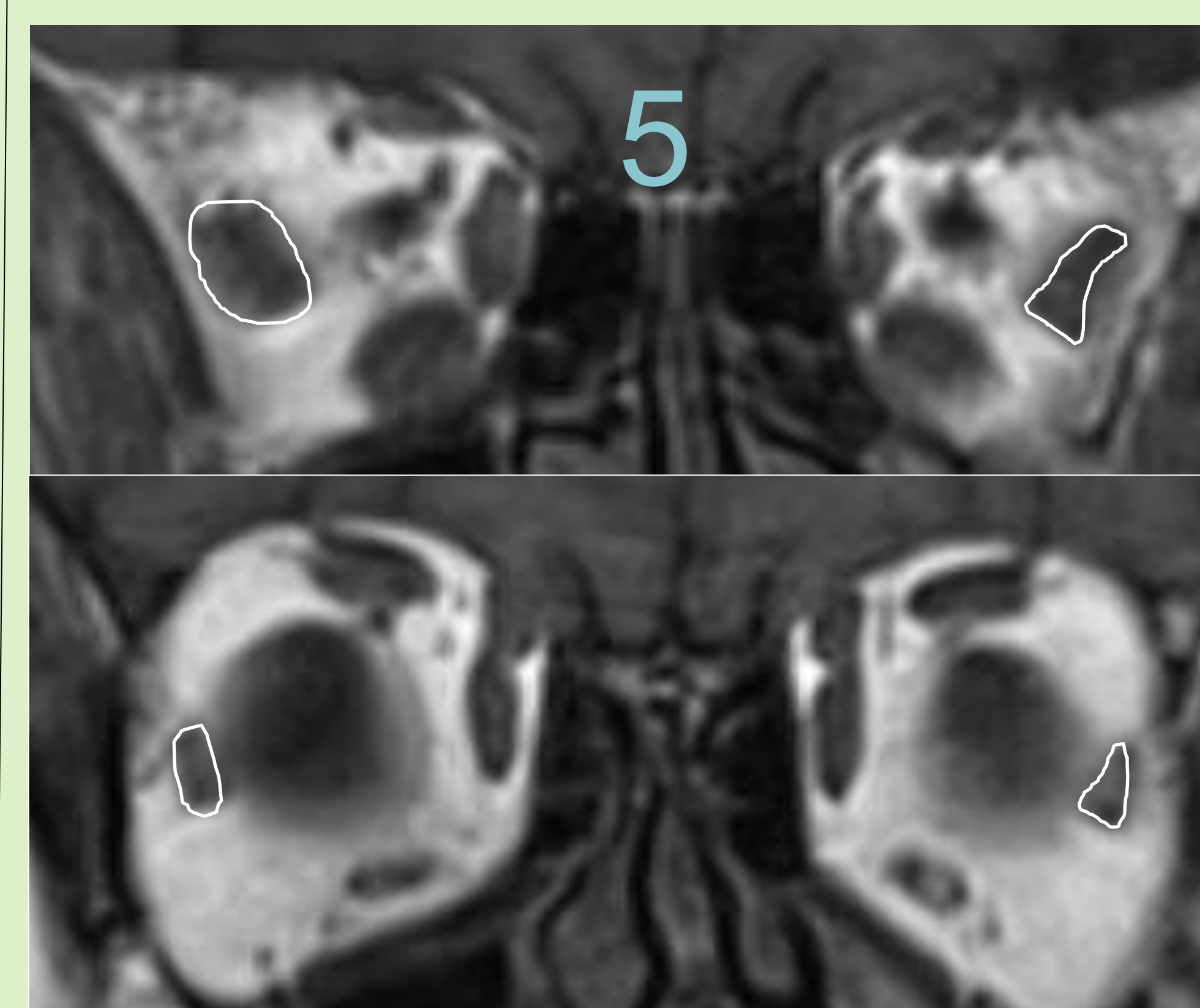
From Surgical procedure for correcting globe dislocation in highly myopic strabismus. Makoto Yamaguchi, Tsuranu Yokoyama, And Kunihiko Shiraki. Am J Ophthalmol 2010;149:341–346.



Axial MRI scans of brain and orbits showing bilateral Lateral Rectus atrophy (red arrows), in a patient with traumatic **bilateral 6th Cranial Nerve Palsy** and large angle esotropia.



MRI of both orbits in a patient with acquired left eye exotropia and loss of adduction, showing **isolated Medial Rectus muscle atrophy** in the left eye (red arrows)



Coronal MRI scans of the orbit in a patients with V-pattern esotropia and left eye abduction deficit, showing significant reduction in volume of the superior compartment of the left Lateral Rectus muscle, and the resulting change in shape compared to the right Lateral Rectus muscle – **Superior Compartment Paresis of Lateral Rectus muscle.**

Conclusion

Radiology of the orbits can help in evaluation, diagnosis and treatment planning in patients with acquired horizontal strabismus associated with abduction and adduction deficits. Radiology of the orbits perhaps does not help in evaluation of concomitant horizontal strabismus, such as infantile esotropia, accommodative esotropia and comitant exotropias, and in Duane's syndrome or in the evaluation of stretched scars following strabismus surgery.

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