Augmentation of Distal Biceps Tendon Ruptures with the Lacertus Fibrosus: A Biomechanical Study in a Tendon-Deficient Model

Antonio Cusano

Matthew R LeVasseur MD, Antonio Cusano MD, Michael R Mancini, Colin L Uyeki, Matthew J Pina MD, Elifho Obopilwe, Andrew E Caputo MD, Augustus D Mazzocca MD

I would like our paper to be considered for the prestigious H.Kirk Watson, M.D. Founder’s Award

ABSTRACT – should include background information and a description of methods, programs, or practices. *

Background: Chronic distal biceps tendon ruptures may require tendon graft augmentation secondary to tendon attrition or retraction. The lacertus fibrosus is a local, cost-effective graft that can be used to supplement reconstruction.

Purpose: To evaluate the biomechanical strength of distal biceps tendon repairs with lacertus fibrosus augmentation in a tendon-deficient model.

Study Design: Controlled laboratory study.

Methods: Sixteen fresh-frozen matched cadaveric pairs of elbows were randomized into two groups: (1) standard distal biceps tendon repair and (2) tendon-deficient (50% step cut) repair with lacertus fibrosus augmentation. All repairs were completed using an oval bone trough and two double-loaded No.2 braided nonabsorbable sutures in a locked Krackow fashion tied over a lateral bone bridge. For the lacertus augmentation group, the lacertus was wrapped circumferentially in a tubular fashion around the tendon to restore the native size and incorporated into the Krackow suture. All specimens underwent cyclic loading and then were loaded to failure. Displacement, stiffness, load to failure, and mode of failure were recorded.

Results: The standard repair and lacertus augmentation groups had similar displacements on cyclic loading (1.66±0.62 mm vs. 1.62±0.58 mm; p=0.894). The stiffness was significantly greater for the standard repair (21.3±2.5 N/mm vs. 18.5±3.5 N/mm; p=0.044). Both groups provided excellent mean peak load to failure strengths, despite the standard repair being significantly greater (462.4±140.5 N vs. 377.3±101.1 N; p=0.022). The primary mode of failure in the standard repair group was fracture at the bone bridge (5/8), as compared to suture pullout (4/8) in the lacertus augmentation group.

Conclusion: Lacertus fibrosus augmentation of a tendon-deficient biceps repair is less stiff and has lower load to failure compared to repair of the native tendon, however these values remain biomechanically acceptable above critical
thresholds. Consequently, lacertus augmentation is a viable option for chronic distal biceps tendon ruptures with tendon attrition.

Please attach files with diagrams and/or photos to support your abstract (10 MB limit)

lacertus_figurestables.docx
819.64 KB · DOCX

Please attach the abstract presenter's CV

curriculum_vitae_cusano_8.12.pdf
213.16 KB · PDF