

## Biomechanical Comparison of a Single versus Double - Row Suture Anchor Technique for Rotator Cuff Repair

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Rotator cuff repair using transosseous tunnels improves footprint contact area and pressure when compared to suture anchor techniques. A double - row technique has been used clinically to improve footprint coverage by a repaired tendon. We hypothesized that an arthroscopic “transosseous - equivalent” rotator cuff repair using tendon suture - bridges will demonstrate improved pressurized contact between tendon and tuberosity when compared to a double - row technique. In six fresh - frozen human shoulders, a “transosseous - equivalent” 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 (four suture - bridges). In six of the contra lateral specimens, two types of repair were performed randomly in each specimen: 1) a double - row repair and 2) a “transosseous - equivalent” repair using a single screw (two suture - bridges). For all repairs, pressure - sensitive film was placed at the tendon - footprint interface, and software was employed to obtain measurements. The mean pressurized contact area between the tendon and insertion was significantly greater for the four suture - limb technique ( $115.7 \pm 12.88 \text{ mm}^2$ , 72.3%) compared to both the double - row ( $56.2 \pm 25.8 \text{ mm}^2$ , 35.1%) and two suture - limb ( $91.7 \pm 8.2 \text{ mm}^2$ , 57.3%) techniques ( $p < 0.05$ ). The mean interface pressure exerted over the footprint by the tendon was also greater for both the two ( $0.23 \pm 0.04 \text{ MPa}$ ) and four ( $0.27 \pm 0.04 \text{ MPa}$ ) suture - limb techniques compared to the double - row technique ( $0.19 \pm 0.01 \text{ MPa}$ ) ( $p < 0.05$ ). The arthroscopic “transosseous - equivalent” rotator cuff repair technique improved pressurized contact area and overall pressure between tendon and footprint when compared to a double - row technique. A “transosseous - equivalent” technique, employing suture - bridges, may help optimize the healing biology at a repaired rotator cuff insertion.