term results are necessary to evaluate whether the TOPIC procedure stands the test of time from both a clinical and sports outcome perspective in order to be considered the treatment of choice for large OLTs at long-term follow-up.

**Category: Ankle/Foot/Calf**

**One-Year Serial MRI Study of the Calf Muscle Volume and Fatty Degeneration after Achilles Tendon Repair**

Abstract ID# 21517
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**Summary:**

Based on one-year serial quantitative MRI assessment, the soleus muscle volume did not fully recover and fatty degeneration in the soleus muscle progressed in the first postoperative year. On the other hand, HFL showed early muscle volume recovery, and it suggested that FHL compensates for decreased ankle plantar-flexion strength.

**Data:**

Background: Recovery of calf muscle function is one of the important factors that influence the clinical outcome of Achilles tendon repair. A number of studies reported the calf muscle atrophy is a common long-term problem after surgery, however, there is still lack of data concerning early postoperative morphological changes in calf muscle following Achilles tendon repair. The aim of this study was to investigate changes over time in the calf muscle volume and fatty degeneration during one year after Achilles tendon repair with use of quantitative MRI measurements. Methods: A prospective one-year serial MRI study was carried out with 20 patients who underwent tendon repair surgery for unilateral acute Achilles tendon rupture. MRI assessment was performed at 1, 3, 6 months, and 12 months after surgery. The healthy contralateral leg was also scanned at 12 months after surgery as control. The muscle volume was measured for medial and lateral gastrocnemius (MG/LG), soleus (SOL), and flexor hallucis longus (FHL). The fatty degeneration was measured for MG, LG, and SOL. Relative volume or fatty degeneration changes in the affected leg compared to the healthy contralateral leg were calculated as percentage ([injured/healthy control]x100 (%)) to assess structural changes over time. One-way repeated measures analysis of variance with the Bonferroni post hoc analysis was performed to compare the change in each value over time. Results: Muscle volumes of MG, LG, SOL, and FHL were 93.1%, 91.9%, 85.7%, and 96.9% at 12 months after surgery, respectively. MG, LG, and FHL muscle volumes improved over time and recovered to almost equal to the healthy side at 12 months after surgery (p = 0.062, 0.224, and 1.000, respectively). SOL muscle volume was significantly lower than the healthy side at all time points (p < 0.001), with poor recovery over time. Fatty degeneration of MG, LG, and SOL were 118.2%, 113.9% and 121.1% at 12 months after surgery, respectively. MG and LG fatty degeneration did not change significantly (p = 0.289 and 0.553, respectively), but there was a statistically significant increase in fatty degeneration of SOL over time (p < 0.001). Conclusion: Among the triceps surae muscle, SOL muscle was most negatively affected by surgery as for muscle volume and fatty degeneration. Contrary to other calf flexors, the SOL muscle volume decreases with time for 6 months and recovered only 85% of healthy control at 1 year after surgery. These early postoperative findings were similar to previous studies of long-term follow-up and may affect the clinical outcome of Achilles tendon repair. Postoperative management to recover soleus muscle function at early phase after surgery before return-to-sporting activities should be considered.

**Category: Ankle/Foot/Calf**

**Diagnostic Accuracy of Weightbearing CT in Detecting Subtle Chronic Syndesmotic Instability: A Prospective Comparative Study**

Abstract ID# 22939
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**Summary:**

Syndesmotic Instability: A Prospective Comparative Study

Diagnostic Accuracy of Weightbearing CT in Detecting Subtle Chronic Syndesmotic Instability: A Prospective Comparative Study

Data:

Introduction: Improving the diagnosis of subtle syndesmotic instability (SSI) represents one of the most challenging missions in orthopaedic surgery, since undiagnosed instability frequently leads to post-traumatic ankle arthritis. The advent of weight-bearing computed tomography (WBCT) brought hope for improved non-invasive SSI diagnosis, particularly by utilizing distal tibio-fibular syndesmotic (DTFS) area and volume measurements. The goal of this study was to prospectively evaluate the diagnostic accuracy of WBCT Distance Maps (DM), Area and Volumetric Measurements in Detecting Chronic Subtle Syndesmotic Instability. We hypothesized that WBCT measurements would demonstrate high diagnostic accuracy in detecting chronic subtle syndesmotic instability. Methods: This is a prospective comparative diagnostic controlled study. We included patients who met the following criteria: chronic syndesmotic injury (>6 months), Normal tibiofibular clear space (<6mm), 18 years old or older, no hindfoot malalignment (0.6°-Foot Ankle Offset <5;), flexible hindfoot deformity (Progressive Collapsing Foot Deformity stage I) and those without major ankle arthritis changes (The Kellgren and Lawrence score 1). All included patients and controls underwent Foot/Ankle WBCT. We measured distance mapping, area and volume at 1.3, 5 cm from the ankle joint. All patients with suspected syndesmotic instability underwent arthroscopic assessment/treatment (passage of 3 mm sphere in the tibio-fibular space at the syndesmosis while performing manual external rotation test confirmed syndesmotic instability). Results: 15 patients were included in the study and matched to 12 controls. Area measurements were most accurate at 1 cm proximal to ankle joint (70.4%) and less accurate at 3 cm and 5 cm (46.8% at both sites). Volume measurements were most accurate at 1 cm proximal to the ankle joint (66.2%) followed by measurements at 3 cm (62.5%), while the least accurate was measurement at 5 cm (56.5%). Conclusion: WBCT Distance, Area and Volumetric Measurements demonstrated only low/average diagnostic accuracy in detecting chronic subtle syndesmotic instability. We found also that area measurement at 1 cm and volumetric measurements at 1 and 3 cm proximal to the joint were to be the best diagnostic tools. Minimum syndesmotic distances, area measurements (1cm) and Volumetric measurements (1 and 3 cm) were significantly increased in the injured side in comparison to the contralateral non-injured side.

**Category: Ankle/Foot/Calf**

**Can All Weightbearing Stable Weber B Fractures Be Treated Functionally with Orthoses? - A Prospective Non-Inferiority Study Comparing Weightbearing Stable Fractures with and without Stress Instability**

Abstract ID# 23016
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**Summary:**

This study found that Weber B/SER ankle fractures that appear stable on weightbearing radiographs can be treated successfully with orthoses and weightbearing allowed, resulting in excellent clinical outcomes at two years. Interestingly, a concomitant unstable gravity stress test, which may indicate a partial deltoid ligament rupture, did not influence the outcome.

**Data:**

Background Assessment of potential tibiotalar displacement (stability) should dictate treatment of Weber B/supination-external rotation (SER) fractures. Tibiotalar stability is primarily determined by competence of the deltoid ligament. If intact (SER2), abundant evidence supports functional orthosis treatment. While if ruptured (SER4), operative fixation is necessary to preserve stability. However, evidence suggest that one third to half of these common fractures probably have partial deltoid ligament rupture (classified SER4a), determined by stability evaluation using weightbearing radiographs deemed stable, but with concomitant stress tests deemed unstable. Traditionally, SER 4a fractures have been treated operatively, but some studies have suggested that