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Case Report

Case report on heavy eye syndrome

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ABSTRACT

In high myopia, acquired esotropia can be present as strabismus fixus convergence also known as Heavy Eye Syndrome (HES). Although exotropia and hypertropia have been reported, patients typically present with diplopia due to increasing esotropia and hypotropia with limitations on abduction and elevation. We reported two cases of HES based on history and clinical examination, which includes anterior and posterior segment examination and squint evaluation. The MRI of both patients showed displacement of lateral rectus inferiorly and nasal shifting of superior rectus. In both the cases forced duction test (FDT) was positive for affected medial rectus (MR) when performed under local anaesthesia. Subsequently, they underwent loop myopexy of superior rectus (SR) with medical rectus (MR) along with MR recession for affected eye. Postoperatively, Case 1 had a residual esotropia of 18 prism dioptre (PD) and case 2 had 40 PD compare to preoperatively 70 and 80 PD respectively, measured with the krimsky test. Axial length lengthening and herniation of sclera between the SR and LR muscles are the two main contributors to HES. To stop additional herniation, the inter-muscular link must be restored. Loop myopexy is an elegant and effective procedure to achieve good cosmetic and functional results for HES.

Keywords: HES, Strabismus fixus convergence, Esotropia, Loop myopexy

INTRODUCTION

In high myopia, acquired esotropia can be present as strabismus fixus also known as HES. Patients commonly have complaints of diplopia due to increasing esotropia and hypotropia with limitations on abduction and elevation, however exotropia and hypertropia have also been reported.[1,2]

HES is not common in childhood. Patients usually have high myopia-around (-18.00 D as per Hayashi et al). Few patients in adulthood complain about diplopia of new onset while others may be concern about the appearance of their eye.[3,4] Aged and high myopes are more likely to have an acquired esotropia and/or a vertical heterotropia.[5] Differentiation of HES from sagging eye syndrome (SES) is based on the following clinical features: non-myopic elderly patients come with esotropia, which is worse at distance along with degenerative changes such as bilateral blepharoptosis and deepening of lid sulcus, all of which are seen in SES. [2]

CASE REPORT

Case 1

A male of 17 years of age presented with complaints of progressive diminished vision in both eyes as well as the inward deviation of his right eye and inability to move his eye outward over the past 5 years. The patient didn't have any previous history of ocular trauma, previous strabismus surgery, thyroid disorder, diurnal variation, diabetes, or hypertension. For the last 5 years, he has been using glasses.

On examination, BCVA (best-corrected visual acuity) was 6/24 with -17.5DS/-1.25DC×10 and 6/24 with -14.0 DS/-3.75DC×175 as well as near vision of N12 and N10 in his right and left eyes, respectively. Anterior segment findings on slit lamp bio-microscopy showed NS 1 (nuclear sclerosis grade-1) and PSC (posterior sub-capsular cataract bilaterally (right eye >> left eye). Both eyes fundus findings suggest a pale disc and dull foveal reflex in the macular area, whereas in the periphery, chorioretinal atrophy with scalloped margins suggests gyrate atrophy of the fundus bilaterally. Axial length was 31.42 and 30.99 in right and left eyes respectively. His IOP (intra-ocular pressure) was 14 mmHg in his right and 16 mmHg in the left eye.

On squint evaluation, both eyes had 90 PD (prism dioptre) esotropia over glasses and when corrected for the prismatic effect of myopic glasses, it was 70 PD esotropia. Ocular motility showed limited abduction of both eyes while the rest of extraocular movements were within normal limits (Figure 1).

Figure 1: Pre operative 9 gaze photo.

MRI showed displacement of the LR (lateral rectus) inferiorly and nasal shifting of the SR (superior rectus). (Figure 2).

Figure 2: Case 1 MRI showed inferior displaced IR and nasal shift of SR.

Based on the above findings of high myopia, increased axial length, inferior displacement of the LR and nasal displacement of the SR, the diagnosis of heavy eye syndrome was made. The patient was advised of right eye cataract surgery followed by right eye loop myopexy with or without MR recession based on FDT (Forced duction test).

