CASE REPORT
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THERAPEUTIC MANAGEMENT OF DEEP DIGITAL FLEXOR TENDONITIS IN A SPORTING HORSE – A CASE REPORT

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ABSTRACT

An eight-year-old sporting horse was reported with complaint of lameness and the case was diagnosed as deep digital flexor tendonitis of right forelimb. Diagnosis was made with thermoscan and ultrasonography. The case was treated with rest, compression bandage, hydrotherapy and exercise management. Digital flexor tendon injuries if not treated in time could hamper the sporting career of equines.

Keywords: Digital flexor tendonitis, Hydrotherapy, Sporting horse, Thermoscan, Ultrasonography.

INTRODUCTION

Flexor tendons namely the deep digital flexor (DDF) tendon and the superficial digital flexor (SDF) tendon run down the back of the limb from the level of the knee/hock (Webbon, 1977). The SDF ends on the pastern and the DDF end on the back of the pedal bone. At the level of the knee and hock along with the fetlock and pastern region the tendons are enclosed by a fluid filled sheath. The most commonly recognised sheath is the digital sheath at the fetlock/pastern region with the sheath at the hock called the tarsal sheath and the knee carpal sheath. Several strong, short annular ligaments help to keep the tendons in place in regions of high movement such as joints (Coudry and Denoix, 2013). The DDF runs down the back of the leg and behind the heel to attach to the bottom of the coffin. Its main job is to flex the leg, but it also plays a supporting role at the heel, where the tendon fibres fan out and pass over the distal sesamoid bone.

Injury to these tendons commonly occurs during competitions or exercises. Unfit horses are prone to tearing of fibres if exposed to strenuous exercise. Even in fit equine athletes, fast work or work on uneven ground high-speed jumping can damage these structures. The degree of damage can range from minor, with minimal fibre damage to severe with total tendon rupture. DDF injuries can sideline horses for varying amounts of time based on their severity.

CASE HISTORY AND OBSERVATIONS

An eight-year-old sporting gelding was reported to the veterinary clinic with complaint of lameness for last 2 days. The horse was actively participating in one star level eventing competition prior to the onset of lameness. No other physiological abnormalities were reported.

The sporting horse was having a body condition score of five (Carroll and Huntington, 1988) and was very active. On clinical examination, the horse was showing a body temperature of 100.1 °F, heart rate of 50 beats per minute, respiration rate of 22 breaths per minute and a capillary refill time of less than two seconds. The mucous membrane was pale pink and the patient was well hydrated. The haematological and serological values of patient were apparently normal (Table 1)

The horse was trotted on a flat hard surface initially in a straight-line followed by in small circles in either direction. The landing phase of right forelimbduring trotting revealed head node and was identified as lame limb. All four limbs were examined systematically from the distal joint upwards. Palpation did not reveal any swelling in the right forelimb (Fig. 1). Palpation of right forelimbat the level of caudal fetlock joint revealedpain. Pain sensation was also observed while palpating the tendons.

Thermographic examination was carried out to detect the seat of lameness. The scan revealed presence of white patches on the distolateral aspect of fetlock region of the right forelimb (Fig. 2).

Table 1: Haematological and serological parameters

PARAMETER	VALUE
Haemoglobin	13.5 g/dl
Total leukocyte count	10 thousands/mm^3
Neutrophils	62 %
Lymphocytes	36 %
Eosinophils	01 %
Monocytes	01 %
RBC Count	10.2 millions/mm^3
Platelet count	2.20000/mm^3
Packed cell volume	40 %
Aspartate amino transferase	184 U/L
Lactate dehydrogenase	138 U/L
Creatine kinase	290 U/L
Protein	6.2 g/dL

Fig 1: Appearance of patient

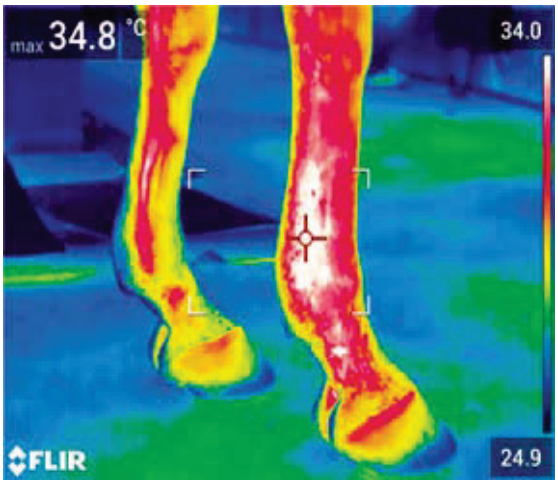

Fig 2: Thermoscan image

Ultrasonographic examination on transverse view revealed hypoechoic patch in the DDF of right forelimb. SDF and suspensory ligament (SL) were apparently normal(Smith *et al.*, 1994). No other pathological changes could be revealed sonographically on the right forelimb (Fig. 3).

