Variation in Treatment Recommendations for Fracture of the Distal Radius: Actual Radiographs Versus Radiographic Measurements

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Purpose: The primary purpose of the study was to compare the interobserver variability of surgeon recommendation for operative treatment of a distal radius fracture when provided with either actual radiographs or just radiographic measurements. Secondarily, factors associated with greater likelihood of recommending operative treatment were evaluated.

Methods: 677 orthopaedic surgeons, members of the Science of Variation group, were invited to evaluate online the case scenarios of 30 consecutive adult patients with a distal radius fracture treated at our emergency department. Surgeons were randomly assigned either to the group receiving actual radiographs or to the group with just the radiographic measurements. Both groups read in addition a paragraph containing all available clinical information. 259 of all invited raters (38%) assessed all 30 cases; 124 were assigned to the group "measurements" and 135 received radiographs. The multirater agreement was calculated with the Fleiss generalized kappa. Factors associated with operative treatment choice were sought in bivariate and multivariable analysis.

Results: Surgeons who received measurements only recommended operative treatment significantly more often, but were less likely to agree than surgeons evaluating actual radiographs. Surgeon factors significantly associated with a greater likelihood of recommending operative treatment was the area (Europe and countries other than US), years of practice (less than 21 years of practice), and the specialty hand and wrist. Patient factors (younger age, female sex, left side, lesser comorbidities, diagnosed osteoporosis, and no known alcohol or drug abuse) and radiographic information (AO Type B or C, fracture of the ulnar styloid, dorsal comminution, and more dorsal tilt) significantly explained nearly 40% of the operative treatment recommendation.

Conclusion: Radiographic deformity and some changes, which were not measured or measureable, provided significant information about the injury and influenced the treatment recommendation beyond the measurements alone.

See pages 99 - 147 for financial disclosure information.