

Antero-medial Transposition of Inferior Oblique for a Superior Oblique Palsy: A Case Report

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ABSTRACT

A 29-year-old female presented with large-angle hypertropia, and small-angle exotropia associated with inferior oblique over action (IOOA). Orthoptic examination revealed right hypertropia of 35 PD with 12 PD of exotropia by prism cover test. There was no restriction of ocular motility, but we found right inferior oblique over action. She had a head tilt of approximately 30 degrees towards the left side. The Patient underwent "Antero-medial transposition of the inferior oblique" to correct strabismus. After surgery, she was orthotropic in the primary position with an average head-chin posture. Single approach surgery like the antero-medial transposition with an overacting inferior oblique may help to correct the large angle hypertropia associated with superior oblique (SO) palsy.

Key Words: Hypertropia, Inferior oblique, Superior Oblique, Palsy, Overaction.

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INTRODUCTION

Strabismus surgery involving inferior oblique muscle is usually done for Inferior Oblique Over-action (IOOA) associated with Superior Oblique (SO) palsy, V-pattern transverse strabismus, or dissociated vertical deviation (DVD). Superior oblique palsy may be congenital or acquired, acquired being more common than congenital in cases of isolated cranial nerve palsy. SO palsy is often associated with ipsilateral IOOA. Weakening of inferior oblique (IO) muscle is the main purpose of surgical correction. The weakening procedures of ipsilateral overacting IO muscle include medial myectomy, anterior alteration and anterolateral transfixation.¹⁻³ We report a case of superior oblique palsy with IOOA corrected by antero-medial transposition of IO.

CASE REPORT

A 29-year-old Bangladeshi female came to us for management of her deviating eye. She presented with

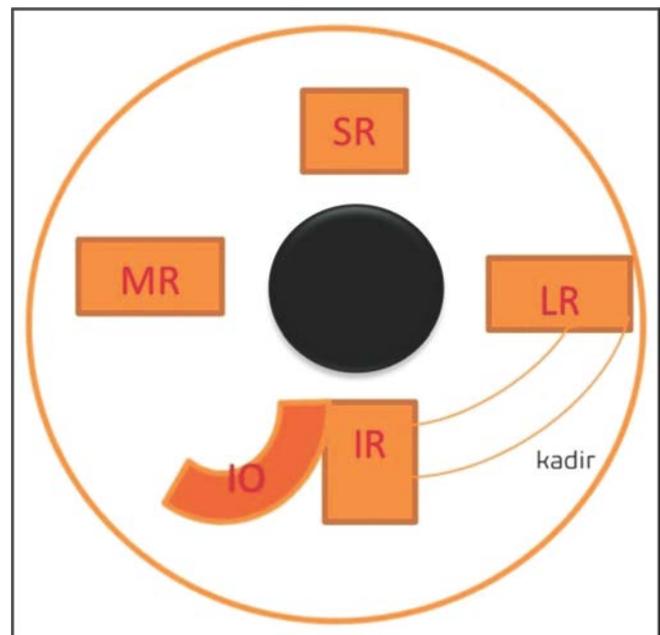


Figure 1: Diagrammatic view of antero-medial transposition of inferior oblique muscle.

hypertropia and exotropia of her right eye. History revealed that it was first noticed at the age of 9 years and she did not undergo any treatment. There was no history of trauma or accident. The refractive status was -1.00D sphere and -0.75D Sphere in her right and left eye, respectively. The best corrected visual acuity was 6/6 in both eyes. Orthoptic examination revealed right hypertropia of 35 PD with 12 PD of exotropia by prism cover test. There was no restriction on assessing ocular motility, but we found right inferior oblique over action. She had a head tilt of approximately 30 degrees towards the left side. Fundus examination showed significant extorsion in the right eye. We diagnosed her as a case of Right superior oblique muscle palsy; Park's 3-step test also supported the diagnosis.

Anterior segment and posterior segment were normal, and she had no systemic issues.

Informed consent was taken, and we performed antero-medial transposition of IO muscle to correct hypertropia. IO was reinserted onto the sclera at the medial (nasal) border with the direction of the IR muscle. Postoperatively, Ocular alignment was good, and no significant hypertropia was observed in either eye after three weeks of surgery. Foreign body sensation and mild redness were noted in the early days of surgery.



Figure 2: Left; Pre-operative condition showing Hypertropia and exotropia in the right eye. Right, Postoperative photograph with good ocular alignment.

DISCUSSION

SO receives innervation from fourth cranial (Trochlear) nerve and functions explicitly to intort, infraduct and abduct.^{2,3} The nucleus of the trochlear nerve is situated inferior to the oculomotor nucleus in the midbrain at the plane of inferior colliculus. The bundle of the Cranial Nerve (CN) IV decussates to the contralateral side at the anterior medullary velum in the ceiling of the fourth ventricle before leaving the dorsal brainstem. After it exits the brainstem, the trochlear nerve loops around the lateral part of the cerebral peduncle at the superior border of the pons; its

pathway continues anteriorly to pierce the dura and come in the lateral part of the cavernous sinus and move through the superior orbital fissure and finally enters the orbit. It passes ventrally and medially to innervate the superior oblique muscle.³ The Parks-Bielschowsky three-step test helps to diagnose trochlear nerve palsy.⁴

Cranial nerve IV palsy can affect patients of any age or gender. A compensatory head tilt may develop in the direction away from the affected muscle; ipsilateral hypertropia and excyclotorsion are commonly seen due to SO palsy. Management of Trochlear nerve palsy depends on the causative factors. Treating the underlying causative factors is the mainstay of management of a patient with acquired CN IV palsy. Surgery is indicated when other procedures do not respond.²

The surgical techniques yielded over the years include disinsertion, denervation-extirpation, myectomy and recession, which weaken the action of the inferior oblique muscle.^{6,7} Anterior transposition of IO has been reported as an effective weakening technique for correcting IOOA associated with trochlear nerve palsy.^{8,9} However, anti-elevation syndrome remains a drawback to this method. Therefore, to manage a large angle hypertropia of palsy with IOOA, anterior and nasal reinsertion of IO is a good option.⁶ In this technique, a muscle hook may be used to separate the IO muscle followed by disinsertion and reattachment of the disinserted part of the IO muscle to the sclera, commonly 2 mm medial and 2 mm beyond the IR muscle insertion.⁶ Thereby, it places the low oblique insertion anterior to the x-axis and nasal to the y-axis, thus transforming it to an intorter and depressor in adduction.⁷ IO is disinserted and again re-inserted to the sclera at the nasal border of the IR along the direction of the muscle.

Hussain et al, reported that in a case series of nine patients anterior and nasal transposition of the IO was more effective in unilateral cases than bilateral cases.¹⁰ Anterior and nasal transposition of the IO muscle help in reducing the over elevation in adduction and eliminating the exodeviation of the eyes in up gaze, but esodeviation may occur in downgaze.

CONCLUSION

Anterior and nasal transposition of the IO muscle is a good and acceptable option to correct large angle hypertropia with IOOA in a single sitting.

Conflict of Interest

Authors declared no conflict of interest.

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Author's Designation and Contribution

Syed Mehbub Ul Kadir; Assistant Professor: *Concepts, Design, Literature search, Manuscript preparation, Manuscript editing, Manuscript review.*

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