

# Clinical Outcomes of Total Wrist Arthroplasty in Patients with Rheumatoid Arthritis: Minimum 10-Year Follow Up

Yuichiro Matsui<sup>1</sup>, Norimasa Iwasaki<sup>2</sup>

<sup>1</sup>Section for Clinical Education, Faculty of Dental Medicine, Hokkaido University, <sup>2</sup>Department of Orthopaedic Surgery, Hokkaido University School of Medicine

## INTRODUCTION:

We developed a semiconstrained total wrist prosthesis (DARTS Total Wrist System) and conducted a clinical trial in patients with rheumatoid arthritis (RA). We have reported the favorable clinical outcomes of this wrist prosthesis up to 5 years postoperatively. However, the long-term outcomes have not yet become clear. The objective of this study was to clarify the clinical outcomes of this wrist prosthesis for the treatment of patients with severe wrist RA for a minimum 10-year follow up.

## METHODS:

From 2010 through 2012, total wrist arthroplasty (TWA) with one manufacturer's total wrist prosthesis was performed for 20 wrists in 20 patients with RA (5 men, 15 women) in a clinical trial. The mean patient age was 64 years (range, 50-84 years). Preoperative radiographs showed Larsen grade IV in 16 wrists and grade V in 4 wrists. Patients were evaluated clinically and radiologically before surgery and at 10 years or more after surgery. Evaluated parameters included pain on the visual analog scale (VAS), the range of motion, Figgie score and DASH score.

## RESULTS:

The total wrist prosthesis was approved by the Ministry of Health, Labor and Welfare of Japan in 2016. The minimum 10-year follow-up clinical results (mean, 11.3 years) were available for 14 patients (3 men, 11 women) because 6 patients died before 10 years had passed. The mean VAS at the final follow up was significantly improved compared with the preoperative value. The mean wrist extension angle tended to increase compared with before surgery, while the mean wrist flexion angle tended to decrease. The mean Figgie and DASH scores were significantly improved compared with before surgery. Radiographic evaluation revealed implant loosening in 4 of the 20 wrists at 1.5 years after surgery, with 1 additional case of loosening at 5-year follow up. However, there was no new case of component loosening identified at the final follow up.

## DISCUSSION AND CONCLUSION:

We investigated the clinical outcomes of our total wrist prosthesis for patients with severe wrist RA more than 10 years after surgery. Our TWA system provides acceptable clinical outcomes with no serious complications requiring revision for a minimum of 10 years after surgery.



FIGURE 1: Preoperative A posteroanterior and B lateral radiographs of the wrist of a 50-year-old woman with RA. C, E Posteroanterior and D, F lateral radiographs at immediately and 10 years after TWA, respectively