

Is Early Total Care of Bicondylar Tibial Plateau Fractures Safe?

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Background/Purpose: The optimal treatment for bicondylar plateau fractures remains controversial. Contrary to popular practice, which favors staged protocols, we have used early single-stage open reduction and internal fixation (ORIF) to treat these injuries whenever possible. The purpose of this study was to determine the safety of this strategy.

Methods: We retrospectively reviewed all the patients who were treated with primary ORIF for AO/OTA type 41-C bicondylar plateau fractures in our Level I trauma institution. We selected patients for whom follow-up data were available for a minimum of 12 months. The primary outcome measurement was the reoperation rate within 12 months for repeat ORIF, irrigation-debridement (I&D) for infection or wound dehiscence, fasciotomies for compartment syndrome, treatment of malunion and nonunion, amputation, knee fusion, manipulation under anesthesia for stiffness, and hardware removal. For a subset of patients who were enrolled in a study with prospective data collection, we also evaluated functional outcome using the Short Form (SF)-36 and the Selected Functional Movement Assessment (SFMA), and analyzed the quality of fracture reduction using four radiographic criteria.

Results: 149 cases (145 patients) with AO/OTA type 41-C bicondylar plateau fractures were operated in our institution between 2005 and 2014. 80 patients were male and 65 female. The mean age of the patients was 50.8 years (range, 19-86). All but 14 fractures were closed (Gustilo I: three cases; Gustilo II: four cases; Gustilo IIIA: four cases; Gustilo IIIB: one case; Gustilo IIIC two cases). Primary ORIF was performed in 135 patients (90.6% of cases). Nine patients (6.0%) were treated with a staged protocol and five patients (3.4%) were transferred to our institution after initial treatment with an external fixator. Patients who benefited from primary ORIF were operated within 24 hours after admission in 60.0% of cases and within 48 hours in 89.7%. Eighteen patients (13.3%) who were treated with primary ORIF sustained repeat surgery within 12 months for complications. The reoperation rate was 10.4% if hardware removal was excluded. Eight patients developed a wound infection requiring I&D, 2 of them after open fractures. Three patients were reoperated for compartment syndrome requiring fasciotomies. Three patients underwent repeat surgery for nonunion and one patient for early fixation failure. Four patients were reoperated for hardware removal for pain or disturbance. No surgeries were recorded for malunion, amputation, knee fusion, or manipulation under anesthesia. Secondary outcome measurements were obtained for a subset of 39 patients who enrolled in a study with prospective data collection. For those patients, the SF-36 score changed from 56.2 for the Physical Component Summary and 51.9 for the Mental Component Summary at baseline to 52.4 and 46.0, respectively, at 12 months. In the same period, the normalized SFMA changed from 45.4 to 56.5 for Function, and 45.7 to 55.7 for Pain. In 82.1% of cases, three or four of the four radiographic criteria used to assess the quality of fracture reduction were met.

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.

Conclusion: Provided surgery is performed without delay by experienced orthopaedic trauma surgeons, a large proportion of bicondylar tibial plateau fractures can be safely treated with primary ORIF. Early surgery does not preclude good quality of reduction, and the reoperation rate within 12 months as well as functional outcomes are comparable when confronted to published results for surgical treatments using a staged protocol.