

**Risk Factors for Revision Surgery Following Uncemented Radial Head Arthroplasty for Unreconstructible Radial Head Fractures: Minimum 3-Year Follow-up**

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**Purpose:** The purposes of this study were to assess the revision rate following radial head arthroplasty (RHA) and to determine risk factors associated with revision surgery.

**Methods:** A total of 122 patients with 123 RHAs (mean age 50.7 years [range, 18-79]) who underwent RHA for unreconstructible radial head fractures (RHF) between 1994 and 2014 and were at least 3 years out from surgery were included. Demographic variables, injury- and procedure-related characteristics, radiographic findings, complications, and revision procedures were assessed. Cox regression analysis was performed to identify risk factors that are associated with revision surgery following RHA.

**Results:** The median follow-up for the study cohort was 7.3 years (interquartile range, 5.1-10.1). All patients had unreconstructible RHF of which type Mason/Johnston IV were the most prevalent (80; 65.0%). One or more associated osseous or ligamentous injury was seen in 89 elbows (72.4%). The median time to surgery was 7.0 days (interquartile range, 3.0-11.0). Implanted RHAs were categorized as rigidly fixed (65; 52.8%) or loosely fixed (58; 47.2%). A total of 28 elbows (22.8%) underwent revision surgery at a median of 1.1 years (interquartile range, 0.3-3.8) with the majority of patients (17, 60.7%) undergoing revision surgery within the first 2 years. The most common reason for revision surgery was implant loosening (14, 29.2%). Univariate Cox regression suggested that Workers' Compensation claims (hazard ratio [HR]: 5.48,  $P < 0.001$ ) and the use of an external fixator (HR: 4.67,  $P = 0.007$ ) were significantly associated with revision surgery. The variable selection based on Cox regression models resulted in a model with Workers' Compensation claims as a single predictor.

**Conclusion:** Revision rates following RHA for unreconstructible RHF are high, with the most common cause for revision surgery being painful implant loosening. Revision surgeries are predominantly performed within the first 2 years after implantation and surgeons should be aware that Workers' Compensation claims and the use of an external fixator are associated with revision surgery.