Achilles Operative vs Non Operative Treatment:  
**Gap in Knowledge**

Mark Glazebrook  
M.Sc., PhD, MD, FRCS(C), Dip Sports Med  
Associate Professor Dalhousie University Orthopaedics,  
Halifax, Nova Scotia CANADA

Achilles Tendonopathy Predisposes to Rupture


Failure of Tendon & Tendonopathy  
- Force required for Tendon Rupture = Tensile strength of Tendon  
- Tendonopathy decreases tensile strength  
- Force required for Rupture is directly proportional pre-existing tendonopathy

**Achilles Rupture: How do we Treat?**

Need for EBM  
- i. Avoid Bias (systematic deviation from truth)  
- ii. Avoid decision-making by 3rd parties  
- iii. Provide patients with best available Treatment Options

Assessing the Literature

**Introducing Levels of Evidence to the Journal**


**Grades of Recommendation**


**LITERATURE REVIEW**

**AAOS Guide line:**

THE DIAGNOSIS AND TREATMENT OF ACUTE ACHILLES TENDON RUPTURE GUIDELINE AND EVIDENCE REPORT

Conclusion:  
Evidence for Treatment of Achilles Tendon Rupture is conflicting!!  
No Definitive Answer on Operative Vs Non Operative.
Operative versus Nonoperative Treatment of Acute Achilles Tendon Ruptures A Multicenter Randomized Trial Using Accelerated Functional Rehabilitation
Kevin Willits, et al THE JOURNAL OF BONE & JOINT SURGERY (A) VOLUME 92-A NUMBER 17 DECEMBER 1, 2010

Methods

RCT LEVEL I 144 pts 72 Operative and 72 Non Operative
All patients an accelerated rehabilitation protocol
Primary outcome:
Rerupture
Positive Thompson squeeze test,
Palpable gap
loss of plantar flexion strength.
Secondary outcomes:
Isokinetic strength
Leppilahti score,
Range of motion,
Calf circumference 3, 6, 12, 24 mos.

Results
– Demographics Cohorts Comparable

Primary outcome:
NO Difference in Rerupture:
Operative 2
Non Operative 2

Secondary outcome:
NO Difference:
Isokinetic strength
Leppilahti score,
Range of motion,
Calf circumference (3, 6, 12, 24 mos.)

Complications Operative Group (13) Non operative Group (6)
Operative vs Non-Operative Treatment of Achilles Tendon Ruptures, a Meta-Analysis of Randomized Controlled Trials

Alex Sorocelean MD CM MPH, Feroze Sidhwa B.Sc, Shahram Aarabi MD MPH, Annette Kauffman PhD MPH, Mark Glazebrook MD PhD

Methods

• Inclusion criteria:
  • Randomized studies (Level I or II) Achilles tendon rupture,
  • comparing surgical intervention Non operative treatment
• Exclusion criteria:
  • Non-randomized studies,
  • delayed presentation (beyond three weeks),
  • re-ruptures,
  • duplicate data was excluded

The primary outcome: re-rupture rate.
Secondary outcomes:
  • strength
  • complications
  • range of motion,
  • time to return to work,
  • calf circumference,
  • function.

STUDIES INCLUDED IN META ANALYSIS

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Op VS Non OP (*Functional Rehabilitation*)

- No increase in Re Rupture
- No difference in strength and Calf size
- Lower complication rates for Non op Rx
- Faster Return to work with Operative

**Non-operative treatment for Achilles Tendon Ruptures Summary**

- Evidence exists to support treatment of Achilles Tendon Ruptures with Operative and Non operative Care.
- **Grade A Support**
  - (Level I Studies with consistent findings)
  - Recent Meta Analysis Favors Non-op with Functional rehabilitation
  - Best LEVEL I STUDY and MOST RECENT META ANALYSIS Favors s Non op. with Functional rehabilitation
  - Athletes may favor Operative Treatment to “return to Work/Sport”
  - All patients need to be Informed prior to consent for Treatment
What about the Gap??

Non-operative versus operative treatment of acute tendo-achilles rupture remains controversial.

Some surgeons recommend using a maximum gap size between the proximal and distal remnants to determine suitability for non-operative treatment, but there is no evidence of correlation between gap size and outcome.

This study set out to determine the answer to this question: **Does MRI Gap Size Make a difference on treatment outcome?**

**Methods:**

All adult patients who attended the emergency department with a clinically suspected tendo-achilles rupture were placed in a plantarflexed cast, and underwent MRI scanning to confirm the diagnosis.

They were then counselled on the risks and benefits of operative versus non-operative treatment and those opting for the latter were asked to take part in the study. The patients were then treated using a functional rehabilitation programme, modified from that previously published by Willits et al.

- Outcome measures at 12 months included:
  - Achilles tendon Total Rupture Score (validated patient reported outcome measure)
  - Strength (determined by standing heel raise height)
  - Re-rupture

The gap sizes were determined using MRI by a single radiologist who was trained in musculoskeletal radiology and also blinded to the clinical outcomes.

- Results:
  - 70+ patients were recruited into the study.
  - 1 year review and 4 had incomplete data sets.
  - All but one injury occurred while participating in sport.
  - The average age was 42 years (range of 19-70).
  - The average gap size recorded by MRI was 47.7mm (range of 16.5 to 110).
  - The average ATRS score was 82 (range 40-100)
  - Single limb heel raise height as a percentage of the non-injured side was 70% (range 4-115).
  - There were 2 documented re-ruptures. No correlation could be shown between gap size and ATRS score (Spearman rank coefficient = 0.387 p=0.019) or gap size and strength (Spearman rank coefficient = 0.070 p=0.359).

