The Role of Emergency Department Utilization After Elbow Arthroscopy

Wesley Day[1], Michael J. Gouzoulis[2], Rahul H. Jayaram[2], Jonathan N. Grauer[2]
[1]Albert Einstein College of Medicine, NY, [2]Yale School of Medicine, CT
Wesley.day@einsteinmed.edu

Disclosures: Wesley Day (N), Michael J. Gouzoulis (N), Rahul H. Jayaram (N), Jonathan N. Grauer (8-Editor-in-Chief of North American Spine Society Journal, 9-board member of North American Spine Society)

INTRODUCTION: Elbow arthroscopy is less commonly performed than arthroscopy of other larger joints. While indications have been defined, technical pearls described, and outcomes characterized, other aspects have not been as well-studied, including post-procedural emergency department (ED) visits. The current study leveraged a large, national, multi-insurance, administrative database to highlight the incidence and factors associated with ED visits in the 90 days following elbow arthroscopy.

METHODS: Adult patients who underwent elbow arthroscopy were identified in the 2010 to 2022 PearlDiver Mariner 161 national administrative database. Studies using this de-identified aggregate database was deemed exempt by our institution's Institutional Review Board. Exclusion criteria included patients with diagnoses of trauma, tumor, or infection within the 90 days prior to surgery, and patients who were not insured in the database for at least 90 days after surgery. Based on coding for ED care, patients were categorized by whether they visited the ED in the 90 days following surgery. Those who did versus those who did not were compared on age, sex, Elixhauser Comorbidity Index (ECI, a quantitative measure of comorbidity burden), geography by region of the United States, and type of insurance plan. Further, ED visits were characterized by incidence (presence or absence), timing (weeks following surgery) and reasons for ED visit (elbow-related or not). Finally, the rate of those who were admitted during an ED visit was described.

RESULTS SECTION: A total of 16,310 adult patients who underwent elbow arthroscopy were identified, of which 1,086 (6.7%) visited the ED within 90 days after surgery. Compared to patients who did not visit the ED, those who did were independently associated with younger age (OR: 1.23 per decade decrease, $p < 0.001$), higher ECI (OR: 1.21 per 1-point increase, $p < 0.001$), different geography (OR: 1.42 for Midwest relative to West, $p < 0.001$), and Medicaid insurance (OR: 1.88 relative to Commercial, $p < 0.001$) (Figure 1).

Among the patients who visited the ED, 491 (45.2%) visited once, 406 (37.4%) visited twice, 90 (8.3%) visited three times, 61 (5.6%) visited four times, and 38 (3.5%) visited more than 4 times (Figure 2). The incidence of ED visits was highest during the first two postoperative weeks (0.53% and 0.45% of the total number of patients getting elbow arthroscopy, respectively) and gradually diminished toward weekly baseline (0.18%) over the following weeks.

When assessing reason for ED visits, the proportion of patients associated with elbow-related diagnoses decreased over the first 3 postoperative months, from 65% in month one to 37.7% in month two and 26.6% in month 3. In terms of admissions subsequent to elbow arthroscopy, 182 patients (1.1% of all patients receiving elbow arthroscopy) were admitted to a hospital at least once in the 90 postoperative days, including those admitted on the day of surgery. Of these, 135 patients were admitted from a postoperative ED visit, which represents 12.4% of those who utilized the ED.

DISCUSSION: As elbow arthroscopy increases in incidence over the years, postoperative metrics such as ED visits are of interest to optimize care, improve patient experience, and minimize costs. Of the overall large study population isolated in the current study, 6.7% presented to the ED in the 90 days following surgery. Based on multivariate analysis, compared to those who did not visit the ED, those who did were found to have differences in clinical characteristics (younger age and higher comorbidity) and non-clinical characteristics (geographic region and insurance). The timing, reasons, and admissions related to such postoperative ED visits were defined.

As with all studies using administrative claims databases, the accuracy of the current study is limited by its retrospective design and coding accuracy. Further, the study was not able to separate based on the surgical indications for elbow arthroscopy or elbow-specific outcome metrics. Finally, while ICD-9 and 10 codes were used to determine primary indications for ED visits, multiple factors may have been of concern and those that were elbow-related or not could have been incompletely separated.

SIGNIFICANCE/CLINICAL RELEVANCE: By using a large national cohort to define the factors related to ED visits following elbow arthroscopy, postoperative protocols can be refined and optimized to keep patients out of the hospital.

IMAGES AND TABLES:

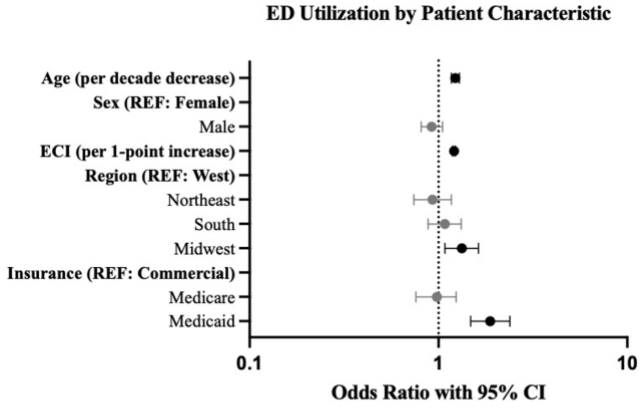

Figure 1. Forest plot demonstrating multivariable logistic regression characterizing patient factor predictors of ED utilization. **Bold** = statistically significant with $p < 0.001$.

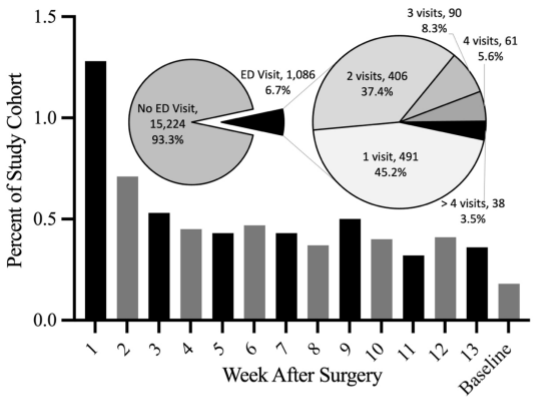

Figure 2. Bar graph demonstrating the percent of elbow arthroscopy patients who visit the ED in each postoperative week. Expanded pie charts demonstrating the proportion of elbow arthroscopy patients who visited the ED and the frequency of ED visits by those patients in the postoperative 90-day window.