

# Management of Injuries of Tendon Achilles at NMC Hospital NawabShah

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**Abstract:** *Introduction:* Tendon Achilles is largest tendon of the body and is made of fibrous tissue, descends from calf & gets attached to calcaneum. The injuries of this strongest tendon are not only uncommon but disabling as well. Twenty one tendons in 20 patients were managed successfully using Bosworth repair in the department of Orthopaedics NMC Hospital NawabShah during the period from March 2002 to April 2006.

*Patients & Method:* All patients were male and age ranged from 25 years to 55. Thirteen injuries were caused due to direct trauma, 3 patients noticed sudden jerk during high jump while playing, 3 had fall while running on plain ground and use of prolong corticosteroids caused 2 bilateral tendon injuries in one patient (Figure 1). Eleven patients sustained right side injury while 9 had their left side tendon injury. All patients were admitted through OPD & Emergency departments and were operated after their pre-op work & anesthetist's fitness was completed. Period lapsed from injury to admission was one day to 3 months and surgery was performed within 1day to 6 days after their admissions (Figure 3).

*Results:* All twenty patients healed completely. Out of these 20 patients 17 were farmers, one medical professional and two were agriculture mechanics (Figure 4). Follow-up period in all these patients was over 15 months and no patient lost to follow-ups.

*Conclusion:* Public awareness service programs and interaction between Orthopaedic consultants and other health professionals including general practitioners of the areas can prevent not only delay in diagnosing such problems, but shall minimize the ailment suffered by these patients. Nevertheless, all injuries of tendon Achilles should be dealt immediately to restore the full function of this strongest tendon of body regardless the lapse of any length of time.

**Keywords:** Bosworth, repair, tendon achilles.

## INTRODUCTION

The muscles of calf are powerful one & the Tendo Achilles strongest tendon among all other tendons in the body. This tendon pushes the foot downwards when calf muscles contracts. The contraction of these muscles helps in standing on toes, running, jumping & walking. Tendo Achilles can be injured due to overuse like in athletes, improper foot-wear, side-effects of medicines esp. local injection of cortisone [1] and accident / direct trauma. Bosworth repair has advantage to resolve the problem of short aponeurosis esp. in old injuries, where approximation of both ends is usually difficult. The name of this tendon is after the Greek worrier, Achilles.

## PATIENTS & METHOD

Twenty patients with their 21 injured tendons Achilles were managed in the department of Orthopaedics NMC Hospital NawabShah from March

2002 to April 2006. Among them 13 had sustained direct injury to their tendons resulting from trauma (Figure 1), 3 patients noticed tendon injury during their high jumps while playing Bad Minton, other 3 fallen down after having ruptured their tendons while running on plain ground; and 1 patient who was also having asthma & OA knees for last seven years sustained injuries of his tendon Achilles, bilaterally.

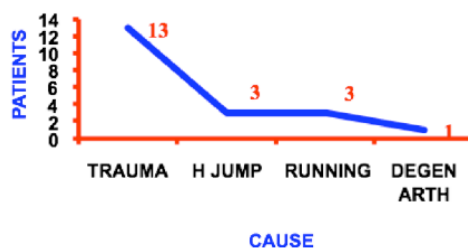


Figure 1: Cause of injury.

All patients were male & required surgical intervention for the repair of their injured tendons. The tendon can rupture spontaneously following trivial injury due to some existing disease [2].

Age of patients ranged from 25 years to 55; 16(76%) patients were 20-25 years, 3 (14%) were

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between 25-40 years & one (5%) was of 55 years age indicating the trauma as a major cause of tendon injury in young age group (Figure 2).

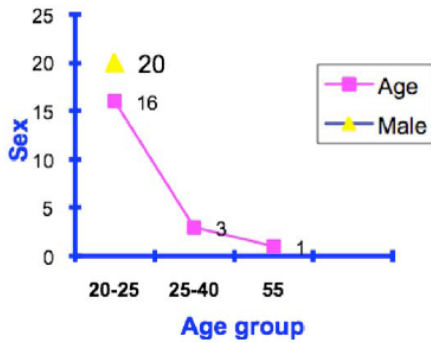


Figure 2: Age and sex PTS.

Right side was involved in 11 patients and left in nine patients. Incidence of rupture was observed more in left Achilles tendon than the right [3-5], largely due to right-side-dominant justifying the need to push off with the left leg.

Rupture of the Tendo Achilles is found more in males, with a male-to-female ratio 1.7:1 to 12:126 [6, 7], possibly due to the fact that males were more involved in sports requiring surgery for the repair of their injured tendons. Among them, 13 had sustained direct injury to their tendons resulting from axe injury in 3, koder in 4, glass-cut in 2, sharp sheet-cut of a passing by vehicle in 2 and fall of trolley hook in 2 patients (Figure 3). Three patients noticed tendon injury during their high jumps while playing Bad Minton; this particular observation was specifically mentioned by all three patients, one of them was a medical practitioner as well (Figure 4).