**Conclusion:**

No correlation between MRI measured gap size of the ruptured tendo-achilles and the Achilles tendon Total Rupture Score.

THANK YOU!!!
Appendix:

Accelerated Rehabilitation Program For Operative Treatment of Achilles Tendon Ruptures\(^1\) (Apr/2013 Updated Version)

Prepared and Modified by: Daniela Rubinger, BSc.PT, Citadel Physiotherapy
Mark Glazebrook MSc. PhD MD FRCS(C)

\(0-2\) weeks

Plaster cast with ankle plantar flexed approx. 20 degrees non weight bearing with Crutches

\(2-4\) weeks

- *Breg* walking boot with 2-4 cm heel lift
- Protected weight-bearing with crutches:
  - Week 2-3 – 25%
  - Week 3-4 – 50%
  - Week 4-5 – 75%
  - Week 5-6 – 100%
- Active plantar and dorsiflexion range of motion exercises to neutral, inversion/eversion below neutral
- Modalities to control swelling (US, IFC with ice, Acupuncture, Light /Laser therapy)
- Scar mobilization and education re. wound management
- EMS to calf musculature with seated heel raises when tolerated.
- Patients being seen 2-3 times per week depending on availability and degree of pain and swelling in the foot and ankle.
- Knee/hip exercises with no ankle involvement e.g. leg lifts from sitting, prone or side-lying
- Non-weight bearing fitness/cardio work e.g. biking with one leg (with boot walker on), deep water running (usually not started to 3-4 week point)
- Hydrotherapy (within motion and weight-bearing limitations)
- Emphasize need of patient to use pain as guideline. If in pain back off activities and weight bearing.

\(4-6\) weeks

- Continue weight –bearing as tolerated
- Continue 2-4 week protocol
- Progress EMS to calf with lying calf raises on shuttle with no resistance as tolerated around week 5-6. **Please ensure that ankle does not go past neutral while doing exercises.**
- Continue with physiotherapy 2-3 times per week.
- Emphasize patient doing non-weight bearing cardio activities as tolerated with boot walker on.

\(6-8\) weeks

- Continue physiotherapy 2 times a week
- Continue with modalities for swelling as needed.
- Continue with EMS on calf with strengthening exercises. **Do not go past neutral ankle position.**
- Remove heel lift (if had 2-2 cm lifts take 1 out at a time over 2-3 day period)
- Weight – bearing as tolerated, usually 100% weight bearing in boot walker at this time.
- Active assisted dorsiflexion stretching, slowly initially with a belt in sitting
• Graduated resistance exercises (open and closed kinetic chain as well as functional activities) – start with Theraband tubing exercises
• **With weighted resisted exercises do not go past neutral ankle position.**
• Gait retraining now that 100% weight bearing
• Fitness/cardio to include weight –bearing as tolerated e.g. biking
• Hydrotherapy

8-12 weeks

**Ensure patient understands that tendon is still very vulnerable and patients need to be diligent with activities of ADL and exercises. Any sudden loading of the Achilles (e.g. Trip, Step up stairs etc.) may result in a re-rupture**

• Wean off boot (usually over 2-5 day process – varies per patient)
• Wear Achillo Train™ Compression ankle brace to provide extra stability and swelling control once Boot walker removed.
• Return to crutches/cane as necessary and gradually wean off
• Continue to progress range of motion, strength, proprioception exercises
• Add exercises such as stationary bicycle, elliptical, walking on treadmill as patient tolerates.
• Add wobble board activities – progress from seated to supported standing to standing as tolerated.
• Add calf stretches in standing (gently) **Do not allow ankle to go past neutral position.**
• Add double heel raises and progress to single heel raises when tolerated. **Do not allow ankle to go past neutral position.**
• Continue physiotherapy 1-2 times a week depending on how independent patient is at doing exercises and access they have to exercise equipment.

12-16 weeks

• Continue to progress range of motion, strength, and proprioception exercises
• Retrain strength, power, endurance through eccentric strengthening exercises and closed kinetic chain exercises.
• Increase cardio training to include running, cycling, elliptical as tolerated.

16 weeks plus

• Increase dynamic weight bearing exercise, including Sport specific retaining, i.e. Jogging, weight training

4-6 months

• Return to normal sporting activities that do not involve contact or sprinting, cutting jumping etc. if patient has regained 80% strength.

6-9 months

• return to sports that involve running/jumping as directed by medical team and tolerated if patient has regained 100 % strength.

1. This Protocol is a modified Version of the Protocol used in: Operative versus Nonoperative Treatment of Acute Achilles Tendon Ruptures: A Multicenter Randomized Trial Using Accelerated Functional Rehabilitation: Kevin Willits, MA, MD, FRCSC1; Annunziato Amendola, MD, FRCSC2; Dianne Bryant, MSc, PhD3; Nicholas G. Mohtadi, MD, MSc, FRCSC4; J. Robert Giffin, MD, FRCSC1; Peter Fowler, MD, FRCSC1; Crystal O. Kean, MSc, PhD1; Alexandra Kirkley, MD, MSc, FRCSC5