



Original Article

Surgical Repair of Open Achilles tendon Injuries Using No.1 Prolene to Pull Down the Proximal Tendon: A Safe Technique

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Abstract

From July 1998 to October 2004 forty-seven patients with open tendo-Achilles injuries were treated pull down the proximal tendon with no.1 prolene. In this surgical method no.1 prolene was threaded through the proximal tendon and the same suture material passed through the distal tendon and its bilateral ends were tightened over the rubber button either under the heel or by the sides of the heel. Box sutures apposed cut ends of the tendon. The ankle was placed in the cast in near neutral position. At six weeks the cast was removed and active flexion program was started. Partial weight bearing was allowed at seven weeks and full bearing was allowed at ten weeks after surgery. The average follow up period is 1.8 years. All the patients exhibited full range of motion at the final follow-up.

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Introduction

Almost all of our tendon Achilles injuries are open injuries. Spontaneous ruptures are rarely found in this part of the world. Most often the treatment of ruptured tendon is by direct end-to-end suture non-absorbable suture material (e.g. prolene). The ankle held in extreme equinus position. If once infected, it leads to chronic discharging sinus. It will not be cured before the complete removal of the suture material, which may lead to ugly adherent scar. The scar may or may not be painful. Except that the long period of immobilization requires long rehabilitation time. We treated early open injury of the tendon with pull down of the proximal and a short period of immobilization in order to reduce post-operative equinus contracture of the foot and to allow the patients to

return to daily activities as soon as possible. In this paper we describe the method of repair and we evaluate the results of our treatment

Technique of operation

The patient was prone on the operating table with the leg exanguinated. A longitudinal incision was made parallel and medial or lateral to the tendon-Achilles. Close to the cut area care was taken to avoid the sural nerve on the lateral side. The paratendon was then opened longitudinally and Allis tissue forceps were used to grasp the cut proximal end of the tendon. Sustained gentle traction then pulled this down into view. No.1 prolene suture material was then threaded through the tendon approximately 3cm. proximal from the cut margin. The medial and lateral end of the suture passed distally through the distal tendon and

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subcutaneously and pulled out through the heel pad (long needle of 4 inches or 10 cm. wire used). Using box suture the tendon was repaired with Vicryl 3 zero or four zero while placing the foot in the relaxed equinus position.

The proximal tendon was subsequently pulled down with prolene suture to relieve any excessive tension on the suture in the cut margin with ankle joint close to the neutral position¹. The prolene stay suture are passed through a felt pad and tied over a rubber button. The wound is closed using fine interrupted catgut sutures for paratendon and interrupted prolene or nylon suture for the skin. The wound is dressed and well padded long leg (above knee) cast is applied with the foot just short of neutral position (slight equinus 5° to 10°).

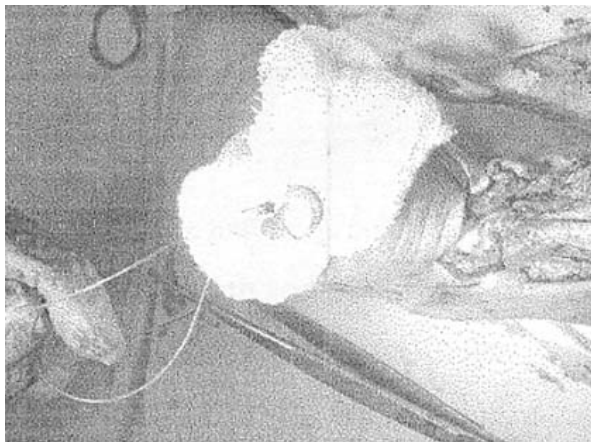
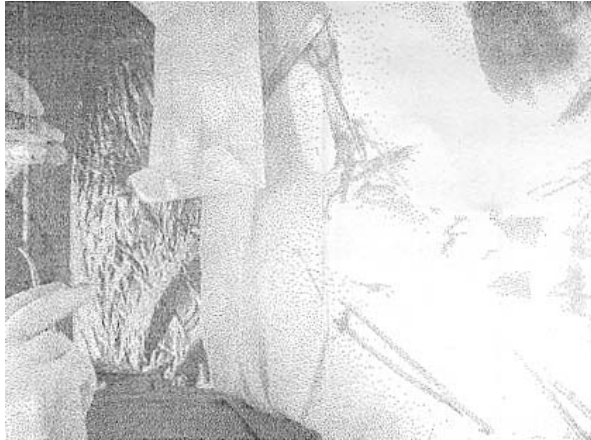


Fig. 1 & 2: No 1 prolene threaded through the proximal and distal ends of cut tendon and by the side of the heel.

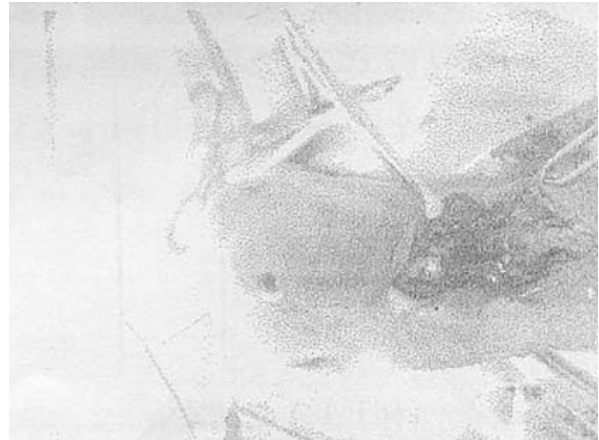


Fig. 3: Ends of the prolene suture material tightened over a rubber button.