FDT was positive for the right MR when performed under local anaesthesia. Loop myopexy with MR recession was planned and proceeded with.

Case 2

A 74-year-old female presented with diminution of vision in both eyes and inward turning of left eye since 4 years. On examination BCVA in right eye was 6/12 with-1.25 DS/-2.50DC×90 and left eye was 4/60 with-1.25DS/-1.50DC×100 as well as near vision was N10 and N36 in right and left eye respectively. Slit lamp examination of the anterior segment revealed pseudophakia bilaterally, fundus findings suggestive of myopic macular degeneration with chorioretinal atrophy in both eyes. Axial length was 29.30 and 29.34 mm in right and left eye respectively. Her IOP was 18 mmHg in right eye and 16 mmHg in her left eye.

On squint evaluation, the krimsky test left eye had 80 PD esotropia. Ocular motility showed limited abduction and elevation of the left eye as well as limitation in abduction of the right eye, while the rest of the extraocular movements were within normal limits (Figure 3). MRI showed inferior displacement of LR and nasally shifting of SR (Figure 4).

Based on the above findings, a diagnosis of HES (heavy eye syndrome) was made and Patient was advised left eye loop myopexy with or without MR recession based on FDT. FDT showed positivity for the left MR. Loop myopexy with MR recession of left eye was planned and proceeded.

Figure 3: Case 2 pre operative 9 gaze photo.

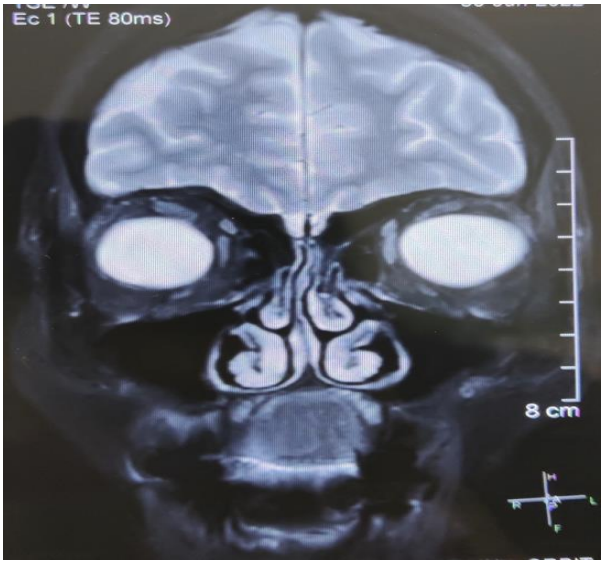

Figure 4: Case 2 MRI showed inferior displaced IR and nasal shift of SR.

Treatment

Surgical steps included limbal conjunctival peritomy followed by, the scleral tunnel which was made in the superior-temporal quadrant 14 mm distance from the limbus in between LR and SR insertion. A 240-silicone band was passed below the SR and LR muscle belly through the tunnel and the band was tightened with the sleeve such that the SR and LR muscle bellies were approximated (Figure 3). A limbal conjunctival opening was made and MR was recessed by 5 mm in both cases (Figure 4).

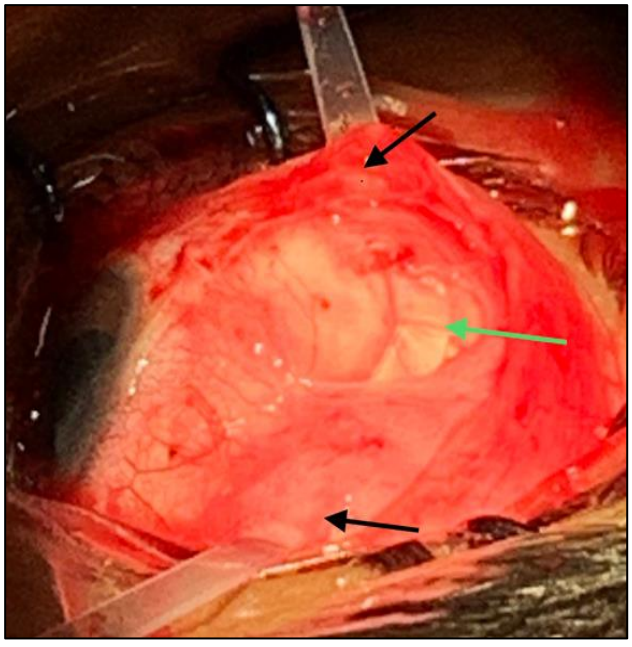

Figure 5: Loop myopexy of SR and IR muscles (black arrow). Passage of silicon band in between bellies if two muscles (black arrow).

