Case Report

Surgical repair of traumatic rupture of superficial and deep digital flexor tendon in a 7 year old working mule with complicated skin injury

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ABSTRACT

A 7 year old working mule, with the history of traumatic injury on left hind limb, was presented to TVCC within 6-7 hours of injury with open complicated skin wound. Physical and clinical examination revealed rupture of superficial and deep digital flexor tendons with relative soft tissue and skin damage. The case was diagnosed as traumatic flexor tendon rupture and posted for surgical correction by Bunnell-Mayer suturing technique. Anaesthesia was induced using Xylazine (1.1 mg/kg) and Ketamine (2.2 mg/kg) combination and maintained with thiopental sodium (500 mg) under lateral recumbency. Polylactin-910 (#2) suture was preferred for tenorrhaphy because of higher tensile and functional strength. Post-operative immobilization was achieved by fiber-glass full limb cast. Animal showed lameness for the first post-operative week, and then slowly reduced. During the cast removal at 6th week post-operatively, there was exuberant granulation tissue formation, which was removed by using cauterezation. The dressing of wound was continued with proper debridement and antibiotic till the re-establishment of damaged tissue.

Keywords: Horse, Tendon, Polyglactin, Tenorrhaphy

INTRODUCTION

Surgical repair of flexor tendon lacerations involves debridement of wound with or without tendon suturing and closure of the wound under general anesthesia in lateral or dorsal recumbency. The aim of tenorrhaphy is to restore tendon gliding function, minimize gap formation between the tendon ends, minimize adhesion formation, and preserve functional vasculature.\(^1\) Therefore, in the present case, the objective was to oppose and immobilize the tendons, so as to facilitate the normal functioning of the limb to prevent ground touching posture of the fetlock (hyperextension of metatarsal-phalangeal joint). As the condition is worsened with both flexors rupture, immobilization without suturing has the less scope of healing compared to traditional debridement and immobilization technique by loop pulley and the interlocking loop tenorrhaphy.\(^2,3\)

METHODS

A 7 year old working mule with the history of traumatic injury on left hind limb was presented to TVCC with open complicated skin wound. Physical and clinical examination revealed rupture of superficial and deep digital flexor tendons with relative soft tissue and skin damage (Figure 1). Animal was made lateral recumbent by anesthetic protocol of Xylazine (1.1 mg/kg) and ketamine (2.2 mg/kg) combination for induction and Thiopental sodium (500 mg) for maintenance. Preoperatively antibiotic combination of Inj. Amoxicillin and Sulbactam 12 mg/kg body weight was administered. The surgical site was prepared aseptically by applying 0.5 per cent chlorhexidine solution. The flexing of the fetlock joint and distal phalanges was done to locate the distal tendon end (Figure 2 and 3). The wound was debrided and lavaged using diluted povidone-iodine solution to
remove dirt and foreign materials. Finally the tenorrhaphy was performed by two suture techniques i.e. the three loop pulley and the interlocking loop using Polyglactin 910 (#2) (Vicryl®). Subcutaneous tissue was opposed in conventional manner by using same suture material. Immobilization was done by using splints and casting the limb fully with 6 inch fiber glass (Figure 4). The repeated casting was performed on every 4 week interval for two times.

**Figure 4: Full limb cast after surgery.**

### DISCUSSION

The ligament and tendon healing follows a cardinal events consisting of haemorrhage, inflammation, fibroplasia, synthesis of collagen and remodelling. The first collagen to be formed is Type III collagen at the site of injury, and it forms the inter-fibrillar cross-linkage awarding early stability and mechanical strength.

Ultrasonography is the most common technique used to diagnose the tendon rupture and monitor healing. The extensive number of treatments available for the treatment of tendon and ligament injuries but good outcome is rare. Treatment should be selected as per the stage and severity of disease, use of horse (racing is still the most severe test for an effective treatment) and follow-up time (re-injuries tend to occur when the horse is back racing but not before). Most of the cases show the guarded prognosis, but the outcome depends on accurate diagnosis of which structure is injured, the stage and severity, and the treatments based on the pathophysiology.

Very few cases, reported in the literature, related to the repair of traumatic tendon ruptures. Carbon fiber tows or sutures were used successfully for the repair of tendon in both experimental and clinical studies. Tenorrhaphy of the deep digital flexor tendon, with carbon fiber sutures with external cooptation, had a cosmetic outcome and provided better support than external cooptation without tendon sutures. Results of these studies suggested that carbon fiber may be an advantageous suture material for the repair of lacerated tendons. In a study of appositional superficial digital flexor tenorrhaphy in horses, nylon produced a stronger, less reactive scar than carbon fiber, particularly after 6 months of healing. A study found that horses treated surgically were 1.3 times more likely to race on 5 or more occasions, but there was a trend towards an increased risk of new or recurrent injury. These horses were also 5.5 times more likely to experience suspensory ligament injury.
CONCLUSION

Tendon injury is the one of the most common cause of culling of horses in the racing field. In the present case animal showed lameness for the first post-operative week and then slowly reduced. During the cast removal at 6th week post-operatively injured site showed exuberant granulation tissue formation which was removed by using cauterization. Post-operative antibiotic (inj. amoxicillin and sulbactam 12 mg/kg body weight twice daily) was administered for 10 days, and dressing of wound was continued with proper debridement up to convalescence period. After the end of treatment period, controlled exercise programme for rehabilitation of the horse was followed. There is a risk in the rehabilitation duration, with studies demonstrating poorer prognosis for return to racing without re-injury in horses rested for not less than 6 month.

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