



## CASE REPORT

### Achilles Tendon Rupture and Surgical Repair in a Dog - A Case Report

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#### ABSTRACT

A three year old male boxer dog was presented with unknown history of trauma resulting in dropped right hock and partial weight bearing on the limb. Physical examination and ultrasonography revealed complete rupture of superficial digital flexor and gastrocnemius tendons. Under the combination of atropine, diazepam and ketamine general anaesthesia, termino terminal suturing of both the tendons by locking loop suture pattern with No.1 polyglactin was done. Post operatively, the limb was immobilized with a padded plaster of paris (POP) bandage with a window at the incision site for regular dressing. The dog showed partial weight bearing on the operated limb from 3<sup>rd</sup> post operative day which improved progressively. After 4 months of surgery there were no signs of lameness / gait abnormality and the dog showed complete recovery.

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#### INTRODUCTION

The tendoachilles tendon is formed by tendons of insertions of the gastrocnemius, superior digital flexor and a conjoined tendon formed by tendons from the biceps femoris, semitendinosus and gracialis muscles. Injuries affecting the calcaneal tendon in dogs are usually a result of direct trauma (Vaughan, 1979). The main objective of surgery for tendon injuries in dog is to restore an adequate tensile strength to support body weight (Fahie, 2005). The healing process of tendon injury is usually difficult and uncertain because the prognosis varies widely depending on the amount of trauma and the time that elapses between the trauma and treatment (Spinella *et al.*, 2010). The present report puts on record the successful repair of Achilles tendon in a dog.

#### Case presentation

A three year old, male, boxer was presented to the Teaching Veterinary Clinical Complex, Gannavaram with an unknown history of trauma eight days back. There was a lacerated wound above the right hock joint on caudal aspect. The dog was showing dropped hock, plantigrade stance with partial weight bearing on the limb. On physical examination, with the stifle fully extended, the tibio tarsal joint could be completely flexed without flexion tension of the digits and cut ends of the tendons could be palpable wide apart. Radiographic examination

revealed no evidence of calcaneal avulsion injury. Ultrasonography using a linear transducer in longitudinal plane revealed a break in continuity of the superficial digital flexor and gastrocnemius tendons (Figure. 1). The condition was diagnosed as rupture of Achilles tendon and surgical repair was planned. The standard preoperative blood parameters were in normal range.

#### Surgical technique:

The dog was kept off feed for 8 hours and off water for 4 hours. After routine surgical preparation of the site, Injection Atropine sulphate was given @ at the dose rate of 0.04 mg/kg body weight subcutaneously, 30 minutes before induction of anaesthesia. Anaesthesia was induced and maintained with Injection Diazepam given at the dose rate of 0.5 mg/kg body weight and Injection Ketamine was given at the dose rate of 5 mg/kg body weight mixed in a single syringe given intravenously. The dog was placed on left recumbency, with affected limb up. A 5 cm skin incision parallel to the tendon was given above the right hock joint on the caudal aspect. The tendon ends were isolated from the surrounding tissue, and the margins were debrided, irrigated and modelled in order to become regular. The cut ends of each singular component of the complex tendon were identified and were brought close together with complete extension of the limb and a termino terminal tenorrhaphy was performed on the superficial digital flexor and gastrocnemius tendons

separately (Figure. 2). A locking loop suture pattern using No. 1 polyglactin was done for both the tendons. The subcutaneous tissue and skin incision was closed in routine manner. Post - operatively, modified plaster of paris cast with a metallic splint on the cranial aspect of the hock joint with heavy padding extending from the stifle joint to mid metatarsals was applied. A window in the cast was created at the site of skin incision for regular dressing of the wound (Figure. 3). The dog was administered Inj. Taxim 500 mg intramuscularly once daily and Injection Meloxicam was given at the dose rate of 0.2 mg/ kg body weight intramuscularly once a day. The wound was dressed regularly with complete restriction of physical activity of the dog. The cast was advised for four weeks.

## RESULTS AND DISCUSSION

The dog started partial weight bearing on the operated limb on third post operative day. The skin wound was dry without any oozing or swelling at the site of surgery. The skin sutures were removed on 12<sup>th</sup> post operative day and the dog showed progressive improvement in weight bearing. After 4 weeks, the owner was advised to perform passive physiotherapy by extension and flexion of the hock joint and simple padded bandage was applied for one more month. After 3 months of the surgery, both the hock joints have almost the same range from the ground, with no signs of lameness or gait abnormality with normal tendon strength at the hock joint (Figure. 4).

