

## Drs Golinvaux and Desai reply to Dr Ring

### In Reply:

We greatly appreciate Dr. Ring's time and interest in our manuscript. Radial neck nonunion following non- or minimally displaced fractures is certainly an area of great curiosity. We agree that this would be most ideally studied in patients with sequential radiographs at least 6 months to 1 year following a non-displaced radial neck fracture. Given that nonunion in this injury seems to be quite rare, this would require a very large cohort and might face research ethics hurdles because of the unnecessary need for exposure to radiation by many patients. Furthermore, many of these patients begin to be asymptomatic as early as 4 weeks postinjury and, thus, may not feel the need to present for additional imaging.

We do feel an important emphasis needs to be placed on the scope of our study. Similar to Dr. Ring, we have treated patients who return at a later date following injury and have the incidental finding of a radial neck nonunion without symptoms. Although this occurrence represents a fascinating phenomenon in its own right, our study sought specifically to identify the incidence of symptomatic radial neck nonunions. This is important to consider in both the analysis and the interpretation of the findings in our study.

In response to Dr. Ring's thoughtful questions, we will answer to the best of our ability within the limitations of our data. With regards to the percentage of radial neck fractures that had an elbow radiograph more than 1 month following injury, unfortunately, these data were not collected as part of the study. We agree this would be interesting to capture in future studies on the topic. However, based on our current protocol for fracture follow-up, we believe most of these patients would have a radiograph at least 1 month following injury. The routine management of a non- or minimally displaced radial neck fracture typically involves obtaining a 2-week postinjury radiograph and then an additional study at 4 to 6 weeks. Although some variability typically exists among providers, it is our standard practice to obtain radiographs beyond 1 month for the fractures that we treat.

For the 8 patients in our series who were diagnosed with a symptomatic nonunion of the radial neck, each had ongoing pain or persistent loss of range of motion. These were symptoms felt by the provider to be beyond what would be expected in the normal course of healing for a non- or minimally displaced radial neck fracture. The retrospective chart review design of our study limits our insight into the surgical decision making and patient counseling discussions that surrounded each specific circumstance to decide whether to proceed with surgery or continue nonsurgical measures. Several of our patients were unable to return to meaningful work in the setting of prolonged pain following their injury. In these cases, the decision to operate on their symptomatic radial neck nonunion was predicated on the patient's stated goals and understanding of the risks and benefits of the available options.

The objective of the present study was to bring light to the incidence and characteristics of the rare symptomatic nonunion following a non- or minimally displaced radial neck fracture. We share Dr. Ring's enthusiasm for the topic, as well as his intuition that many of these injuries may also proceed to asymptomatic nonunion. We advocate for a future large prospective series of patients to include prolonged radiographic follow-up to better characterize and treat both symptomatic and asymptomatic nonunions of radial neck fractures.

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