

Biomechanical Comparison of Knotted Transosseous Equivalent Versus Speed-Bridge Rotator Cuff Repair Techniques: A Systematic Review. JK Ansah-Twum, (M.D., SOM), CK Cannizaro, JW Belk, and AF Vidal, M.D., Department of Orthopedics, University of Colorado, Denver, CO.

This study compared the biomechanical outcomes of knotted transosseous equivalent (TOE) and knotless transosseous equivalent (KL-TOE) rotator cuff repair (RCR) techniques. A systematic review was performed according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines using PubMed, Embase, and the Cochrane Library to identify studies that compared the biomechanical properties of knotted TOE and KL-TOE (Speed-bridge) RCR techniques. The search phrase used was (Double Row) AND (rotator cuff) AND (repair) AND (biomechanical). 9 studies (150 cadaveric shoulders) met the inclusion criteria. Of the 9 studies, 6 showed improved biomechanical properties using the knotted TOE method compared to KL-TOE RCR technique. Ultimate load to failure ranged from 310 ± 82 N to 549 ± 163 N in knotted TOE repairs while ranging from 166 ± 87 N to 416.8 ± 120.0 N in KL-TOE repairs. 1 study found no significant difference in medial row fixation point displacement, construct stiffness, and ultimate load to failure when comparing knotted and knotless medial anchor sutures in a TOE double-row RCR. Of the remaining 2 studies, 1 indicated that KL-TOE repair shows an improved self-reinforcement effect, without diminishing footprint contact, compared to the same repair with medial knots. The other suggested strain at the medial suture level was significantly greater when the medial sutures were tied compared with those untied. Preliminary results of this systematic review indicate that the biomechanical properties of yield load, ultimate load, footprint contact area, and footprint pressure are significantly improved with reduced gap formation in knotted TOE RCR compared to KL-TOE repairs.