Does single plating of complex tibial plateau fractures portend to lower infection rates?

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INTRODUCTION:
There is scarce evidence related to the impact of single versus dual plating on the infection rates in complex bicondylar tibial plateau fractures. We aimed 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 two level 1 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 SSIs after the index operation. Cohorts were compared to evaluate average age, number of males, mean BMI, tobacco use, alcohol use, and compartment syndrome. The overall rates of SSIs, superficial SSIs, and deep infections requiring reoperation were compared using chi-square 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, 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 SSIs 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 SSIs (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=0.03) 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.
DISCUSSION AND CONCLUSION: In this comparative cohort study single plating in fixation of complex bicondylar tibial plateau fractures is associated with a lower rate of SSIs as compared to dual plating, especially for 41C1 and 41C2 fractures. These findings have important implications for the management of such complex fractures and suggest lower grade injuries should be managed with single plating. Additionally, among dual plated patients with infections requiring reoperation, the medial components had a higher rate of involvement.