Rate of Symptomatic Hardware Removal After Treatment of Distal Fibular Fractures with an Intramedullary Screw

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Purpose: The purpose of this study is to compare the rates of hardware removal between plate osteosynthesis and intramedullary screw fixation of distal fibula fractures in a larger cohort than previously reported. Secondarily, we sought to compare the rates of hardware removal for infection between the 2 groups. We hypothesized that the intramedullary screw fixation cohort will have significantly fewer hardware removals for pain and infection.

Methods: Patients were identified using CPT codes for operative fixation of ankle fractures between 2013 and 2021. Charts were reviewed to obtain patient age, body mass index, smoking status, diabetes, and open versus closed fracture. Imaging and operative reports were reviewed to determine OTA fracture classification, fixation method, plate and screw type and length, healing, initial medial clear space (MCS) widening, MCS and tibiotalar joint space on final follow-up, and hardware removal for pain or surgical site infection. Patients were excluded if they had a pilon fracture or ipsilateral tibial shaft fracture or less than 90 days of follow-up. Statistical analysis was then performed to compare plate versus screw group baseline characteristics and outcomes. Propensity scoring was then performed to help account for differences in the plate and screw groups and data analyzed after adjusting for the propensity score.

Results: 619 patients met inclusion criteria. 542 were treated with plate osteosynthesis and 77 were treated with intramedullary screws. 62 patients underwent symptomatic hardware removal in the plate group (11.4%) compared to 3 patients in the screw group (3.9%) ($P = 0.046$). No patients underwent hardware removal for infection in the screw group compared to 19 patients (3.5%) in the screw group ($P = 0.1516$). Healing rates between the groups and MCS on final radiographic follow-up were similar. Propensity scores were found to be significantly different between the plate and screw groups ($P<0.0001$). However, when adjusting for this it did not alter our outcomes for hardware removal.

Conclusion: Patients treated with intramedullary screw fixation for fibular fractures associated with rotational ankle fractures are significantly less likely to require a second procedure for hardware removal for symptomatic hardware than those treated with plate osteosynthesis, with similar rates of healing.