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Case Study

Surgical Management of Traumatic Achilles tendon in Female Goat and Cow: A Report

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Abstract:

A 16 month-old non-descript female goat and 5 year old cow was brought to Pet Care Clinic and Veterinary dispensary following an accidental injury caused by a knife and sharp object leading to the sudden onset of complete inability to bear weight on the right and left hind limb in she goat and cow respectively. Achilles tendon, evidenced by abnormal hock angulation and loss of limb support. Surgical correction was undertaken to restore tendon continuity. The cut/ruptured tendon ends were reconstructed using a three-loop pulley suture technique to ensure secure fixation and adequate tensile strength. Postoperative stabilization was accomplished by immobilizing the whole affected hind limb with a plaster of paris cast to ensure ideal healing conditions. Stringent limitations on movement and consistent postoperative care were upheld during the recovery phase. After 35 days, the cast was gently taken off, showing satisfactory tendon recovery without issues. Steady and continual enhancement in locomotor abilities was noted throughout rehabilitation, ultimately leading to full recovery of normal weight-bearing and walking. This clinical case study demonstrates that prompt surgical treatment along with efficient external stabilization and a structured rehabilitation program can result in positive functional results for Achilles tendon injuries in animals

Keywords: Achilles tendon, goat, immobilization, three-loop pulley suture

Introduction:

The Achilles tendon, commonly known as the Common Calcaneal Tendon (CCT), is a robust band of connective tissue and the largest tendon in the body, is particularly prone to injury because of its superficial position and relatively poor blood supply. This tendon is vital for hock extension and enables normal activities including standing, walking, and jumping. It is formed by the convergence of tendons from five muscles, resulting in three major tendinous components derived from the gastrocnemius,

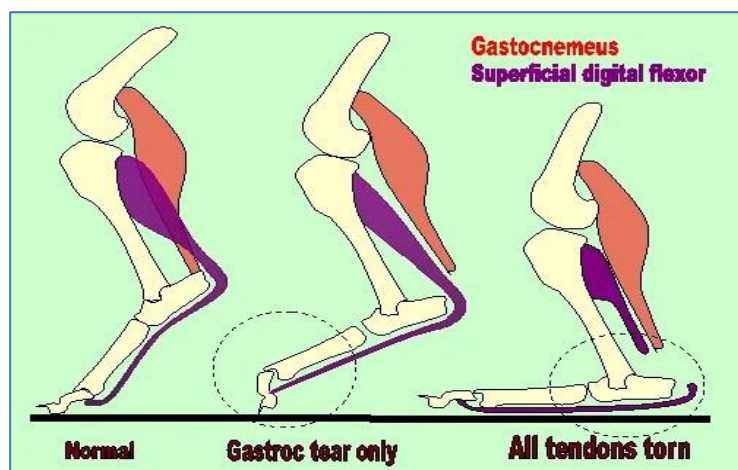
superficial digital flexor, biceps femoris, gracilis, and semitendinosus muscles (Dyce *et al.*, 2009). Functionally, the gastrocnemius muscle plays a key role in extension of the hock joint and flexion of the stifle joint (Sisson and Grossman, 1953). In ruminants, rupture of the Achilles tendon or gastrocnemius muscle represents a severe clinical condition and may arise from excessive mechanical stress (Anderson *et al.*, 1996) such as lacerations from sharp objects and injuries sustained during fights. Moreover, in cows affected by post-partum paralysis or hypocalcaemia, repeated efforts to stand can impose excessive strain on the tendon, predisposing it to rupture (Tyagi and Singh, 2010). Repair and clinical management of a severed tendo Achillis in large animals present considerable difficulty, whereas in small ruminants is quite easy due to the less body weight. The main goal of treatment is to restore sufficient tensile strength so that the animal can effectively support body weight (Raghunath *et al.*, 2014). Successful management of such cases requires meticulous tendon repair combined with adequate immobilization of the affected limb using appropriate supportive devices to facilitate proper tendon healing (Mahajan and Gupta, 2016). Additionally, successful surgical outcomes depend on maintaining limb immobilization for at least six weeks following tendon repair.

