

A Novel Case of Superior Rectus Injury and Its Subsequent Surgery

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Key Words

Superior rectus · Dog bite · Knapp procedure

Abstract

We report a presumed damage to the left superior rectus (SR) muscle following a dog bite injury that resulted in a marked weakness of elevation and vertical diplopia. A 30-year-old male presented in October 2010 following a dog bite around his left superotemporal orbit. An ophthalmic examination was unremarkable. The patient immediately complained of vertical diplopia, which did not settle during a period of observation lasting approximately 9 months following the attack. An orthoptist examination confirmed a marked restriction of upgaze. A diagnosis of isolated SR injury, secondary to the dog bite, was suspected. A left Knapp procedure was performed. The surgery was uneventful with scar tissue found around the SR. Three months following his surgery, the patient was orthophoric in both primary positions and in the downgaze with a residual 20-prism dioptre hypotropia in the upgaze. Our patient was unusual in that the bite weakened the SR in isolation. We also show the successful management of this novel case using a simple Knapp procedure. © 2015 S. Karger AG, Basel

Introduction

We report a presumed avulsion of the left superior rectus (SR) muscle following a dog bite injury, which resulted in a marked weakness of elevation and vertical diplopia. The patient was successfully treated using a Knapp transposition procedure. Several cases of ocular trauma following dog bites have been reported, including the 'canine tooth syndrome', which results in a superior oblique weakness; however, such a case of SR weakness and its subsequent treatment has not yet been previously reported in the literature. The aim of this case report is to show a novel mechanism of SR injury and the use of the Knapp procedure to manage this.

Case Report

A 30-year-old male presented in October 2010 following a dog bite around his left superotemporal orbit. No ocular trauma was found on examination; however, an upper lid laceration had been previously repaired leaving a scar on the upper tarsus. The patient immediately complained of vertical diplopia following the attack; however, despite an extended period of observation lasting 9 months, he remained symptomatic. Visual acuity was 6/6 OU, and he maintained single vision by using a chin-up head position. His ophthalmic examination was unremarkable. An orthoptist examination confirmed a marked restriction of upgaze. The patient was able to look up beyond the midline (see Hess Charts) (fig. 1). There was no increase in intraocular pressure on attempted elevation. Prism cover testing was performed at distance fixation and showed a 40-prism diopter (PD) left hypotropia in upgaze, 35 PD in the primary position, and 3 PD hypophoria on the downgaze. He was binocular in downgaze, measuring 85' in depression using the Frisby test. On the MRI scan, the SR was grossly intact; however, motion blurring meant that it was not possible to exclude small abnormalities. Despite the absence of imaging confirmation, a diagnosis of isolated SR injury, secondary to the dog bite, was suspected. Forced duction testing under general anaesthetic was free in all positions, indicating that an elevating force was required. A left Knapp procedure was performed. The surgery was uneventful with scar tissue found around the SR. An ophthalmic examination 3 months following surgery showed a visual acuity of 6/6 OU, and it also showed that the patient had a residual 20 PD hypotropia in the upgaze; he was, however, orthophoric in both primary positions and in the downgaze (fig. 2). The patient was discharged with him being asymptomatic in the majority of his daily activities.

Discussion

The Knapp procedure is normally utilised to treat double elevator palsy. However, the Knapp procedure can also be used where an elevating force needs to be generated (as in our case). The Knapp procedure is a transposition of the lateral and medial rectus muscles towards the borders of the SR. The transposition may be combined with an inferior rectus recession at a later date [1]. In our case, there was no inferior rectus contracture as the forced duction test was free, so a recession was not required. Dog bites causing ocular damage usually occur in children and are well documented. Reported injuries include: soft tissue lacerations, orbital fractures, medial rectus rupture and ptosis from levator palpebrae superioris damage amongst others [2, 3]. A case of isolated trauma to the SR causing either a paresis or palsy has not been previously reported. One report of a superior rectus palsy following a contralateral lesion of the superior rectus nuclei has been reported; however, in that patient, surgical intervention was not required [4]. This makes the usage of the Knapp procedure in our case novel. Our patient did not experience any other ocular damage and was left with only a small scar on the superior tarsus from the bite. Separating SR from the roof of the orbit is the levator muscle and the frontal nerve. Interestingly, the patient had no ptosis, and so it was presumed that the bite must have been a very unusual mechanism as there was no lasting damage to either of these structures. A possible mechanism may have been a puncture wound where any damage to the levator muscle may have been insufficient to cause a functional loss. The nearest comparable pathology is the canine tooth syndrome. It was first reported in 1982. Canine tooth syndrome is a palsy of the superior oblique muscle and an inability to elevate the eye in abduction following dog bites [5, 6].