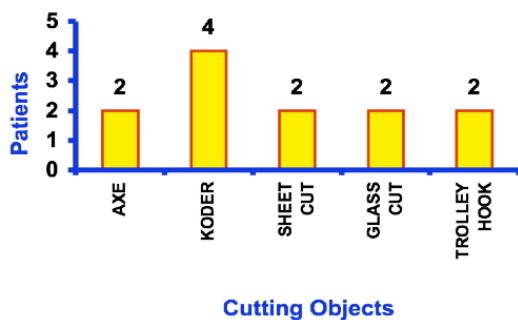


Figure 3: Detail of direct Trauma.

Size of gap between two ends of ruptured tendon was variable in 14 patients (70%) ranging from 2.5 cm to 5cm necessitating Bosworth repair for shorter aponeurosis is difficult to bring close the freshened ends of tendon; in which 1 cm wide facial strip is used to bridge & reinforce the tendon gap. Whereas only six

patients (30%) who came within first week of their injury had no obvious gap between stumps and ends of their tendons could be repaired directly without further reinforcement.

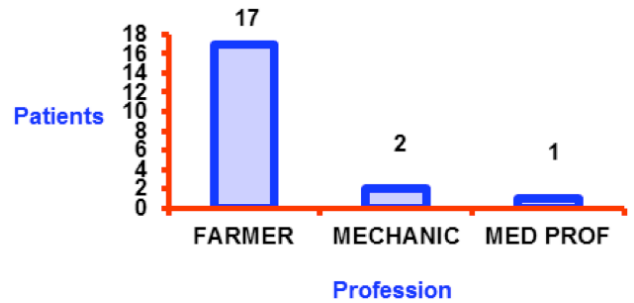


Figure 4: Profession of patients.



Picture 1: Showing defect of tendon Achilles.

Operated limb of all patients was kept in above knee POP cast with mild to moderate equinus foot for three weeks and then below knee walking cast with almost plantigrade foot for further 3 weeks.

Meanwhile, strengthening exercises for thigh muscles were started as soon as patients were out of bed that is on their second post-op day. All patients were made ambulatory with the support of crutches or walking aids. Stitches were removed in all patients between 12 to 15 days post-operatively during their wound examinations through a window in POP cast. All injured tendons were repaired with proline suture (No 1 & 2) besides the Bosworth repair in 14 patients. Post operatively, two patients had marginal necrosis of their wound edges which was resolved with spontaneous closure of these wounds. 3 patients developed solitary sinuses across the long axis of wounds due to long cut-ends of proline were un-usually left inside the wounds. This problem was managed by counseling these patients that sinuses are not due to the presence of

any infection and reason of irritation should be over when visible cut ends of proline suture were removed after six weeks time.

All repairs were united uneventfully. In 14 patients where repair was accomplished by Bosworth method, no significant deficit in function of ankle in planter flexion was so far noticed by these patients.

## RESULTS

All patients were male & surgical repair was instituted for managing these tendon injuries. Complete data of these patients were registered on admission and updated on their follow ups in OPD and review of data revealed the following analysis: Out of 20 patients, thirteen had sustained direct injury to their tendons resulting from trauma, 3 noticed tendon injury during their high jumps while playing, other 3 fallen down after having ruptured their tendons while running on plain ground; and 1 patient who was having OA knees for last five years also sustained injuries of his tendon Achilles, bilaterally.

Among the twelve patients four who came after one month of their injury, experienced some degree of stiffness of their ankle partly for the reason of their less compliance towards the exercise & physical therapist; and partly they had continuous immobilization by potters & bone setters for their problem of difficulty in walking.

One patient was found having incomplete planter flexion of his foot for the reason just after change of first pop cast slackness was noted at the repair site of his tendon (Figure 5). On removal of second cast after six weeks, ultrasonography revealed the continuity of repair of his tendon Achilles suggesting development of some slackness of repair site. But this patient had no difficulty in walking except he couldn't planter flex his



Figure 5: Complications.

foot to full extent. Post operatively; two patients (10%) had marginal necrosis of their wound edges, as commonly used incision was made in lower calf skin which has relatively poor blood supply and it was resolved with daily change of dressings with tissue healing solutions and healed spontaneously. Three patients (15%) developed solitary sinuses across the long axis of wounds due to long cut-ends of proline which become a cause of irritation under the skin and appearance of a suture tract with watery drainage was a reason of some worry in these patients.

All repairs were united uneventfully. Follow-up period was over the period of 15 months in all these patients.

