Outcomes of Total Elbow Arthroplasty and Hemiarthroplasty of the Elbow for Comminuted Distal Humerus Fractures: A Retrospective Comparative Study

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INTRODUCTION:
There has been an increasing interest in elbow hemiarthroplasty as a way of circumventing the problems with total elbow arthroplasty (TEA) for comminuted distal humerus fractures in the elderly. There are few studies in the literature comparing outcomes of these procedures. The primary aim of the study is to compare the early clinical and radiological outcomes of patients undergoing TEA and hemiarthroplasty for distal humerus fractures.
METHODS: Retrospective analysis of data for patients undergoing hemiarthroplasty or TEA for distal humerus fractures (OTA- C3 Comminuted total articular fractures) was done. This is a non-randomized consecutive pragmatic series from a single centre. A minimum follow-up of 12 months was required for inclusion. Patients with delayed/neglected presentation(> 3 weeks) and conservatively managed fractures needing delayed arthroplasty were excluded.
RESULTS:
A total of 22 patients (12 TEAs and 10 hemiarthroplasties) were operated in the period between 2015-2021(mean follow-up-40 months). The mean age of the patients undergoing total elbow replacement was 81.3 years against 70.4 years for hemiarthroplasty ($p<0.05$). The mean arc of flexion-extension was 13-124 degrees and 22-123 degrees in the TEA and hemiarthroplasty group respectively($p>0.05$). The mean range of supination was 84 and 74 degrees($p>0.05$) while pronation was 84 and 86 degrees($p>0.05$) in the TEA and hemiarthroplasty groups respectively. The mean QuickDASH for the hemiarthroplasty group was 9.8 as compared to 14.5 ($p>0.05$). There were no cases of infection, dislocations, intra-operative fractures or revision surgery. One patient each in the hemiarthroplasty and total elbow arthroplasty group developed transient neuropraxia of the ulnarnerve post-operatively that recovered over the follow-up period.

Heterotrophic ossification was seen in 5 patients with TEA and 7 patients with hemiarthroplasty($p>0.05$). Osteolysis was seen around the ulnar component in 3 patients with TEA without any migration while none of the patients with hemiarthroplasty showed signs of loosening. There were two cases of mild ulnar wear in the hemiarthroplasty group on radiographs.

DISCUSSION AND CONCLUSION:
Total elbow arthroplasty and hemiarthroplasty provide predictably comparative clinical and radiological outcomes on early follow-up. While ulnar sided loosening and restriction of activities are an issue with total elbow arthroplasty, these problems are circumvented by hemiarthroplasty potentially providing a better quality of life to the more active patient. Longer follow-up is necessary to determine the survival of these prostheses in the long-term.