

12 **EFFICACY OF EARLY CONTROLLED MOTION OF THE ANKLE IN NON-OPERATIVE TREATMENT OF ACUTE ACHILLES TENDON RUPTURE. AN ASSESSOR-BLINDED RCT**

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Background Early controlled ankle motion (ECM) is widely used in the non-operative treatment of acute Achilles tendon rupture although its safety and efficacy has not been investigated properly in a randomized setup.

Purpose/aim of the study To investigate if ECM of the ankle was superior to immobilization (IM) in the treatment of acute Achilles tendon rupture.

Materials and methods The study was performed as an assessor blinded randomized controlled trial with patients allocated in a 1:1 ratio to one of two parallel groups. Patients aged 18 to 70 years were eligible for inclusion. The ECM group performed movements of the ankle 5 times a day from week 3 to 8 after rupture. The control group was immobilized (IM). The primary outcome was the Achilles tendon Total Rupture Score (ATRS) evaluated at 1 year post-injury. Secondary outcomes were: heel-rise-work test (HRW), Achilles tendon elongation and rate of re-rupture. Analysis was conducted as intention-to-treat with imputation of missing data.

Findings/results 189 patients were assessed for eligibility and 130 included from February 2014 to December 2016; 64 ECM and 58 IM. There was no statistically significant differences ($p > 0.3$) between the ECM and the IM groups at 1 year; Mean (SD) ATRS was 74 (18) and 75 (18), respectively. HRW was 60% (21) and 60% (21) of the uninjured limb, and elongation was 18 mm (13) and 16 mm (11), respectively. Correspondingly, there were 6 and 7 re-ruptures.

Conclusions ECM revealed no benefit to IM in any of the investigated outcomes.

13 **DEEP VEIN THROMBOSIS AFTER ACUTE ACHILLES TENDON RUPTURE. AN RCT COMPARING EARLY CONTROLLED MOTION OF THE ANKLE WITH NO MOTION**

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Background Deep vein thrombosis (DVT) following acute Achilles tendon rupture (ATR) is common (up to 34%) and potentially dangerous. Immobilization (IM) is thought to be an important factor in the pathogenesis.

Purpose of the study To investigate if early controlled ankle motion ECM could reduce the incidence of DVT compared to IM in the treatment of acute Achilles tendon rupture.

Materials and methods The study was performed as a randomized controlled trial. Patients aged 18 to 70 years were eligible for inclusion. Treatment was non-operative. The ECM group performed movements of the ankle 5 times a day from week 3 to 8 after rupture. The control group was IM for 8 weeks. Follow up was performed with Color Doppler ultrasound at 2 and 8 weeks by two experienced radiologists. DVT was a secondary outcome, why a secondary power calculation was performed: 124 patients were required to have a 60% chance of detecting, as significant at the 5% level, a decrease in DVT from 34% in the IM group to 17% in the ECM group.

Findings/results 189 patients were assessed for eligibility and 130 randomized: 68 (ECM-group) and 62 (IM-group). All patients participated in the follow up. 62 (47.7%) patients were diagnosed with DVT; 34/69 (49.3%) in the ECM group and 28/61 (45.9%) in the IM group ($p = 0.70$).

Conclusions The incidence of asymptomatic DVT was higher than previously reported as 48% presented with DVT. ECM revealed no benefit to IM in reducing the incidence of DVT.

14 **INDIVIDUAL TREATMENT SELECTION FOR ACUTE ACHILLES TENDON RUPTURE BASED ON THE COPENHAGEN ACHILLES LENGTH MEASUREMENTS (CALM)**

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Background Acute Achilles tendon rupture (ATR) can be treated operatively or non-operatively. An evidence based selection tool is needed to guide choice of treatment.

Purpose To investigate if treatment selection in patients with ATR can be guided by Amlang's ultrasound classification (AmC) or the Copenhagen Achilles Length Measurement (CALM).

Methods The study was performed as a prospective cohort study. Patient were 18 to 70 years and treated non-operatively. AmC and CALM were performed at baseline and correlated to outcome at 1 year. The primary outcome was the Achilles tendon Total Rupture Score (ATRS). Secondary outcomes were: heel-rise-work test, re-rupture rate and CALM at 1 year. ROC analysis was performed to determine a cut off for acceptable elongation of CALM at baseline given that elongation at 1 year was not to exceed 10%. ClinicalTrial.gov Identifier: NCT02062567.

Results CALM was performed at baseline in 130 patients and AmC in 109. AmC showed no statistically significant correlation to any outcome parameter. CALM at baseline correlated to CALM at 1 year $r = 0.214$ ($p < 0.01$). The ROC model had $AUC = 0.67$. An elongation of 7% at baseline had a sensitivity of 0.77 and specificity of 0.50.

