

Introduction

Post-traumatic elbow instability is a challenging problem to treat. Failure of treatment can result in recurrent or chronic instability. In patients with high risk of recurrent instability, surgeons may back up their repair with hinged or static external fixation, cross pinning, or the internal joint stabilizer (IJS). Of these, only IJS and hinged external fixation (HEF) allow for elbow range of motion while in place.

Given the successful use of HEF in the literature, this study sought to identify unique indications for the IJS in treatment of elbow instability.

Methods

Retrospective review of all patients 18 years and older, with minimum of 3 months follow-up, treated from 2017-2020 for traumatic elbow instability by an upper extremity traumatologist at a Level 1 academic center with minimum of 3 months follow-up. Patient were treated with an IJS (internal joint stabilizer) alongside standard measures of care for their traumatic elbow instability. Postoperatively, patients were immobilized and non-weight bearing until the soft tissues healed, followed by progressive mobilization in a hinged elbow brace. Outcome measures included mechanical failure, infection and need for an unplanned revisions operation.

Results

Demographics

- N = 22 patients included
- Mean follow-up: 9 months [3-20 months]
- Mean age: 46 years old [23-78yo]



Figures 1A-C. Titanium hinge attached to a plate with 3.5mm screws and a 2.4 mm axis pin [Skeletal Dynamics (Miami, FL)].

Results

Comorbidities

- 4 had open fractures on presentation (18.2%)
- 5 (22.7%) were 60 years of age or older
- 9 (41.0%) had a BMI of 30 or greater
- 5 (22.7%) had a history of one or more cerebral insults: stroke (4), traumatic brain injury (1), Parkinson's disease (1), intracranial hemorrhage at time of elbow injury (1).
- 3 (13.6%) smoked tobacco
- 3 (13.6%) reported alcohol abuse
- 3 (13.6%) reported methamphetamine or heroin abuse
- 5 (22.7%) did not undergo removal of the IJS (4 lost to follow-up, 1 declined)

Results

Vast majority regained elbow stability uneventfully

- Final arc of motion: 17°-114° average flexion-extension
- Mean pronation 68° , mean supination 66°

Complications

- Ulnar neuropathy (1), superficial infection (1), deep infection (1), instability recurrence (1), mechanical plate failure without recurrent instability (1)

Conclusions

IJS versus hinged elbow fixation (HEF):

- Both with high rates of success in the literature
- Both allow for postoperative motion
- HEF is bulky, heavy and requires pins site care
- HEF has a risk of pin site infection, which increased with length of time the frame is on

IJS (internal joint stabilizer):

- Safe to use, low profile, no special care required, no increase in infection risk
- Easier for complex patients to manage. Patients who were frail elderly, obese, mentally ill, cognitively impaired or had sustained a cerebral insult (stroke, TBI, neurodegenerative) tolerated the IJS well, including planned surgical removal
- They had equal outcomes after IJS use to other patients in the study and in the literature, despite their 'higher risk' status