Primary Versus Salvage Total Elbow Arthroplasty for Treatment of Distal Humerus Fractures

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Purpose: Distal humerus fractures in the elderly can be treated with open reduction and internal fixation (ORIF) or total elbow arthroplasty (TEA). TEA is a viable option for elderly patients with comminuted intra-articular distal humerus fractures; however, there are concerns regarding longevity and complications, bringing up the question of whether there is any benefit or harm in attempting ORIF first and performing a salvage TEA later in case of ORIF failure. The aim of this study is to investigate differences in reoperation rates between primary TEA for distal humerus fractures compared to salvage TEA following a failed ORIF.

Methods: This is a retrospective study conducted at two large health systems. Patients were included if they underwent TEA for treatment of an acute distal humerus fracture (<40 days from time of injury) or TEA for treatment of a failed ORIF. Data were retrospectively collected and analyzed. We hypothesized that salvage TEA would be associated with a higher rate of revision surgery.

Results: A total of 116 patients was identified: 68 underwent primary acute TEA for treatment of their distal humerus fracture, while 48 had salvage TEA after a failed ORIF (mean age: 73 years, 81% female). The mean age in the primary TEA group was 76 years, which was significantly higher than the mean age of 68 in the salvage group ($p<0.001$). The rate of revision TEA was significantly higher in the salvage TEA group (11 of 48, 23%) compared to the primary TEA group (4 of 68, 6%, $p = 0.007$). There were also more subsequent unplanned surgeries in the salvage group compared to the primary TEA group (29 vs 14, $p = 0.04$). The rate of aseptic loosening requiring revision TEA trended toward significance in the salvage group (13% vs 3%, $p = 0.11$).

Conclusion: To our knowledge, this is the largest study comparing primary acute TEA to salvage TEA for the treatment of distal humerus fractures. Patients undergoing salvage TEA had significantly higher rates of revision arthroplasty as well as total unplanned reoperation procedures. In these elderly patients, a primary TEA may be a better approach than an attempt at ORIF and later conversion to TEA.