Lateral rectus recession for consecutive exotropia in esotropic Duane syndrome: A case report

Saif Alobaisi1, Khaled Alabduljabbar2, Abdulmalik Alyahya2, Abdulaziz Aldaghri1

Abstract:
Consecutive exotropia is considered a rare complication after medial rectus recession that is performed for cases of esotropic Duane syndrome. Here, we present a case of 5-year-old female initially presented with the limitation of abduction, narrowing of the palpebral fissure, and globe retraction of the left eye along with a mild left face turn. She was diagnosed with Duane syndrome Type 1. She was treated with the medial rectus recession (6.5 mm). Postsurgery, she developed a consecutive exotropia. This was managed successfully with the ipsilateral lateral rectus recession (8 mm). Following this surgery, the patient was orthoptic in the primary position and her abnormal head posture was markedly improved.

Keywords:
Consecutive exotropia, Duane syndrome, LR recession, MR recession

INTRODUCTION
Consecutive exotropia is considered a rare or an uncommon complication after medial rectus recession that is performed for cases of esotropic Duane syndrome. Consecutive exotropia in Duane syndrome occurs when the force generated by the lateral rectus, either actively through misinnervation or passively through lateral rectus contracture, is greater than the corresponding medial rectus force.[1]

In this report, we present a case with Duane retraction syndrome type 1 with consecutive exotropia developed after ipsilateral medial rectus recession which was treated by ipsilateral lateral rectus recession to improve her exotropia, upshooting, and the abnormal head posture (AHP).

CASE REPORT
A 5-year-old girl presented to the pediatric ophthalmology clinic in King Khaled Eye Specialist Hospital, Riyadh with type 1 (esotropic) Duane retraction syndrome of the left eye. A large medial rectus recession (6.5 mm) of the affected eye was performed. On 20-day postoperation visit, she presented with outward deviation and AHP.

Upon examination, she was found to have significant consecutive exotropia. She had developed an AHP signified by a right face turn and a chin down position. In addition, globe retraction was noted on attempted adduction with narrowing of the palpebral fissure [Figure 1].

The ocular examination showed that the best-corrected visual acuity was 6/6 in both eyes. She preferred her right eye to fixate and adopted an AHP whereby she had a right face turn and a chin down position. Ocular motility test showed limitation of both adduction (−3) and abduction (−4) in the left eye, with narrowing of the palpebral fissure and upshooting of the eye in attempted adduction. Prism alternate cover test in a straight-ahead position revealed an exotropia (XT) of 30–35 Δ in primary position, 50 Δ XT upon right gaze with upshoot, and esotropia of ~40 Δ upon left gaze. There were no significant differences in upgaze or downgaze. Sensory evaluation showed left eye suppression for both far and near distances with the Worth four dot test. A gross stereopsis of 4800 s of arc

How to cite this article: Alobaisi S, Alabduljabbar K, Alyahya A, Aldaghri A. Lateral rectus recession for consecutive exotropia in esotropic Duane syndrome: A case report. Saudi J Ophthalmol 2021;35:140-2.
was noted with the Titmus Fly Test. She was diagnosed to have consecutive exotropia as a complication of after medial rectus recession.

Squint surgery was undertaken by the same pediatric ophthalmology consultant to correct the misalignment and to treat the secondary aberrant movements. The hang-back method (around 8 mm) was used to weaken the lateral rectus muscles of the affected eye.

During her surgery, she was found to have positive forced ductions to adduction of the left eye. This finding pointed toward a lateral rectus contracture and the need for it to be released. When the lateral rectus muscle was detached from the globe, the forced ductions were freed. The muscle was then recessed 8 mm from its original insertion.

At her 6-month follow-up visit, there was improvement in her AHP, a reduction of ocular deviation in primary position, and an improved upshot on attempted adduction. Orthoptic evaluation showed exotropia of 6 Δ and 10 Δ at far and near distances, respectively. The patient has been on regular follow-up to date [Figure 2].

**DISCUSSION**

Consecutive exotropia is a known complication of strabismus surgery. It can develop after a large medial rectus recession is done for Duane retraction syndrome type 1. An innervational imbalance between the lateral rectus and the medial rectus muscle occurs after a large medial rectus weakening. This in turn causes a marked reduction of adduction saccadic velocities due to marked lateral rectus co-firing on attempted adduction. The severely compromised adduction leads to consecutive exotropia. The marked co-contraction of the lateral rectus on adduction augments the effect of the weakening of the medial rectus, leading to an overcorrection in the primary position.\(^1\)

AHPs are commonly seen in DRS. A patient with an incomitant strabismus will adopt a head posture to obtain a comfortable single binocular vision. If there is an imbalance of muscle forces in the primary position, the patient will select a field of gaze where the affected eye has a balance of forces. In DRS with exotropia and markedly limited adduction, the lateral rectus often undergoes contracture. A face turn to the side opposite the affected side may result. The head position is governed by the eye with limited ductions and imbalanced muscle forces. Thus, to correct a face turn in DRS, the muscle forces in the affected eye must be balanced in the primary position. The surgical plan must include releasing restriction and muscle contracture.\(^2\)

Various surgical procedures are recommended for the correction of strabismus and co-contraction in Duane syndrome. Recession of lateral rectus muscle with Y-split is effective in the treatment of upshoot and downshoot with globe retraction in Duane syndrome.\(^3\) Since Y-splitting requires greater tissue dissection and large recessions, there is a potential risk of inadvertent tearing of the tight lateral rectus muscle.\(^4\) Weakening of either the superior or inferior oblique muscle to treat upshoot or downshoot has been disappointing and indicates that these abnormal movements are not related to oblique dysfunction\(^5\) but are instead caused by the co-contraction of medial and lateral rectus muscles and the taut lateral rectus muscle.\(^6\)

In our case, weakening of the lateral rectus muscle and suturing it back on to the globe eliminated the abnormal head turn, decreased exotropia, and globe retraction upshoot in the affected eye.

In conclusion, lateral rectus recession is a good surgical option to treat consecutive exotropia in Duane retraction syndrome to achieve orthotropia and treat AHP.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.
REFERENCES

1. Kraft SP. A surgical approach for Duane syndrome. J Pediatr Ophthalmol Strabismus 1988;25:119-30.
2. Pressman SH, Scott WE. Surgical treatment of Duane’s syndrome. Ophthalmology; 1986;93:29-38.
3. Rao VB, Helveston EM, Sahare P. Treatment of upshoot and downshoot in Duane syndrome by recession and Y-splitting of the lateral rectus muscle. J AAPOS 2003;7:389-95.
4. Sukhija J, Kaur S, Singh U. Isolated lateral rectus recession with Y splitting versus anchoring of the lateral rectus muscle in patients with exotropic Duane syndrome. JAAPSO 2014;18:147-50.
5. Parks MM. Ophthalmoplegic syndromes and trauma. In: Duane TD, editor. Clinical Ophthalmology. Vol. 1, Ch. 20. Philadelphia: Harper and Row; 1982.
6. Jampolsky A. Surgical leashes and reverse leashes in strabismus surgical management. In: Symposium on strabismus. Transactions of the New Orleans Academy of Ophthalmology. St. Louis (MO): Mosby; 1978. p. 244-68.