

Case report

Isolated inferior rectus muscle rupture following trauma

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Abstract

Background: Isolated rectus muscle ruptures are rare ophthalmic emergencies which may result in permanent diplopia. **Objective:** To highlight updates on clinical features, surgical treatment options and potential complications for isolated inferior rectus ruptures. **Case:** A 39-year-old man came to our emergency department complaining of diplopia and upward deviation of the right eye after experiencing an animal injury. Extraocular movements were limited in the right eye in the downgaze position. The alternate prism and cover test, both at distance and near testing, showed hypertropia of 40 prism diopters (PD) of the right eye. The right eye had periorbital swelling and conjunctival haematoma. An inferior rectus rupture repair was performed under local anesthesia and monitored sedation. Follow-up examination revealed a 20 PD hypertropia, causing diplopia in all gazes. A second surgical intervention was planned six months after the initial surgery, an inferior rectus 6 mm resection was performed, after which orthophoria was achieved in the primary position both at distance and near testing.

Keywords: Inferior rectus muscle, strabismus surgery, trauma, rupture

Introduction

Traumatic rupture of an extraocular muscle is a well known ophthalmic emergency condition and is usually accompanied by penetrating globe and orbital trauma or injuries to adnexial structures. Injuries to the rectus muscle are usually associated with penetrating orbital trauma, eyelid laceration, complex orbital fractures or iatrogenic causes. (Batra et al, 2012; Godeiro et al, 2005; Gupta et al, 2008; Demirayak B, 2015; Paysse et al, 2000; Sloan et al, 1998; Yipp et al, 2006). To the best of our knowledge, there are few published studies on isolated inferior rectus rupture (Batra et al, 2012; Gupta et al, 2008; Sloan et al, 1998). Loss or

incarceration of a rectus muscle requires urgent surgical intervention. Management modalities remain controversy. We aimed to present inferior rectus muscle rupture case treated with primary repair and resection of the muscle as a second surgical intervention. Written informed consent forms were obtained from the patient.

Case report

A 39-year-old man presented with periorbital swelling, conjunctival hemorrhage, diplopia and upward deviation of the right eye for 8 hours, after experiencing an animal injury. Ophthalmic examination revealed that the best corrected visual acuity was 7/10 in the right eye and 10/10 in the left eye. Ocular motility of the right eye had complete restriction of downward movement, while motility of the left eye was normal. The alternate prism and cover test, both at distance and near testing,

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showed hypertropia of 40 prism diopters (PD) of the right eye. (Figure 1) There was an approximately 2 centimeters length laceration in the inferior bulbar conjunctiva and when the laceration route was followed, ruptured inferior rectus muscle was easily visualized. Computed tomography (CT) revealed a normal right orbit except edema at periorbital region. Urgent surgical intervention was performed within 8 hours of presentation. After informing the patient about the surgery and risks, we chose to perform surgery under local anesthesia with sedation. The forced duction test was negative. A transconjunctival approach was preferred to expose the inferior rectus. After dissecting tenon and conjunctiva, we saw that there was 10 mm of the distal part of the muscle attached to the globe. At this stage we ordered the patient to downgaze and upgaze until we located the proximal part. By following the movement in the tenon and subconjunctival space, we located the proximal part of the muscle. The distal muscle segment was sutured to the proximal muscle stump and tenon tissue around it with three 6-0 vicryl sutures. Although in the early postoperative follow-up period the patient showed only 10 PD hypertropia on the right side, in late follow-up examinations he showed 20 PD hypertropia, as well as diplopia in all gaze directions (Figure 2). The patient could not tolerate this condition and we decided to perform a second surgical intervention. In this surgery we performed a forced duction test, which was negative. We then performed a 6 mm inferior rectus resection; postoperatively no deviation in the primary position at either distance or near testing was present (Figure 3). There was diplopia only in the 30 degree downgaze position, which was well tolerated by the patient.



Figure 1: Clinical presentation of the patient shows hyperopia at primary position and restriction of the infraduction.



Figure 2: After the first surgical intervention, patient showed approximately 10 prism diopters hyperopia at right side in postoperative follow-up period



Figure 3: After the second surgical intervention, no deviation at the primary position and minimal limitation at infraduction

Discussion

The inferior rectus muscle originates in the annulus of Zinn. Traumatic injury to the inferior rectus muscle is usually accompanied by orbital fractures (Sloan et al, 1998; Godeiro et al, 2005; Paysse et al, 2000). The medial rectus muscle is the most frequently injured extraocular muscle, followed by the inferior rectus muscle, the superior rectus muscle, and the lateral rectus muscle, respectively (Yargıç & Yazıcı, 2010; Yipp et al, 2006). Diagnosis of a ocular muscle injury depends on clinical suspicion and radiological findings. A preoperative CT scan is an important diagnostic tool for finding a tear in the extraocular muscle (Paysse et al, 2000; Tomasetti et al, 2013). If the CT is normal in spite of clinical indications, an MRI may be mandatory for identifying injured muscles (Kashima et al, 2012). In our patient we revealed hypertropia, total downgaze ocular motility limitation and there was no orbital fracture in CT imaging. After applying a topical anesthetic drop, the lacerated conjunctiva retracted and ruptured inferior rectus muscle was easily visualized in the slit lamp examination.

Treatment modalities of ruptured ocular muscles is controversial (Tomasetti et al, 2013). While the reattachment of a snapped or torn muscle is widely accepted treatment

for an early diagnosed defect, sometimes simultaneous surgery to other muscles is required (Paysse et al, 2000; Tomasetti et al, 2013, Asadi et al, 2006; Godeiro et al, 2005; Cherfan et al, 2011). Other treatment choices are partial or total transposition procedures, recession of the ipsilateral antagonist muscle and anterior transposition of the inferior oblique muscles (Asadi et al, 2006; Godeiro et al, 2005; Cherfan et al, 2011). Although these treatment options should be evaluated on an individual patient basis, transposition procedures have an increased risk of anterior segment ischemia (Paysse et al, 2000; Godeiro et al, 2005).

Conclusion

We presented an unusual case of an isolated inferior rectus muscle rupture that was successfully treated with early surgical repair and additional inferior rectus resection in late follow up period.

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