## DISCUSSION

The conservative treatment of tendon Achilles injuries consists of immobilization of leg in a above knee cast with equinus foot for about 6-8 weeks [8]. This was advocated by those workers who were of the opinion that both operative and non-operative results were just similar [4, 9-13]. Non-operative treatment has its supporters, whereas surgical repair of a ruptured tendon was advocated in late nineteenth century by Polaillon [14]. Furthermore, surgical repair has been the preferable method in last 20 years esp. for sport men and younger individuals. This was also suitable for those cases in which treatment has been delayed for some reasons. In managing the acute injuries of tendon, the primary object was also not to lengthen the injured tendon, which cannot be achieved with non operative method [15].

Many workers were against the surgical repair, on the basis of higher rate of complications mentioning it as the main disadvantage [4, 9, 10, 12, 13, 16].

In spite the fact that much research on etiology of the tendon Achilles is worked out, true reasons are yet not clear [17].

Sports activities were noticed as major cause of Tendo Achilles injury esp. Badminton [18]. Other 3 patients fallen down after having had rupture of their tendons while running on plain ground during their different activities and were taken to nearby health facility & remained undiagnosed; and 1 patient who was having OA knees and asthma for last seven years also sustained bilateral injuries of his tendon Achilles with interval of six weeks time. Since, this patient could walk with the support of stick and presumed his this

disability as an increasing severity of existing chronic knee pain, whereas he had spontaneous but painless rupture of his both of Achilles tendons. The same patient who was being treated as a case of OA knees & asthma was only diagnosed after few visits and detail history & thorough examination revealed Simmonds test positive in both legs & a gap in these tendons was also detected.

Corticosteroids when given orally for treating the systemic diseases also have been implicated in the etiology of tendon rupture.



**Picture 2:** Showing percutaneous gap in tendon.

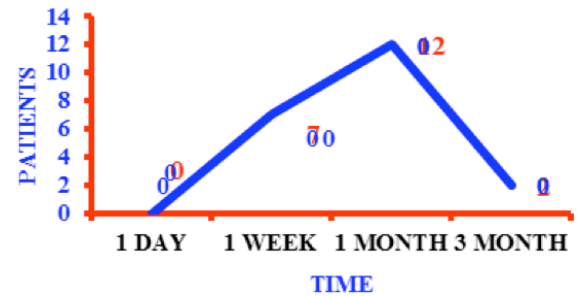
At Department of Orthopaedic Surgery University of Aberdeen Medical School Scotland, twelve patients who were managed with long-term oral therapy with corticosteroids for the treatment of chronic obstructive small airways disease were diagnosed with a rupture of the Achilles tendon after a ten year period. Four of them sustained a bilateral injury [19]. Majority of patients (16) who were 20-25 years of age indicated the involvement of young-age worker group and incidence of trauma as a major cause of tendon injury in this study (Figure 6).

Size of gap between two stumps was variable in 14 patients (70%) ranging from 2.5cm to 5cm, necessitated Bosworth repair. Bridging of two ends with fibrous tissue was observed per-operatively in 04 of patients and they were able to walk with difficulty and therefore reported late after having all sort of remedies from their local areas. In fact, over 20% percent of patients who get their tendon Achilles injured may be diagnosed late [20].

Thompson [16, 20, 21], mentioned the significance of Calf-squeeze test in 1962 [22, 23], five years after Simmonds [24].

Blood supply to tendon decreases as the age increase [25], and the area of the Achilles tendon 2 cm proximal to its attachment is prone to rupture; is avascular one [26-28], etiology of which is still not clear [17].

Multiple factors like inflammatory & autoimmune can cause spontaneous rupture of the Achilles [29]. Also genetically determined collagen abnormalities [30], infectious diseases [31], and neurological conditions [16] can be responsible for the rupture.



**Figure 6:** Time B/W injury and admission.

To avoid muscle wasting due to disuse during the period of immobilization in cast [32], all patients were advised to carry out the isometric contractions of the calf.

## CONCLUSION

Having gone through the management of these 20 patients who in spite of the fact, had injury of their tendon Achilles for variable times and were yet remained undiagnosed and couldn't get prompt & proper treatment even lapse of at least one week to 3 months time. It has now become imperative to ensure every effort aiming at awareness for the public and patients. This task can easily be accomplished by arranging seminars, public awareness service programs and interaction between Orthopaedic consultant and other health professionals including general practitioners of different areas. This attempt can prevent not only unnecessary delay in diagnosing such problems, but shall minimize the ailment suffered by these patients.

Nevertheless, all injuries of tendon Achilles should be dealt immediately to restore the full function of affected limb. Proline suture must be carefully cut during the repair of tendon to avoid incidence of worry some suture-tract post-operatively. Nevertheless, a thorough physical examination of such patients having history of old injury is mandatory, lest a correct diagnosis might be masked or delayed.

Treatment should be according to the need of individual's activity-level if optimum; then surgery should be undertaken esp. in sports men and active people.

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