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Clinical Article

SURGICAL MANAGEMENT OF CONTRACTED FLEXOR TENDONS IN THE FORELIMBS OF TWO COW CALVES

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SUMMARY

The study reports the successful surgical management of contracted flexors tendons in the forelimbs of two male cow calves. Both the calves were aged less than 7 days and were presented with knuckling at the level of fetlock joint. Aseptic surgical transection of the contracted superficial and deep flexor tendons (tenotomy) was done under diazepam sedation and local infiltration analgesia. The limbs were externally immobilized using splints and bandaging in case 1 and fiberglass cast in case 2. Complete weight bearing was noticed at two weeks in both the calves without any complication.

Keywords: Contracted flexor tendons, Cow calves, Forelimbs, Knuckling, Splints, Tenotomy

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Tendon disorders are a well-known cause of locomotory dysfunction in calves. The congenital causes can be either hyperextension deformities or flexural deformities. Flexural limb deformities are commonly reported in cattle calves and causes an inability to achieve or maintain normal extension of the limb (Tulleniers, 1986). Etiologic origins for contracted flexor tendon include inherited factors, in-utero malpositioning and overcrowding caused by the size of the fetus relative to the dam (Anderson *et al.*, 2008). A detailed physical examination is important to diagnose the condition and radiography for the prognosis of the case (Fazili *et al.*, 2014).

The present report describes the history, clinical signs, diagnosis and surgical management of the contracted flexor tendons of the both forelimbs in two cow calves.

Two male cow calves of age less than one week and weighing nearly 30 kilograms were presented to the Veterinary Clinical Complex, with the history of difficulty in walking from the both forelimbs due to caudal bending or curvature/knuckling at the level of fetlock joints. The physical examination of the flexed fetlock joints was undertaken along with assessing the gait by making the calves walk on a hard floor to determine the degree of contracture. It was mild (Fig. 1) in case 1 and moderate in case 2 (Fig. 2). Hind limbs were normal and calves had no other congenital anomaly in both cases. The clinical parameters like rectal temperature, heart rate and respiratory rate were within the normal range.

The palmar side of the metacarpal bone was prepared aseptically by shaving the hairs and scrubbing the area with chlorhexidine. The calves were sedated with intravenous injection of diazepam (Lori®; Neon Laboratory Limited, Andheri East, Mumbai) @ 0.25 mg/kg body weight and local analgesia at the surgical site was achieved by linear infiltration of 2% lignocaine hydrochloride solution. After painting of site with 5% povidone iodine (Betadine®; Win-Medicare Pvt. Ltd., Nehru Place, New Delhi), a 2-3 cm long incision was made in the mid metacarpal region above the point of bifurcation of the flexor tendon. Separation of the underlying tissue was done using the blunt scissors followed by lifting the superficial flexor tendon with the help of artery forceps and then severed (Fig. 3). The fetlock joint was extended to check the degree of correction. The degree of contracture was not relieved hence, the deep digital flexor tendon was also severed similar to as done for the superficial flexor tendon. The skin incision was closed in simple interrupted suture pattern with non-absorbable nylon suture material. A cotton gauze piece was placed over sutured line followed by bandaging of the limb with PVC splint on the caudal aspect (2 inch wide) in case 1 and fiberglass cast in case 2 (Figs. 4 and 5). The procedure was repeated on the other fore limb in both the cases.

The antibiotic and analgesic therapy were administered which consisted of Inj. Enrofloxacin (QuinIntas; Intas Pharmaceutical Ltd., Ahmedabad, India) @ 5.0 mg/kg bwt. once a day and Inj. meloxicam (Melonex; Intas Pharmaceutical Ltd., Ahmedabad, India) @ 0.5 mg/kg bwt once a day, intramuscularly for 5 and 3 days, respectively. Three injections of Oxytetracyline (Steclin; Zydus AHL, Ahmedabad, India) @15 mg/kg body weight were advised to be given intravenously on

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Fig. 1. Photograph of the calf 1 with mild forelimb contracture at the level of fetlock joint.

alternate day. The owner was advised to change the bandage and again reinforce it with splints if it gets wet or displaced.

Both the calves recovered without any complication after a week of the operative procedure. The post-operative gait analysis revealed considerable relaxation and both the calves showed weight bearing on their hooves (Fig. 6).

Contracture or shortening of flexor tendon results in knuckling of fetlock joints is commonly reported in new born cow calves (Steiner, 2014, Rashmi *et al.*, 2018). The condition is believed to be caused by an autosomal recessive gene or abnormal posture of foetus in-utero (Frazer *et al.*, 1991) or previous injury or nutritional deficiency (Adams, 1966). The timely diagnosis and surgical management is a crucial step and influences the outcome. As otherwise, in severe and long-standing cases, the skin and phalanges of the involved limbs can be severely injured and increase the likelihood of developing suppurating arthritis, as well as producing digital extensor tendon rupture as a sequela (Salas *et al.*, 2021). A complete physical examination is required before initiating surgical treatment for contracted tendon as the condition is usually accompanied with other congenital abnormalities like cleft palate, arthrogryposis and dwarfisim (Fazili *et al.*, 2014). Some reports mentioned the management of contracted tendon with conservative treatments in mild cases (Arieta and Fernández, 2011; Hermida *et al.*, 2013) which is usually not sufficient in cases having moderate or severe degrees of contracture.

The goal of tenotomy of flexor tendons in severe cases of flexural limb deformity in calves is to obtain sufficient correction so that the hoof contacts the ground without the knuckling of fetlock (Mosbah *et al.*, 2012). Management of the contracted flexor tendons or knuckling of limbs is recommended with tenotomy of either superficial or deep flexor tendons or both (Yardimci *et al.*, 2012; Sato *et al.*, 2020) and injection of tetracycline

Figs. 2 & 3. **(2)** Photograph of the calf 2 with moderate forelimb contracture at the level of fetlock joint; **(3)** Photograph showing the lifting of SDF tendon.

Figs. 4 & 5. Photograph of the calf 1 with mild forelimb contracture at the level of fetlock joint.

Fig. 6. Photograph of case 1 at one week

intravenously (Fazili *et al.*, 2014; Kidd, 2019) or both. External immobilization of the limbs with caudal splints is necessary in moderate to severe cases (Anderson *et al.*, 2008). The site of surgical resection of contracted tendon

was mid-metacarpal region, where the tendon lacks the synovial sheath and individual tendons are easily palpable (Krishnamurthy and Purohit, 2021). Post-operative complications as reported by Turner (1984) include muscle, tendon atrophy, adhesion and decubital wound depending on the surgical technique and post-surgical management undertaken.

Contracted flexor tendons of the forelimbs are common congenital anomaly in cow calves and it can be surgically corrected by the combination of tenotomy of both superficial and deep flexor tendons of the forelimbs and external immobilization of the limb in extended position.

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