

## Achilles Tendon Length, ATRS and Functional Outcomes 5 Years After Acute Achilles Tendon Rupture Treated Conservatively

Kristoffer Weisskirchner Barfod, MD, PhD, DENMARK

Rasmus Kastoft, Medical student, DENMARK

Jesper Bencke, PhD, DENMARK

Merete Speedtsberg, MSc, DENMARK

Rasmus M Søndergaard, MSc, DENMARK

Jeanette Ostergaard Penny, MD, PhD, DENMARK

Copenhagen University Hospital Hvidovre  
Copenhagen, DENMARK

### Summary:

Acute Achilles tendon ruptures, randomized to conservative treatment +/- early weight bearing, had elongated tendons and lower heel raise work, as well as a delayed heel lift during gait - 4.5 years post rupture. Weight bearing did not impact results.

### Abstract:

#### Introduction

Achilles tendon rupture may lead to significant functional deficits, which mechanisms are poorly understood. The primary aim was to investigate if the Achilles tendon (AT) was longer, muscles weaker or gait changed on the injured leg 4-5 years after the injury. Secondary aim was to compare functional outcomes with patient reported Achilles Tendon Total Rupture Score (ATRS).

#### Patients / Materials / methods

We invited all participants from an RCT of conservatively treated AT Rupture (ATR) with or without early weight-bearing (early-WB, non-WB), and 12 months of follow up. Of the original 56, 37 patients participated, 19 from early-WB (1 re-rupture (RR)), and 18 from non-WB (2 RR). Time from injury to follow up was 4.5 years (4.1 to 5.1). AT length was measured using ultrasound with a validated protocol (Barfod K.W. et al.). Heel raise work was measured on a 10 degree inclining platform. The exercise lasted until the patient could not maintain frequency or height of lift. Number and height of lift was measured using reflective markers in a Vicon system, and total work calculated. Foot pressure mapping (FPM) was measured barefoot, using an EMED platform (novel, Germany).

Statistics: T-test for limb to limb comparisons and linear regression for ATRS correlations was applied.

#### Results

Including RR in the sample did not impact the results. We found no differences in any of the variables between the early-WB and non-WB groups.

Compared to the uninjured limb, the Achilles tendon was an average of 1.8 (1.2-2.3) cm longer on the injured limb, which produced 40% less work. A smaller calf circumference ( $p<0.001$ ), larger dorsiflexion ( $p=0.001$ ), and Achilles tendon resting angle ( $p<0.001$ ) was found for the injured limb. Difference in mean medial forefoot peak pressure was approaching significance (healthy 484 (SD 165) KPa, injured: 439 (SD 160),  $p=0.08$ ). Similarly the difference in pressure / time integral of the medial forefoot was approaching significance (Healthy: 129 (SD 35) KPa, injured: 115 (SD 44) KPa,  $p=0.08$ ). Duration of contact time of the heel was extended and heel lift off was delayed in the injured limb ( $p=0.02$  for both).

ATRS could not be linked to Achilles tendon length or total work using linear regression.

#### Conclusion

Conservatively treated Achilles tendon ruptures were approximately 1.8 cm longer. The limb was persistently

# ISAKOS

**International Society of Arthroscopy, Knee Surgery and  
Orthopaedic Sports Medicine**

11<sup>th</sup> Biennial ISAKOS Congress • June 4-8, 2017 • Shanghai, China

---

## Paper #188

weaker. A subtle change in heel contact duration and time of heel rise could be detected on the injured limb. ATRS does not appear to correlate directly with AT length or loss of total work.