



Comparative Study between Operative and Non-Operative Management of Complete Achilles Tendon Rupture

Authors

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Introduction

Achilles tendon rupture is the most common tendon rupture in the lower extremity. The injury most commonly occurs in adults in their third to fifth decade of life.^[1] Acute ruptures often present with sudden onset of pain associated with a "snapping" or audible "pop" heard at the site of injury. Patients can describe the sensation of being kicked in the lower leg. The injury causes significant pain and disability in patient populations.

Achilles tendon injuries typically occur in individuals who are only active intermittently (i.e., the "weekend warrior" athletes). The injury is reportedly misdiagnosed as an ankle sprain in 20% to 25% of patients. Most commonly affected as 10% report a history of prodromal symptoms, and known risk factors include prior intratendinous degeneration, fluoroquinolone use, steroid injections, and inflammatory arthritides.^[2,3]

Achilles tendon ruptures occur at a rate of 18 patients per 100,000 people annually, according to various research in the literature. An Achilles tendinosis incidence rate of 7% to 18% in runners, 9% in dancers, 5% in gymnasts, and 2% in tennis players, has been recorded in the literature. Achilles diseases afflict around 1 million athletes each year, according to estimates.^[4]

Achilles tendon ruptures can be caused by a variety of factors, including sudden, forced plantar flexion of the foot, direct trauma, and chronic tendinopathy or intratendinous degenerative diseases. A ruptured Achilles tendon can occur while diving, playing tennis, basketball, or running. Furthermore, Corticosteroids, overexertion, and usage of quinolone antibiotics are all risk factors for Achilles tendon ruptures that can be avoided. About two to four centimeter above the insertion of the Achilles tendon, tendon ruptures are most common. Achilles tendon ruptures most commonly occur in the left side in right-handed people, and vice versa.^[5]

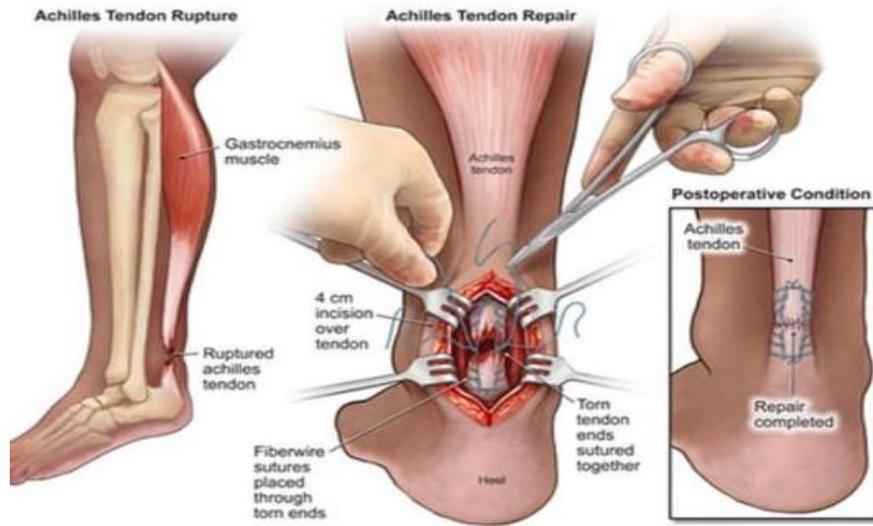


Figure 01



Figure 02



Figure 03

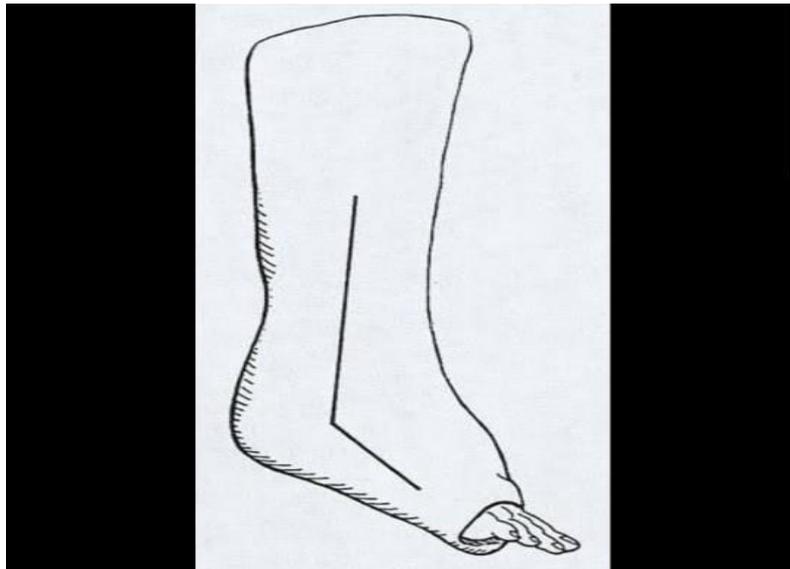


Figure 04



Figure 05



Figure 06



Figure 07

Purpose of study

- To compare the efficacy of operative and nonoperative modalities to repair Achilles tendons.

