

## [<a name="\\_GoBack"></a>](#)Long-Term Outcome of Unlinked Total Elbow Arthroplasty for Rheumatoid and Juvenile Idiopathic Arthritis in Patients Less than Fifty Years Old

Keiichiro Nishida<sup>1</sup>, Yoshihisa Nasu<sup>2</sup>, Shunji Okita<sup>1</sup>, Ryuichi Nakahara<sup>1</sup>, Yoshifumi Hotta, Shuichi Naniwa<sup>1</sup>, Noriyuki Shimizu<sup>1</sup>, Ryozo Harada<sup>2</sup>, Toshifumi Ozaki<sup>3</sup>

<sup>1</sup>Okayama University, <sup>2</sup>Okayama University Hospital, <sup>3</sup>Okayama Univ Hosp/Dept of Ortho Surg

### INTRODUCTION:

There are concerns regarding complications and longevity of total elbow arthroplasty (TEA) in young patients. In contrast, a few previous pieces of literature are limited to the reports on linked elbow devices for patients, including posttraumatic arthritis. The current study aimed to investigate the long-term clinical and radiographic outcome of unlinked TEA for Japanese patients with inflammatory arthritis less than fifty years old.

### METHODS:

We retrospectively reviewed the medical records of all patients who underwent TEA in our institute between 1986 and 2019. This study was approved by the Ethics Committee of our institute. Within the 337 elbows treated by primary TEA, 27 elbows in 22 patients aged less than 50 who underwent primary TEA with unlinked elbow prosthesis were identified and included in the current study. There were 26 elbows with rheumatoid arthritis and one with juvenile idiopathic arthritis. They were all women; the mean patient age was 46 years (35 to 49), and the mean follow-up period was 12 years (range, 3 to 26). The preoperative radiographic conditions of the elbows were evaluated to be Larsen grade IV in 25 and V (bony ankylosis) in two elbows. One patient had a history of open synovectomy of the affected elbow, but the other 26 elbows had no previous surgical intervention. Outcome measures included pain, range of motion, Mayo Elbow Performance Score (MEPS), radiographic evaluation for radiolucent line and loosening, complication, and revision surgery with or without implant removal. Statistical analysis was performed by paired Student's t-test and Wilcoxon's signed-rank test to compare pre-and postoperative data with p-value < 0.05 regarded as significant. Survival of the prosthesis was analyzed by the Kaplan–Meier method with revision surgery with or without the implant removal as the endpoint.

### RESULTS:

Seventeen patients were available for direct examination. Of the remaining five patients, four died, one was lost to follow up, and we used the record at the final follow up for the analysis. Pain scores significantly improved from 14 (14 to 45) points preoperatively to 43 (30-45) postoperatively (p<0.0001). The mean pre-and postoperative arcs were 73° (0° to 150°) and 121° (55° to 153°) in extension/flexion, and 103° (10° to 180°) and 163° (100° to 180°) in pronation/supination, respectively. The mean ROM scores significantly improved from 13.5 (5 to 20) points preoperatively to 19.1 (15 to 20) points postoperatively (p<0.0001). The mean stability scores significantly improved from 6.3 (0 to 10) points preoperatively to 9.1 (5 to 10) postoperatively. The mean function scores also significantly improved from 13.3 (0 to 25) points preoperatively to 22.8 (10 to 25) postoperatively (p<0.0001). The mean MEPS significantly improved from 48 (15 to 70) points preoperatively to 94 (70 to 100) points at the final follow up (p<0.0001). The elbows were rated as fair in 11, and poor in 16 elbows preoperatively, excellent in 22, good in four, and fair in one elbow postoperatively. Complications were noted in six elbows (six patients; 27%), one elbow with deep infection, and four elbows with an ulnar neuropathy requiring additional surgeries. Four of the five patients with ulnar neuropathy who required additional surgeries had the flexion-extension arc of 30° or less, and three had flexion of less than 100°. There was no revision with implant removal, and there was no radiographic evidence of loosening around the components. With any revision surgery or revision with implant removal as the endpoint, the survival rates up to 25 years were 81.3% (95% confidence interval (CI), 60.8 to 91.8), and 100%, respectively, as determined by Kaplan-Meier analysis (Figure).

### DISCUSSION AND CONCLUSION:

The current study showed that the clinical outcome of primary unlinked TEA for young patients with inflammatory arthritis was satisfactory and comparable with those for elderly patients. Previous reports of linked TEA in relatively young patients (under 55) have shown that radiolucent lines occurred in 11-64% and loosening in 9-55% of patients, requiring revision surgery in 22-82% of patients. However, these studies included relatively high demand posttraumatic arthritis in 23.5-39.1% of patients, possibly related to prosthesis loosening and revision surgery. The difference in the indication, group sizes, follow-up period, and the retrospective nature of the current study makes comparing the outcome with previous reports with linked elbow prosthesis difficult. However, a favorable survival rate might support unlinked devices for young patients with this disease entity with caution of a relatively high incidence of ulnar nerve neuropathy in patients with a stiff elbow.