Conclusions

This patient was unusual in that the bite managed to weaken the SR in isolation. We also showed the successful management of the case using a simple Knapp procedure.

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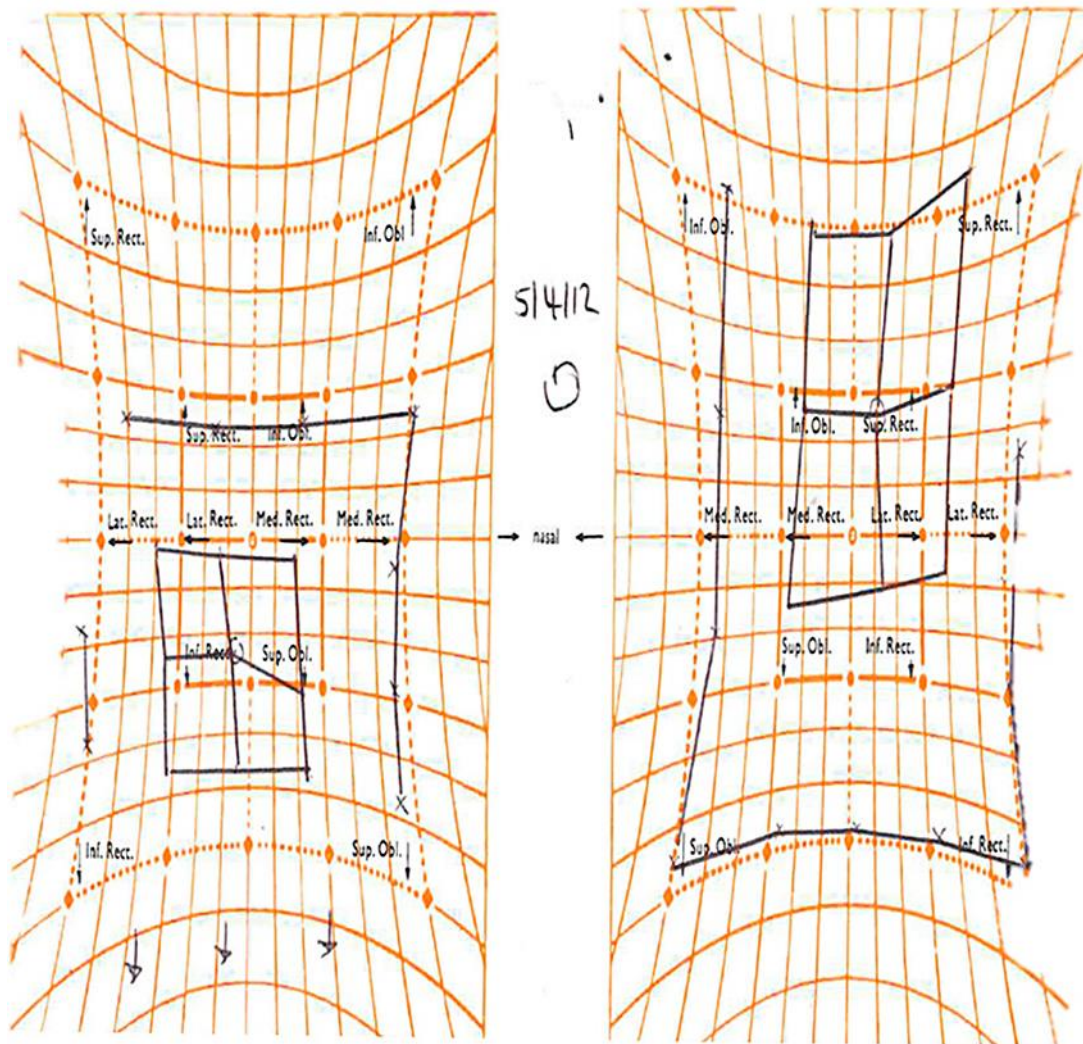


Fig. 1. Hess chart.

