FIELD MEDICINE

ACHILLES TENDON RUPTURE IN MIDDLE AGED SOLDIERS; AN EXPERIENCE OF 10 CASES

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ABSTRACT

Objective: To evaluate the effectiveness of open surgical repair in the treatment of Achilles tendon rupture and to compare it with other forms of management.

Study Design: Case series.

Place and Duration of Study: Study was conducted by two surgical teams in various Military hospitals in Pakistan and Pak level 3 hospitals Darfur. Duration was three years from June 2008 to June 2011.

Material and Method: We gathered an experience of ten cases of tendo Achilles ruptures. We used open surgical repair employing Krachow suture technique in most of our cases under spinal anesthesia. Postoperatively the foot was immobilized in a non-weight bearing cast in equinus position for two weeks, followed by another two weeks in a cast with the ankle at almost 90° then another two weeks at 90° and progressive weight bearing. The patients were followed up for a mean period of 18 months.

Results: Clinical results were good with no loss in range of motion. Complications were 2 (20%) early infections which required debridement and repeated change of dressings. One patient complained of mild pain at operation site off and on but it did not hinder his physical activities. Mean time to return to professional activities on average was 3.5 months; they resumed their sporting activities on average of 6.8 months after the initial injury.

Conclusion: Open surgical repair is the main and standard treatment providing strong repair with a low complication and lowest re-rupture rate as compared to percutaneous repair or conservative treatment.

Keywords: Achilles tendon; Acute rupture; Open surgical repair.

INTRODUCTION

Achilles tendon ruptures are encountered in middle-aged adults who remained athletes. The methods of treatment are conservative and surgical repair. Conservative treatment, consisting of immobilization in an equinus cast for six to twelve weeks carries a significant risk of re-rupture.

Surgical treatment can either be percutaneous tenorraphy of the Achilles tendon having fewer skin infections but a little higher rate of re-rupture[1] or open surgical treatment which carries a limited risk of re-rupture but a greater risk of infection and wound healing problems[3,11,12]. We used open surgical repair techniques for Achilles tendon ruptures[14] in our study since June 2008 to June 2011.

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MATERIALS AND METHOD

This was a case series in which we performed open surgical repair of Achilles tendon ruptures. Duration of study was three years from June 2008 to June 2011. Study was conducted by two surgeons in various Military hospitals in Pakistan (CMH Rawalpindi, CMH Lahore) and Pak level 3 hospital Darfur. It was an experience of ten patients who presented with Achilles tendon rupture. Male soldiers 28-44 years of age were included in the study. They remained athletes or sportsmen. The cause of rupture in these patients was sports injury, indirect trauma (fall, stumbling). Female soldiers and civilians were not included in the study, soldiers having age below 28 and above 44 years, soldiers not involved in sports or athletic events and those having direct trauma like road traffic accidents were also not included.

Operative technique

Tourniquet was placed on the leg in the supine position, before turning the patient prone.

The patient was placed in prone position with both legs on a cushion, leaving the talocrural joint and the foot free to be mobilized. Longitudinal incision was made just medial to Achilles tendon. Without creating a flap, the incision was carried down to the para-tenon. The level of the rupture of the Achilles tendon was identified and the proximal tendon was mobilized by sweeping a finger circumferentially around the tendon border (thus breaking up adhesions). Using non-traumatic clamps, the ends of the ruptured tendon were matched to achieve optimal length.We used a Krachow whip stitch, along each tendon edge, using strong prolene no 2-0 or 1 suture. The locking loops tighten and stabilize their grasp on the tissue as the strands of the suture are pulled to remove slack, and later as the repair is stressed.

Following the core suture repair, a 2-0 Vicryl suture on a non-cutting needle was run to further oppose the irregular edges of the ruptured tendon. The paratenon was closed, especially over the tendon repair site. Skin was closed. A plaster cast was applied with the ankle in the equinus position obtained while suturing. This post-operative cast was removed after two weeks and replaced by a second cast with the ankle in slight equinus position, almost at a right angle, for another period of two weeks. A third cast was given at right angle for another two weeks. Weight-bearing was permitted from the fifth week.

