

Does Adjustable-Length Loop Femoral Cortical Suspension Loosen After Anterior Cruciate Ligament Reconstruction? A Retrospective Comparative Study

Matthew J. Boyle, BSc, MBChB, FRACS, USA

Kathryne Judith Stabile, MD, MS, USA

Tyler Vovos, BS, USA

Cameron Walker, PhD, NEW ZEALAND

Jonathan Roth, MD, USA

William E. Garrett, Jr., MD, PhD, USA

Duke Sports Medicine, Department of Orthopaedic Surgery, Duke University Medical Center
Durham, NC, USA

Summary:

In this retrospective comparative study of 188 patients undergoing primary anterior cruciate ligament reconstruction using hamstrings autograft, we found no significant difference in knee stability or graft failure between adjustable-length and fixed-length loop femoral cortical suspension; our results suggest that adjustable-length loop femoral cortical suspension does not clinically loosen.

Abstract:

Introduction: The optimal femoral soft tissue graft fixation technique in anterior cruciate ligament (ACL) reconstruction remains controversial. Adjustable-length and fixed-length loop femoral cortical suspension devices have both demonstrated satisfactory biomechanical properties and high loads to failure. Adjustable-length loop devices provide the additional benefits of eliminating the need for multiple loop sizes and maximizing femoral tunnel fill, however recent research has suggested that these devices may loosen. Despite these laboratory findings, there have been no clinical studies comparing knee stability between adjustable-length and fixed-length loop devices. The purpose of this study was to compare patients managed with adjustable-length loop femoral suspension with patients managed with fixed-length loop femoral suspension with respect to knee stability and graft failure rate following primary ACL reconstruction using hamstrings autograft.

Methods: A consecutive series of 188 eligible patients with a mean age of 25.9 years (12.6 – 54.6 years) who underwent anatomic primary ACL reconstruction using quadrupled-loop hamstrings autograft by a single surgeon at a single institution from November 2006 to February 2013 were retrospectively identified through a review of hospital records. These patients were divided into two groups according to femoral fixation; 73 patients who received adjustable-length loop cortical suspension, and 115 patients who received fixed-length loop cortical suspension. Aside from femoral fixation, all patients followed a uniform surgical and postoperative protocol. The two patient groups were compared at six months, one year, and two years postoperatively with Lachman test, pivot shift test, KT-1000 arthrometer testing, and graft failure rate. Graft failure was defined as a grade 2+ Lachman test (no discernable end point), any pivot shift, greater than 5 mm side-to-side difference in KT-1000 arthrometer testing, and/or revision ipsilateral ACL reconstruction surgery.

Results: The two patient groups were comparable at baseline, with no significant difference in age ($p=0.86$), gender ($p=0.08$), operative side ($p=0.65$), body mass index ($p=0.40$), mechanism of injury ($p=0.15$), or rates of medial or lateral meniscal repair or meniscectomy (all $p>0.05$).

There was no significant difference between the two groups in maximum side-to-side difference in KT-1000 arthrometer testing at six months (mean 1.51 mm (adjustable-length group) vs. 1.79 mm (fixed-length group),

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$p=0.23$), one year (mean 1.44 mm vs. 1.64 mm, $p=0.48$), or two years (mean 1.14 mm vs. 1.07 mm, $p=0.90$) postoperatively. There was no significant difference between the two groups in number of patients with a maximum side-to-side difference in KT-1000 arthrometer testing of 0-2 mm, 3-5 mm, or >5 mm at six months, one year, or two years post-operatively (all $p>0.05$). There was no significant difference between the two groups in rate of graft failure (10% vs. 11%, $p=0.71$) or timing of graft failure in affected patients (mean 11.4 months vs. 13.8 months, $p=0.51$).

Conclusions: We have identified no significant difference in knee stability or graft failure rate between adjustable-length and fixed-length loop femoral cortical suspension in this retrospective comparative study. Our results suggest that adjustable-length loop suspension does not clinically loosen after anterior cruciate ligament reconstruction.