



Distal radius fracture fixation in the elderly: does better form equal better function?

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Distal radius fractures are the most common of all fractures and account for 14% of all extremity fractures (1). Good alignment can be achieved and maintained even in elderly patients with osteoporosis (2). However, it is debatable whether the pursuit of anatomical alignment is necessary, as an acceptable alignment on radiograph does not necessarily translate to a good functional outcome. This concept was proposed as early as 1814 by Abraham Colles, who noted that sufferers of his eponymous fracture were eventually able to regain full wrist functionality, despite persistent deformity (3). With the increasing tendency toward surgical treatment of distal radius fractures, as well as the growing proportion of elderly, it is necessary to investigate whether surgical fixation produces better outcomes in these patients (4).

A recent study published in the *Journal of Bone and Joint Surgery (American Volume)* by Saving *et al.* compared nonoperative treatment with volar plate fixation for displaced distal radius fractures in patients aged >70 years (5). Three previous randomized controlled trials which focused on a similar cohort of patients had shown operative treatment uniformly led to a better radiological result (6-8). The changes in patients' functional outcome are, however, inconsistent among the studies. Martinez-Mendez *et al.* (8) found that the functional outcome and quality of life were significantly better after volar plate fixation compared with conservative treatment at 2 years. In contrast, Bartl *et al.* (7) found open reduction and internal fixation led to better wrist mobility at 3 months but that results at 12 months were not clinically different

from the conservative treatment group. Arora *et al.* (6) similarly showed that patients in the operative treatment group had better wrist function in the early postoperative time period, but there were no significant differences between the groups from six months onwards. In light of these mixed findings, the correct indications for surgical fixation in the elderly population remain undetermined.

This recent study by Saving *et al.* adds to the body of evidence for determining these indications amidst the current controversies in the literature. A primary strength of this study is that it had a relatively large cohort and was adequately powered. Furthermore, it had the fewest crossovers among similar studies with only 2 patients in the nonoperative group treated by volar plate fixation. It demonstrated better outcomes with surgical fixation among elderly patients up to one-year follow-up. Although the study was well-executed, we wish to address several issues regarding methodology.

First, the study was initially set up as 2 separate protocols with different inclusion and exclusion criteria, such as the inclusion of displaced intraarticular fractures and high energy injury at one study center but not the other. It is important to define rigorous criteria for patient selection in a prospective study. Additionally, the recruitment period of the study was exceptionally long, from 2009 to 2017, and there may have been changes in confounders during this time such as improvement in surgical techniques, changes in surgical team and changes in implant technologies over time. As a result, significant differences may exist between the intervention group and control group that result in

erroneous attribution of cause and effect.

It was not clear whether the content and frequency of rehabilitation therapy was similar between the groups. Operatively treated patients may have received more intensive rehabilitation than conservatively treated patients, thus leading to better outcomes. In this study, operatively-treated fractures were immobilized via splint for two weeks, which differs from the conventional practice of allowing patients to enjoy free range of motion immediately (9).

Elderly patients are not a homogenous cohort: some require assistance in basic needs, some are independent in daily living, and some even partake in skydiving. It is important to note that functional improvement observed in the intervention group could represent the benefit of surgery for lower-demand patients, or reflect a selected sample of higher-demand elderly individuals who respond to surgical treatment more similarly to younger. The level of activity and functional demand of elderly patients can be measured using validated instruments such as the Physical Activity Scale of the Elderly (10). This allows us to assess the generalizability of the results to the target population. As of now, the relationship between functional demand and the functional gain as a result of surgical fixation of distal radius fractures remains unclear.

With the increasing functional demand in the rising number of elderly, maintaining independence is of mounting importance. While studies of surgical versus conservative treatment appeared to show equivalence in the long term, the pain suffered by patients in their early healing phase should not be overlooked. Notably, the study by Saving *et al.* demonstrated that surgically repaired fractures benefitted from a more rapid recovery in the first 3 months post-op. As such, operative treatment may allow earlier mobilization and return to daily living without prolonged plaster immobilization. This study provides further evidence that operative treatment for distal radius fractures improves the radiological and functional outcome in the elderly patient cohort. However, we still require additional, high-quality evidence to fully evaluate the benefits and indications for surgical intervention.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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