

Varying Distance between Suture-Endobuttons Does Not Improve Stability of the Transected Syndesmosis in a Motion Tracking Cadaveric Model

Taylor Patricia Stauffer¹, Albert Thomas Anastasio, Kenneth Brinson, Gabriel Joseph, Calvin Chan², Hunter Storaci, David Eirin Oji, Loretta Chou², Brian Lau³

¹Duke School of Medicine, ²Stanford University, ³Duke Sport Science Institute

INTRODUCTION: A growing body of evidence favors the use of dynamic fixation techniques such as suture endobutton over rigid screw fixation for syndesmotic injuries. However, specific dynamic fixation techniques have been poorly evaluated.

METHODS: The purpose of this study was to compare single suture-endobutton fixation (single) to double fixation with suture-endobuttons placed one centimeter (cm) apart (double 1 cm) and double fixation with suture-endobuttons placed three cm apart (double 3 cm).

RESULTS: All three endobutton constructs improved the stability of the syndesmosis by reducing aberrant motion after transection. There was no clear superiority of either single suture-endobutton (SEB), double suture-endobuttons placed 2 and 3 cm above the joint line (DSEB 1), or double suture-endobuttons placed 1 and 4 cm above the joint line (DSEB 3). DSEB 3 and DSEB 1 showed equal median laxity for tibia internal rotation (2.7 degrees, DSEB 1 (2.0 – 3.2) degrees, DSEB 3 (2.3 – 2.8) degrees), tibia external rotation (-0.2 degrees, DSEB 1 (-0.4 - 0.4) degrees, DSEB 3 (-0.4 - 0.3) degrees), and fibula external rotation (-0.3 degrees, DSEB 1 (-0.7 - 0.3) degrees, DSEB 3 (-0.7 - 0.7) degrees).

DISCUSSION AND CONCLUSION: Cadaveric biomechanical studies are critical to evaluate various suture-endobutton constructs prior to widespread use in patients. Our results demonstrate that the added cost of a second suture-endobutton may not confer substantial additional stability to the syndesmosis. Likewise, increased spread between suture-endobuttons appears to have minimal impact of syndesmotic stability.