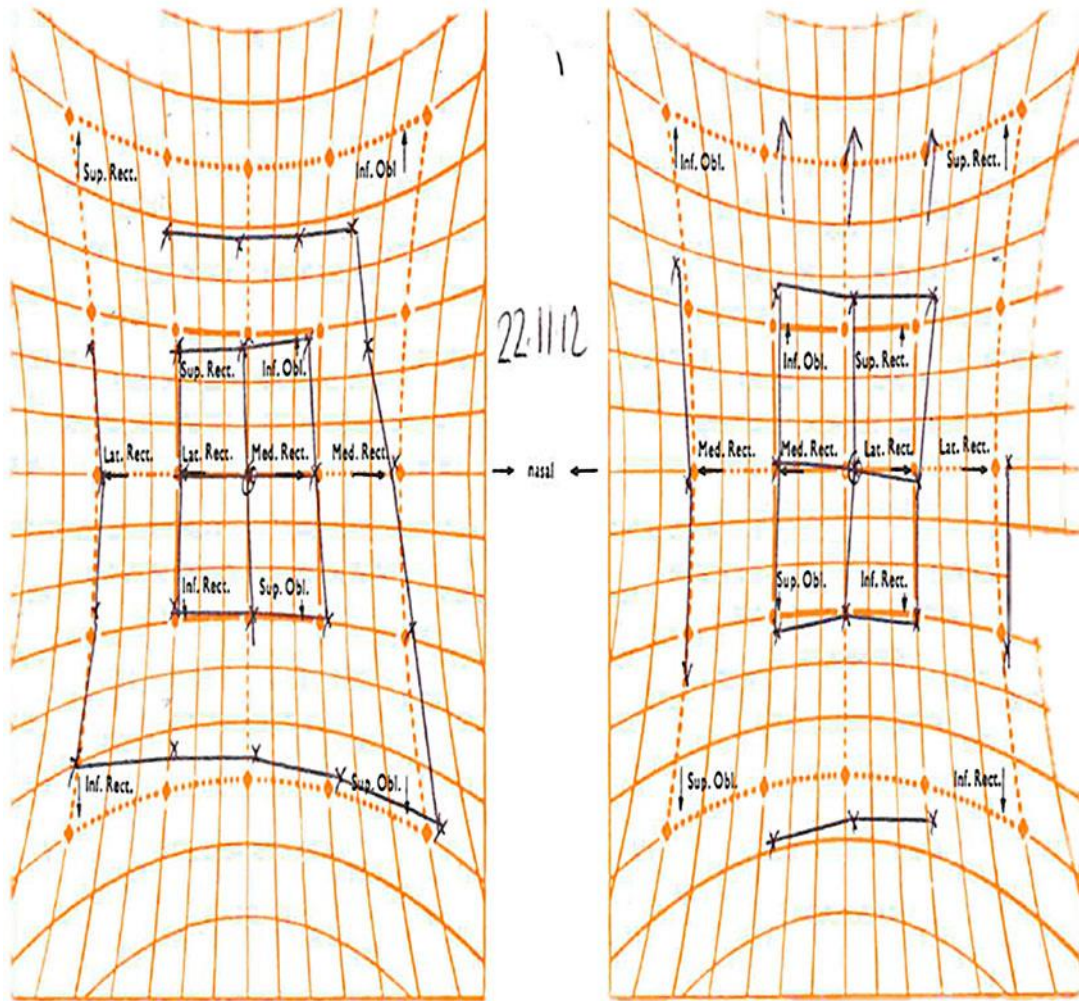


Fig. 2. Hess chart.