Friday, 9:20 – 9:55 am

Session VII: Sports

Moderators: Robert B. Anderson, MD - a – Wright Medical Technology, Inc; DJ Orthopaedics; b – Wright Medical Technology, Inc; DJ Orthopaedics; c – Wright Medical Technology, Inc; DJ Orthopaedics; d - Wright Medical Technology, Inc; DJ Orthopaedics; e – Wright Medical Technology, Inc
Richard D. Ferkel, MD - a – Mitek; Smith & Nephew; e – Smith & Nephew

9:20 am
Elongation of Anterior Talofibular Ligament with Range of Motion After Modified Brostrom Procedure: A Biomechanical Investigation
Presenting: Kevin L Kirk, DO - n – nothing to disclose

Additional Authors:
John T. Campbell, MD - a – Synthes Carticept; b – DePuy, A Johnson & Johnson Company
Gregory P. Guyton, MD - n – nothing to disclose
Brent S. Parks, MS - a – Synthes; Zimmer;DePuy; Arthrex; EBI/Biomet; Stryker; c – Arthrex; DJ Orthopaedics; Darco; e – Zimmer
Lew C. Schon, MD - a – DePuy, A Johnson & Johnson Company; Synthes; EBI; Zimmer; Aircast (DJ Ortho); KMI/Integra; Stryker; Allosource; Medtronic; Nexa Orthopaedics-Tornier; Arthrex, Inc; BioMimetic; Biomet; Royer Biomedical, Inc; Carticept Medical Arthrocare; b – DePuy, A Johnson & Johnson Company; Nexa Orthopaedics-Tornier; Biomet; Zimmer; Arthrex, Inc; c – Aircast (DJ Ortho); Arthrex, Inc; Darco; Nexa Orthopaedics-Tornier, Zimmer; d – Nexa Orthopaedics-Tornier; Royer Biomedical, Inc; Bioactive Surface Technologies, Inc; e – DePuy, A Johnson & Johnson Company; Nexa Orthopaedics-Tornier; Biomet; Zimmer; The Snyder Center of Pain Pharmacology

Summary:
We evaluated elongation of the anterior talofibular ligament (ATFL) before and after lateral ligament reconstruction within a physiologic range of motion with protected and unprotected isolated dorsiflexion/plantarflexion range of motion. The use of protected range of motion of the ankle after lateral ankle ligament reconstruction was not associated with elongation of the ATFL. The ATFL elongated significantly by comparison without protected dorsiflexion/plantarflexion. The study provides biomechanical support for early protected dorsiflexion/plantarflexion range of motion after Brostrom reconstruction.

Abstract:
Background
Elongation of ligaments during early mobilization after reconstruction may be associated with decreased stability. We evaluated elongation of the anterior talofibular ligament (ATFL) before and after lateral ligament reconstruction within a physiologic range of motion with protected and unprotected isolated dorsiflexion/plantarflexion range of motion.

Methods
Six fresh frozen cadaver legs were used with the ATFL meticulously dissected. A differential variable reluctance transducer (DVRT) was spaced to span the course of the ATFL using consistent placement points based on previous reports. Elongation was measured in a load frame with protected motion of 30° plantarflexion and 10° dorsiflexion for the intact and sectioned ATFL and for the repaired specimen with and without protected motion. The proximal DVRT anchor point was detached for sectioning and repair of the ATFL and replaced at the same position. Testing was 1000 cycles at 1 Hz for the repaired protected specimen and 10 cycles at 1 Hz for all other stages.

Results
Initial elongation in the unprotected repaired group was significantly higher than initial elongation in the intact (p < 0.01), sectioned (p = 0.02), and repaired protected (p < 0.01) groups. Final
elongation in the unprotected repaired group was also higher than final elongation in all other groups (p < 0.01 for all comparisons).

Conclusions
The use of protected range of motion of the ankle after lateral ankle ligament reconstruction was not associated with elongation of the ATFL. The ATFL elongated significantly by comparison without protected dorsiflexion/plantarflexion.

Clinical Relevance
The study provides biomechanical support for early protected dorsiflexion/plantarflexion range of motion after Brostrom reconstruction.