

Fixed Angle Locking Plate Fixation of Complex Comminuted Patellar Fractures

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Background/Purpose: Comminuted patella fractures are difficult orthopaedic injuries and commonly result in persistent functional impairment. Goals of patellar fracture treatment include restoration of the extensor mechanism and congruent reduction of the articular surface. Hardware irritation and loss of fixation are the most common complications related to fixation. When complex patella fractures are encountered, standard tension band fixation techniques may not be able to provide stable fixation; alternative means of fixation are then required. Methods such as fracture fragment excision, wire cerclage, and plate fixation have all been described. Multiple studies have evaluated the biomechanical performance of patellar plate fixation, yet clinical series are limited. The purpose of this study is to evaluate the radiographic and measured functional outcome of patients with comminuted patellar body fractures treated with fixed angle plate and screw implants. Our hypothesis is that fixed angle plate fixation can be employed successfully for comminuted patellar fractures.

Methods: A retrospective study was performed at a single Level I trauma center of all patients with comminuted patellar fractures (OTA/AO 34C2 and C3) treated with a fixed angle locking plate between 2010 and 2015. Patients were identified by ICD-9, CPT code, and chart review. Patient demographic, fracture, and surgical fixation information was recorded. Follow-up data specifically evaluated the presence of bothersome hardware, need for reoperation, and fracture union. Functional data including the Knee Outcome Survey (KOS), Lower Extremity Functional Scale (LEFS), and goniometer measured knee range of motion were evaluated in patients available for follow-up.

Results: A total of 33 patients with comminuted patellar fractures underwent fixed angle plate fixation. Eighteen 34C2 fractures and fifteen 34C3 fractures were identified; 11 fractures were open. Locking minifragment implants were used in all cases. Supplemental screws outside of the plate were used in 16 cases and additional nonabsorbable suture fixation was used in 2 cases. One case of fracture fixation failure occurred and required revision surgery. 15 patients were available for clinical re-evaluation and functional outcome scoring. Follow-up averaged 142 weeks (range, 19-240 weeks). The average KOS score was 60.67 (max 75) and the average LEFS score was 62.26 (max 80). Average range of motion was 1-132° at latest follow-up. Four patients noted hardware irritation; no patient underwent elective hardware removal. One postoperative infection occurred and removal of hardware was performed following fracture union.

Conclusion: Fixed angle minifragment plates provide reliable fixation for complex patellar body fractures. We report the largest clinical series of comminuted patellar fractures treated with a fixed angle plate and screw devices. Complications of the technique, including fracture fixation failure, infection, and bothersome hardware necessitating removal were

rare. Knee range of motion and patient-reported functional outcome scores demonstrated excellent clinical results following these difficult injuries. Fixed angle plating is a promising and viable option for the fixation of complex patellar fractures and should be considered when standard fixation or fragment excision cannot be performed.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.