# Tendon-to-Bone Pressure Distributions at a Repaired Rotator Cuff Footprint Using Transosseous Suture and Suture Anchor Fixation Techniques

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## Abstract

### Background

Interface contact pressure between the tendon and bone has been shown to influence healing. This study evaluates the interface pressure of the rotator cuff tendon to the greater tuberosity for different rotator cuff repair techniques.

### Hypothesis

The transosseous tunnel rotator cuff repair technique provides larger pressure distributions over a defined insertion footprint than do suture anchor techniques.

### Study Design

Controlled laboratory study.

### Methods

Simulated rotator cuff tears over a 1 × 2-cm infraspinatus insertion footprint were created in 25 bovine shoulders. A transosseous tunnel simple suture technique (n = 8), suture anchor simple technique (n = 9), and suture anchor mattress technique (n = 8) were used for repair. Pressurized contact areas and mean pressures of the repaired tendon against the tuberosity were determined using pressure-sensitive film placed between the tendon and the tuberosity.

### Results

The mean contact area between the tendon and tuberosity insertion footprint was significantly greater for the transosseous technique (67.7 ± 5.8 mm2) compared with the suture anchor simple (34.1 ± 9.4 mm2) and suture anchor mattress (26.0 ±5.3 mm2) techniques ($P < .05$). The mean interface pressure exerted over the footprint by the tendon was also greater for the transosseous technique (0.32 ± 0.05 MPa) compared with the suture anchor simple (0.26 ± 0.04 MPa) and suture anchor mattress (0.24 ± 0.02 MPa) techniques ($P < .05$).

### Conclusion

The transosseous tunnel rotator cuff repair technique creates significantly more contact and greater overall pressure distribution over a defined footprint when compared with suture anchor techniques.

### Clinical Relevance

Stronger and faster rotator cuff healing may be expected when beneficial pressure distributions exist between the repaired rotator cuff and its insertion footprint. Tendon-to-tuberosity pressure and contact characteristics should be considered in the development of improved open and arthroscopic rotator cuff repair techniques.