Ulnar sided wrist pain and distal radioulnar joint osteoarthritis: is surgical arthroplasty enough?

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Abstract

Distal radioulnar joint (DRUJ) arthritis is a common cause of ulnar wrist pain in rheumatoid and osteoarthritis. Modified arthroplasty for the DRUJ is a minimally invasive procedure for the treatment of isolated DRUJ osteoarthritis. The purpose of this study was to evaluate the efficacy of the procedure and the incidence of related ulnar wrist pathology as well as the incidence of subsequent ulnar wrist surgeries. All patients having modified arthroplasty for the DRUJ between 1994-2008 were retrospectively reviewed. Measurements included range of motion, grip strength, and subjective status. Data regarding other wrist surgeries was recorded. There were 29 patients, 23 of which had a follow-up of over 8 weeks (average 16 months, SD=24). Fourteen patients had no to minimal pain, 6 had pain with heavier activities (2 severe), and 2 reported constant pain at the surgical site. Of the 4 more painful patients, three had additional surgery after the DRUJ arthroplasty. In all 96% of the patients had another procedure involv-ing the ulnar-wrist complex either prior to surgery, at the time of surgery or following surgery for modified arthroplasty. We suggest that pathology involving the ulnar-wrist complex is often a syndrome consisting of multiple related diagnoses including but not limited to arthritis of the DRUJ. Multiple procedures may be needed, or a more aggressive approach such as ulnar head replacement may be indicated so that pathology at both the distal radioulnar and ulnocarpal joints is addressed concomitantly.

Introduction

The ulnar-wrist complex remains unclear and controversial in reference to its basic anatomy, clinical diagnosis and therefore its treatment.1,2 Clinical dysfunction in the distal radioulnar joint (DRUJ) is especially common following distal radius and ulna fractures, in rheumatoid arthritis, and is still being investigated.3-4 Arthritis in this joint is often seen on radiographs, but the clinical correlation between the radiographic signs, and pain and dysfunction remains unknown. In addition, other ulnar sided wrist pathology may occur with DRUJ dysfunction such as ulnar styloid fracture, and tear of the triangular fibrocartilaginous complex (TFCC). In rheumatoid arthritis, attenuation of other ligaments can cause additional pathology further complicating the diagnosis. Treatment options include osteotomy, soft tissue repair, ulnar head excision and DRUJ arthroplasty.5,6,7

Modified arthroplasty for the DRUJ was described by Watson et al. in 2002 for the treatment of limited DRUJ arthritis.12 A minimal procedure consisting of osteophyte removal was attempted, based on the premise that limited surgery may bring relief to osteoarthritic joints.13 The results of eleven wrists were reported with an average follow-up period of 30 months. Following our clinical impression that the results of this procedure are limited, the purpose of this study was to evaluate the incidence of additional ulnar wrist procedures performed before, after or at the same time as the modified arthroplasty.

Materials and Methods

All patients having modified arthroplasty for the DRUJ between the years 1994-2008 were retrospectively reviewed. Surgery was performed by the same surgeon. Demographic information was collected, including age, gender, dominance, affected side, occupation, and history of injury, as well as any other wrist/hand diagnoses and surgery. The indications for surgery were prolonged pain on supination, tenderness over the DRUJ, and discomfort with a piano-key test as well as radiographic findings of DRUJ arthritis.14,15 Wrist posterioranterior (PA) views were used to evaluate the existence of DRUJ arthritis and arthritis was defined by narrowing of the joint space with or without osteophytes.

Operative technique: The operative technique has been described and consists of a dorsal approach to the joint with synovectomy and removal of the (usually) proximal osteophytes. No additional soft tissue repair is performed.15 Following surgery, patients are instructed to start active range of motion within 2-3 days and are followed in hand therapy for an average of 6 weeks.

Measurements at last followup were reviewed, including active and passive range of motion, grip strength, and subjective status. The occurrence of additional surgical procedures before, at the same time as, or after the DRUJ arthroplasty were examined, especially those related to pathology of the DRUJ and ulnar wrist. We distinguished between procedures performed on the ulnar wrist and those addressing pathology on the radial wrist. Those that addressed the ulnar wrist were essentially treating the same pathology as our minimal arthroplasty (basically a failure of the minimal DRUJ arthroplasty), while a procedure such as four corner fusion addressed arthritis between the scaphoid and radius and would require a separate surgery to address the DRUJ if painful. Paired t-test was used for normally distributed differences and Wilcoxon Sign-Rank test for skewed differences. There were 29 patients in all. Average age was 44.2 years (SD=14.2); there were 17 males and 12 females. The characteristics of the population are presented in Table 1.