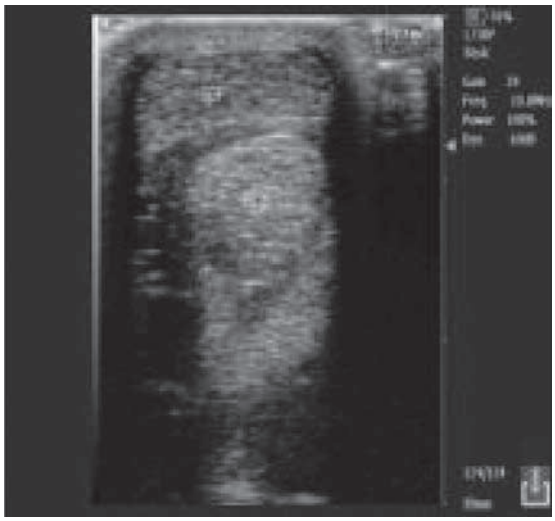

Fig 3: Hypoechoic patch in the deep digital flexor tendon

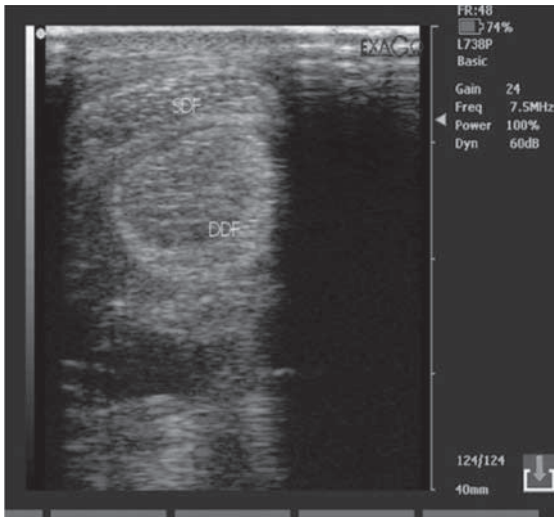

Fig 4: Ultrasound image on tenth day

TREATMENT AND DISCUSSION

Topical application of cold water (5 °C)was given for thrice daily for three days to cause vasoconstriction at the site of injury(Oikawa and Kasashima, 2002). On the fourth day onwards flexor tendons of the right thoracic limb were heated

with continuous ultrasound for 10 minutes twice daily per effective radiating area of 5.0 cm^2 using a frequency of 3.3 MHz and an intensity of 1.0 W/cm^2. This was followed by compression bandage, which was changed every 24 hours for one week (Montgomery *et al.*, 2013)

The case was reviewed after 1st week and there was marked decrease in lameness and reduced pain on palpation of right forelimb. The improvement of the condition was confirmed by ultrasonography (Fig. 4) after 10 days. The sporting horse was slowly returned to exercise by 2nd week and had an uneventful recovery within one month.

Tendonitis usually appears after fast exercise and is associated with overextension and poor conditioning, fatigue, poor conditions of sports arena, and persistent training when inflammatory problems in the tendon already exist (Dowling *et al*, 2000). Defective shoeing may also predispose to tendonitis. Poor conformation and poor training also have been implicated (Wallis *et al.*, 2010). The horse was exercised and prepared for competition in a newly laid out arena and could have contributed towards the injury.

Tendon injuries are characterised by an increased thermal pattern relative to adjacent regions (Eddy *et al.*, 2001). Thermography is often used along with the physical examination to detect and/or confirm areas of palpable pain (Turner, 1991). Ultrasonography is a very commonly used technique to diagnose tendon injuries in equines (Reef, 1991). In the proximal forelimb, the DDF tendon lies dorsolateral to the SDF tendon. As DDF runs distally, it becomes more circular and also reduces in the cross-sectional area (CSA). In the mid-metacarpal level, the accessory ligament (AL) of DDF tendon joins the DDF on its dorsal surface and becomes enclosed in the paratenon. In the distal metacarpal region, the DDF tendon increases in the CSA and becomes oval in shape at the level of the metacarpal joint (Smith, 2008). The hypoechoic area in present case was localised and extended only to a short distance proximo-distally.

Tendonitis is best treated in the early, acute stage. The horse should be stall-rested, and the swelling and inflammation treated aggressively with cold packs and systemic anti-inflammatory agents. Some degree of support or immobilization should be used, depending on the amount of damage to the tendon(Smith, 2008). Use of analgesic was avoided since the horse actively participated in international equestrian events and had a history of repeated colic admissions. Analgesic effect of ice-cold water and therapeutic ultrasound was judiciously used during treatment.

Ultrasound can impart both thermal and non-thermal effects to the body tissues. Thermal effects alter the skeletal muscle contractile process, reduce muscle spindle activity and reduce muscle spasm to increase tissue extensibility. This effect also cause vessel vasodilatation and enhance circulation and assists process of healing. Elastic properties of collagen tissue and its molecular bonding are altered by heating. Micro streaming of fluids along cell membranes alters cell membrane structure, function and permeability. Pulsed ultrasound reduces neural conductivity of peripheral nerves there by reducing muscular spasm and pain.

CONCLUSION

The digital flexor tendons are complex structures and are commonly implicated in equine lameness. There are multiple ways to diagnose flexor tendon pathologies and this can be achieved stable-side using diagnostic anaesthesia, thermography, ultrasonography, magnetic resonance imaging, contrast tenography and tenoscopy. Ultrasonography is the main imaging modality used to assess tendonitis as used in this case study. Such injuries should not be taken lightly and should be treated in time. Reaching a proper diagnosis can be tricky but is very important, as important as an effective treatment approach.

In the present case an eight-year-old eventing horse was diagnosed with deep digital flexor tendonitis of right forelimb through thermoscan and ultrasonography. The case was treated with rest, compression bandage, hydrotherapy, therapeutic ultrasonography and exercise management. The patient had an uneventful recovery in one month.

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