The Utility of "Joint Above and Below" Imaging for Low-Energy Ankle Fractures

Ryan P. Bailey, BS*; Savannah F. Baimbridge, BSA; Jacob Siahaan, MS; James F. Kellam, MD; Stephen J. Warner, MD, PhD*

Purpose: Present standards of orthopaedic care suggest that despite physical examination (PE) findings, dedicated radiographs should be taken of the joint above and below (JAB) a fracture to evaluate for other associated fractures. However, limited evidence supports this practice, and clinical experience questions the utility of these radiographs in isolated low-energy fractures of the lower extremity. The aim of this study was to determine the value of this standard and seek opportunities to decrease the cost of health care, minimize radiation dose, and increase the efficiency of patient care.

Methods: A retrospective review was performed of patients presenting between 2018 and 2020 to any orthopaedic surgeon within our hospital system with ankle fracture via a low-energy mechanism. Exclusion criteria included patient age <18 or >85 years, high-energy fracture, pathologic fracture, and falls >3 feet. Fisher's exact test was used to compare groups based on PE status and hospital setting. A Mann-Whitney U test was used to determine relationships between fracture rate and continuous variables.

Results: JAB imaging was ordered for 116/201 patients, 109 (94%) of whom had negative PE findings. An associated fracture was found via JAB imaging in 4 of 109 patients with a negative PE, all managed nonoperatively. An associated fracture was found via JAB imaging in 3 of 7 patients with positive PE findings. This difference in the rate of fractures found between PE groups was statistically significant (P = 0.004). 30 of 84 patients seen at community hospitals had JAB imaging taken, compared with 86 of 117 patients seen at the academic hospital. This difference between groups is statistically significant (P<0.001).

Conclusion: Over half of patients presenting with a low-energy ankle fracture were further investigated with radiographs of the JAB despite negative physical examination findings. A fracture was found in only 3.67% of these patients, all of whom were managed nonoperatively. Utilizing the patients' clinical presentation as a determinant for further imaging, the diagnostic yield was improved significantly, with a fracture found in 43% of patients. Further, our data suggest that JAB imaging is more frequently performed in an academic setting compared to community hospitals. In order to limit the cost of health care, radiation dose, and delays in patient care, clinical presentation should be utilized as a determinant for the value of additional imaging in patients with low-energy ankle fractures.