

Effects of Extensor Synovectomy and Excision of the Distal Ulna in Rheumatoid Arthritis on Long-Term Function

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Purpose Objective outcomes data after excision of the distal ulna in rheumatoid arthritis are lacking. The aim of this study was to evaluate the functional results of this surgery in the long term.

Methods We prospectively collected data on range of motion (22 wrists), visual analog pain scores (14 wrists), and grip strength measured using a Jamar dynamometer (20 hands) in a group of 23 patients (26 wrists) preoperatively and at 3 months, 12 months, and a minimum of 5 years postoperatively (range, 5.3–10.4 y). The Jebsen-Taylor hand function test was administered to 9 patients at the same time points. A subgroup of patients also underwent extensor carpi radialis longus to extensor carpi ulnaris tendon transfer (11 wrists).

Results At one year, there were improvements in wrist pronation and supination, which were maintained at final follow-up. Active radial deviation decreased significantly at 3 months ($p = .01$) and one year ($p = .02$); this remained reduced at final follow-up (not significant). Wrist extension and active ulnar deviation showed slight improvements by one year, but reduced to levels below that measured preoperatively by final follow-up. Wrist flexion was significantly reduced at all time points postoperatively. Grip strength showed improvement from 10.0 kg (standard deviation [SD] 4.1 kg) preoperatively to 12.5 kg (SD 4.6 kg) 1 year after surgery and returned to preoperative levels (9.5 kg, SD 5.6 kg) by final follow-up. Wrist pain was significantly reduced from a mean score of 5 (SD 4) preoperatively to 2 (SD 2) postoperatively ($p = .01$). The Jebsen-Taylor hand function test showed improvements in writing and card turning.

Conclusions In the long term, excision of the distal ulna in rheumatoid patients results in an improvement in some aspects of hand function. There is a significant ($p = .01$) reduction in wrist pain but a reduction of wrist flexion. (*J Hand Surg 2010;35A:1442–1448. Copyright © 2010 by the American Society for Surgery of the Hand. All rights reserved.*)

Type of study/level of evidence Therapeutic IV.

Key words Excision, distal, ulna, Jebsen hand function, rheumatoid.

RHEUMATOID ARTHRITIS (RA) is a chronic, systemic autoimmune disease often affecting the hand and wrist.¹ At the wrist, the distal radioulnar joint (DRUJ) is most commonly involved.² Re-

section of the distal ulna, in combination with extensor tenosynovectomy, is a recognized method of addressing the DRUJ involvement in this disease.² The procedure aims to reduce pain, improve function, prevent tendon

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damage, and correct deformity.³ However, there is no consensus as to the efficacy of this surgery.^{4–6} Therefore, there is a need to assess the long-term functional outcomes of patients with RA undergoing hand surgery.

Only a few studies have looked at functional outcome after resection of the distal ulna.^{7–11} We previously reported our prospective results at 1-year follow-up with regard to improvements in pain, hand function, and range of motion.⁸ In this study, we extended our observations by prospectively measuring functional outcome using the Jebsen-Taylor hand function test, visual analog pain scale, grip strength, and range of motion at a minimum follow-up of 5 years to assess the efficacy of the procedure in the long term.

PATIENTS AND METHODS

We undertook a prospective study looking at 34 patients with RA undergoing excision of the distal ulna on 39 wrists between May 1997 and April 2002. All patients had well-controlled disease at the time of surgery and gave informed consent. Approval was obtained from the local ethics committee. Over the 10-year follow-up period, we lost 10 patients (11 wrists) to follow-up. Three patients (3 wrists) died, 2 patients (3 wrists) were hospitalized long-term, 1 patient (1 wrist) moved out of the area, and 4 patients (4 wrists) withdrew from the study. Two further wrists in 2 patients were excluded as they went on to have a wrist arthrodesis. One patient, who had bilateral excision of the distal ulna, remained in the study for range of motion, pain, and grip strength evaluation in the nonfused wrist. This left us with 23 patients (26 wrists) in whom measurements were undertaken preoperatively and at a minimum of 5 years of follow-up (range, 5.3–10.4 y). It was not possible to collect every measurement in all patients. Range of motion data were collected in 22 of these wrists, pain was scored in 14 wrists, grip strength was measured in 20 hands, and Jebsen-Taylor hand function was administered in both the operated and unoperated hands of 9 patients. The mean age of the patients was 58.6 years (range, 38–87 y). All but one of these patients was female. A subgroup of patients underwent extensor carpi radialis longus (ECRL) to extensor carpi ulnaris (ECU) transfer. Data for this subgroup were analyzed separately.

Surgical technique

The senior author carried out all procedures as described previously.⁸ Briefly, under general anesthesia and tourniquet control, a straight dorsal incision was made. The extensor retinaculum was reflected along the sixth dorsal compartment, an extensor tenosynovec-

tomy was undertaken, a segment of the terminal branch of the posterior interosseous nerve was resected, and the distal ulna was excised just proximal to the DRUJ. Synovectomy of the radiocarpal joint was performed, Lister's tubercle was excised, and the capsule was closed. We relocated the palmarly subluxed ECU tendon to its dorsal position with a radially based sling of the extensor retinaculum. The remaining retinaculum was divided, with one segment sutured deep to the tendons and the other sutured over the tendons to prevent bowstringing. A subgroup of patients who had a tendency to radially rotate the wrist on active extension preoperatively underwent an ECRL to ECU tendon transfer (11 wrists). A closed suction drain was inserted if there was excessive bleeding from the cut bone end and a plaster of Paris volar wrist splint was applied. If a drain was used, it was removed the next day and the patients began active pronation and supination exercises the following day. The plaster splint was replaced with a thermoplastic splint at 3 weeks postoperatively and active wrist flexion and extension exercises commenced, except when an ECRL to ECU transfer had been performed, in which case the wrist was statically splinted for 6 weeks.

Measures of pain, power, and range of motion

All measurements were performed on the operated hand preoperatively and at 3 months, 1 year, and a minimum of 5 years postoperatively (range, 5.3–10.4 y) by the same hand therapist. Owing to the difficulty associated with collecting data over an extended period, some patients were not available for assessment at all intermediate time points.

We made all range of motion measurements with a goniometer using a standardized protocol. Flexion, extension, pronation, supination, and active ulnar and radial deviation were measured in 22 wrists (21 patients).

Pain was measured using a visual analog scale (1–10) preoperatively and postoperatively. Complete data at final follow-up were available for 14 wrists in 12 patients. Grip strength was measured using a Jamar dynamometer (Bolingbrook, IL) in 20 operated wrists (19 patients).

Jebsen-Taylor hand function

The Jebsen-Taylor hand function test¹² is a timed, objective, standardized test that has been shown to be reliable in assessing hand function in RA patients.^{8,13–15} It consists of 7 tests carried out in both the operated and unoperated hands. The tests include (1) writing a short sentence, (2) turning over cards,

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