



Case report

Resection and anterior transposition of the inferior oblique muscle for treatment of inferior rectus muscle hypoplasia with esotropia

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ABSTRACT

Purpose: To report a case of inferior rectus muscle hypoplasia with esotropia, which was treated successfully by resection and anterior transposition of the inferior oblique muscle.**Observations:** A 1-year-old boy presented with esotropia. He had esotropia of 15–30° and intermittent left hypertropia. At the age of 3 years, the alternate prism cover test showed esotropia of 35Δ and left hypertropia of 25Δ. Magnetic resonance imaging of the orbit revealed left inferior rectus muscle dysgenesis. Strabismus surgery was performed and a hypoplastic left inferior rectus muscle was identified. We performed bilateral medial rectus muscle recession, and resection and anterior transposition of the left inferior oblique muscle. Nine months after the surgery, the patient had esotropia of 8Δ and left hypertropia of 6Δ.**Conclusion and importance:** Resection and anterior transposition of the inferior oblique muscle is useful for hypoplasia of the inferior rectus muscle accompanied by horizontal strabismus.© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Inferior rectus muscle aplasia or hypoplasia is a rare cause of strabismus, and commonly requires surgical intervention. Although previously reported cases have been described mainly using the superior rectus muscle-weakening procedure, or the medial and lateral rectus muscle transposition technique with or without detachment of these muscles from the sclera, the best surgical procedure for this anomaly when it is combined with horizontal strabismus has not been discussed in detail. We report a case of inferior rectus muscle hypoplasia with esotropia, which was treated successfully by surgery without using a horizontal rectus muscle transposition technique.

2. Case report

A 1-year-old boy presented with esotropia, which had been noticed since 6 months of age. His medical history was unremarkable. He had 30° of esotropia with intermittent left

hypertropia. Ocular motility examination showed under-elevation in adduction of the right eye. Precise measurements inside gaze could not be obtained due to poor cooperation. The external examination was notable for a slight right head tilt. Cycloplegic refraction was +5.00 D in both eyes. Slit lamp examination and funduscopy did not detect any abnormalities. He was prescribed glasses for hyperopia, but he had residual esotropia and left hypertropia. At the age of 3 years, the best-corrected visual acuity was 0.6 (+4.75 + 0.75 × 180) in the right eye and 0.4 (+5.00) in the left eye. Ocular motility testing showed under-elevation in adduction of the right eye (Fig. 1). The alternate prism cover test showed esotropia of 35Δ and a left hypertropia of 25Δ at distant fixation. Fundus photographs revealed bilateral incyclotorsion much worse in the left eye. Magnetic resonance imaging (MRI) of the orbit revealed left inferior rectus muscle dysgenesis (Fig. 2).

Strabismus surgery was performed to correct the left hypertropia and esotropia. An intraoperative forced duction test showed tight medial rectus muscles in both eyes. Traction sutures were placed at the inferior and inferotemporal limbus. A limbal conjunctiva incision from the 4 to 7 o'clock position was created to obtain the best visualization of the inferior rectus muscle. With a careful inspection of the inferior quadrant of the sclera, a hypoplastic left inferior rectus muscle was found at a distance of 8.5 mm

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Fig. 1. Preoperative ocular motility photographs in nine positions of gaze, showing underaction of the right inferior oblique muscle.

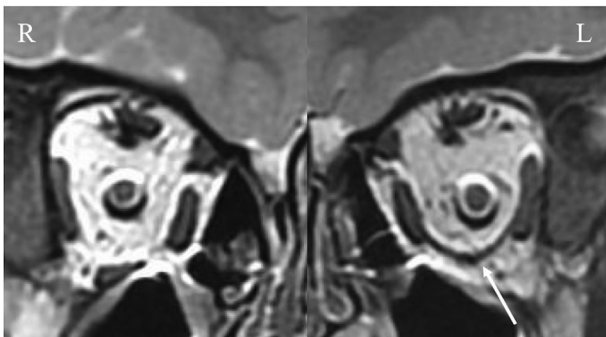


Fig. 2. T2-weighted coronal magnetic resonance images of the right (R) and the left (L) eye, showing abnormality of the left inferior rectus muscle (arrow).

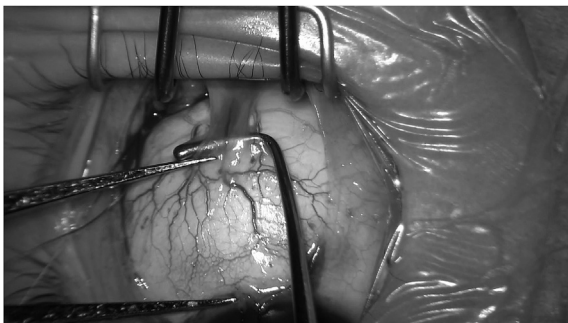


Fig. 3. Intraoperative photograph showing hypoplastic left inferior rectus muscle.

from the limbus (Fig. 3). The lateral rectus muscle was identified at the normal location. Then, the eye was rotated in the superonasal direction. The left inferior oblique muscle was encountered underneath the lateral rectus muscle insertion. When the inferior

oblique muscle was identified, it was secured with two small muscle hooks and its distal end was isolated. A double-armed 6-0 polyglactin 910 suture was placed at its distal end and the inferior oblique muscle was detached from the sclera. The suture was fixed at a point 2.5 mm anterior to the inferior rectus muscle insertion, which was located at a distance of 6.0 mm from the limbus. A 5-mm bilateral medial rectus muscle recession was performed in the usual manner from a new limbal incision on the nasal site. After these procedures, the eye position was checked under general anesthesia using the spring back test, and we found that the left eye was still hypertropic. The suture on the inferior oblique muscle was released from the sclera and a new double-armed suture was placed on the left inferior oblique muscle approximately 4 mm behind the previous suture. The new suture was fixed at the same location of the sclera in a bow-tie fashion. The eye position exhibited a small amount of left hypertropia in the spring back test, which was deemed acceptable. Finally, the excess left inferior oblique muscle was resected and the suture was tied firmly.

Nine months after the surgery, the patient had esotropia of 8Δ and left hypertropia of 6Δ in the primary position. A slight right head tilt persisted. Bilateral incyclotorsion in the fundus photograph remained unchanged (Fig. 4). Versions and ductions showed only a small limitation in infraduction during abduction of the left eye (Fig. 5). The patient is currently under observation.

3. Discussion

Initially, the patient in this case showed under-elevation in adduction of the right eye because he preferred to fixate with his left eye. Moreover, he showed a right head tilt on the side opposite the hypoplastic inferior rectus muscle. MRI was indispensable for the diagnosis of this case, and allowed effective surgical planning. Kim et al. also reported a case of a patient who presented with monocular elevation deficiency and was finally found to have contralateral inferior rectus agenesis after MRI.¹ Thus, if a patient

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