Internal Joint Stabilizer: A Safe Treatment for Traumatic Elbow Instability

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Purpose: Traumatic elbow instability with or without fracture remains difficult to manage. Challenges include persistent or recurrent instability and stiffness. Novel treatments are available but have not been independently evaluated in the literature. This study's purpose is to report early results of the "Internal Joint Stabilizer of the Elbow" (IJS-E) in the treatment of terrible triad injuries and other unstable post-reduction elbow dislocations with or without fracture. The primary outcome was elbow stability after removal of the IJS-E device. Secondary outcomes were elbow flexion-extension arc, forearm pronation-supination arc, Disabilities of the Arm, Shoulder and Hand (DASH) scores, and postoperative complications.

Methods: A retrospective review was performed of all patients treated with IJS-E at an academic Level-I trauma center by 2 surgeons over a 2-year period. 20 patients were identified who met inclusion criteria, 11 of whom sustained terrible triad injuries. Six patients underwent concurrent radial head replacement during the initial operation. All were allowed unrestricted range of motion postoperatively, and device removal was scheduled at 3 months postoperatively. Three patients did not follow up for removal of the IJS-E device, leaving 17 patients available for assessment of stability and range of motion. Elbow stability was assessed radiographically under anesthesia immediately following IJS-E removal. Range of motion was assessed clinically under anesthesia at that time and at clinical follow-up. 12 patients were available by phone for collection of DASH scores. Complications were collected by chart review.

Results: All elbows were radiographically stable at time of IJS-E removal. Mean range of motion at time of IJS removal was flexion-extension 13° (range, 0°-45°) to 108° (range, 45°-130°), pronation 67° (range, 5°-90°), and supination 64° (range, 5°-90°). Mean time to removal was 111 days (range, 58-159). Mean range of motion at last follow-up was flexion/extension 17° (range, 0°-45°) to 106° (range, 45°-130°), pronation 71° (range, 0°-90°), and supination 65° (range 5°-90°). Mean time to last follow-up was 142 days (range, 19-332). Mean DASH score was 31.25 overall (range, 7.5-84.2) and 22.6 for patients at least 30 days postoperatively (range, 7.5-45.7). Mean time to collection of the DASH score was 240 days (range, 27-590). Two of the 3 patients with retained IJS-E devices reported DASH scores of 15.8 and 49.1. Two patients (12%) required revision for hardware failure, both of which occurred within 3 weeks. No patient developed postoperative wound infection. One patient (6%) developed heterotopic ossification.

Conclusion: The use of the IJS-E offered safe surgical treatment of traumatic elbow instability, particularly terrible triad type injuries. It allows for early range of motion and was effective in restoring elbow stability. We believe the use of this relatively novel system should be explored more.