ISSN: 2581 – 3633
PubMed - National Library of Medicine - ID: 101745081

International Journal of Medical Science and Advanced Clinical Research (IJMACR)

Available Online at:www.ijmacr.com

Volume – 6, Issue – 1, February - 2023, Page No. : 374 - 382

Functional Outcome of Surgically Treated Tendoachilles Ruptures

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How to citation this article : Dr. B Joseph Kartheek, Dr. A Srinivasa Rao, Dr. Panchala Harinagendra, Dr. P. Uday Kumar, "Functional Outcome of Surgically Treated Tendoachilles Ruptures", IJMACR- February - 2023, Volume – 6, Issue - 1, P. No. 374 – 382.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Introduction: Achilles tendon is so vital to the foot and ankle's function, Achilles tendon rupture (ATR) is a potentially serious injury that occurs frequently in athletes and sports and primarily affects healthy young people to adults in their forties and fifties. The injury necessitates extensive therapy, and many individuals do not regain full function.[1]

The damage can be treated surgically or non-surgically, and there is presently no consensus on which is the best option. When compared to a longer period of plaster cast treatment, it was recently discovered that using a more functional orthosis reduces the risk of re-rupture. However, according to a new systematic analysis, it is the rehabilitation, not the initial treatment, that is most important.[2]

Aim: To assess the clinical outcome of surgical management of tendoachilles rupture and associated soft tissue injuries.

Objectives

1) To study and analyze the results in terms of functional outcome of surgical management of tendoachilles rupture.

2) To study various pitfalls and complications associated with surgical management of tendoachilles rupture.

Materials and methods: 25 patients were included in this study and assessed for a period of 2 years and where

functional outcome was done using Quigley's Scoring System. The patients were evaluated follow up period of 2 weeks, 4 weeks, and 12weeks until complete ankle range of motion was achieved.

Results: In this study using Quigley's Scoring System 8 were excellent, 12 good, 5 fair, outcomes were observed.

Conclusion: Rupture of the Achilles tendon is common and said to be increasing. Signs include a palpable gap at the rupture site, and marked weakness of ankle plantar-flexion (movement so toespointd onwards).

Options for management include non-surgical interventions (plaster of Paris, bracing or splinting) or surgical repair of the tendon. Surgical repair of ATR.

Keywords: ATR (Achilles tendon rupture), DVT (Deep Vein Thrombosis)

Introduction

Achilles tendon is so vital to the foot and ankle's function, Achilles tendon rupture (ATR) is a potentially serious injury that occurs frequently in athletes and sports and primarily affects healthy young people to adults in their forties and fifties. The injury necessitates extensive therapy, and many individuals do not regain full function. In ball and racket sports, the injury is widespread, and its prevalence has risen in recent decades. This rise is thought to be linked to an increase in the number of middle-aged adults participating in high-intensity sports. ATR is more common in males intheir30sand50s thanitisinwomen.[1]

The damage can be treated surgically or non-surgically, and there is presently no consensus on which is the best option. When compared to a longer period of plaster cast treatment, it was recently discovered that using a more functional or those is reduces the risk of re-rupture. However, according to a new systematic analysis, it is the rehabilitation, not the initial treatment, that is most important.[2]

Aims and objectives of the study

Aim

To assess the clinical outcome of surgical management often do achillesrupture and associated soft issue injuries.

Objectives

1) To study and analyse the results in terms of functional outcome of surgical management of ten do achillesrupture.

2) To study various pitfalls and complications associated with surgical management often do achillesrupture.

Materials and methods

Study design

This study was conducted at the hospital level as an observational study to assess the clinical outcome of surgical management of tendoachilles rupture and associated soft tissue injuries.

Study period, place of study and duration

The study was conducted in the Department of Orthopaedics, Katuri Medical College & Hospital, a tertiary care referral hospital in Guntur, Andhra Pradesh from 2020 to2022.

Sample size

The sample size has been estimated to be 25 patients with Achilles tendon rupture admitted in our institute.

Inclusion criteria

1. Achilles tendon rupture
2. Age10to60years
3. Patient swilling for follow up.
4. Written informed consent
5. Palpable gap between severed ends and Thompson squeeze test positive

Exclusion criteria

1. Patients not willing for follow-up
2. Medically unfit
3. Traumatic ten do achillesrupture with vascular injuries
4. Patients with foot or ankle fractures.
5. Ageless than 10 and more than 60 yrs.

