Elbow CT is Not Needed to Check for Occult Intraarticular Extension in Spiral Distal Third Humeral Shaft Fractures

Harrison Ferlauto, John Joseph Corvi, Pierce Joseph Ferriter, Ramone Brown, Bradford O. Parsons, Jaehon M Kim, Michael R Hausman, Paul Joseph Cagle

INTRODUCTION:

It is known that spiral distal third tibial shaft fractures are associated with occult intraarticular extension in approximately 50% of cases. As such, the standard of care is to obtain an ankle CT for all spiral distal third tibial shaft fractures to check for intraarticular extension. In a similar way, we have noticed a tendency for orthopaedic and emergency physicians alike to routinely obtain an elbow CT to check for intraarticular extension in cases of spiral distal third humeral shaft fractures (Figure 1). This, however, is despite a lack of evidence for analogous phenomena in the upper extremity. Therefore, the purpose of this study was to determine the incidence of occult intraarticular extension in the setting of a spiral distal third humeral shaft fracture.

METHODS:

We performed a retrospective chart review of all patients within our health system who presented to the ER with an acute traumatic spiral distal third humeral shaft fracture between the years 2010 and 2025. Patients with transverse fractures, mid-shaft humerus fractures, distal humerus fractures, oncologic fractures, and skeletally immature patients were excluded. Extracted data included patient demographics, humerus radiographs at the time of injury, any available elbow or upper extremity CT scan at the time of injury, and any relevant operative report. The gold standard test for presence of intraarticular extension was either CT scan or direct visualization at the time of surgery.

RESULTS:

In total, we identified 141 patients with an acute traumatic spiral distal third humeral shaft fracture. All patients had plain film radiographs of the injured humerus. Fifty-nine patients (42%) had an available CT scan of the elbow, and an additional 50 patients (35%) had an available operative report. Thus, 109 patients total (77%) possessed a gold standard test for intraarticular extension, and 32 patients (23%) had neither a CT scan nor operative report and were thus excluded from further analysis. Of the 109 patients with a gold standard test, four (4%) had intraarticular extension of the fracture into the elbow joint. However, in all four cases, the intraarticular extension was obvious on the initial plain film radiographs (Figure 2). There were no cases of occult intraarticular extension.

DISCUSSION AND CONCLUSION:

In the setting of a spiral distal third humeral shaft fracture, the incidence of occult intraarticular extension into the elbow joint appears to approach 0%. Any rare cases of concomitant intraarticular extension seem to be readily apparent on plain films alone. Therefore, we recommend against routinely obtaining an elbow CT to check for occult intraarticular extension in the setting of a spiral distal third humeral shaft fracture. Avoiding this additional CT scan can reduce undue cost, radiation exposure, and scanning burden on both the patient and health system.