Immediate tendon suturing is the treatment of choice for tendon injuries in dogs with a goal to provide a strong repair that is resistant to gap formation at the anastomosis site and is able to support the tendon during healing. The suture pattern should not adversely affect the tendon vasculature and should avoid adhesion formations (Moore *et al.*, 2004). The suture material selected should be inert, strong easy to pass through tissues and should maintain tensile strength until the anastomosis has its own strength. Monofilament polypropylene or nylon has been described as the most appropriate suture material for tendon repair and the largest size that comfortably passes through the tendon should be used (Bloomberg, 1993). The No. 1 polyglactin used in the present case also provided the desired tensile strength till complete healing of the tendon. Spinelle *et al.* (2010) indicated that steel wires, polydioxanone or polyglyconate may also be used and the recommended suture size ranges from 3 to 0, as the larger suture material could negatively affect the healing process by increasing tissue reaction. Gap formation at the site of tendon suturing can significantly delay tendon healing. Tendon repair with a gap of more than 3 mm are reported to be at increased risk of rupture during the first 6 weeks post operatively (Moore *et al.* 2004). Terminal anastomosis with no gap between the cut ends of both superficial digital flexor and gastrocnemius tendon using a single loop suture pattern for individual tendons was done. In contrary, Roe, 2001, recommended use of multiple locking loop sutures as they are biomechanically superior to a single loop pulley suture. Moore *et al.* (2004), recommended use of the 3 loop pulley suture pattern for canine tendon repairs, in preference to the use of 2 locking loop sutures. Conflicting resources exist regarding the issue of post operative immobilization. Complete limb

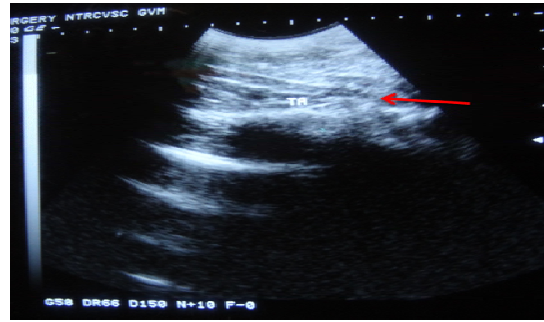


Fig. 1: Ultrasonogram showing rupture of Achilles tendon

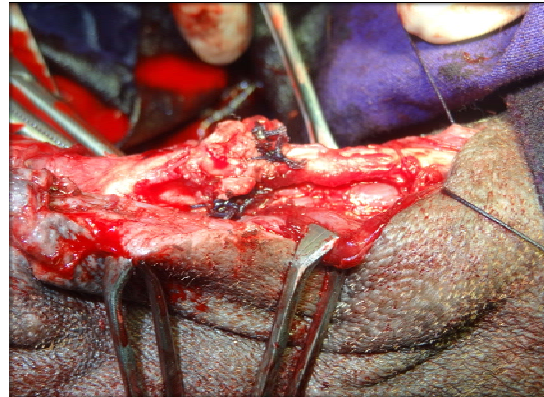
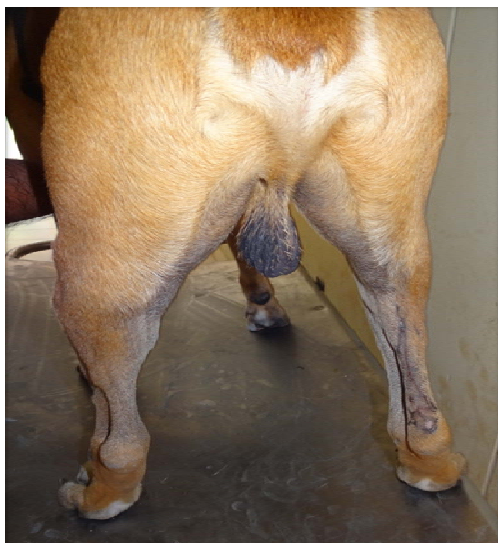


Fig. 2: Intraoperative photograph showing Completion of SDF and Gastrocnemius tenorrhaphy



Fig. 3: Photograph showing immediate stabilization of the limb with modified plaster of paris cast along with metallic splint and a window at the suture line.



**Fig. 4:** Photograph showing complete weight bearing on the right hind limb after 60 days post operative.

immobilization such as with a transarticular external fixation for a longer than 21 days resulted in a significant reduction in vascularity of the wound site (Gelberman *et al* 1980). Hence, in the present case less vigorous external coaptation such as cranial splint with POP cast is applied for 4 weeks. Such less vigorous external coaptation techniques promote collagen orientation that is parallel to tendon stress (Mason and Hillen, 1941). Other external coaptation methods consist of splints, full casts or cranial or caudal half casts. Impaired wound management, increased limb muscle atrophy and development of pressure sores are the primary disadvantages of the external coaptation (Sivacolundhu *et al* 2001). Hence, the window provided at the site of skin sutures in the POP cast helped in regular wound dressing in the present case. The physiotherapy provided in the post operative period prevented the tendon adhesion and muscular atrophy as also recommended by Shani and Sharar, (2000) and Montgomery and Fitch (2003). The time taken for complete recovery in the present case is 4 months which is less than the time taken for normal limb functionality of 5 months reported by earlier authors (Nielsen and Pluhar, 2006). It is concluded that locking loop suture technique using polyglactin is suitable for tenorrhaphy and post operative stabilization of the limb with POP cast and a

window is essential for complete healing of the tendon and clinical recovery.

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