Abstracts

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Category: Ankle/Foot/Calf

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

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Introduction: Improving the diagnosis of subtle syndesmatic 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 syndesmatic (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 Syndesmatic Instability. We hypothesized that WBCT measurements would demonstrate high diagnostic accuracy in detecting chronic subtle syndesmatic instability. Methods: This is a prospective comparative diagnostic controlled study. We included patients who met the following criteria: chronic syndesmatic injury (>6 months), Normal tibiofibular clear space (<6mm), 18 years old or older, no hindfoot mal-alignment (0.6°-Foot Ankle Offset <5.2°), 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, and 5 cm from the ankle joint. All patients with suspected syndesmatic 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 syndesmatic 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 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 syndesmatic 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 syndesmatic 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
they may be eligible for nonoperative treatment. It remains unclear whether it is necessary to distinguish between weightbearing stable fractures with (SER4a) and without (SER4a) concomitant stress instability and treat them differently. We undertook this study to evaluate outcome non-inferiority of weightbearing stable Weber B fractures with concomitant gravity stress radiographs considered unstable (SER4a) and stable (SER2) after a consistent treatment protocol using functional orthoses and weightbearing allowed. Methods We performed a prospective, non-inferiority study on 149 patients with stable weightbearing radiographs. Gravity stress radiographs were used to classify fractures as stable (SER2, n=88) or partially unstable (SER4a, n=61). All participants were treated with a functional orthosis and weightbearing allowed and were followed for two years. The primary outcome was the Manchester-Oxford foot and ankle questionnaire (MOxFQ; range 0-100; lower scores indicate fewer symptoms). A non-inferiority margin was prospectively defined as 7.5 points. Secondary outcomes included the Olerud-Molander Ankle Score, assessment of ankle congruence of injured ankles versus uninjured side, treatment-related adverse events, and thromboembolic events. Results Primary outcome data were available from 144 out of 149 (96.6%) participants at two years. The between-group difference was 1.0 MOxFQ points in favour of the SER2 group (95% confidence interval -1.4 through 3.4, P = .397). These findings were consistent with non-inferiority. We found no appreciable between-group differences for any other outcome. Conclusions In Weber B fractures that are stable on weightbearing radiographs, nonoperative treatment using functional orthoses and weightbearing allowed leads to excellent and non-inferior outcomes comparing patients with concomitant stress test instability (SER4a) and with stress test stability (SER2). These findings suggest that all weightbearing stable Weber B fractures may be treated functionally with orthoses, and identification of gravity stress instability seem redundant.

Category: Ankle/Foot/Calf

Long-Term Patient Outcomes For Treatment Of Difficult Osteochondral Lesions Of The Talus With Particulated Juvenile Allograft Cartilage Implantation ± Calcaneal Autograft

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Summary:
While patients with and without calcaneal bone graft showed improvement, patients without calcaneal bone graft incorporation had significantly greater improvement in functional outcome scores. Whether these differences are due to graft incorporation or larger lesion size is unclear.

