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Case Report

Medicine Science 2016;5(4):1008-10

Medicine Science International Medical Journal

Traumactic superior oblique tendon rupture: case presentation

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Received 31 March 2016; Accepted 14 April 2016
Available online 22 Apr 2016 with doi: 10.5455/medscience.2016.05.8462

Abstract

We present a 47-year-old male with superior oblique (SO) tendon rupture that developed due to a broken metal hook while installing snow chains on his car. The patient presented to our clinic as an emergency for the right eye trauma and pain. The examination revealed a small cut in the right upper eyelid and an edematous tendinous structure that extended downwards through the conjunctival cut at the upper fornix. This structure was thought to be the SO tendon. Emergency exploration and SO tendon repair were performed under general anesthesia. The SO tendon was sutured to its own insertion region 5 mm in width and 5 mm behind a point 3 mm temporal to the superior rectus muscle. The conjunctiva was also repaired. There was 6 PD (prism diopter) right hypertropia and vertical diplopia on postoperative follow-up. The diplopia symptoms improved in the postoperative 3rd month. The patient had no diplopia at the 6th month follow-up but 4 PD hypertropia continued.

Keywords: Trauma, superior oblique tendon rupture, surgical treatmen

Introduction

The rupture of extraocular muscles due to trauma is rare. The recti are affected more commonly in such cases [1,2]. The order of frequency for traumatic rupture of the extraocular muscles is the medial rectus, inferior rectus, superior rectus, and lateral rectus in descending order. Rupture of the oblique muscles is less common. Superior oblique (SO) ruptures are quite rare [3].

Case

The hook at the end of the flexible part slipped from the hands of a 47-year-old male patient and hit him in the right eye while installing snow chains on his car (Figure /B). The patient said he did not allow the hook to stay stuck in this eye and pulled it out. He patient was referred to our clinic from the emergency service with swelling and pain in the right eye.

The left visual acuity and other findings were normal. An incision about 14 mm long with irregular borders progressing from nasal to superior was observed in the right upper eyelid. The upper lacrimal canal had been disrupted. A tendon-like tissue prolapsed from the medial upper eyelid (Figure 1/A). The patient could not open his righteye voluntarily. When carefully examined without pressure on the eye, the vision in the right eye was full. Anterior segment examination revealed a cut about 10 mm long and an edematous tendinous structure extending downwards in the upper nasal fornix. No corneal, iris or pupil abnormality was observed. No cataract, vitreous hemorrhage, or foreign body in the vitreous or retina was found with pupillary dilatation. Intraocular pressure was 12 mmHg with the applanation tonometer. No foreign body was seen on orbital computed tomography. Strabismus measurements could not be performed because the patient could not open his eyes and a penetrating injury could not be excluded. Immediate exploration and repair under general anesthesia was planned. Patient consent was obtained before surgery.

Surgical procedure No globe penetration was observed during the exploration. The superior rectus (SR) was intact (Figure 2/A). The tendon of the superior oblique muscle after the trochlea was found to have detached from its location of adhesion to the sclera. The tendon was sutured 3 mm temporal and 5 mm posterior to the insertion of the SR to a scleral area 5 mm in width after passing it under the SR. The conjunctiva, eyelid and lacrimal canal cuts were also repaired.

Postoperative follow-up and results: We found 6 PD right hypertropia and vertical diplopia in the primary position at the postoperative 1st week. The patient had no diplopia in the primary position at the postoperative 3rd month follow-up (Figure 2/B). The head tilt test results were normal. Excyclotorsion was not present on the Double Maddox rod test. The patient had no symptom at the six-month follow-up. The eyes appeared orthotropic in the primary position with normal eye movements and 4 PD hypertropia was present on the strabismus examination (Figure 3). The Titmus test result was 100 arc/sec. The Worth four-point test result was five points. The patient was followed-up without intervention.

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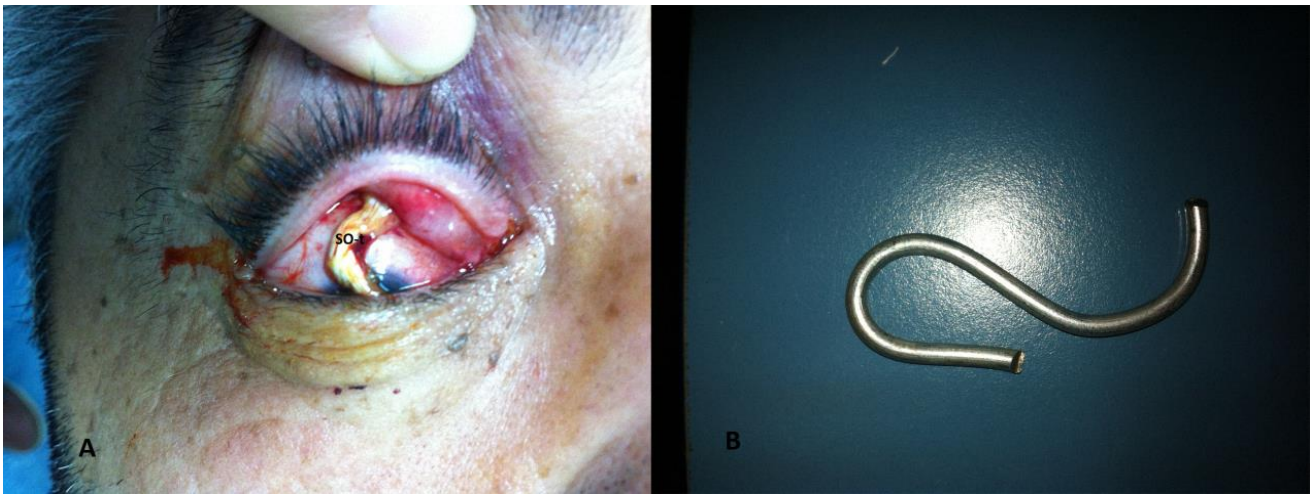