- Patients unable to attend the follow-up examinations at 4 months after the injury.
- Unwilling for this study

Materials & Methods

- A prospective randomise study conducted in the department of orthopaedic at Katihar medical college.
- Period: February 22 to February 23
- 20 patient treated with non operatively with equines ankle cast and boots and 20 Patient treated with end to end tendon repair by Bunnell's method
- Follow up and examination was performed after 8 months of treatment

Methodology

Each patient randomly assigned for operative or nonoperative treatment. In the operative treatment group, the patients will be operated on under general, spinal, or local anesthesia. The patients will be placed in the prone position during the operation. A tourniquet is not always used. The skin will be handled carefully. The rupture will be identified through a straight posterior incision. The paratenon will be handled carefully and incised longitudinally. The ends of the ruptured tendon are freed. The ruptured Achilles tendon will be sutured using Bunnell's end-to-end method, sometimes with apposition sutures in the surface of the tendon. The suture material used in the tendon repair varied from absorbable to nonabsorbable, and different sizes will be used. The skin will be closed with nylon sutures.

Inclusion Criteria

- Aged ≥ 18 years old.
- The Achilles tendon rupture will be closed
- A decrease of plantar flexion of the foot, and a positive Thompson's test,84
- Patients will be able to attend the follow-up examinations at 4 months after the injury.
- The patients will be able to undergo surgery.
- Willing for the study.

Non operative

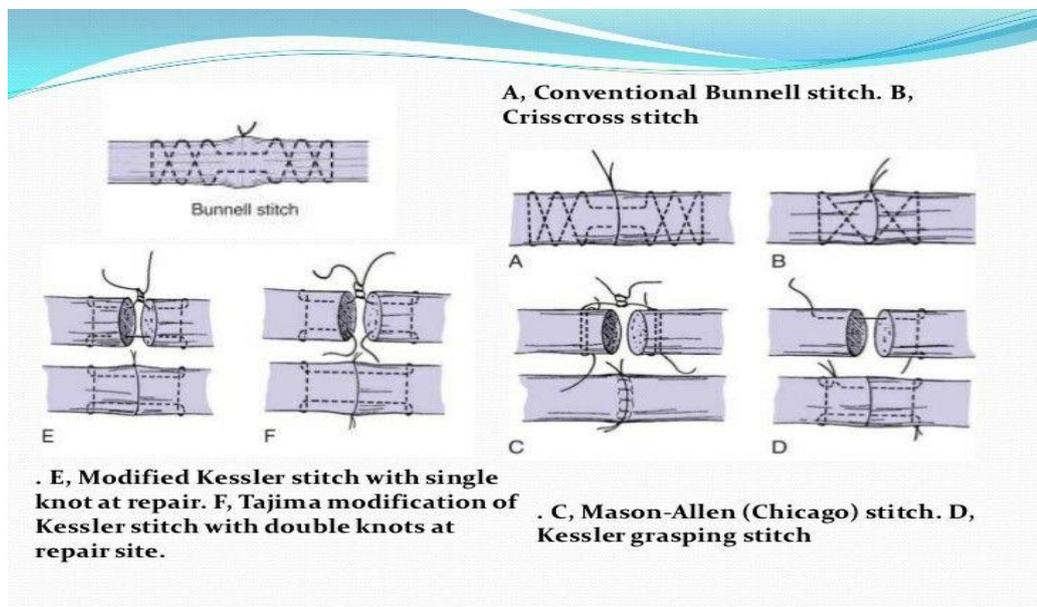
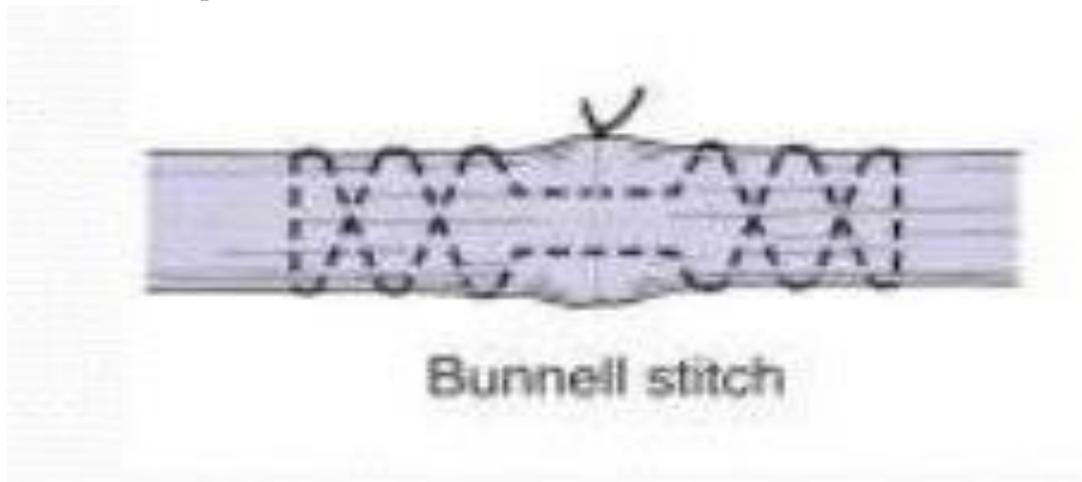
The patients in the nonoperative treatment group will be treated with a below knee plaster cast with the foot in 20° of plantar flexion for the first 4 weeks without weightbearing. After this period, a new cast with a heel will be applied with the foot in neutral position. The patients wore this cast for 4 weeks, and they will be allowed to bear weight during this period. When the casts will be removed after 6 and 8 weeks, respectively.