Anatomy:

The Achilles' tendon is made of five tendons; four of these tendons attach to the heel or calcaneus bone and one goes over the back of the heel bone to the toes of the hind limb. The Achilles tendon or common calcaneal tendon is a powerful complex formed primarily by the fusion of the gastrocnemius tendon, the superficial digital flexor tendon, and tendons from the biceps femoris, semitendinosus, and gracilis muscles. It inserts on the calcaneal tuber (heel bone), providing crucial tensile strength for weight-bearing and locomotion, often subjected to extreme loading.

Case history and Observations:

A 16 month-old non-descript female goat and 5 year old cow was brought to Pet Care Clinic and Veterinary dispensary, Manegaon of Bhandara district of Maharashtra with the history of being unable to bear weight in right and left hindlimb after an accidental injury caused by a knife and sharp object and the right and left hock was dropped in the goat and cow respectively.



The feed and water intake, urination and defecation were normal. On physical observation/examination, there was a lacerated wound above the right hock on caudal aspect. A swelling was noticed above the hock joint and an area of relaxation was felt in the tendon's continuity. On clinical examination, all the physical parameters like temperature, heart rate and respiration rate were normal. Thus, the case was diagnosed

as ruptured tendo-achilles and the surgical reconstruction was attempted.



Photo 1: Severed ends of tendo Achilles



Photo 2: After Tenorrhaphy using three-loop pulley suture

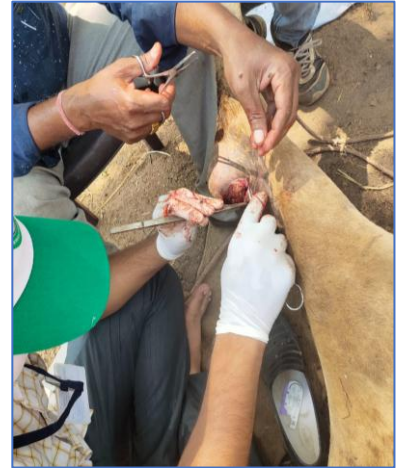


Photo3:After skin closure in female goat



Photo 4: Plaster of Paris external coaptation application after tenorrhaphy

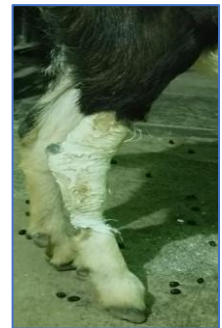


Photo 5: Day 35 postoperative in female goat



Photo 6: Day 65 postoperative in cow

Surgical Intervention:

The she goat and cow were sedated with xylazine hydrochloride at 0.1 mg/Kg intramuscularly and was locally infiltration of 2% lignocaine hydrochloride around the surgical site @ 3mg/kg. The she goat

and cow were casted on lateral recumbency. The surgical site was prepared aseptically. Linear incision was made parallel to the cut/ruptured tendo achilles on the caudal aspect and the severed tendon ends were exteriorized and the margins were debrided. By keeping the hock joint in the extension position, the cut ends were brought near for suturing. Tenorrhaphy was carried out by three loop pulley sutures using vicryl No.1-0. The skin was apposed by simple interrupted pattern using nylon sutures No.1. The surgical wound was cleaned and plaster of paris was applied as external coaptation to prevent tension on the affected tendo Achilles. A window was created in the plaster of paris for regular dressing of the suture site. Postoperatively, antibiotic Amoxycillin was administered at the dose rate of 20 mg/kg intramuscularly, and meloxicam was administered @ 0.2 mg/kg intramuscularly for 5 days. Skin sutures were removed on 15th postoperative day. Plaster of paris was removed after 35 days. The she goat and cow recovered progressively and was able to bear weight after 60 days.

Conclusion:

The three-loop pulley method using vicryl suture material proved effective for tenorrhaphy. Postoperative limb stabilization using a plaster of Paris cast with a window is crucial for achieving full tendon healing and satisfactory clinical recovery.

Acknowledgment:

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