Figure 1: A) Post-traumatic prolapse of the superior oblique muscle tendon (SO-t) downwards from the upper fornix B) The metal hook that caused the rupture of the SO tendon

Figure 2: A) The superior rectus (SR) muscle and the superior oblique (SO) muscle tendon after exploration B) The patient at primary gaze in the post-operative 3rd month

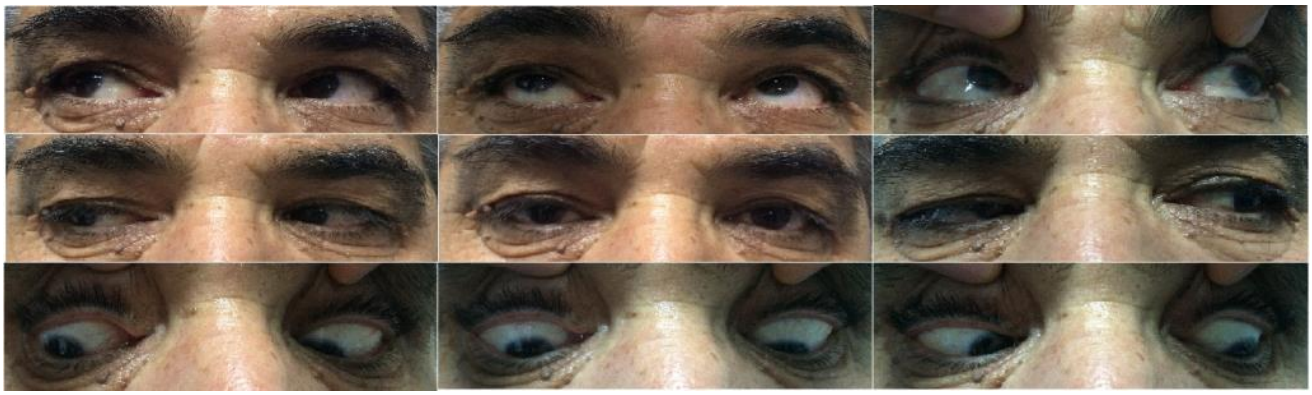

Figure 3: The result in the nine cardinal gaze positions at the post-operative 6th month

Discussion

The SO muscle is the longest muscle originating from the Zinn circle. Approximately one third of its length is made up by the tendon. The tendinous structure starts 10 mm before the trochlea, passes under the superior rectus, and adheres to the sclera at the superotemporal part of the eyeball. The adhesion area is approximately 10-14 mm long. Traumatic injury of the SO muscle is rare and usually due to hook-like structures and occurs together with penetrating upper lid injuries [4,5]. Iatrogenic SO injury has also been reported during upper eyelid surgery [6]. Our case had also suffered an injury with a hook.

Chung et al. [1] repaired the ruptured SO tendon with a 5 mm recession from the medial border of the superior rectus as it was not possible to find the distal end but 20 prism diopter hypertropia developed in the post-

operative 3rd month. The reason was thought to be the iatrogenic fibrosis that developed in the superior rectus after exploration and the muscle not being connected sufficiently laterally to avoid the effect of weakening. Ipsilateral inferior rectus resection was performed for the hypertropia correction and the hypertropia improved. Since we believed the tendon had detached from the insertion region in our case, it was sutured 3 mm temporal and 5 mm posterior to the superior rectus insertion. Approximately 6 PD right hypertropia and vertical diplopia developed but the diplopia had improved at the 3th month follow-up. There was no diplopia and only 3 PD hypertropia at the 6th month follow-up. Harish et al. [2] accidentally excised the SO tendon that was loose and free at the medial border of the superior rectus and no progressive sequelae had developed at the 6th month follow-up. They suggested the reason as the intact posterior fibers of the SO tendon. The tendon in that case had been totally torn as in our patient. We were able to suture the tendon to its anatomical location 5 mm in width. We believe that this suturing prevented a serious post-operative problem.

In conclusion, we believe that the location of the rupture should be determined and suturing performed accordingly in the repair of traumatic SO ruptures. Suturing that conforms to the anatomic insertion will decrease potential post-operative problems. It should be possible to attain a high degree of functional and surgical success in this way.

References

1. Chung HJ, Baek JW, Lee YC. Traumatic rupture of the superior oblique muscle tendon. Korean J Ophthalmol. 2014;28(3):265-67.

2. Harish AY, Ganesh SC, Narendran K. Traumatic superior oblique tendon rupture. J AAPOS. 2009;13(5):485-7.

3. Bloom PA. Medial rectus rupture: A rare condition with unusual presentation. J R Soc Med. 1993;86(2):112-3.

4. Bachynski BN, Flynn JT. Direct trauma to the superior oblique tendon following penetrating injuries of the upper eyelid. Arch Ophthalmol. 1985;103(10):1510-4.

5. Warrier S, Wells J, Prabhakaran VC, Selva D. Traumaticrupture of the superior oblique muscle tendon resulting inacquired Brown's syndrome. J Pediatr Ophthalmol Strabismus. 2010;47(3):168-70.

6. Kushner BJ, Jethani JN. Superior oblique tendon damage resulting from eyelid surgery. Am J Ophthalmol. 2007;144(6):943-8.