Reviewer’s report

Title: The relationship between distal radius fracture malunion and arm-related disability: A prospective population-based cohort study with 1-year follow-up

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Reviewer: William Cooney

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Overview... This is a prospective, non randomized study of distal radius fractures from 200-2002 in which closed reduction and casting was compared with closed reduction and pin or external fixation to determine the incidence on fracture malunion

Methods: Treatment in the ETU were compared with operating room treatment with reduction in the Operating room under axially block or general anesthesia and pin fixation in a total of 143 patients. A DASH score was registered in the first week after fracture treatment and compared with one year DASH. Recorded were objective findins of motion and strength at follow-up. The functional assessment of the patients result was compared with radiographic measures of malunion ( dorsal angulation of the distal radius and ulna variance).

Concerns related to the method and materials related to
1. Lack of a classification of fractures on which treatment could be based or stratified. The more severe fractures likely had operating room treatment
2. Difference in anesthetic block. Hematoma does not provide muscle relaxation for ease of reduction
3. DASH Score was mailed to patients. Confusion on accurate completion of the DASH score could have occurred
4. Patients were not formally randomized
5. Why was the study results delayed in presentation for nearly 8 years; how was data stored over this time period.
6. Patients were not separated into minor vs major trauma

Results: Results were reported based on radiographic assessment of dorsal tilt and ulna variance. Radial inclination and articular step off were not correlated with results. Patient outcomes were measured with subjective assessment by DASH Score and patient strength (grip) and motion. Complications were recorded Results were better with operative intervention with general anesthesia or block than ETU treatment. DASH scores correlated with radiographic appearance and measures.

Concerns related to the results were:
1. There was no wrist score utilized such as the Gartland Werley or Mayo or Krimmer wrist scores. A wrist score is suggested

2. AO System of fracture assessment was used retrospectively rather than prospectively and therefore comparison of results between different treatment methods could be questions. This should be a stated limitation

Discussion

Comparison of this study with others in the literature should be reported early, in particular studies that suggested that radiographic appearance and patient outcomes did not correlated. With the elderly patient, there are a number of studies that suggested that radiographic results (absence of malunion) did not affect outcome. The value of this study is that it shows the reverse. The results agree with this reviewers experience that anatomic reduction is important. Indeed, the better results with external fixation and open reduction and plate fixation demonstrate that function follows anatomy.

Concerns of Discussion

1. More discussion of the limitations of the study are needed
   a. Prospective nature of the study is questioned since DASH was performed after treatment and mailed to patient. How was the DASH returned—by mail or during followup?
   b. Why was there such a long study reporting period
   c. Treatment was not based on fracture classification; how was intra-articular fractures considered in the study; Excluded?
   d. Clarify the fall out of patient followup
   e. Review study by Macdermid related to the DASH and clinically important DASH score change of values

Overall an interesting study that demonstrates that patient outcomes, including the elderly, are influenced by the accuracy of fracture reduction.