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CORR Insights®: What Are the Risk Factors and Complications Associated With Intraoperative and Postoperative Fractures in Total Wrist Arthroplasty?

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Where Are We Now?

Patients who undergo successful total wrist arthroplasty (TWA) for advanced wrist degeneration report a better ability to perform certain daily living activities [4, 7], and cost-utility analyses suggest the

intervention provides cost-effective value to patients [2]. Despite these benefits, TWA is less-frequently performed compared to total wrist arthrodesis [3, 5, 7]. In 2015, 1765 total wrist arthrodeses were billed to Medicare, compared with only 410 TWAs [3]—a number that actually is trending down [4]. Many hand surgeons are reluctant to recommend TWA due to concerns regarding high complication rates and limited survivorship [3, 5, 7]. I note that a major indication for TWA in the past, inflammatory arthritis, now is generally better managed medically. If symptoms persist despite disease-modifying drugs, some of these patients indeed will benefit from

TWA, particularly if they have a sedentary or low-activity lifestyle. Likewise, patients with osteoarthritis (OA) or posttraumatic arthritis who are willing to forego heavy demands on at least one of their wrists may choose TWA in order to maintain the mobility necessary to perform activities of daily living that benefit from wrist motion.

In the current study, Wagner and colleagues report their 40-year institutional experience with TWA. The authors conclude that intraoperative fractures occur in only 2% of cases, and that fractures did not affect implant survival, as long as the fracture and implant were stabilized.

Where Do We Need To Go?

The greatest gap in our knowledge regarding TWA relates to how much activity modern implants—with features that minimize bone resection and instability [4, 6, 7]—can tolerate. As implant designs change, more patients may prefer an option that retains wrist

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motion. The same patients, however, may have increased functional demands as disease-modifying agents improve their activity. It may become increasingly difficult to assume general activity level and generalize treatment decisions on the basis of labels such as “OA” and “rheumatoid arthritis”.

Wagner and colleagues address whether OA is a risk factor for fracture, and report a hazard ratio for intraoperative fracture of 6.32, but with a *p* value that was not statistically significant (*p* = 0.06). Would a larger sample size of patients with OA undergoing TWA better elucidate whether they are at higher risk for intraoperative fracture? It is possible. But it is also important to note that the primary outcome of the study was that intraoperative fracture did not affect long-term survival, given that the fracture and implant are stabilized, so it may not matter to the patient outcome.

Patients are advised to avoid heavy activities after TWA, but how much activity are they actually doing? Are there specific factors related to activity, implant design, and patient characteristics that could help us more accurately provide recommendations?

If we can improve our understanding of the intra and postoperative complications, implant survivorship, and risk factors associated with TWA, we could better communicate those

risks to our patients, and improve our selection of patients who might benefit from TWA over wrist arthrodesis.

How Do We Get There?

While multicenter randomized controlled trials would best compare total wrist arthrodesis and TWA in appropriate patients, these studies are difficult to coordinate, particularly for uncommonly performed procedures like TWA. Many hand surgery centers will not do a single TWA in a year, and the variations in surgeon experience and indications may lead to unacceptable bias in the results.

Many of the current knowledge gaps in TWA relate to choosing the right patients and following their long-term outcomes. Improved knowledge of both complications and functional outcomes for TWA recipients will go a long way towards matching the right patient to the right procedure. Wagner and colleagues demonstrate the value in institutional registries by answering important questions about patients and arthroplasty implants. Greater participation and funding of national, regional, and/or society registries will allow for ongoing evaluation of less frequently performed arthroplasties such as TWA.

Our patients may be more active than we realize [1]. Knowledge of

patient activities after TWA may help better delineate the true functional gains obtained from the procedure, as well as adherence to recommended activity restrictions. This will likely require the use of both joint-specific outcome measures and general-activity scores. Perhaps computer-adaptive testing can accurately assess functional activity, while minimizing the item responses for the participants on a large scale.

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