

1 **Minimum 2-year patient report outcomes following fixation of displaced greater tuberosity**
2 **fractures: A Matched Cohort Analysis.**

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4 **Medical Student:** Dylan Rakowski

5 **Mentor:** Frank Scott, MD

6 **List of Authors:** Dylan R. Rakowski, Joseph J. Ruzbarsky, Thomas E. Woolson, Marilee P.

7 Horan, Philip-C Nolte, Peter J. Millett.

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16 **ABSTRACT**

17 **Background:** Isolated greater tuberosity (GT) fractures account for approximately one fifth of all
18 proximal humerus fractures, however, there remains a paucity of research regarding the outcomes
19 of GT fracture fixation. Furthermore, as greater tuberosity fractures are avulsion fractures of the
20 rotator cuff, an acute rotator cuff repair group enables a comparison of the fixation technique under
21 the circumstances of bone-to-bone and tendon-to-bone interfaces.

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23 **Purpose and Hypothesis:** The purpose of this study was to evaluate and compare patient-reported
24 outcomes following isolated GT fracture fixation to acute rotator cuff repair (RCR) at a minimum
25 of 2 years. It is hypothesized that patients who underwent fixation of GT fractures with a double-
26 row technique would have equivalent patient-reported outcome measures to those treated for an
27 acute rotator cuff tear.

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29 **Methods:** Patients who underwent isolated GT fracture fixation were compared in a 1-to-3 fashion
30 with patients who underwent arthroscopic RCR for an acute rotator cuff tear by a single surgeon
31 between January 2006 and July 2018. Data was prospectively collected and retrospectively
32 reviewed. Patient-reported outcomes (PROs) were compared pre- and post-operatively as well as
33 between groups (ASES, SF-12 PCS, SANE, QuickDASH, and satisfaction). Reoperation rates
34 were analyzed.

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36 **Results:** A total of 57 patients, 14 patients with isolated GT fracture fixation, mean age of 45.7
37 years old, and 43 patients who underwent ARCR for acute tears, a mean age of 56.6 years old,
38 were evaluated ($p=0.050$). ASES scores significantly improved from 39.7 to 94.0 ($p=0.018$) in the

39 isolated GT fracture fixation group and from 51.0 to 95.2 ($p < 0.001$) in acute RCR group. At final
40 follow-up, mean QuickDASH scores were 8.9 and 7.9 ($p = 0.667$) and SANE scores were 90.1 and
41 87.3 ($p = 0.616$) for the GT and acute RCR groups, respectively. The median satisfaction was 10/10
42 for the GT group and 10/10 for the RCR group. Additional comparison of patients who underwent
43 double-row repair for an acute rotator cuff tear or isolated GT fracture revealed no significant
44 difference in outcomes ($p > 0.404$).

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46 **Conclusion:** Minimum 2-year patient report outcomes following fixation of isolated GT fractures
47 show relatively high outcome scores whether treated by open reduction and internal fixation or
48 arthroscopic fixation using a double row, bridging suture anchor technique, which relays the
49 importance of selecting a treatment based on fracture morphology but also post-operative goals,
50 lifestyle, and shared-decision making. The improvements in PROs are similar to those achieved
51 with acute rotator cuff tears that were fixed arthroscopically with RCR. Further analysis of these
52 results suggests that the functional outcomes of tendon-to-bone healing with linked, double-row
53 rotator cuff repairs are similar to those of bone-to-bone healing as seen with GT fractures.

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56 **Level of Evidence:** III, Retrospective comparative study

57 **Keywords:** Greater tuberosity fractures, acute rotator cuff repair, patient reported outcomes