Surgical technique

With the patient prone, make a poster medial longitude inalincision 8 to 10 cm long; make it about 1 cm medial to the tendon, and end it just proximal to where the shoe counter strikes the heel. The skin incision should be off center to prevent late irritation by shoes directly over the tend on in the mid line carry the incision sharply through the skin, subcutaneous tissues, and tendon sheath. Reflect the tendon sheath with the subcutaneous tissue, minimizing subcutaneous dissection. Approximate the ruptured ends of the tendon with No.5non absorbable tension suture, using a modified Kessler stitch through the stump 2.5cm from the rupture. Plantar flex the foot 0 to 5 degrees, flex the knee 15 degrees, and approximate the ends of the tendon by tying the tension suture Use a tendon stripper and harvest the plantar is tendon releasing it proximally. Layita side in amoistsponge. Place the frayed ends of the tendon in as nearly normal position as possible and repair the rupture with multiple 2-0absorbablesuturesanteriorlyandposteriorly. Place the previously harvested plantar is tendon in a facial needle and pass it circumferentially, first through the posterior and then through the anterior part of the tendon2cm from the rupture. Use multiple 2-0 absorbable sutures to tack the plantarist end on to the Achilles tendon. The distal tendon usually is long enough to be fanned out and tacked over there pair, as described by Lynn. Close the facial sheath and subcutaneous tissues with 2-0 absorbablesutures. Close the skin and apply sterile dressing. Apply a short leg cast with the foot in gravity equines. In 14 cases of Achilles tendon rupture end to endre pair with modified Kessler's technique was done, in10casesof Achilles ten do rupture pull through technique was used and in 1 case augmentation of Achilles tendon with peroneusbrev is was done. After repair of tendon wound is closed in layers including peri ten on, sterile dressing is applied, a short leg cast with foot in gravity equines is applied.

Figure 1:

Figure 2:

Figure 3:

Figure 4:

Figure 5:

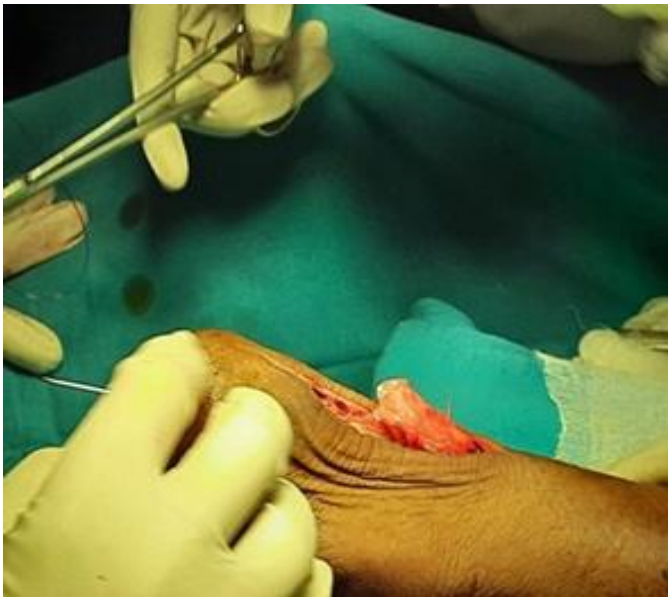

Figure 6:

Figure 7:

Figure 8:

Figure 9:

Immediate Po stop period

In immediate post operative period the patient is kept on systemic antibiotics and regular wound inspection is done with window over casting. Wound is examined for superficial infections, edema, necrosis, and wound dehiscence and heel problems. Suture removal is doneusuallyon12th-14thpost operative day. B/K(Below Knee) casting continued and window closed after suture removal.

Table 1: Rehabilitation protocol for tendoachillesre pair

0-2weeks	Slab/splint; Applied in plantar flexed position non-weightbearingwithcrutches(immediatelypost-operativeorafterinjury)
2-4weeks	Air cast walking boot with 2-cm heel lift. Protected weight bearing with crutches. Active plantar flexion and dorsiflexion to neutral, inversion/eversion below neutral, modalities to control swelling Incision mobilization modalities (e.g., friction, ultrasound, stretching)Knee/hip exercises with no ankle involvement(e.g., leg lifts from sitting, prone, or side-lying position)Non–weight-bearing fitness/cardiovascular exercises (e.g., bicycling with one leg, deep-water running)Hydrotherapy(with in motion and weight-bearing limitations)
4-6weeks	Weight bearing as tolerated. Continue activities as above
6-8weeks	Remove heel lift from boot. Weight bearing as tolerated Dorsiflexion stretching, slowly graduated resistance exercises (open and closed kinetic Chain, functional activities) Pro prospective and gait training Modalities, including ice, heat, and ultrasound as indicated Incision mobilization Fitness / cardiovascular exercises, including weight bearing as tolerated (e. g., bicycling, elliptical machine, walking and /or running on treadmill.
8-12weeks	Wean off boot Return to crutches and/or cane as necessary and gradually wean off. Continue to progress range of motion, strength, proprioception
>12weeks	Continue to progress range of motion, strength, proprioception Retrain strength, power, endurance Increase dynamic weight-bearing exercise, include employ metric training Sport-specific training

- The patients were evaluating data follow up period of 2 weeks, 4 weeks, and 12 weeks until complete ankle range of motion was achieved. Out of 25 the patients treated surgically, 5 patients developed wound gaping and 4 patients developed scarhypertrophyat 4 weeks follow up post operatively.