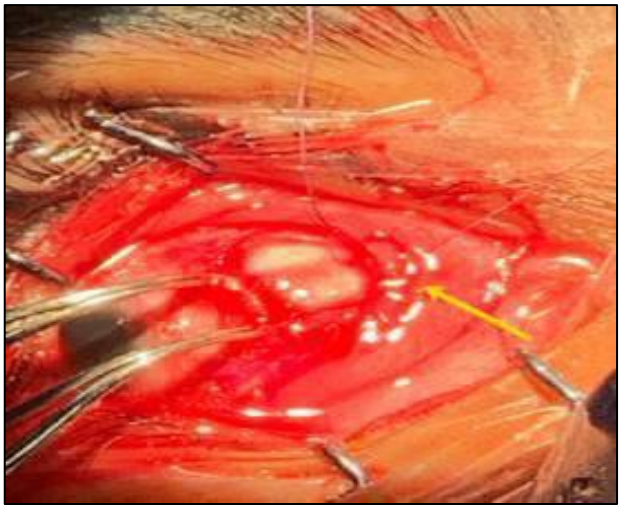

Figure 6: MR recession (yellow arrow).

Postoperatively, case 1 had a binocular vision of 6/18 P with +2.0DS/-2.50DC×160. (Low vision due to pre-existing gyrate atrophy of fundus) and case 2 had 4/60 with -1.25DS/ -1.50DC×100 (low vision due to myopic macular degeneration). Case 1 had a residual esotropia of 18 PD and case 2 had 40 PD (Figure 5) measured with Krimsky test. Both patients were satisfied with their surgery and didn't want other eye surgery.

Figure 7: Case-1-post op 9 gaze photo.

Figure 8: Case 2-post op 9 gaze photo.

DISCUSSION

Axial length lengthening and herniation of the sclera between the SR and LR muscles are the two main contributors to heavy eye syndrome. Mechanical adduction is caused by SR's nasal displacement. The inferior displacement of the LR limits abduction. The gross esotropic and hypotropic position of the eye is fixed. To stop additional herniation, the intermuscular link must be restored. Surgery is needed for visual rehabilitation as well as for cosmesis.

As the fundamental pathophysiology of the problem is not addressed, the conventional recess-resect operation in HES is less successful. The other procedures that have been described to stabilize the eye are superior transposition of LR and MR insertion, loop myopexy of LR and SR, hemi transposition of LR and SR with scleral fixation combined with MR recession (Yamada technique), hemi-Jenson procedure and Yokoyama procedure.[6-9]

Correcting the muscular pathways of both SR and LR muscles has produced the best results. Loop myopexy of the SR and LR muscles either with or without muscle splitting is the most commonly performed surgery.[1] In 23 patients, Yamaguchi et al showed that loop myopexy + MR recession was effective. They were effective in raising the maximum angles of abduction and sursumduction as well as lowering the angle of ocular deviation and the angle of the globe's dislocation. Only 1 patient had a positive FDT after surgery, whereas all 23 patients had positive FDTs before surgery. During follow-up (mean 48.8 months), ocular deviation, ocular movement limitation, and globe dislocation did not recur.[10]

The 16 patients had successful results after Akbari et al improved this surgery by employing two sutures for muscle belly union.[11]

While many professionals have combined loop myopexy and MR recession, a tiered method lessens the total amount of surgery necessary whereas a combined strategy removes the need for a second procedure.[4]

To avoid multiple surgeries, we performed myopexy of SR and LR with MR recession in single surgical session on our patients.

CONCLUSION

Loop myopexy is an elegant and effective procedure to achieve good cosmetic and functional results for HES.

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