Journal of Entomology and Zoology Studies

Available online at www.entomoljournal.com

J E Z S Journal of Entomology and Zoology Studies

**E-ISSN: 2320-7078**
**P-ISSN: 2349-6800**
JEZS 2018; 6(3): 544-546

Received: 16-03-2018
Accepted: 17-04-2018

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# Surgical management of congenital flexor tendon deformity in calves: A review of three cases

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**Abstract**
Three female calves, age group of 3-5 days old were presented to referral veterinary polyclinic, Indian Veterinary Research Institute, Izatnagar during a month of November 2016 to February 2017 with history of non weight bearing and knuckling of both the fore limbs in two calves and abnormality in both the hind limbs in one calf. There was difficulty in extension of fetlock joint noticed on clinical examination in both the calves. Hind limb of other calf showed difficulty in extension of hock joint and rotation of fetlock joint noticed. The cases were tentatively diagnosed as contracted tendon and decided for surgical correction. Animal was placed in lateral recumbency and partial tenotomy was done under 2% lignocaine analgesia on all the limbs. Post operatively limbs were stabilized with PVC splint and soft bandage. After two weeks of surgery animal recovered fully with normal weight bearing on affected limbs. It is a congenital anomaly which could be corrected by surgical Tenotomy procedure along with PVC splint stabilization. Further breeding of this animal should be avoided.

**Keywords:** Knuckling, congenital defect, contracted tendon, partial tenotomy

## 1. Introduction
Congenital deformity of locomotor system mostly observed in calves, lambs and foals and affects flexor and extensor tendon of fetlock and pastern joints [1]. Due to affection of tendon animal inability achieve or maintain the normal extension of the limbs [2]. This condition may affect the flexor tendon of one or both the fore limbs and hind limbs but fore limbs affection is more common [3]. In severe cases there may be some bony involvement. Congenital contracted tendon is common defect in cattle and there is no breed predilection [4]. Etiological origin of contracted tendon due to inherited factors, in utero malpositioning and overcrowding caused by size of the fetus relative to the dam. But some authors suggest that this condition is caused by autosomal recessive gene. At birth, calves were not able bear weight on affected limbs due to shortening of superficial and deep digital flexor tendon and associated muscles at fetlock and pastern region [5]. The present report describes the successful surgical management of contracted flexor tendon deformity in three calves.

## 2. Materials and Methods
The cases included in this report were clinical cases referred to Polyclinic during a month of November 2016 to February 2017, Indian Veterinary Research Institute; Izatnagar with history of since birth animal not able to stand on both the forelimbs in two calves and both the hind limbs in one calf. All the physical parameters were within the normal range. Clinical examinations revealed knuckling of both the fore limbs in two calves with flexed fetlock joint and inability to keep the limb flat on the ground (Fig. 1)

**Fig 1:** Bilateral contracted flexor tendon in forelimbs

Hind limbs examination showed there was flexion of hock joint and twisting of fetlock joint in both the hind limb of another calf (Fig. 2).

**Fig 2:** Bilateral contracted flexor tendon in hind limbs

Based on history and clinical signs the cases were diagnosed as contracted flexor tendon deformity and decided for surgical correction. All the animals were restrained in lateral recumbency and surgical site was prepared aseptically. Local infiltration of 2% lignocaine was carried out at the medial side of the fetlock joint. Stab incision was made on the medial side of the limb along the line of superficial digital flexor tendon. Partial tenotomy was done on both the medial and lateral side of the limb at multiple sites after forcibly extending the fetlock joint. In one animal after superficial tenotomy manual pressure was applied to extend the limb but was not successful. So, the deep digital flexor tendon also severed. In hind limbs, contracture of tendon was more severe so both the superficial and deep flexor tendon was partially severed at multiple sites to extend the limbs. After that, all the animal limbs were stabilized with PVC splint and soft bandage from elbow to hoof in forelimbs and hock to hoof in hind limbs applied for 20 days. Post operatively animal made uneventful recovery.

## 3. Results and Discussion

Fore limbs flexural deformity affected animals started to bear weight immediately after the surgical correction with supportive bandage (Fig 3).

**Fig 3:** Postoperatively calves bear weight on both the forelimbs

Recovery of hind limbs affected animals took two month to get normal gait and posture due to severe superficial and deep digital flexor and extensor tendon contracture (Fig 4).

**Fig 4:** Calf ambulating after two month of surgery

In new born calves, contracture or shortening of flexor tendon results knuckling of fetlock joints frequently and rarely carpal joints. This was concurrent with present studies where the two animals showed sign of knuckling at the both the forelimbs. The degree of knuckling may vary from mild flections of knee to severe flections of fetlock and pastern joints [6]. Malformations of distal limbs are more frequent congenital anomaly found in human and animals [7]. The majority of the contracted flexural deformity in calves observed within the first few days of birth. Similar results were found in a study of Shivaprakash *et al.* [8] where the young cow claves were mostly affected with contracted tendon flexural deformity. Flexural deformity may vary from mild to severe. In mild case, calf may walk on the toe but heels do not touch the ground. In moderate cases, calf may walk on the dorsal side of the toe instead of heel. Severe cases affected animals are forced to walk on the pastern, fetlock or carpal joints. Chronic cases animals may be recumbent and unable to nurse the colostrums which lead to arthritis [9]. In the present case affected animals were recumbent and unable to bear weight. A complete physical examination should be warranted to rule out other diseases before initiated surgical treatment for contracted tendon because contracted tendon always occurs with other abnormalities like cleft palate, arthrogryposis and dwarfisim [10]. This was contradictory to present studies where no cases affected with other congenital abnormalities. According to the Anderson *et al.* [2] treatment of flexural deformity should be initiated immediately after recognition of the problem when calf get older contracted tissue become less responsive for treatment. Most flexural deformity of limbs could be corrected with non surgical treatment but surgical method is routinely used for correction of more severe deformity of limbs or when failure of other method of treatment [11]. But in this case choice of non surgical treatment was not possible due to severity of the condition and failure of manual extension of limbs so surgical interference was the best choice to relief the condition. Treatment was found satisfying in case of congenital anomaly of contracted tendon only one or two limbs were involved [12]. Calves with severe flexural deformity were corrected by tenotomy performed in the metacarpal and metatarsal regions until limb get fully extended where the tendon lacks synovial sheath and individual tendon are easily palpated in this area [13] Bandaging and splinting of limb should be done until animal getting normal walk postoperatively. Post operative complication like muscle, tendon atrophy, adhesion and decubital wound depends upon the adopted surgical techniques and method of immobilization [14]. In present

study, no animal showed any of these post operative complications. Postoperatively non steroidal anti inflammatory drugs provide analgesia for calves and are useful for decreasing post operative pain related to surgery and extension of soft tissues caused by weight bearing. After removal of bandage animal walking normally without knuckling of limbs.

## 4. Conclusion

In conclusion, early presentations of contracted tendon cases were surgically managed along with proper application of splint. Tenotomy is a relatively very simple surgical procedure but post operative care is uttermost of importance in the outcome.

## 5. Acknowledgement

Authors are highly thankful to the Director, Indian Veterinary Research Institute, Izatnagar, and Division of Surgery for providing facility and cooperation for this study.

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