Elbow Hemiarthroplasty for Distal Humerus Fractures

Yousif Atwan MD MSc FRCSC, Ryan Gao MBChB PhD FRACS, Andrew C. Wright MBBS BSc FRCS (Tr&Orth) MSc (Res), Adam C. Watts MBBS BSc FRCS (Tr&Orth)
Wrightington Upper Limb Unit, Wrightington Wigan and Leigh NHS Trust, Wigan, UK.

Background. Historically, the surgical management of distal humerus fractures has mostly included open reduction and internal fixation or total elbow arthroplasty. Distal humerus hemiarthroplasty has emerged as an alternative option for non-reconstructable fractures with preserved radial head and proximal ulnar articular surfaces. The aim of this study is to evaluate the outcomes of distal humerus hemiarthroplasty for the treatment of distal humerus fractures.

Methods. A retrospective review of cases by two surgeons at a single institution was completed. Inclusion criteria included patients with distal humerus fractures who had underwent distal humeral hemiarthroplasty with a modern convertible implant system. Patients with prior ipsilateral elbow surgery and those without a minimum of 12 months of clinical and radiographic follow up were excluded. Outcomes analyzed included Visual Analog Score (VAS) for pain, range of motion (ROM), clinical/radiographic complications, and reoperations.

Results. A total of 47 patients were included in this study with a single case being an open fracture. Average age was 74 years (range, 53 – 94 years) and 40 patients (85%) were female. The dominant arm was affected in 11 cases (23%) and 45% of cases were classified as Grade 3 by the American Society of Anesthesiologists (ASA) Classification. Thirty-eight of these fractures underwent surgery within four weeks of the initial injury. Average follow-up time was 32 months (range, 12 – 115 months). At latest follow up, the mean VAS pain score was 1.7 (range, 0 – 8). Average post-operative ROM ranged from 18° (range, 0° – 70°) of extension to 122° (range, 90° – 140°) of flexion. Average pronation was 89° (range, 70° – 90°) and average supination was 87° (range, 25° – 90°). The complication rate was 28% (n = 13) and the reoperation rate was 13% (n = 6). Complications included mild to moderate ulnar neuropathy (n = 8), deep infection (n = 4), and dislocation (n = 1). Reoperations included stage 1 revision for infection (n = 2), ulnar nerve transposition for persistent ulnar neuropathy (n = 2), revision of olecranon osteotomy fixation for non-union (n = 1), and conversion to total elbow arthroplasty for instability (n = 1). Mayo Elbow Performance Scores will be provided at the time of presentation.

Conclusion. Distal humerus hemiarthroplasty is an appropriate surgical option for patients with non-reconstructable distal humerus fractures and preserved ulna and radius articular surfaces. Future large randomized controlled trials are needed to compare outcomes of elbow hemiarthroplasty to total elbow arthroplasty within this patient population.