



# Heavy Eye Syndrome as a Cause of Recurrent Strabismus

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Received: May 01, 2023

Accepted: June 14, 2023

Published Online: June 21, 2023

Journal: Journal of Radiology and Medical Imaging

Publisher: MedDocs Publishers LLC

Online edition: <http://meddocsonline.org/>

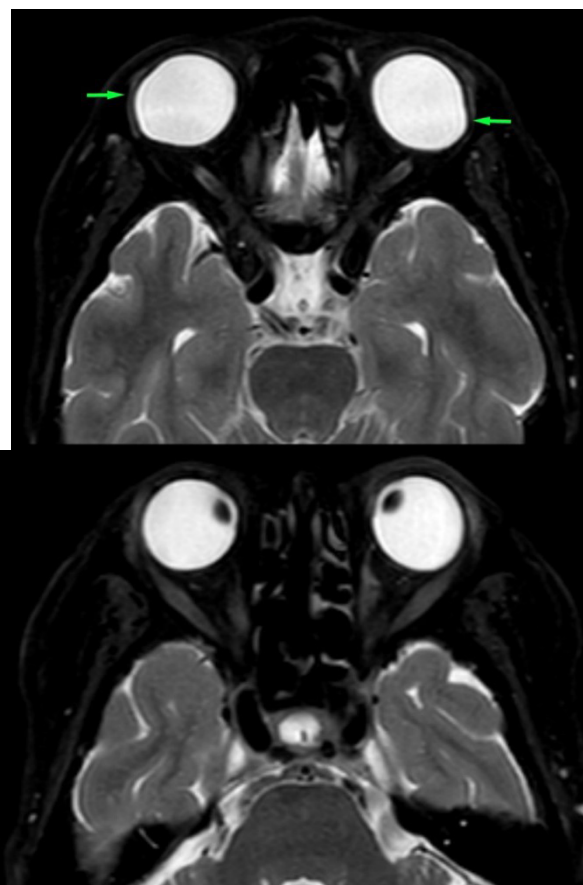
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## Clinical History

A 69-year-old Filipino female presented with progressive esotropia and hypotropia for almost 20 years, accompanied by bilateral poor visual acuity. She noted previous corrective surgery however there is a recurrence of signs and symptoms.

## Imaging Findings

Both globes exhibit increased anteroposterior dimension relative to their width with a note of focal bulging of its posterolateral portions. These also exhibit severe superotemporal shifts and inferomedial deviations. There is apparent superolateral stretching of the intraocular and intraorbital segments of the bilateral optic nerves. This may be due to mechanical forces secondary to the globe's deviation. There is no gross evidence of atrophy. There is an inferior shift of the lateral rectus muscle and a nasal shift of the superior rectus muscle. The dislocation angle measures 139.5 degrees on the right and 131.3 degrees on the left. The bilateral lateral rectus-superior rectus bands are not delineated, maybe severely thinned out.



**Figure 1:** Axial T2 fat saturated image shows increased anteroposterior dimension relative to their width (1A) with a note of focal bulging of its posterolateral portions, pointed by the green arrows (1B).

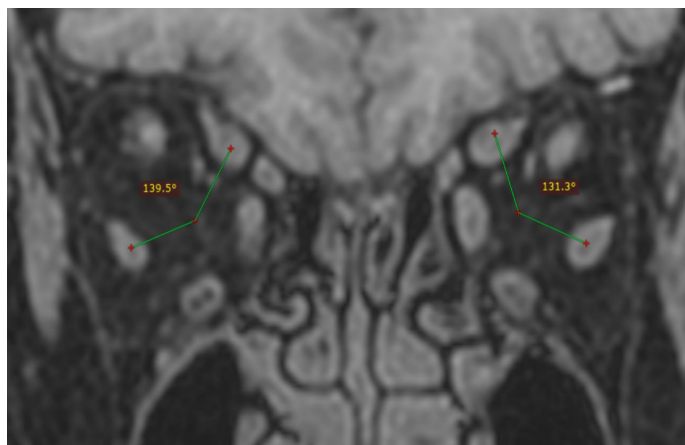


Also peculiar to this case is the wavy contour of the bilateral medial recti.

