# Part II: Biomechanical Assessment for a Footprint-Restoring Arthrsocopic Transosseous-Equivalent Rotator Cuff Repair Technique Compared to a Double-Row Repair Technique

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We hypothesized that a "tranosseous-equivalen"t repair will demonstrate improved tensile strength and gap formation between tendon and tuberosity when compared to a double-row technique. In six fresh-frozen human shoulders, a" transosseous-equivalen"t rotator cuff repair was performed: a suture limb from each of two medial anchors was bridged over the tendon, and fixed laterally with an interference screw. In six contralateral match-paired specimens a double-row repair was performed. For all repairs, a materials testing machine was sued to cyclically load each repair from 10 N to 180 N for 30 cycles; each repair underwent tensile testing to measure failure loads at a deformation rate of 1 mm/min. Gap formation between tendon edge and insertion was measured using a video digitizing system. The mean ultimate load to failure was significantly greater for the " transosseous-equivalen"t technique (443.0±87.8 N) compared to the double-row techniques:299.2±52.5 N) (p=0.043). Gap formation during cyclic loading was not significantly greater for the " transosseous-equivalen"t and double-row techniques: 3.74±1.51 mm, and 3.79±0.68 mm, respectively (p=0.95). Stiffness for all cycles was not statistically different between the two constructs (p>0.40). The" transosseous-equivalen"t rotator cuff repair technique improves ultimate failure loads when compared to a double-row technique. Gap formation is similar for both techniques. A " transosseous-equivalen"t repair helps restore footprint dimensions, and provides a stronger repair than the double-row technique which may help optimize healing biology.