Postoperative Management

Straight leg rising exercises and active motion were begun one day after surgery. At three to five days the wound was inspected and the patient was allowed up non-weight bearing on crutches. The long leg cast was replaced with a short leg cast three weeks after surgery. The prolene were extracted without anesthesia. At six weeks short leg cast removed. An active planter flexion exercise was started. After about a week partial weight bearing was allowed. At ten weeks full weight bearing and at about twelve weeks calf raise exercise started. An one inch (2,5cm) heel raise was advised for about eight weeks.

Materials and Method

From July 1998 to October 2004 we treated 47 patients comprising 30 men and 17 women with open tendon Achilles injuries using pull down the proximal tendon by no. 1 prolene at sadar hospital Chapi Nawabganj and Rajshahi medical college hospital. All the patients had unilateral injury. Operations were performed within 24 hours except in three. The right legs were involved in 28 cases and left in 19 patients. The average age of the patient was 23. 28 years (range 09-60 years). Average final follow up period was 1.8 years (11 months to 3 years). All the patients were injured by sharp weapon except in 5 closet injury.

Results

During follow up the range of motion of the ankle joint was recorded. The average dorsiflexion at 8 weeks was -2°. The average dorsiflexion at 10

weeks improved to 10°. At about 12 weeks post operation average dorsiflexion is about 20°, which is very much close to the normal range of motion.

The patients had no problems regarding ADL (activities of daily living). At About 8 months after surgery strength and power were on average is about 90% of that of the normal side. All the patients were able to stand on their toes about 6 months from the operation, through height of the heel above the floor varies. At the final follow up the calf circumference was on both sides in 25 cases and reduced in 22 cases. All the patients were able to walk long distances and could use stairs without significant discomfort. During the follow up period there was no tendon necrosis or re-rupture occurred among 47 cases. Skin healing was delayed by superficial infection in 3 cases.

Discussion

Most papers on calcaneal tendon injury deal only with subcutaneous rupture³⁴⁵. The most common cause of injury in our series was division by a sharp objects usually some part of farm equipment. In all of our patients the distal site of fracture not near calcaneum, would have made direct repair easy and thus to check tendon length and lesion. The technique restores continuity of the tendon at proper tension and has sufficient strength to resist re-rupture. As we do not put any non-absorbable suture material in the repair site so there is no chance of development of chronic discharging sinus, later ugly scar when infected. In our series there was only two superficial infection and delayed skin healing but no deep infection was found.

Reduction of calf circumference is usual, even many years after rupture but we found little reduction of the power of planter-flexion. Lee & Smith (1972) attributed the reduction in the bulk of the calf muscles to an altered configuration of the triceps surace². Any change in the range of motions indicates tendon shortening or lengthening. Our method is infective in reducing post-operative dorsiflexion limitation because ankle is placed in near neutral position immediately after surgery and early rehabilitation

program is initiated. The primary suture associated with pulling down the proximal tendon with the prolene no-1 restores the normal tendo-Achilles length and tension and thereby minimizes any subsequent weakness. Jacobs et al. reported that planter flexion strength of the injured leg undergoing surgery was 75% of the strength of the uninjured leg⁶. In our series average strength and average power of the injured leg was about 90% of those of the contra lateral leg at an average of initial 8 months after surgery the recovery achieved by this method means that the patient regained good post operative functional abilities as quickly as possible.

Conclusion

Forty seven cases with fresh open Achilles tendon injuries were treated by pull down of the proximal tendon. Average dorsiflexion was 20 degrees at 12 weeks after surgery, was quite close to the normal range of motion. This method is effective in reducing postoperative dorsiflexion limitation. No infection related long-term effect is found in any case. All the patients return to normal daily activity within any physical limitation.

References

1. Motohahi H, Uematu H, Kaneko H, Honda K. Surgical repair of Achilles tendon ruptures using wire to pull down the proximal tendon. *J Ortho Surg.* 1996; 4(1): 73-78.
2. Nistor L. Surgical and non-surgical treatment of Achilles tendon rupture. *J Bone Joint Surg.* 1982; 63: 394-99.
3. Kellam JF, Hunter G A. Review of the operative treatment of Achillies tendon rupture. *Clin Ortho.* 1985; 201: 80-3.
4. Aldam CH. Repair of Calcaneal Tendon Ruptures. A safe technique, *J Bone Joint Surg.* 1998; 71:486-8.
5. Gillies HJ. the Management of fresh ruptures of the tendo-Achillies. *J Bone Joint Surg.* 1970; 52: 337-42.
6. Jacobs D, Martens M, Van Audekercke R, Mulier Jc. Comparison of conservative treatment and operative treatment Achillies tendon rupture. *Am J Sports Med.* 1978; 6: 107-11.

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