The rest of the ocular contents show normal signal characteristics.

The orbital apices, optic chiasm, sella, and extrasellar structures appear normal.

The imaged cranial nerves are intact.



**Figure 2:** Coronal T1 DIXON image shows the displacement of the superior and lateral recti with resultant increased dislocation angles.

## Discussion

### Background

Heavy Eye Syndrome (HES) or strabismus fixus convergence is a rare cause of acquired esotropia in the setting of high myopia [1].

### Clinical Perspective

HES usually presents with diplopia because of progressive esotropia and hypotropia, causing limited eye movements [2]. Imaging is suggested to demonstrate anatomical abnormalities to confirm definite diagnoses and exclude differential diagnoses [3].

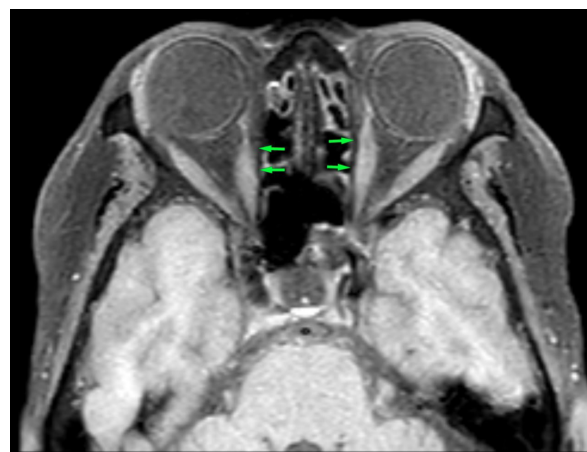
### Imaging Perspective

The inferior shift of the lateral rectus muscle and nasal shift of the superior rectus muscle produces an increased dislocation angle, compatible with the most recognized pathophysiologic theory of HES [4]. Resultant limited elevation and depression of the eyes are observed, as well as abduction.

According to previous literature, connective tissues may have a role in the pathogenesis of HES. Like the patients in the study of Maoili et al., degeneration of the LR-SR band is noted in our patient, suggesting a possible role in the pathogenesis of HES. It has a consequential inferior displacement of the lateral rectus present as esotropia and hypotropia [1]. However, according to Rutar et al., this may not explain severe cases such as in our patient.

The elongation of both globes predisposes their posterior aspects to be dislocated out of their respective muscle cones [5], explaining their fixed position in our patient.

It is important to note that cranial nerve palsies may present like HES. A previous report states that abducens nerve palsy



**Figure 3:** Axial T1 fat saturated image shows the wavy contours of both medial recti.

mimics HES [6]. Otherwise, the imaged cranial nerves are radiologically intact.

With high soft tissue contrast, MRI provides a satisfactory assessment of the abovementioned muscles and connective tissues. Key findings, in this case, are the increased dislocation angle, elongated globes, and thinned-out LR-SR bands, confirming the diagnosis of HES.

### Outcome

In conclusion, we advise routine orbital and cranial MRI in the assessment of patients with progressive esotropia and hypotropia for adequate evaluation of possible etiologies. In addition, it offers essential pre-operative information, which ultimately benefits possible surgical management.

### Take Home Message

1. MRI is a vital tool in possible cases of HES, for definite diagnosis and satisfactory elimination of differential diagnoses.
2. Displacement of the superior and lateral recti with resultant increased dislocation angle confirms the diagnosis of HES in patients presenting with progressive esotropia and hypotropia.
3. LR-SR band degeneration may be a compounding factor in the pathogenesis of HES.

The authors declare no conflict of interest.

**All patient data have been completely anonymized throughout the entire manuscript and related files.**

### Final Diagnosis

Heavy eye syndrome, bilateral.

### Differential Diagnosis List

- Sagging eye syndrome
- Cranial nerve palsies, especially abducens nerve
- Graves orbitopathy

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