



## Case report

### Surgical Approach for the Treatment of Foot Knuckling in a Horse

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## Abstract

A horse with flexural deformity of the metatarsophalangeal joint was evaluated and the condition was diagnosed as chronic contraction of both superficial and deep digital flexor tendons. Evaluation was made on the basis of clinical signs and visually observed lesions. The horse was treated with tenotomy of both superficial and deep digital flexor tendons. In this study, the horse responded enough to withstand light draught work, although a firm swelling on the proximal part of the hind fetlock is still present. The owner quit the treatment programme and we were unable to continue monitoring the development of the condition.

**Keywords:** Flexural deformity, Tenotomy, Fire cauterization

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## Introduction

Contraction of the flexor tendons may be either congenital or acquired; it may involve the deep and/or the superficial digital flexor tendons (Stashak, 2002). Congenital contraction may occur as a result of many reasons such as genetic factors (Hutt, 1968), due to outbreaks of influenza in the mares during pregnancy (Fessler, 2005), while acquired contraction may occur as a result of pain which potentially initiate a flexion withdrawal reflex that results in flexor muscle contraction (Stashak, 2002). The clinical manifestation of the flexion varies depending on the tendon affected and the degree of contraction.

Two distinct clinical conditions are associated with the desmopathy of the

accessory ligament of the deep digital flexor tendon (ALDDFT) of the hind limb. Traumatically induced injury resulting in acute onset lameness appears to have a favourable prognosis, with most horses returning to previous work. However, postural changes, once present, are irreversible and indicate a poor prognosis (Eliashar *et al.*, 2005). Knuckling and/or semi flexion of the metatarsophalangeal joint may accompany the condition; therefore, if a horse is presented with a flexural deformity of this joint, desmopathy of the ALDDFT should be considered as a primary differential diagnosis (Eliashar *et al.*, 2005).

Horses with mild to moderate flexural deformity of the metatarsophalangeal joint

treated with corrective trimming and shoeing; or with desmotomy of the accessory ligament of the deep digital flexor tendon and corrective shoeing, returned to useful work. None of the horses with severe disease treated with desmotomies of the accessory ligaments of both deep and superficial digital flexor tendons, followed by corrective shoeing, responded enough to withstand strenuous athletic training (Wagner *et al.*, 1985). This study aimed to document the results of surgical treatment of a foot knuckling in a horse with contraction of both deep and superficial digital flexor tendons.

### Case presentation

A seven years old grey horse of local breed was brought to the clinic of the Faculty of

Veterinary Science, University of Nyala, South Darfur State, Sudan. The history presented by the owner revealed that the animal suffered from mild limbing of the left hind limb six months ago, immediately after the occurrence of lameness the animal was put at complete rest after application of fire cauterization on the thigh (Figure 1-a) and croup (Figure 1-b), and the affected joint (Figure 1-c). The animal was also injected with antibiotic and it was not examined by any veterinarian during that time. The animal owner reported that the affected limb lost function gradually after the mild limbing until it was completely knuckled three months after occurrence of the lameness.



Figure 1-a: Fire cauterization of thigh



Figure 1-c: Fire cauterization of fetlock joint



Figure 1-b: Fire cauterization of croup

Visual examination of the animal revealed that the animal was suffering from third degree knuckling of the foot. The animal was unable to walk properly or even to support its weight on the proper way as shown in Figure (2). Full manual extension of the fetlock was impossible. Examination of the area revealed contraction of both deep and superficial



**Figure 2: Complete knuckling of the foot**

The surgical operation was performed under general anaesthesia (Xylazine HCl  $1.1\text{mg.kg}^{-1}$  +Ketamine HCl  $2.2\text{ mg.kg}^{-1}$  +Thiopentone sodium  $1\text{mg.kg}^{-1}$ ) injected intravenously together with local contracted tendons were palpated and separated, then the deep digital flexor tendon was transected, however, the limb did not return to its normal position and still incompletely extended at the level of fetlock region, a quick decision was made to transect the superficial digital flexor tendon. The tenotomy of both the deep

digital flexor tendons. Visual examination also showed that there was an infected wound on the dorsal aspect of the fetlock joint as illustrated Figure (3), also there were signs of fire cauterization on different parts of the hind limb. Surgical interference was the decision of the team due to severity and chronicity of the contraction.