Evaluation

Due to lack of dynamo metric studies muscle were estimation could not be done.

Quigley's scoringsystem

Objective grade of injury after surgery for ruptured Ten do Achilles comparing involved side with UN involved side.

Patients are followed up to a period of 2 years, ranging from 3 month to 2 years mean wound healing time and also mean weight bearing time.

Results

Table 1: Distribution of subjects according to the method followed for tendon pair.

Method of tendon repair	Frequency	Percent
End To End Repair	14	56.0%
Pull Through Technique	10	40.0%
Augmentation Technique	01	4.0%
Total	25	100%

Table 2: Distribution of subjects according to presence of complications

Complications	Frequency	Percent
Wound gaping	05	20.0%
Scar hypertrophy	04	16.0%
Nil	16	64.0%
Total	25	100%

Table 3: Distribution of subjects according to outcome based on Quigley's scoring system.

Outcome	Frequency	Percent
Excellent	08	32.0%
Good	12	48.0%
Fair	05	20.0%
Poor	0	0%
Total	25	100%

Table 4: Distribution of subjects according to the site of rupture.

Site of Rupture	Frequency	Percent
Zone1	23	92.0%
Zone2	02	8.0%
Zone3	0	0%
Total	25	100%

Table 5: Distribution of subjects according to duration for presentation to hospital.

Presentation to Hospital	Frequency	Percent
< 28days	23	92.0%
> 28days	02	8.0%
Total	25	100%

Figure 10:

Figure 11:

Figure 12:

Discussion

Functional outcome among the study participants:

Thecurrentstudyreportedthatamongthe25subjects, end to end repair was done in 14 subjects, pull through technique was used for tendon repair in 10 subjects and augmentation technique was used fort end on repair in the rest 1subject.

The functional outcome was evaluated by

1. Ability to both plan tarflexas well as dorsi flex the ankle joint.
2. Patient's ability to walk and to stand on toes is tested.
3. Healing of the skin wound over the Tendo Achilles region.
4. Patient's return to work, school etc.
5. Patient's satisfaction.

In the present study, 8 subjects had excellent outcome, 12 subjects had good outcome and5subjectshadfair outcome. There were no subjects with poor outcomes.

5 subjects had wound gaping,4 subjects had scar hypertrophy while the rest 16subjects did not have any complications.

The study by LikkaLantto, et al showed that the results were excellent for 8 surgical patients (28%), good for 11 surgical patients (38%), and fair for 10 surgical patients (34%).[3]

Study by Balakrishnan M Acharya, et al reported that the overall outcome of the surgical repair of Achilles tendon rupture was safe and effective with good functional outcome and minimal minorcomplications.[4]

Huang J, Wang C et al and Costa ML et al in his study explained about the Functional rehabilitation sing early weight bearing or/ and ankle motion has become re common place lately and has not resulted in an increased risk of re-rupture.[5,6]

Pooled result so free rupture rate in meta-analyses range from 2.3%—5% with surgical treatment to 3.9%—13% with non – surgical treatment was concluded by Deng S et al.[7]

Jildeh TR et al in his study found that wound infections and scar tissue formation are complications related to the surgery. AT repairs are generally associated with a low risk of both infection and re-rupture.[8]

Pajala A et al also found that Deep infections are more common in patients with risk factors such as older age, obesity, diabetes, corticosteroids useandsmoking.[9]

Zee AAG et al showed that examples of individual factors include age over 40, history of venous thrombosis, obesity, thrombophilia, and cardiac or respiratory failure.[10]

Calder JDF et al found that regardless of treatment, ATR is associated with a high prevalence (around35−50%) of deep venous thrombosis (DVT)[11] when screened with ultrasound.

Conclusion

Rupture of the Achilles tendon is common and said to be increasing. Signs include a palpable gap at the rupture site, and marked weakness of ankle plantar-flexion (movement so toes point onwards). Options for management include non-surgical interventions (plaster of Paris, bracing or splinting) or surgical repair of the tendon. Surgical repair of ATR is a good option.

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