

# Does Early Elbow Motion Improve Postoperative Outcomes After Elbow Fractures?

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## Introduction

- Many patients are placed in a postoperative splint after elbow trauma, which has been associated with complications, such as stiffness, reduced range of motion, pain, reduced circulation, and muscle atrophy.
- Early motion after operative fracture fixation has the potential to allow for earlier recovery of mobility and strength with no effect on fracture alignment.
- There is a paucity of data on the benefits of early motion after elbow trauma.
- The purpose of this study is to assess the impact of early motion on outcomes in patients with surgically treated elbow fractures.
- We hypothesize that early motion will significantly improve outcomes in the early postoperative period but will demonstrate no difference in outcome after 1-year.

## Methods

- A prospective randomized clinical study including all patients with surgically treated elbow fractures (distal humerus, proximal radius, proximal ulna) is currently being conducted.
- The control group is placed in a splint for two weeks postoperatively.
- The experimental group is allowed to initiate motion immediately after surgery with a soft tissue dressing placed over the incision site.
- Pain and functional status are measured using the American Shoulder and Elbow Surgeons Elbow (ASES-E) Score.
- 80 patients will be enrolled and followed for 1-year.

### Statistical Analysis

- Statistical Package for the Social Sciences (SPSS) v.25 (IBM, Armonk, NY) was used to perform the student t-test, to compare outcome measures.

- Values were considered statistically significant if  $p \leq 0.05$ .

## Results

- 10 patients are currently enrolled: 5 splint and 5 early motion.
- Follow-up data for a mean of 4 weeks postoperatively is currently reported.

**Table 1. Demographic and Medical Data.**

Variable	Early Motion	Splint
Gender		
Male	3	2
Female	2	3
Mean Age	57.4 years	49.6 years
Mean BMI	28.1 kg/m <sup>2</sup>	28.9 kg/m <sup>2</sup>
Mean CCI	1.2	2.2

**Table 2. Operative Data.**

Variable	Early Motion	Splint
Mean Time to Surgery	3.2 days	4 days
Intraoperative Complications	None	None
Mean Estimated Blood Loss	120 ml	245 ml
Mean Length of Stay	3 days	15.8 days <small>*one outlier of 58 days</small>

- Early elbow motion patients have less pain, greater ASES-E functional scores, and higher satisfaction in comparison to patients splinted postoperatively, although not statistically significant.

**Table 3. Patient Reported Outcome Measures.**

Variable	Early Motion	Splint	P-Value
Mean Pain	2.2±2.2	4.2±2.2	0.38
Mean ASES-E Functional Score	22.6±14.4	14±8.5	0.36
Satisfaction	9.2±1.6	8.5±1.7	0.59

## Results

- Splinted patients have significantly better extension than early motion patients ( $p=0.05$ ).
- Early elbow motion patients have better flexion, pronation, supination, and strength than splinted patients although not statistically significant.

**Table 4. Physical Exam.**

Variable	Early Motion	Splint	P-Value
Flexion	105±25.9°	86.3±4.1°	0.22
Extension	21±13.6°	47.5±37.5°	0.05*
Pronation	55±25.3°	47.5±28.3°	0.73
Supination	49±26.9°	47.5±37.5°	0.76
Strength	22.2±2	16.7±2.4	$p=0.06$

\*Denote Statistical Significance.

### Complications

- Two splinted patients (40%) and one early motion patient (20%) experienced a wound complication.

## Conclusion

- The preliminary results of this prospective study demonstrate that early motion after operative elbow fixation has the potential to allow for greater improvement in pain and function in comparison to splinted patients at 2 and 6 weeks postoperatively.
- Currently, the study is underpowered to detect statistically significant associations.
- Continued study enrollment and follow-up will allow for a better understanding of the benefits of early motion in patients with surgically treated elbow fractures.
- The results of this study can be used by orthopaedic surgeons to guide their postoperative management of patients with elbow fractures.