Magnetic Resonance Imaging of greater trochanter fractures to determine intertrochanteric extension and the need for fixation: Is it reliable and does it affect outcomes?

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INTRODUCTION: Greater trochanter (GT) fractures are disabling injuries that frequently result in emergency department visits with some patients being unable to bear weight or ambulate, resulting in hospital admission. One potential reason that these seemingly innocuous injuries can be so disabling is the possibility of occult intertrochanteric (IT) fracture extension, not visible on radiographs or computed tomography (CT) scans, which is present in 38% to 80% of these fractures. The objective of this study was to determine the interobserver reliability of utilizing Magnetic Resonance Imaging (MRI) to assess greater trochanter (GT) fractures for intertrochanteric (IT) extension and the need for fixation. The secondary objective was to compare outcomes of operative versus nonoperative management.

METHODS:

Four surgeons reviewed MRIs of patients with greater trochanter fractures on radiographs to determine complete IT extension (extending to medial cortex) and the need for fixation. Patients that a majority of surgeons agreed had complete IT extension on MRI were compared to patients that did not to evaluate differences in fracture displacement, length of stay, discharge disposition, and mortality. Patients admitted for isolated low-energy GT fractures on radiographs that were treated with operative versus nonoperative management were also compared.

RESULTS:

Eighty-six patients were included. Median age was 64 years (Interquartile range 53 to 73) and 66.3% (n=57) were males. Agreement for complete IT extension and the need for fixation were both considered weak (Kappa 0.55). A majority of surgeons agreed that 22 (25.6%) fractures had complete IT extension and that 21 (24.4%) needed fixation. Out of the 22 patients judged to have complete IT extension, 14 (63.6%) received fixation. There were no cases of displacement of occult IT fractures. Patients with complete IT extension, compared to those who did not, were older (71.5 vs. 61.5 years, $p=0.04$), more likely to be treated operatively (63.6% vs. 17.2%, $p<0.0001$), more likely to discharge to a facility (50.0% vs. 14.1%, $p=0.001$), and did not differ in need for hospital admission, length of stay, or 12-month mortality ($p>0.05$). There were 26 patients that were admitted for having low energy isolated GT fractures on radiographs; operative versus nonoperative management was not associated with a difference in length of stay, discharge to facility, or 12-month mortality ($p>0.05$).

DISCUSSION AND CONCLUSION: This study found weak agreement between surgeons in determining IT extension in the setting of GT fractures and the need for surgical fixation. Considering this weak agreement and that there was no observed difference in outcomes between patients treated with operative versus nonoperative management, the use of MRI to assess and treat GT fractures remains controversial. Based on the results of this study, the investigating orthopaedic trauma division no longer routinely obtains MRIs in patients with GT fractures and pain with weight bearing. Instead, these patients receive a CT scan and if no intertrochanteric fracture is present, they are allowed to weight bear as tolerated. A future study is necessary to determine the efficacy and safety of this practice change.