Results

The average follow up period for the whole group was 21 months (SD 29) with a range of 7 days (one patient not lost to follow-up but unavailable for evaluation) to 8.9 years.
Longer-term data included follow-up prior to any additional surgical procedures. Patients from the originally published series were also included, using the most recently available information. Twenty-three patients had a minimum follow-up period of 8 weeks. These 23 patients had an average follow-up of 16 months (SD = 24), and a range from 8 weeks to 8.9 years.

Functionally, two patients noted problems with activities of daily living and two with heavier activities. Fourteen patients had no to minimal pain, 6 had pain with heavier activities (2 severe), and 2 reported constant pain at the surgical site. Of the 4 more painful patients, three had additional surgery on the ulnar wrist after the DRUJ arthroplasty. One had an anterior transposition of the ulnar nerve at the elbow, one had an extraarticular ulnar wrist procedure performed: triquetral impingement (TILT), and one had a matched ulna arthroplasty, all reporting good function after surgery. The fourth patient was scheduled for a matched ulna arthroplasty, but opted not to have the surgery.

Ten patients (34%) had surgery involving the ulnar side of the wrist and/or DRUJ prior to DRUJ arthroplasty. Prior to surgery, 9 patients (31%) had a diagnosis of ulnar sided wrist pathology other than DRUJ arthritis, and had surgery involving the ulnar wrist complex. These included 5 TFCC repairs, 2 ulnar shortening procedures, 1 DRUJ reconstruction, and 1 TILT procedure. Four patients had additional radial wrist procedures, including 1 dorsal wrist arthroplasty, 1 four corner fusion, 1 scapholunate ligament reconstruction and 1 wrist fusion. Two patients had surgery for both the radial and ulnar wrist.

At surgery 14 (48%) patients had one or more concomitant ulnar wrist surgical procedures including the following: 11 triquetral impingement (TILT syndrome), 3 ulnar styloid excisions, 1 pisiformectomy, and 2 co-compartment releases. Four patients had additional wrist procedures, including 2 dorsal wrist arthroplasties, 1 four-corner fusion, and 2 radial styloidecomies.

Seventeen percent (5 patients) had additional surgery after the DRUJ arthroplasty specific to the ulno-carpal/DRUJ complex (4 patients matched ulna arthroplasty, 1 patient TILT and ulna styloidectomy). Two additional patients (7%) had more global wrist procedures after DRUJ arthroplasty: 1 wrist arthroplasty following a 4-corner fusion, and 1 radiolunate limited wrist arthrodesis. Additional soft tissue procedures included 1 anterior transposition, and 1 carpal tunnel release. The average time between the surgeries (modified arthroplasty and additional procedures) was 11 months (SD = 21.7).

In all, 96% of patients had another ulnar wrist/DRUJ related procedure prior to, during or after the DRUJ arthroplasty. (Table 2)

### Discussion

In this study we found that the majority of patients had an additional ulnar wrist procedure before, during or after the DRUJ arthroplasty (96% of patients). This supports our clinical impression that the results of this procedure are limited. We believe the reason for these results is that most pathologies of the distal radioulnar joint do not occur as isolated problems but rather that they are often accompanied by other related ulnar wrist problems. We suggest that a global approach to ulnar wrist pathology should be practiced, with care-ernment of concurrent surgeries performed. These results may indicate that the modified DRUJ arthroplasty addresses only one component of the pathology that commonly exists.

At this time we suggest that the indications for modified/minimal DRUJ arthroplasty are limited to early stage, isolated, DRUJ arthritis where synovectomy and minimal osteophyte removal may be helpful, but even then the patient should be counseled that further surgery addressing the ulnar side of the wrist may become necessary. Dysfunction at the DRUJ is frequently accompanied by pathology involving the ulnocarpal wrist. Surgical intervention must address all aspects of the DRUJ and ulnocarpal complex for optimum results (e.g. ulna head excision/replacement, TILT, etc.). Further study is required to more fully evaluate and compare the long term results of procedures aimed at the DRUJ/ulnocarpal wrist complex.

### References

5. Fraser GS, Ferreira LM, Johnson JA, King GJ. The effect of multiplanar distal radius...