

Olecranon Fracture Associated with Latitude Total Elbow Arthroplasty - A Consecutive Cohort Study

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Introduction: Total Elbow Arthroplasty (TEA) is an established surgical treatment to manage etiologies of elbow pain and decreased function. Periprosthetic fractures are recognized complications, but there is limited research on olecranon fractures following TEA. This is a retrospective consecutive cohort study reviewing the surgical management and clinical outcomes of five periprosthetic olecranon fracture complications following LATITUDE EV™ TEA.

Methods: This is a single-center, single surgeon study including five periprosthetic olecranon fractures after TEA with a linked LATITUDE EV™ implant, between 2013 and 2022. The anterior-posterior and lateral elbow radiographs, goniometric elbow range of motion (ROM) arc, and a triceps strength and function Medical Research Council (MRC) score collected post-operatively were retrospectively reviewed. One surviving patient was available for prospective evaluation using the Mayo Elbow Performance Score [MEPS] and the Disabilities of Arm, Shoulder, and Hand [QuickDASH] Questionnaire.

Results: The mean age was 77 years (range 69 to 84 years, SD ± 6 years) at index surgery. The mean period from TEA to final follow-up was 23 months (range 8 to 50 months, SD ± 17 months). Four patients were female, and one patient was male. The primary indication for TEA was rheumatoid arthritis (3 elbows), degenerative elbow arthropathy (one elbow), and osteoarthritis (one elbow). The cause of olecranon fracture was intraoperative fracture during TEA (two elbows), acute ground level fall (one elbow), and atraumatic swelling and pain (two elbows). Operative treatment was elected for four of five patients. The MRC score was 5/5 for all patients except the 4/5 score for the non-operatively managed case.

Discussion: The mean ROM arc did not significantly decrease following the complication (88 degrees compared to 103 degrees). A Wilcoxon signed-rank test demonstrated no patients had statistically significant ($Z \pm 1.96$; $p \leq 0.05$) changes in elbow range of motion from pre-TEA to post-operative timepoint. The mean MRC score for triceps strength and function at follow-up was 5 out of 5. The surviving patient scored 65 out of 100 on the MEPS and 48 out of 100 on the QuickDash. Radiographic review demonstrated anatomic healing in all patients, with four operatively treated demonstrating minimal to no subchondral bone loss.

Significance/Clinical Relevance: In a small cohort, patients with acute or atraumatic periprosthetic olecranon fracture complications following LATITUDE EV™ TEA received both operative and non-operative treatment. There was no statistically significant difference in pre-operative versus post-operative ROM arcs, and all internally fixed fractures demonstrated radiographic healing of the olecranon. Strength was 5/5 on MRC grading in operatively managed cases. These findings may be of use to patients and clinicians when discussing potential outcomes of olecranon fracture management following total elbow arthroplasty.