Case report

Paradoxical head tilt in unilateral traumatic superior oblique palsy

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Abstract

Purpose: We report a patient with abnormal head posture following ocular blunt trauma.
Methods: This is report of a case that despite findings compatible with diagnosis of left superior oblique (SO) palsy, the patient acquired an ipsilateral (left) head tilt. The interesting observation in our patient was reduction of left hypertropia and consequent less diplopia with ipsilateral head tilt.
Results: After blunt trauma, our patient adopted paradoxical left head tilt and consequently less diplopia despite acquired left SO palsy. Left inferior oblique myectomy resulted in significant improvement of patient's strabismus and abnormal head position.
Conclusion: Traumatic SO palsy may present with paradoxical head tilt.

Keywords: SO palsy; Head tilt; Traumatic strabismus

Introduction

Superior oblique (SO) palsy is a common finding in traumatic strabismus that presents with vertical deviation, exyclotorsion, and abnormal head posture.1,2 Clinical diagnosis of SO palsy is based on the Parks-Bielschowsky three-step test, torsional deviation measured by double Maddox rod, and ipsilateral inferior oblique overaction.3,4

Patients suffering SO palsy usually adopt an abnormal head posture of contralateral head tilt as a compensating effort to reduce the hypertropia.5–7 However, paradoxical ipsilateral head tilt has also been reported in minority cases of SO palsy; this phenomenon is mainly attributed to increasing the hyperdeviation in order to separate each eye's produced image widely. Further disruption of fusion is more suitable for such patients than effort needed for vertical fusional vergence.8,9

We report a case of post-traumatic SO palsy having less hypertropia and diplopia with ipsilateral head tilt.

Case report

A 44-year-old patient with past history of trauma (20 months ago) and left eye inferior wall reconstruction surgery was referred to our clinic with complaint of diplopia. The patient underwent left eye inferior wall fracture reconstruction and MEDPOR® (Stryker®, MI, USA) implantation 4 days after trauma. Visual acuity was 20/20 in both eyes, and anterior segment exams were normal.

In primary position, left hypertropia was evident. Patient had left head tilt and right face turn (Fig. 1). Deviation increased in right gaze and right head tilt. Double Maddox rod test showed left exyclotorsion of 10° in primary position. Left eye ductions in all direction were full, and no limitation was seen. Upon patching each eye separately, head posture returned to normal position. Paradoxical head tilt also reappeared after 30 minutes patch of each eye. Versions were compatible with left SO palsy.
and left inferior oblique over action (2–3+). Patient’s deviometry is illustrated in Table 1. Indirect ophthalmoscopy revealed excyclotorsion of left eye (Fig. 2). Stereacuity was 40 seconds of arc. Visual field assessment was normal. With the impression of left SO palsy, the patient was scheduled for surgery. Intraoperatively, forced duction test was done, and no limitation was seen. Uncomplicated left inferior oblique myectomy was performed for the patient. One week after the surgery, patient was orthotropic in primary position and all gazes. Three years later during the follow-up visit, he had no complaint of diplopia, and left eye ductions were normal. In addition, no deviation was seen in all gazes and left and right head tilt (Fig. 3).

Discussion

Paradoxical head tilt in the setting of SO palsy has been reported previously in the literature with the mechanism of increasing image separation rather than preservation of single binocular vision. However, our patient was less diplopic with the adopted ipsilateral head tilt. Our measurements also confirmed this fact, showing a lower amount of hypertropia in the affected eye with tilting the head toward the ipsilateral side. Other possible causes of head tilting, such as anisometropia or visual field defect, were also ruled out in our patient.

Machandia and colleagues demonstrated that fulfilling all steps of the three-step test had a sensitivity of about 70% in patients with documented SO palsy. The diagnosis of SO palsy was confirmed by SO atrophy in orbital MRI. According to their study, in 30% of patients with definite SO palsy based on imaging, complete three-step test was inconclusive. Furthermore, they reported that in patients fulfilling only first and second steps of the three-step test (such as our case), sensitivity of the test was about 78% in detecting SO palsy.10

Similar to our case, paradoxical head tilt in unilateral congenital 4th nerve palsy has been reported in a 1-year-old girl. This abnormal head position was evident with the affected eye being fixator. However, in contrast to our case, the hyperdeviation was more prominent in ipsilateral head tilt. A hypothesis for the explanation of their observation is orbital pulley abnormalities.9

Previous history of orbital wall reconstruction surgeries most likely complicated clinical picture of SO palsy in our patient. A possible explanation could be concomitant weakness of ipsilateral inferior rectus muscle. The intorsional effect of inferior rectus muscle paresis might result in more hyperdeviation in contralateral head tilt. However, we did not observe any deviation in the field of action of the inferior rectus muscle in our patient, and the muscle motility exam did not exhibit any

Table 1
Patient’s deviometry in different gazes.

| Right head tilt: | LHT: 25 PD | LHT: 22 PD | LHT: 14 PD |
|------------------|------------|------------|------------|
| LHT: 20-22 PD, XT 6 PD | LHT: 2 PD | LHT: 2 PD |
| LHT: 3 PD, XT 4 PD | XT: 5 PD | XT: 5 PD |
| LHT: 6 PD | XT: 3 PD | XT: 3 PD |
| LHT: 2 PD | NEAR: LHT 6 PD, XT 6 PD | NEAR: LHT 3 PD, XT 3 PD |
| LHT: 3 PD | XT: 3 PD | XT: 3 PD |
| LHT: 2 PD | NEAR: LHT 2 PD, XT 2 PD | NEAR: LHT 3 PD, XT 3 PD |

PD: Prism diopter, LHT: Left Hypertropia, XT: Exotropia.

Fig. 1. Patient's abnormal head posture: Left head tilt and right face turn.

Fig. 2. Fundus Photo of both eyes showing excyclotorsion of left eye.
underaction. Rearrangement of extraocular muscles pulley system also can be another potential mechanism.

Despite diagnostic challenges in this case and its incompatibility with the Parks-Bielschowsky three-step test, proper management of SO palsy was done, and inferior oblique myectomy yielded in complete resolution of patient’s abnormal head position and strabismus.

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Fig. 3. Postoperative ocular motility photographs of the patient in the 9 cardinal positions of gaze reveal no residual deviation or restriction.