The procedure was performed under spinal anesthesia.

Some patients were followed up for a shorter duration and and a couple of patients for more than this duration. A proforma was used to cosmetic apperance and functional results. Patient's subjective evaluation of outcome was also included. It included the following:

- Appreciation of the local cutaneous condition.
- Time interval to resuming weight-bearing, returning to work and playing sports.
- Ability to stand on one foot, hop and walk on tiptoe.
- Comparison of the range of ankle dorsiflexion and plantar flexion.
- Patient's subjective evaluation of the result.

RESULTS

The mean age at presentation was 35 years (range: 28-44). Consent was taken from all the patients for open surgical repair.

The cause of injury was a sports accident in 06 cases (football: 02, basketball: 01; volleyball: 01; not specified: 02), an indirect trauma with excessive strain on the tendon (fall, stumbling) in 04 cases.

The range of time interval between the rupture and the surgical repair was 03 days to 21 days (mean : 12). Two patients underwent surgical repair within first week (20%). Five patients between 08 and 14 days after injury (50%). Three patients underwent repair between 15 and 21 days after rupture (30%). The site of rupture was the main body of tendon in 08 patients (80%). One patient had rupture at musculotendinous junction (10%). In one patient the tendon was avulsed from bone at its insertion (10%).

In one patient who has avulsion of tendon from insertion, a hole was drilled in calcaneum and transosseous suture technique was used for repair by strong non-absorbable tendon to bone sutures. The technique used in other cases was Krachow suture (Figure-1).

The patients were followed up for a mean period of 18 months (range: 12-35). Two patients had early infections (20%) which required debridement and repeated change of dressings. In no case re-rupture of the tendon occurred. There were no late neurological complications, particularly involving the sural nerve (one patient had anaesthesia over the heel in early post-operative period which latter improved). One patient (10%) complained of mild pain at operation site off and on but it did not hinder his physical activities. There was no deep vein

thrombosis. One patient (10%) developed a painful subcutaneous nodule due to the knot of the non resorbable suture.

Our patients returned to professional activities on average of 3.5 months after the initial trauma (range: 02-07). They resumed their sporting activities on average of 6.8 months after the initial injury (range: 5-12).

Monopodal weight-bearing, walking on tiptoe and hopping was possible for all the patients.

