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### Introduction

Patients with pathological axial myopia have a high prevalence of horizontal and vertical strabismus.<sup>1</sup> Heavy eye syndrome, also known as progressive esotropia fixus, occurs in highly myopic patients with large angle esotropia and hypotropia.<sup>2</sup> It is an adult onset esotropia associated with restricted elevation and abduction of variable degree and severity. Imaging techniques have revealed abnormal extraocular muscle position in these patients. The lateral rectus (LR) muscle is displaced inferiorly and superior rectus (SR) muscle is displaced nasally due to superior, posterior and lateral protrusion of the myopic cone.<sup>3</sup> Multiple surgical techniques have been proposed for treatment of this condition, including large bilateral medial rectus recession, bilateral lateral rectus resection and vertical muscle transposition.<sup>4,5</sup> However, treatment is difficult and recurrence of large angle esotropia and/or hypotropia after surgery is common. Loop myopexy technique described by Yokoyama and partial Jensen's procedure seem to be better strategies for management.<sup>6,7</sup> We report the surgical outcome of one patient with heavy eye syndrome who underwent management with SR and LR union suture.

### Materials & Methods

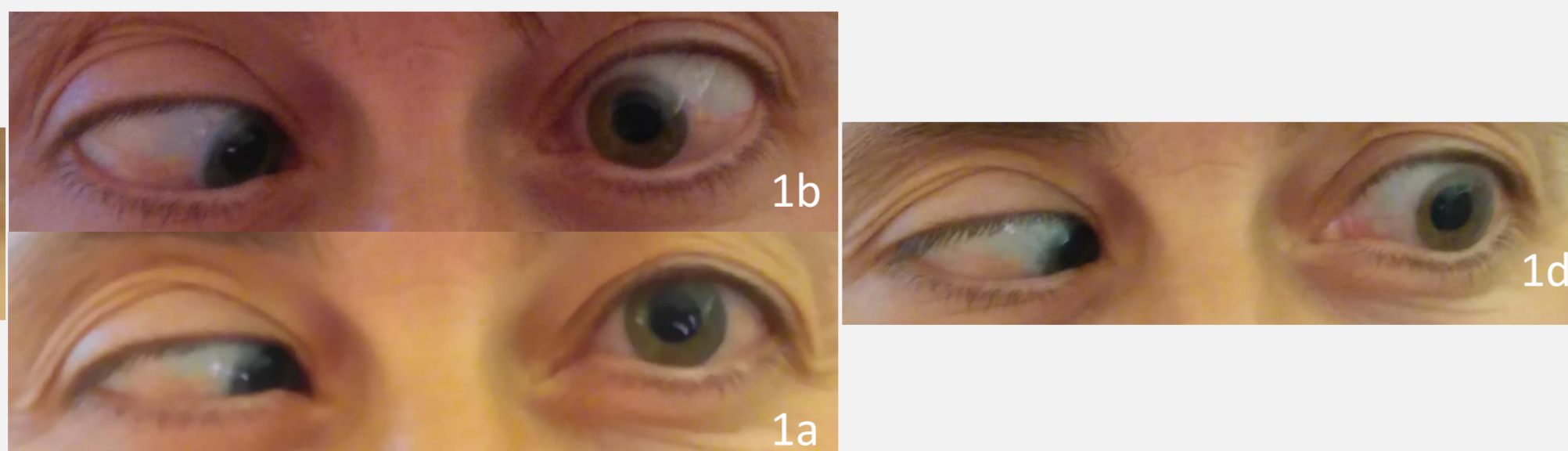
A 45-year-old woman with pathologic high myopia (-24 diopters in either eye), acquired progressive large angle esotropia (75 prism diopters) and bilateral restriction of elevation and abduction was seen in the eye clinic. Best corrected visual acuity of the operated eyes was 0.8 LogMAR. Anterior segment examination was unremarkable but fundoscopy revealed changes compatible with pathologic axial myopia. The degree of ocular deviation was estimated by the Krimsky test. Orthoptic assessment showed significantly impaired abduction and supraduction in both eyes. Table 1 summarizes the degree of restriction of the extraocular movement.

