Does Single Plating of Complex Tibial Plateau Fractures Portend to Lower Infection Rates?

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Purpose: We sought to compare the rate of surgical site infection (SSI) in patients with OTA/AO 41C closed bicondylar tibial plateau fractures treated with ORIF (open reduction and internal fixation) by single versus dual plating.

Methods: This was a retrospective cohort study of participants presenting to 2 Level I trauma centers for OTA/AO 41C closed tibial plateau fractures with at least 10 months of follow-up after ORIF by either single or dual plating. The primary outcome was SSI after the index operation. Cohorts were compared to evaluate average age, number of males, mean body mass index (BMI), tobacco use, alcohol use, and compartment syndrome. The overall rates of SSI, superficial SSI, and deep infection requiring reoperation were compared using $\chi 2$ tests. Additionally, injuries were stratified by OTA/AO fracture subclass and equivalent classes were compared. Finally, among dual-plated patients with infections requiring reoperation, we analyzed the proportion of infections involving either the medial side, lateral side, or both sides.

Results: 222 enrolled patients (147 single plated and 75 dual plated) met the inclusion criteria. Mean age was 53.4 ± 14.3 years, mean BMI 28.3 ± 6.7, and 49.5% (n = 110) were male; both cohorts had similar demographics. The overall rate of SSI was 24.3% (n = 54). Single plating had a significantly lower overall infection rate (single 19.7%, n = 29; dual 33.3%, n = 25, P = 0.03). Single plating also had lower rates of superficial SSI (single 4.8%, n = 7; dual 13.3%, n = 10, P = 0.02) but not deep infection requiring reoperation (single 17.0%, n = 25; dual 26.7%, n = 20, P = 0.09). Our subclass analysis showed single plating had lower infection rates among 41C1 (single 2.6%, n = 1; dual 44.4%, n = 4, P<0.01) and 41C2 fractures (single 13.5%, n = 5; dual 37.5%, n = 9, P<0.01) but not 41C3 fractures (single 31.9%, n = 23; dual 28.6%, n = 12, P = 0.70). Among dual-plated patients with infections requiring reoperation, 65% (n = 13) involved the medial side, 20% (n = 4) involved the lateral side, and 15% (n = 3) involved both.

Conclusion: In this comparative cohort study, 41C1 and 41C2 fractures treated with single plating had a lower rate of SSI as compared with dual plating.