**Figure 3: Infected wound on the dorsal aspect of the fetlock joint**

infiltration of the incision site with LidocaineHCl 5%. After incision of the skin at the caudo-lateral aspect of the midmetatarsal region, tendon sheath was dissected and the two severely and superficial digital flexor tendons resulted in complete extension of the fetlock. The skin was sutured and treated with antibiotic. A wooden cast (from local material) was applied to keep the fetlock extended (Figure 4), and was removed after two weeks.



**Figure 4: The application of wooden cast**

The wound on the dorsal aspect of the fetlock (Figure 3) was treated as an infected wound by cleaning, debridement, local application of iodine and systemic antibiotic. Supportive bandage with window was made for 21 days after operation.

One month later the animal was able to land the foot properly on the ground and it was also able to walk with moderate

limbing. Three months later the animal was able to walk and even to trot with very mild limbing and the wound was completely disappeared leaving a very small scar (Figure 5), but it was noticed that there was over extension of the fetlock joint during foot landing and a firm swelling was observed in the proximal part of the fetlock joint (Figure



**Figure 5: The dorsal part of the fetlock after healing of the affected wound**



**Figure 6: Firm swelling on the proximal part of the fetlock**

## Discussion

Although visual and manual examination were the only available diagnostic aids for this case, it is clear that they were reliable methods for diagnosis as shown by the cure of the case after surgical interference.

Surgical interference is routinely used in treatment of acquired contraction of digital flexor tendons after failure of other methods of treatment and when the case is still acute (Stick *et al.*, 1992; Fulton *et al.*, 1994; Hawkins and Ross, 1995; Southwood *et al.*, 1999), but in this case there was no possibility for other methods of treatment due to severity and chronicity of the case and due to failure of manual extension of the affected joint, so the choice of surgical interference was the right decision to treat the case.

The surgical interference succeeded in treatment of the contraction, but the overextension of the joint during limb landing may indicate that the animal may not be able to carry on hard work. The swelling seen at the proximal part of the fetlock may be due to fibrosis caused by irritation in the early acute stage of the injury.

Deep flexor tenotomy is indicated for severe long standing cases of deep digital flexor tendon (DDFT) contraction, but in others fibrosis and contraction of the joint capsule and its associated ligaments does permit proper realignment. The cosmetic appearance following tenotomy is sometimes unsatisfactory, and the functional ability of the limb is limited due to the drastic nature of the surgery (Stashak, 2002).

The lack of veterinary extension and ignorance of the animal owner had led to a great complications and economical loss to the owner family.

## Conclusion

Tenotomy of both superficial and deep digital flexor tendons appeared to be of a value in treating chronic cases of knuckling in horses. Corrective hoof trimming and shoeing may improve the percentage of operation success and may allow animals to return back to draught work and/or sportive activities.

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#### دراسة حالة

#### التدخل الجراحي لعلاج انثناء المفصل المشطي السلامي في حصان

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#### المستخلص

تم فحص حصان يعاني من انثناء و تشوه المفصل المشطي السلامي وتم تشخيص الحالة علي انها انقباض زمن في كلاً من الوترين السطحي والعميق القابضين للقدم. و تم تقييم الحالة اعتماداً على العلامات الاكلينيكية و الآفات الملاحظة بصرياً. تم علاج الحصان بقطع الوتر السطحي والوتر الغائر الغابض للقدم (SDFT & DDFT). بعد هذه المعالجة الجراحية قد لا يستطيع الفرس تحمل العمل الشاق ولكنه اظهر استجابة لتحمل عمليات الجربما يكفي لتحمل العمل العادي، على الرغم من وجود تورم فيالجزء الداني من مفصل المعقم. صاحب الحصان قرر -الانسحاب من برنامج العلاج مما جعلنا غير قادرين على الاستمرار في مراقبة تطورالعلاج.