Table 1

	Abduction		Adduction	Supraduction		Infraduction
Preoperatively	OD	OS	Normal	OD	OS	Normal
	-7	-3		-5	-4	
Postoperatively	-2	-1.5	Normal	-3	-3	Normal



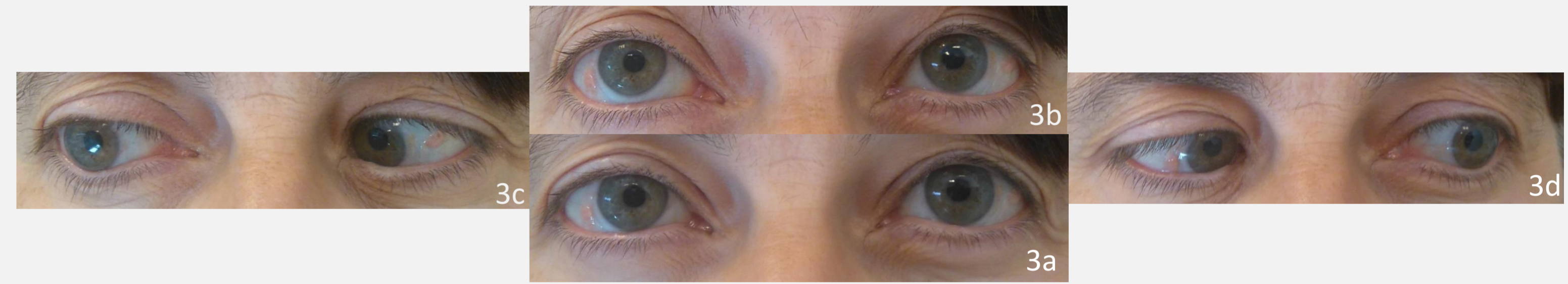
Figures 1 (a-d) show the degree of ocular motility impairment at presentation. The right eye was fixed in adduction with minimal movement. Our patient was diagnosed to have heavy-eye syndrome preoperatively, as confirmed by magnetic resonance imaging (MRI) of the orbit, showing superotemporal herniation of the elongated eyeball with inferior displaced LR and nasally displaced SR muscles (Figure 2).



Forced duction test preoperatively showed bilateral restriction in abduction and supraduction. A superior and temporal limbal peritomy was created. LR and SR muscles were then identified and isolated with a 4'0 silk suture (Mersilk, Ethicon). The temporal half of the SR muscle and the superior half of the LR muscle were sutured with a nonabsorbable 5-0 polyester suture and then united together at 2 sites, 7 mm and 10 mm post muscle insertion without scleral fixation suture. The SR and LR muscles were not disinserted. The procedure was performed bilaterally.

### Results

The case was nearly orthophoric the day after the operation. Three months postoperatively, residual esotropia of 6 prism diopter for both far and near was achieved. At the 12-month follow-up esotropia was found the same. The degree in range of extraocular movement improvement is shown in Table 1. There was significant improvement in range of movement after surgery. At last review a small restriction of abduction was seen in either eye (-2 and -1.5 respectively). Overall, the patient was satisfied with the result. Figure 3 (a-d) show primary position and versions at final follow-up.



### Discussion

High axial myopia, acquired large angle esotropia, limited abduction and displacement of the lateral and superior rectus muscles are compatible with findings reported characteristics of heavy eye syndrome. As mentioned earlier, multiple surgical methods have been recommended for the management of these patients. Bilateral large medial rectus recession and lateral rectus resection may provide good results in earlier stages of the disease with smaller deviation and mild abduction restriction. In advanced cases with lateral rectus displacement, however, this procedure may even worsen the condition.

Union suture of SR and LR is an effective treatment for patients with myopic strabismus fixus as it can reduce the degree of esotropia and increase the range of extraocular movement by a significant amount. No muscle detachment of SR and LR was involved. Therefore, this would potentially decrease the risk of anterior segment ischemia and provide a safer and faster operation. The procedure was performed without any attachment to the sclera since scleral fixation on pathological myopic eyes could impose potential risk of scleral perforation. The medial rectus (MR) muscle can be preserved for further interventions. Simultaneous ipsilateral MR recession to avoid residual esotropia carries the risk of overcorrection and is better to be avoided. Early diagnosis and surgery is advised so to avoid surgery on fibrotic MR/IR and also to prevent the complication of having a disinserted muscle.

### References

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