Data:
INTRODUCTION: Osteochondral lesions of the talus (OCLT) are common traumatic injuries that can be difficult to treat. To date, long-term patient reported outcome measures (PROMs) of patients with particulated juvenile allograft cartilage implantation with or without calcaneal autograft have not been compared. METHODS: From 2010–2012, thirteen patients with difficult to treat OCLTs underwent arthroscopic-assisted implantation of particulated juvenile allograft cartilage (DeNovo NT®) with or without autogenous calcaneal bone grafting by a single surgeon. Inclusion criteria included at least two of the following: 1) shoulder lesions, 2) lesion size >107mm2 and/or deeper than 5mm. Patients were fully evaluated using physical examination, patient interviews, and PROMS. Pre-operative and post-operative PROMs were compared with a Mann Whitney test. RESULTS: When comparing patients in regards to calcaneal bone graft implantation, no difference in age (43.8±14.0 vs. 48.9±10.0yrs. respectively; p-value=0.667), BMI (28.4±6.7 vs. 29.5±4.5kg/m2 respectively; p-value=0.834), pre-operative PROMs (pmin=0.110) or follow-up (100.8±14.6 vs. 107.7±11.3months respectively; p-value=0.153) was noted, however, calcaneal bone graft patients did have a significantly larger lesion size (188.5±50.9 vs. 118.7±29.4mm2 respectively; pvalue=0.027). VAS score final follow-up improvement did not significantly differ between cohorts (p-value=0.889), nor did the FAAM ADL score (p-value=0.522). The FAAM Sports score improved significantly more for the DeNovo alone group compared to the bone graft cohort (p-value=0.032). The AOFAS score improvement did not differ between cohorts (pvalue=0.944), however, the SF-36 PCS improved significantly more for the DeNovo alone group compared to the bone graft cohort (p-value<0.038). No intraoperative/peroperative complications were observed with calcaneal bone grafting. DISCUSSION AND CONCLUSION: This is the first reported study to compare patient reported outcomes of particulated juvenile allograft cartilage alone compared to particulated juvenile allograft cartilage with calcaneal bone autograft, demonstrating positive post-operative, self-reported functional outcomes. While patients with and without calcaneal bone graft showed improvement, patients without calcaneal bone graft incorporation had significantly greater improvement in functional outcome scores. Whether these differences are due to graft incorporation or larger lesion size is unclear.

Category: Ankle/Foot/Calf

Sustained Clinical Success at 7 Years Follow-Up After Arthroscopic Lift-Drill-Fill-Fix (LDFF) Of Primary Osteochondral Lesions of the Talus

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Summary: Arthroscopic LDFF for fixable chronic primary OLTs results in excellent pain reduction and improved functional outcome, with sustained results at long-term follow-up. These results indicate surgeons may consider arthroscopic LDFF as treatment of choice for fragmentous OLT.

Data:
Introduction: The purpose of this study is to describe the long-term clinical results of arthroscopic fragment fixation for chronic primary osteochondral lesions of the talus (OLT), using the Lift-Drill-Fill-Fix (LDFF) technique. Methods: 18 Patients (20 ankles) underwent fixation for a primary OLT with an osteochondral fragment by means of arthroscopic LDFF and were evaluated at a mean final follow-up of 7 years. Pre- and postoperative clinical assessment was prospectively performed by measuring the Numeric Rating Scale (NRS) of pain at rest, during walking and when running. Additionally, the change in Foot and Ankle Outcome Score (FAOS) and the procedure survival (i.e., no reoperation for the OLT) at final follow-up and complications were assessed. A Wilcoxon signed-rank test was used to compare clinical outcomes preoperatively and postoperatively. A two-sided level of P<.05 was considered significant. Results: The median NRS during walking significantly improved from 7 (IQ: 5 - 8) pre-operatively to 0 (IQ: 0 - 1.5) post-operatively (p = <0.001). The NRS during running significantly improved from 8 (IQ: 6 - 10) to 2 (IQ: 0 - 4.5) (p = <0.001) and the NRS in rest from 2.5 (IQ: 1 - 3) to 0 (IQ: 0 - 0) (p = <0.001). The median FAOS at final follow-up was 94 out of 100 for pain, 71 for other symptoms, 99 for activities of daily living, 80 for sport and 56 for quality of life. The FOAS remained significantly improved post-operatively on all subscales, except for the symptom subscale. The procedure survival rate is 87% at final follow-up. No complications were reported. Conclusion: Arthroscopic LDFF for fixable chronic primary OLTs results in excellent pain reduction and improved functional outcome, with sustained results at long-term follow-up. These results indicate surgeons may consider arthroscopic LDFF as treatment of choice for fragmentous OLT.

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Syndesmotic Malreduction Assessment Using Three-Dimensional Distance Mapping: A Cadaveric Weight Bearing CT Study

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