

# Results of Total Elbow Arthroplasty in Patients Less Than 50 Years Old

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**Purpose** Total elbow arthroplasty (TEA) is a treatment option for end-stage arthritis in low-demand patients willing to accept the limitations of TEA. Concern remains regarding the longevity of TEA implants, especially in younger patients. The purpose of this study was to determine the failure rate and complication profile of TEA performed in patients aged less than 50 years.

**Methods** Between 2009 and 2013, 11 linked TEAs were performed in patients aged less than 50 years (mean age, 37 years; range, 22–47 years). Outcome measures included pain; range of motion; Disabilities of the Arm, Shoulder, and Hand scores; Mayo Elbow Performance scores; complications; and reoperations. Elbows were observed for a minimum of 2 years or until mechanical failure. Mean follow-up was 3.2 years.

**Results** At follow-up, 82% of TEAs had experienced a complication. Six elbows sustained mechanical failures (5 had ulnar loosening and one had humeral loosening). Pain improved from 8.0 to 4.9. Extension improved from 34° to 22° and flexion increased from 113° to 128°. Mean Disabilities of the Arm, Shoulder, and Hand score for surviving implants at follow-up was 42.9 (range, 17.5–56.7). Mayo Elbow Performance scores for surviving implants were rated as excellent (2), good (1), and fair (2).

**Conclusions** High rates of early mechanical failure, predominately ulnar loosening, were observed in TEA in patients aged less than 50 years. Surgeons should remain cautious in performing TEA in young patients who can be expected to use the TEA in a more demanding fashion, placing them at higher risk for mechanical failure. (*J Hand Surg Am.* 2017; ■ (■): ■–■. Copyright © 2017 by the American Society for Surgery of the Hand. All rights reserved.)

**Type of study/level of evidence** Therapeutic V.

**Key words** Complications, mechanical failure, revision, total elbow arthroplasty, young.

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TOTAL ELBOW ARTHROPLASTY (TEA) has traditionally been reserved for the elderly, low-demand patient owing to concerns regarding implant longevity.<sup>1</sup> Reports in the rheumatoid population have reported survivorship of 85% to 96% at 5 years and 70% to 92% at 10 years.<sup>2–7</sup> Despite lower functional demands, complication rates in rheumatoid patients have also been reported to be as high as 40%.<sup>8</sup> In higher-demand populations, these complication rates may be higher. Barlow et al<sup>9</sup> showed that patients undergoing TEA routinely use the operative

**TABLE 1. Demographic Information**

Patient	Age and Sex at Total Elbow Arthroplasty	Preoperative Diagnosis	Prior Surgery
1	22 F	Posttraumatic arthritis	Interposition arthroplasty
2	28 F	Juvenile rheumatoid arthritis	
3	28 M	Hemophilic arthropathy	Arthroscopic synovectomy and debridement (2 times) Interposition arthroplasty
4	42 F	Rheumatoid arthritis	
5	47 F	Rheumatoid arthritis	
6*	28 F	Juvenile rheumatoid arthritis	
7*	39 F	Rheumatoid arthritis	Arthroscopic synovectomy and debridement with ulnar nerve transposition
8*	39 M	Posttraumatic arthritis	Open synovectomy and debridement Broken drain removal
9*	40 F	Rheumatoid arthritis	Arthroscopic synovectomy and debridement Radial head resection
10*	47 F	Rheumatoid arthritis	Open synovectomy and debridement
11*	47 M	Posttraumatic arthritis	Lateral ulnar collateral ligament repair Open synovectomy and debridement Lateral ulnar collateral ligament reconstruction Interposition arthroplasty

\*Mechanical failure.

extremity to lift more than recommended; most surgeons recommend a weight-lifting restriction of 10 lb and no repetitive lifting of more than 1 lb.

With the introduction of disease-modifying antirheumatic drugs and better control of rheumatoid arthritis, the number of low-demand patients seeking TEA is decreasing.<sup>10</sup> Instead, younger patients with end-stage arthritis, posttraumatic osteoarthritis or acute elbow trauma now represent a higher percentage of the TEA volume nationally.<sup>10</sup> Two previous studies have examined the performance of TEA in the young patient.<sup>11,12</sup> Both studies reported that 22% of patients required reoperation.<sup>11,12</sup> The purpose of this study was to report the clinical and radiographic outcomes of TEA in younger patients, who are more likely to place the elbow in at-risk situations more frequently and for a longer duration than are traditional low-demand patients undergoing TEA.

## MATERIALS AND METHODS

This was a retrospective cohort series from a single tertiary referral center conducted with institutional review board approval. Between January 2009 and December 2013, 11 elbows in 10 patients aged less than 50 years, underwent TEA for end-stage arthritis.

This represented 6% of TEA performed over the same period at our institution. Table 1 provides demographic information. Mean patient age at surgery was 37 years (range, 22–47 years). All elbows were observed for a minimum of 2 years or until mechanical failure. Mean follow-up for this group was 3.2 years (range, 1.8–5.5 years). One patient sustained mechanical failure before 2 years and was included until the point of revision surgery. All other elbows were observed for at least 2 years.

All elbows failed nonsurgical management before elbow arthroplasty. This included activity modification, over-the-counter analgesics, and intermittent corticosteroid injections at the patient's and physician's discretion. Surgeries were performed by 4 different shoulder/elbow fellowship-trained surgeons. The elbow was approached using a paratricipital approach in 7 elbows, a Bryan–Morrey in 2, and a triceps tongue in 2. The ulnar nerve was transposed at the time of surgery in 8 elbows; 2 elbows had undergone prior ulnar nerve transposition. Implants used included Discovery elbow (DonJoy Orthopedics, Vista, CA) in 8 cases, Coonrad–Morrey (Zimmer, Warsaw, IN) in 3, and Nexel (Zimmer, Warsaw, IN) in 1. Postoperative rehabilitation depended on the surgical approach. When the triceps attachment was not

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