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# Reverse shoulder arthroplasty glenoid fixation: is there a benefit in using four instead of two screws?

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### Abstract

**BACKGROUND:** To allow osseous integration to occur and thus provide long-term stability, initial glenoid baseplate fixation must be sufficiently rigid. A major contributing factor to initial rigid fixation is baseplate screw fixation. Current baseplate designs use a 4-screw fixation construct. However, recent literature suggests adequate fixation can be achieved with fewer than 4 screws. The purpose of the present study was to determine whether a 4-screw construct provides more baseplate stability than a 2-screw construct.

**METHODS:** A flat-backed glenoid baseplate with 4 screw hole options was implanted into 6 matched pairs of cadaver scapulas using standard surgical technique. Within each pair, 2 screws or 4 screws were implanted in a randomized fashion. A glenosphere was attached allowing cyclic loading in an inferior-to-superior direction and in an anterior-to-posterior direction. Baseplate motion was measured using 4 linear voltage displacement transducers evenly spaced around the glenosphere.

**RESULTS:** There was no statistical difference in the average peak central displacements between fixation with 2 or 4 screws ( $P = .338$ ). Statistical increases in average peak central displacement with increasing load ( $P < .001$ ) and with repetitive loading ( $P < .002$ ) were found.

**CONCLUSION:** This study demonstrates no statistical difference in baseplate motion between 2-screw and 4-screw constructs. Therefore, using fewer screws could potentially lead to a reduction in operative time, cost, and risk, with no significant negative effect on overall implant baseplate motion.

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**KEYWORDS:** Basic Science Study; Biomechanics; Cadaver Model; Reverse shoulder arthroplasty; glenoid fixation

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