Conclusions Elongation of the Achilles tendon at baseline measured with CALM was weakly correlated to elongation at 1 year follow up suggesting that CALM at base line can

predict elongation at one year. A cut off of 7% elongation at baseline would have caught 77% of patients who ended up with an elongation above 10% at 1 year.

15 ACUTE ACHILLES TENDON RUPTURE – THE INFLUENCE OF GENDER, AGE AND COMORBIDITY ON TREATMENT OUTCOME

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Introduction Studies suggest that women have worse treatment outcome than men after acute Achilles tendon rupture (ATR). Few studies have assessed the influence of age and comorbidity on treatment outcome after ATR. The aim of the study was to investigate if gender, age and comorbidity affect patient reported outcome following ATR.

Materials and methods The study was performed as a registry study in the Danish Achilles tendon Database. The endpoints were the Achilles tendon rupture score (ATRS) at 4 months, 1 year and 2 years after injury. Variables of interest were gender, age, diabetes, hypertension, rheumatic disease, smoking and previous Achilles tendon disorder.

Results Data were collected from April 2012 to March 2018. 1524 patients participated at 4 months, 1277 at 1 year and 899 at 2 years. Women had statistically significantly lower ATRS at 4 months (mean difference, [confidence interval], p-value) (4.8, [1.78;7.78], $p<0.01$) and 1 year (9.9, [4.3;15.5], $p<0.01$), but not after 2 years. Patients with hypertension (7.6, [1.4;13.8], $p=0.02$) and non-operatively treated patients with rheumatic disease (14.8, [0.4;29.2], $p=0.04$) had lower ATRS at 1 year. Age showed a weak correlation to ATRS at 1 year ($r=0.12$; $p<0.01$).

Conclusion Women scored statistically significantly less than men in ATRS at 4 months and 1 year after ATR. The difference was half the clinically relevant difference at 4 months and peaked at 1 year where it equaled the clinically relevant difference. Hypertension and rheumatic disease led to statistically significantly decreased ATRS. Age did not have clinical relevant influence on ATRS.

16 RELATIONSHIPS BETWEEN A MULTIDIRECTIONAL REACTIVE AGILITY TEST, FUNCTIONAL PERFORMANCE AND PATIENT-REPORTED OUTCOME MEASURES 6 MONTHS AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

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Introduction Return-to-sport testing after anterior cruciate ligament (ACL) reconstruction traditionally occurs during pre-planned activities. The aim of this study was to investigate the relationships between a novel multidirectional reactive agility test, functional performance and patient-reported outcome measures in athletes after ACL reconstruction.

Materials and methods Twenty-eight ACL-reconstructed athletes (24 males, 4 females; 24.6 ± 4.4 years; 6 months postoperative), participated in the study. All athletes underwent an evaluation including a novel multidirectional reactive agility test (tested with Smartgoals, a light-based reactive training system to measure the time to complete a task), functional performance tests: 1) two hop tests (single-leg hop for distance, triple hop for distance), 2) the Y-balance test conducted with eyes closed and patient-reported outcome measures (ACL-Return to Sports after Injury (ACL-RSI) scale, Knee Self-Efficacy Scale (K-SES), International Knee Documentation Committee (IKDC) subjective knee form). Spearman correlation coefficients were calculated between the outcomes on the multidirectional reactive agility test, and the functional performance and patient-reported outcome measures.

Results The time to complete the multidirectional reactive agility test was significantly ($p<0.05$) negatively correlated with absolute hop test distances ($r=-0.52$ to -0.53), hop tests limb symmetry indices ($r=-0.41$ to -0.49), posteromedial ($r=-0.64$) and posterolateral ($r=-0.61$) reach distances on the Y-balance test, and K-SES future ($r=-0.39$), ACL-RSI ($r=-0.39$) and IKDC scores ($r=-0.44$).

Conclusion Faster reactive agility was significantly correlated with better functional performance and patient-reported outcome measures. These results suggest to consider implementing multidirectional reactive agility testing within the continuum of the return-to-sport decision-making process in athletes after ACL reconstruction.

17 SUBCLASSIFICATION OF RECREATIONAL RUNNERS WITH A RUNNING-RELATED INJURY BASED ON RUNNING KINEMATICS MEASURED WITH TWO-DIMENSIONAL VIDEO ANALYSIS

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Introduction The aim of this study was to explore whether homogeneous subgroups could be classified within the running kinematics of a group of recreational runners with a running-related injury (RRI).

Materials and methods Fifty-three recreational runners (15 males, 38 females) with an RRI ran on a treadmill at preferred speed. Digital videos were recorded in the frontal and sagittal plane with two iPads. Outcome measures included foot and tibia inclination at initial contact, and hip adduction and knee flexion during midstance. All angles were manually