



## Partial Lateral Rectus Avulsion Due to Cat Scratch

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### Abstract

Isolated rectus muscle rupture due to trauma without globe damage is extremely rare. The most commonly affected muscle is the medial rectus, while the least affected is the lateral rectus. The oblique muscles are much less affected by trauma because they are protected by the surrounding bone structures. Eye movements should be assessed after evaluating the integrity of the globe and performing a detailed eye examination. The most appropriate treatment should be provided as soon as possible after the degree of damage is determined. Especially in animal-related injuries, rabies prophylaxis should be overlooked in addition to tetanus. Here we present a 37-year-old male patient with partial lateral rectus avulsion due to cat scratch.

**Keywords:** Lateral rectus avulsion, cat scratch, strabismus

### Introduction

Isolated traumatic extraocular muscle avulsion without globe damage is extremely rare.<sup>1,2,3,4,5,6</sup> It usually presents as a decrease in eye movement in the direction of the affected muscle, and at least one rectus muscle is observed to be completely damaged.<sup>5,6,7,8</sup> However, if partial damage has occurred, there may be no significant impact on eye movements. Here we describe an isolated partial lateral rectus avulsion due to cat scratch.

### Case Report

A 37-year-old male patient presented to the emergency department on October 23 after a cat scratch to his left eye. The trauma had occurred approximately 1 hour before presentation, and the patient had no history of systemic or eye disease. He was given a tetanus vaccine in the emergency room. However, he refused rabies vaccination because he was scratched by his pet cat, which was vaccinated against rabies.

In the ophthalmological examination, visual acuity was 20/20 in both eyes. The patient was orthophoric in the primary gaze position and his eye movements were free in all directions. Right eye examination findings were normal. In the left eye, an approximately 2-mm laceration was observed in the lateral bulbar conjunctiva, corresponding to the lateral rectus insertion region, and a pink-white tissue was protruding from the wound ([Figure 1](#)). This tissue was tightly adhered to the globe. Orbital computed tomography (CT) revealed no pathological findings.

The patient was admitted for surgery on the same night. During the surgery, it was observed that a 22-mm-long piece of the lateral rectus muscle had been pulled through the conjunctival laceration ([Figure 2](#)). The remaining superior three-quarters of the lateral rectus muscle was intact, and globe integrity was preserved. The severed muscle piece was excised ([Figure 3](#)). Histopathological examination of the tissue confirmed it was striated muscle. The patient used antibiotic (moxifloxacin hydrochloride 0.5%; Vigamox, Alcon, Fort Worth, TX, USA) and steroid (fluorometholone acetate 0.1%; Flarex, Alcon, Fort

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Worth, TX, USA) drops 4 times a day for 1 week postoperatively.

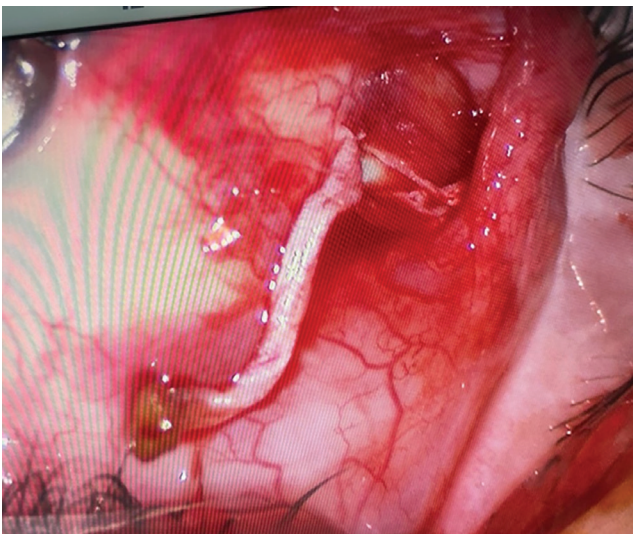
The day after surgery, the patient was orthophoric in the primary position and there was no limitation in eye movements. The patient was checked at 1 week and 1 month postoperatively, and no change in the examination findings was observed.

## Discussion

Although isolated rectus muscle damage due to trauma is rare, the most commonly affected muscle is the medial rectus, followed by the inferior rectus.<sup>1,7</sup> This has been attributed to these muscles' closer proximity to the corneoscleral limbus and Bell's phenomenon.<sup>1,6</sup> In Bell's phenomenon, the medial



**Figure 1.** A 2-mm laceration in the left lateral bulbar conjunctiva with a pink-white tissue protruding from the wound



**Figure 2.** A piece of lateral rectus muscle 22 mm long and 3 mm wide piece protruded from the conjunctival laceration and was tightly adhered at the insertion site. The remaining superior three-quarters of the lateral rectus muscle was intact

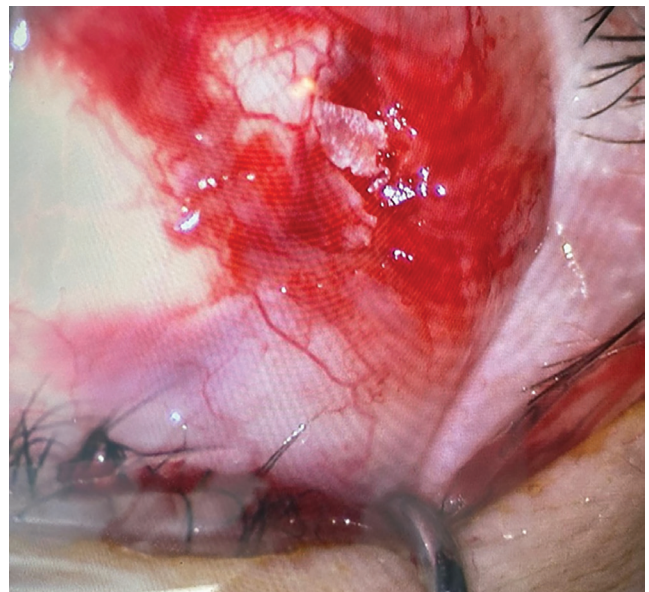
rectus and inferior rectus come to the fore as the eye reflexively moves upward and outward. The oblique muscles are damaged much less frequently because they are well protected by the surrounding tissues.

