

Intramedullary Screw Fixation Versus Traditional Plating for Distal Fibula Fractures

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Purpose: The purpose of our study was to complete a retrospective case-control review comparing outcomes between unstable ankle injuries (bimalleolar-equivalent, bimalleolar, trimalleolar, or pilon fractures) treated with intramedullary screws versus traditional plates and screws. Our primary aim was to compare maintenance of fracture reduction, implant removal rates, and infection rates between these 2 treatment modalities. Our secondary aim was to compare functional outcomes.

Methods: This was a retrospective chart review of 69 consecutive patients from 2011 to 2019 with unstable ankle fractures treated with intramedullary fibular screws (FS) and compared to 216 case-control patients treated with a traditional plate and screw (FP) construct over the same period. The review was performed at a single urban Level I trauma center. Intramedullary fibular fixation was with a 3.5-mm fully threaded stainless steel cortical screw or a 5.0-mm partially threaded titanium cannulated screw.

Results: There was no statistically significant difference in age, gender, diabetes, vascular disease, osteoporosis, laterality of ankle fracture, mechanism of injury, or fracture pattern. Average body mass index was 20 kg/m² in FS group and 32.2 in FP group (P<0.01). Tobacco use was higher in the FS group compared to the FP group (50.7% vs 27.3%, P<0.01). There was no statistically significant difference in fracture characteristics, rate of open fracture, or syndesmotic injury. Rate of fibular union was 90% in the FS group (62/69) and 92% in the FP group (198/216); no significant difference. There was also no statistically significant difference between the FS and FP groups with regard to intraoperative and final follow-up radiographic talocrural angles. The mean AOFAS (American Orthopaedic Foot & Ankle Society) ankle-hindfoot score was 81.2 in the FS group and 83.1 in the FP group (P = 0.66); again, no statistically significant difference. There was no statistically significant difference in Kellgren-Lawrence osteoarthritis grade. There was a significantly decreased rate of implant removal in the FS compared to FP group (8.7% vs 23.1%, P<0.01). The average length of fibular screw was 98.5 ± 30.8 mm (40-150). 37 fully threaded 3.5-mm stainless steel cortical screws were used (53.6%) and 32 (46.4%) partially threaded 5.0-mm titanium cannulated screws.

Conclusion: Our results demonstrate that intramedullary screw fixation of distal fibula fractures in unstable ankle injuries is not inferior to the traditional standard of plate and screw fixation and has the advantage of requiring fewer delayed implant removals. This decreases health-care costs and reduces complications associated with increased surgical procedures.