Exclusion Criteria

- Aged < 18 Years.
- The Achilles tendon open rupture.
- The Achilles tendon partial tear

Operative

- Bunnell’s end-to-end repair



Test for achilles tendon rupture

- Simmonds & thompsons test
- Matles test
- O’brien test
- Copeland test

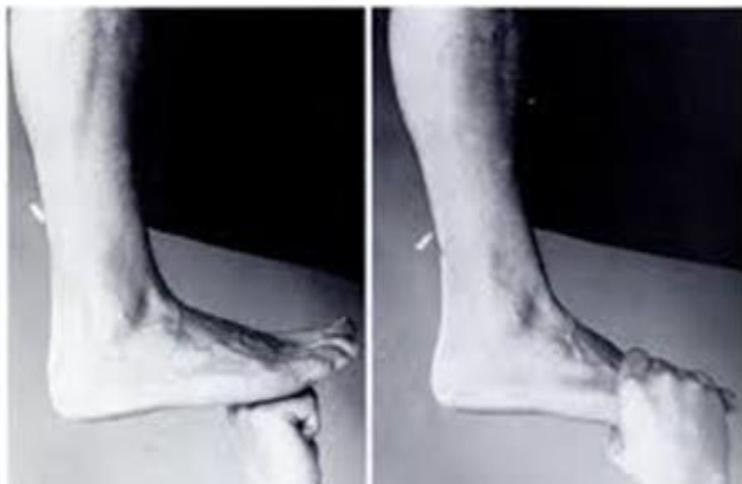
THOMPSON'S TEST



Matle's test



O'Berien test



Copeland Test



Rehabilitation

The first 4 weeks, all patients tried to achieve a normal gait simply by walking. After that, calf muscle exercises will be started for 6 weeks. Jogging will be allowed after 6 weeks of muscle exercises. Sports will be allowed 6 months after the injury will be sustained. The length of the cast period-including weight bearing or not-for the two treatment groups will be chosen because it reflected the mean time and type of cast used in most published studies on Achilles tendon rupture.

Statistical analysis

- Data is analyzed using statistical package for social science (SPSS).
- Results for continuous variables are presented as mean ± standard deviation& calculated using unpaired t test,
- Whereas results for categorical variables are presented as number (percentage).
- Chi-square test is used
- The level $P < 0.05$ will be considered as the cutoff value or significance.

Primary and secondary outcomes

The primary outcome measure was re-rupture rate after operative or nonoperative treatment. Secondary outcome measures included complication rate, functional outcome scores, return to sporting activity, and return to work after

operative or nonoperative treatment. We defined complication rate as the rate of complications other than re-rupture. Complications included reports of wound infection, sural nerve injury, deep vein thrombosis, and pulmonary embolism. Functional outcome scores included the Achilles Tendon Rupture Score (ATRS).²² We subdivided functional outcome scores according to follow-up, into short term (one year or less) and long term (more than one year). We defined return to sporting activity as the duration in months before resumption of sports and return to work as the duration in weeks before resuming work. In studies that reported on both open and minimally invasive surgery, we used the combined outcome measure.

Re Rupture

	Operative	Non-operative
No. of events	2/20	6/20
Chance of re-rupture	10%	30%

Infection

	Operative	Non-operative
No. of events	05/20	01/20
Chance of infection	20%	05%

Functional Outcome

- Functional outcome is defined by return to sporting activity in 6 month after treatment.
- Return to work 4 weeks after treatment.
- Acquiring ROM 6 month's post-operative.

Functional outcome is more or less equal in both operative and non-operative procedures.

Discussion

This systematic review and meta-analysis, including both RCTs and observational studies, compared outcomes after operative versus nonoperative treatment of acute Achilles tendon ruptures. The pooled effect estimate showed that operative treatment was associated with a significant reduction in re-rupture rate compared with nonoperative treatment.

However, operative treatment resulted in a significantly higher rate of other complications.

Conclusion

- In this meta-analysis, operative treatment of acute Achilles tendon ruptures reduced the risk of re-rupture compared with nonoperative treatment.
- However, re-rupture rates are low and differences between treatment groups are small, with a risk difference of 1.6%.
- Operative treatment results in a higher risk of other complications, with a risk difference of 3.3%, mostly due to the increased risk of infection.
- Patients should be counselled about complications, and the final decision for operative or nonoperative management should be based on patient specific factors and shared decision making.