Comparison of Complication Rates in Total Elbow Arthroplasty Performed for Osteoarthritis Versus Rheumatoid Arthritis Versus Fracture: A National Database Study

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INTRODUCTION: Total elbow arthroplasty (TEA) was traditionally a mainstay of treatment for patients with severe inflammatory arthritis. Recently, the indications for TEA have expanded and it has grown into a versatile procedure that can used to treat several pathologies of the elbow. The objective of this study was to compare complication rates between TEA performed for rheumatoid arthritis (RA), fracture (FX), or osteoarthritis (DJD).

METHODS: A retrospective analysis of the MUExtr dataset of the PearlDiver National Database was performed. ICD10 codes were utilized to identify TEA patients from 2010-2020 and separate them into RA, FX, and DJD cohorts. Demographics, comorbidities, hospital data were identified and compared using ANOVA. Systemic complications at 90 days, as well as surgical complications at 90 days and 1 year were compared using multivariable logistic regression. Surgical complications included wound dehiscence, hematoma, deep infection, periprosthetic fracture, stiffness, instability, triceps injury, nerve injury, and need for revision.

RESULTS: 1600 patients (38.9% DJD, 48.8% FX, 12.3% RA) were identified. The majority of patients in all three cohorts were female with the RA group having a significantly higher percentage of female patients compared to DJD and FX (87.3% versus 81.4% and 76.9%, p = 0.003). There were no significant differences noted in systemic complications and surgical complications between all three groups at 90 days postoperative. After controlling for patient factors, FX patients were more likely to develop elbow stiffness (OR 1.53, p=0.006) and less likely to have a triceps injury (OR 0.26, p<0.001) at 1 year than RA or DJD patients (Figure 1).

DISCUSSION AND CONCLUSION: The indications for TEA have expanded over the last ten years with nearly half of all cases being performed for fracture. At one year, those TEAs performed for fracture have a significantly lower rate of triceps injury and higher rate of elbow stiffness postoperatively than when performed for other indications. The nature of fracture injuries and their impact on bone loss preoperatively and potential bone formation postoperatively are likely the cause for such findings. This is important to consider when preoperatively planning, as well as when discussing expected outcomes with patients prior to surgery, especially with the expanded incidence of TEA for fracture being performed over the last decade.

Figure 1

	OR (FX vs reference/DJD)	2.50%	97.50%	p
Joint @ 1 year				
Deep infection	0.586594184	0.26162575	1.279847	0.183
PPFx	0.776088303	0.35268575	1.705357	0.52435
Stiffness	1.535514287	1.13656603	2.08727	0.0056
Instability	1.355182128	0.61415883	3.101351	0.4571
Triceps Injury	0.260367968	0.11408008	0.55366	0.00074
Nerve Injury	1.453087832	0.9546674	1.626672	0.11
Revision	0.941817364	0.48153686	1.870181	0.861

Multivariate analysis comparing surgical complications between TEA performed for fracture to those performed for DJD and RA

FX=TEA for Fracture, DJD=TEA performed for degenerative joint disease, PPFx = Periprosthetic fracture