Visual acuity, fundus examination, and globe integrity should be evaluated carefully in patients with traumatic extraocular muscle injuries. When necessary, a detailed evaluation of the damaged muscle can be performed with tests such as magnetic resonance imaging and high-resolution CT. We performed orbital CT to better evaluate extraocular structures, the condition of the muscle we thought was damaged, and the presence of a foreign body, but this examination is not mandatory in every patient. In addition, the oculocardiac reflex is an important aid in correctly identifying muscle tissue during the operation.<sup>1</sup>

Although there is no consensus on the optimal timing of surgical treatment after injury for a good recovery, Minguini et al.<sup>1</sup> performed repair within 1-3 days and achieved successful results. As we thought an earlier intervention would lead to better motor and sensory recovery, we performed surgery 5 hours after the injury.

In another patient with partial lateral rectus avulsion due to a cat scratch, Williams et al.<sup>5</sup> observed that the muscle piece was detached from the posterior point of origin and attached to the globe at the anterior insertion region, as in our patient. This suggests that the anterior insertion is not the weakest attachment point of the lateral rectus muscle.

Since the medial rectus muscle does not attach to the surrounding tissues, in case of total rupture, it moves further back and is very difficult to find.<sup>1,9</sup> If it is ruptured from the posterior origin region, as in our case, repair is difficult and the ruptured part can be excised. If other muscles are torn from their insertion site, they do not go back too far due to their adhesion to the surrounding tissues and can be easily found and sutured instead.



**Figure 3.** The severed muscle piece was excised

The first treatment option is to reattach the severed muscle or tendon ends. If suitable ends cannot be found, it may be necessary to transfer from adjacent rectus muscles.<sup>6</sup> However, care must be taken during this process, because if one muscle is avulsed and the other two muscles are completely transferred, the blood supply to all three rectus muscles will be impaired. While this can sometimes be done in younger patients, it would be more appropriate to perform partial muscle transfer (such as the Jensen procedure or Nishida transposition surgery with vessel sparing) in children and patients over the age of 50.<sup>6</sup> Vessel-sparing Nishida transposition surgery is more preferred today. Even if patients with partial lateral rectus avulsion exhibit no postoperative impairment of eye movements, regular follow-up should be performed because eye movements may deteriorate in the future due to decreased or lost function in the remaining intact muscle.

After injury, care must be taken in terms of tetanus and rabies prophylaxis. It is known that most animal-related traumas are caused by pets.<sup>10</sup>

Isolated traumatic rectus muscle rupture is an extremely rare condition. Globe integrity and eye movements should be evaluated quickly and the most appropriate treatment provided as soon as possible. When the avulsed muscle piece is large, it may cause restriction in eye movements and eye misalignment. Therefore, repair should always be the first choice, and excision should be considered if this is not possible. Tetanus prophylaxis

should definitely be questioned, and rabies prophylaxis should not be overlooked in animal injuries.

#### **Ethics**

**Informed Consent:** Obtained.

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#### **References**

1. Minguini N, Ikeda KS, de Carvalho KM. Traumatic avulsion of extraocular muscles: case reports. *Arq Bras Oftalmol.* 2013;76:124-125.
2. Plagger DA, Parks MM. Recognition and repair of the "lost" rectus muscle. A report of 25 cases. *Ophthalmology.* 1990;97:136-137.
3. MacEwen CJ, Lee JP, Fells P. Aetiology and management of the 'detached' rectus muscle. *Br J Ophthalmol.* 1992;76:131-136.
4. Reese PD, Judisch GF. Severed musculus rectus internus caused by a dog bite. *Klin Monbl Augenheilkd.* 1988;193:504-505.
5. Williams CP, Sleep TJ, Morris RJ. Lateral rectus muscle avulsion by a cat scratch. *J AAPOS.* 2002;6:397-399.
6. Helveston EM, Grossman RD. Extraocular muscle lacerations. *Am J Ophthalmol.* 1976;81:754-760.
7. Bloom PA, Harrad R. Medial rectus rupture: a rare condition with an unusual presentation. *J R Soc Med.* 1993;86:112-113.
8. Paysse EA, Saunders RA, Coats DK. Surgical management of strabismus after rupture of the inferior rectus muscle. *J AAPOS.* 2000;4:164-167.
9. Knapp P. Lost muscle. In: *Symposium on strabismus: transactions of the New Orleans Academy Ophthalmology.* St Louis: CV Mosby; 1978:301-306.
10. Chang JH, Mills RA, Pater J, Crompton JL. Case series of cat-scratch-inflicted full-thickness corneal lacerations and a review of the literature. *Clin Exp Ophthalmol.* 2012;40:669-674.