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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. Polyglactin-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 cauterization. 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 metatarso-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 1: Ground touching posture of the fetlock before surgery.

Figure 2: Exposed surgical area showing ruptured flexor tendons.

Figure 3: Photograph showing sutured flexor tendons.

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.[4,5] Equine subcutaneous tissue shows more irritation after lavage with chlorhexidine than canine tissue.[6] 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.[7] 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).[8] 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.[9,10] 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.[11] 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.[12]

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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REFERENCES

1. Eliashar E, Schramme MC, Schumacher J. Use of a bioabsorbable implant for the repair of severed digital flexor tendons in four horses. Vet Rec. 2001;148:506-9.
2. Foland JW, Trotter GW, Stashak TS. Traumatic injuries involving tendons of the distal limbs in horses: a retrospective study of 55 cases. Equine Veterinary J. 1991;23:422-5.
3. Gibson KT, Burbidge HM, Robertson ID. The effects of polyester (terylene) fibre implants on normal equine superficial digital flexor tendon. New Zeal Vet J. 2002;50:186-94.
4. Gelberman R, Goldberg V, Kai-Nan, Banes A. Tendon: Injury and Repair of the Musculoskeletal Soft Tissues. American Academy Orthopaedic Surgeons Symposium. 1987:1-40.
5. Jack EA. Experimental rupture of medial collateral ligament of the knee. J Bone Jt Surg. 1950;32:396-402.
6. Amber El, Henderson RA, Swaim SF, Gray BW. A comparison of antimicrobial efficacy and tissue reaction of four antiseptics on canine wounds. Vet Surg. 1983:12:63-88.
7. Watkins JP, Auer JA, Gay S, Morgan SJ. Healing of surgically created defects in the equine superficial digital flexor tendon: Collagen-type transformation and tissue morphologic reorganization. Am J Vet Res. 1985;46:2091-6.
8. Thorpe CT, Clegg PD, Birch HL. A review of tendon injury: why is the equine superficial digital flexor tendon most at risk? Equine Vet J. 2010;42(2):174-80.
9. Brown MP, Pool RR. Experimental and clinical investigations of the use of carbon fiber sutures in equine tendon repair. J Am Vet Med Assoc. 1983;182:956-66.
10. Valdez H, Clark RG, Hanselka DV. Repair of digital flexor tendon lacerations in the horse, using carbon fiber implants. J Am Vet Med Assoc. 1980;177:421-36.
11. Nixon AJ, Stashak TS, Smith FW, Norrdin RW. Comparison of carbon fibre and nylon suture for repair of transected flexor tendons in the horse. Equine Vet J. 1984;16:93-102.
12. Gibson KT, Burbidge HM, Pfeiffer DU. Superficial digital flexor tendonitis in Thoroughbred racehorses: outcome following non-surgical treatment and superior check desmotomy. Aust vet. J. 1997;75:631-5.

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