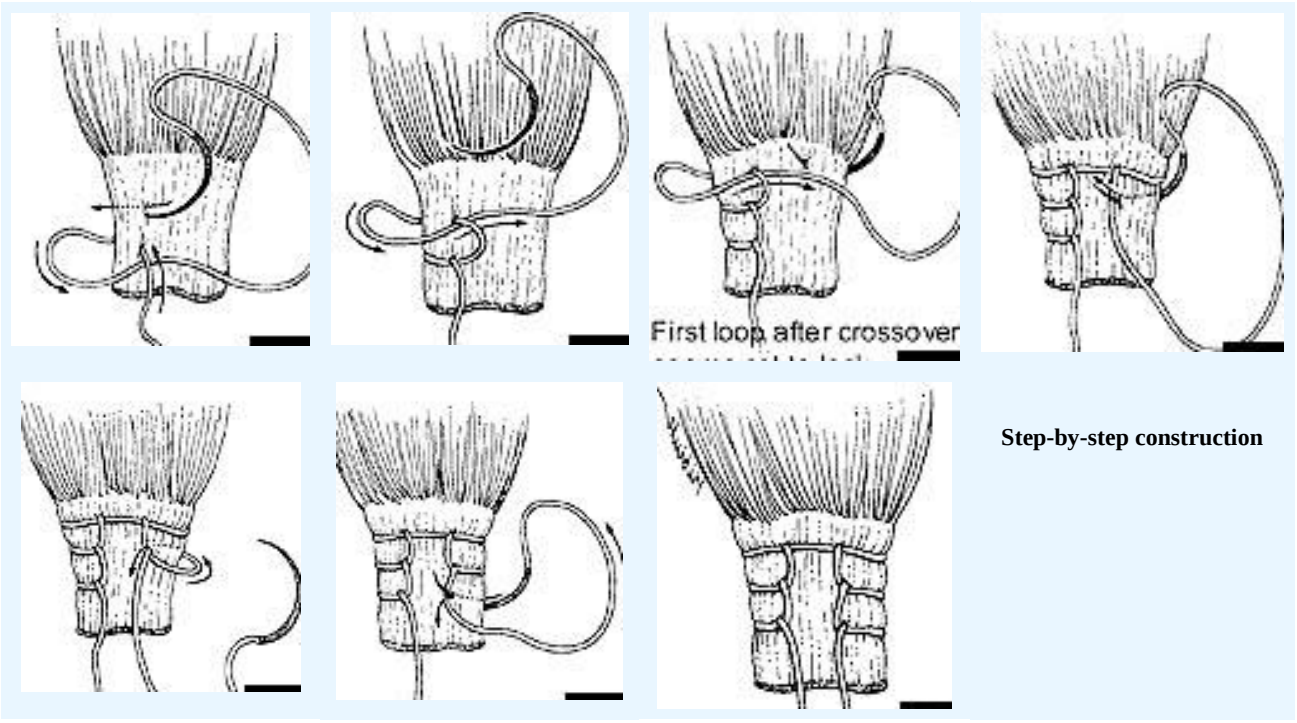

Figure-1: Step-by-step construction of the Krackow suture.
Figures courtesy of Kenneth A. Krackow, MD.

DISCUSSION

Achilles tendon rupture commonly affect middle-aged athletes and can result in considerable functional impairment. While the cause is multifactorial[5]. There is no consensus on the management of acute Achilles tendon rupture. Treatment is either surgical (open surgery or tenorrhaphy) or nonsurgical (strict immobilisation in a cast).

Although surgical methods have a lower rate of re-rupture than non-surgical methods after which the re-rupture rate may be as high as 6 to 10%[16,17], they entail a greater risk of complications.

The best evidence available suggests that operative treatment has a lower rate of re-rupture ranging from 0% to 6%,[4,8] a higher rate of return to the same level of sport participation and a higher complication rate such as cutaneous necrosis and sural nerve damage, if an open technique is used[10]. Percutaneous methods of fixation has lower complication rates with slight increase in the rate of re-rupture when compared with open methods (3%) but it can be used only in acute cases where two weeks (14 days) is the maximum time after injury when percutaneous techniques can be used[10]. In contrast open surgical methods can be used in both acute and chronic cases and at all levels of rupture, be it in the body of tendon or musculotendinous junction or at its insertion. Augmentation of an Achilles

tendon repair has demonstrated no clinical benefit[5].

The main concern with percutaneous techniques is the possibility of damaging the sural nerve[6-9,13].

The immobilization in a plaster cast that we used was for two weeks in the equinus position then two weeks with the ankle close to 90° flexion and two further weeks at 90°. Some physiotherapy protocols recommend early passive mobilization of the talocrural joint after surgery[1]. This is meant to improve vascularisation of the tendon[6] and thus produce more rapid recovery of mobility while limiting the risk of tendon shortening[15].

The strict immobilization protocol of six weeks that we used did not have any major influence on the long-term functional result and allowed patients to limit the painful constraints of immediate mobilization. A simple physiotherapy protocol is enough to achieve good functional results. In our experience weight-bearing was resumed at five weeks. Some authors recommend immediate weight-bearing on the grounds of obtaining a better functional result[2].

CONCLUSION

Open surgical repair of Achilles tendon rupture leads to minimal chances of re-rupture and is the standard treatment option for both acute and chronic tendon rupture. Percutaneous techniques have been used, but these techniques may be marred by wound healing problems. Besides they can only be used for fresh cases. Conservative treatment may lead to re-rupture. Open surgical repair is the main and standard treatment providing strong repair with a low complication and lowest re-rupture rate as compared to percutaneous repair or conservative treatment.

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