

Intramedullary Fixation Versus Plate Fixation of Distal Fibular Fractures: A Systematic Review

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Abstract from Journal of the AAOS Global Research & Reviews | July 2024 | Vol 8, No 7

Study Protocol

The purpose of this systematic review and meta-analysis is to provide an update of the recent literature comparing clinical outcomes of surgically treated fibular fractures using intramedullary nailing (IMN) with open reduction and internal plate fixation (ORIF).

Methods

A literature search reporting clinical outcomes after IMN or ORIF of the distal fibula was conducted on PubMed. Inclusion criteria consisted of original studies; studies focusing on clinical outcomes after IMN or IMN and ORIF published before May 11, 2022; studies with at least 5 patients; and studies reporting union rates, complication rates, and patient-reported outcomes such as American Orthopaedic Foot and Ankle Society (AOFAS) and Olerud-Molander scores. To evaluate the methodological quality of the studies included in this review, the methodological index for nonrandomized studies (MINORS) was used.

Findings

Of 2,394 studies identified, a total of 29 studies (4 LOE-I, 2 LOE-II, 6 LOE-III, 17 LOE-IV) were included consisting of 1,850 IMN patients and 514 plate patients. When comparing union rates, the IMN specific patients revealed a 99% union rate versus 97% union rate for ORIF patients.

IMN patients showed a 15% complication rate whereas ORIF patients had a complication rate of 30%. When comparing studies with both treatments, IMN patients had a significantly lower risk of complications (RR = 0.49, 95% CI, 0.29 to 0.82). The pooled mean surgical time among IMN patients was 41.39 (95% CI, 31.38 to 51.40) and 65.84 (95% CI, 57.12 to 74.55) minutes for ORIF patients. When comparing studies that reported surgical time for both IMN and ORIF, IMN was 3.30 minutes faster.

Among studies that reported time to surgery for IMN and ORIF, time to surgery for IMN was 4.34 days earlier than for ORIF (95% CI, 25.64 to 3.04). The IMN group trended toward a higher mean AOFAS and Olerud-Molander score than the plate group by 4.53 (95% CI, -14.58 to 23.65) and 3.54 (95% CI, -2.32 to 9.41) points, respectively. It suggests that IMN accelerates the restoration of patient function sooner than ORIF due to higher Olerud-Molander and AOFAS scores among IMN patients at 3 months follow up.

Key Takeaways

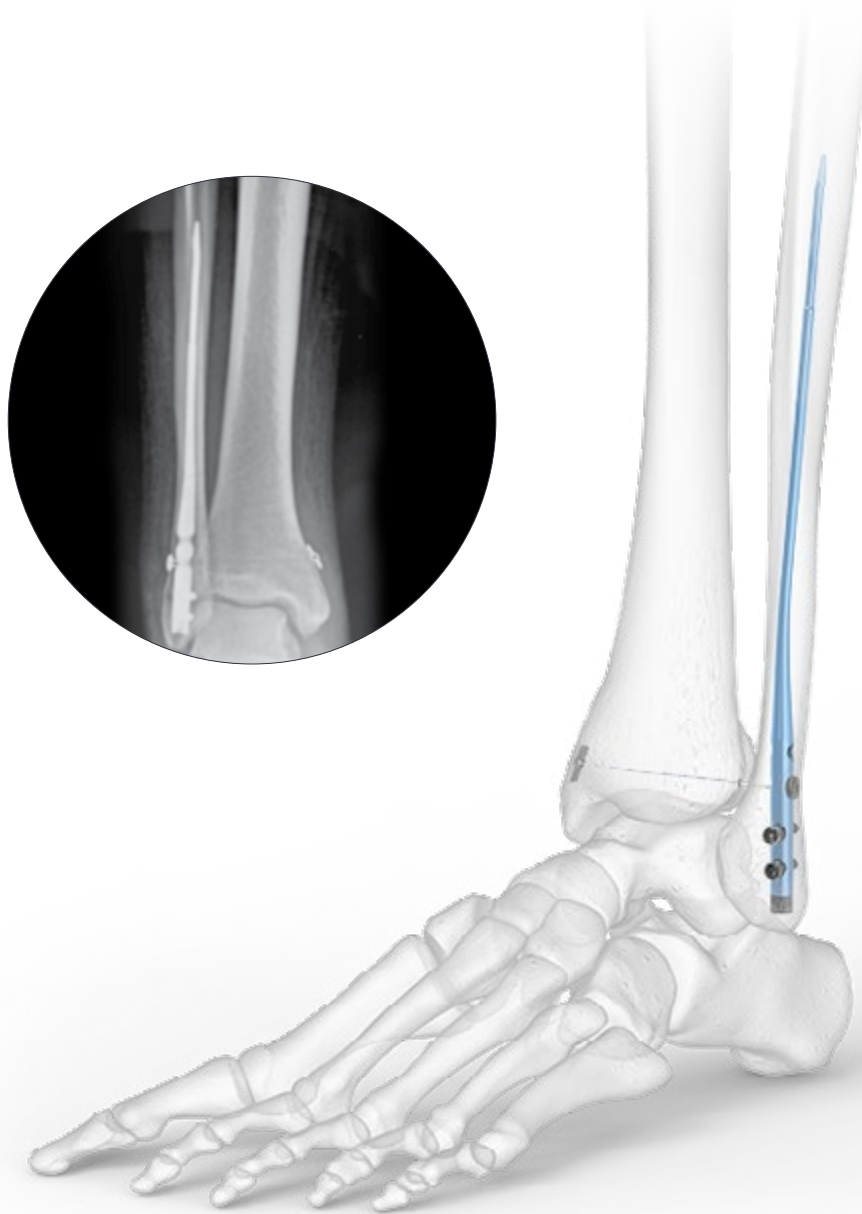
There has been a growing interest in the use of intramedullary fixation devices for treating fibular fractures in recent years.

Current literature reveals near equivalence in union rates between IMN and ORIF (99% for IMN vs 97% for ORIF), yet a significantly lower risk of complications with IMN (15% for IMN vs 30% for ORIF).

Fibular IMN is associated with lower infection rates in part due to their minimally invasive, soft tissue preserving nature with a smaller incision of ~1 to 2 cm. Also, with its less invasive approach, IMN patients were shown to have undergone surgery at least four days sooner than ORIF, suggesting that the general principle to delay surgery until soft tissue swelling has settled may be less critical when considering an IMN technique. Both factors are seen to help reduce the overall risk of wound complications. The long-term benefits of reducing complications from IMN, specifically associated with wound complications in high-risk populations, may notably improve quality of care for patients with distal fibula fractures.

Acumed's Fibula Nail 2 is a great treatment option for fibular fracture fixation. It is particularly advantageous for patient populations where soft tissue preservation is critical—including diabetics, smokers, the elderly, and patients with compromised vascular status or thin, soft tissue envelopes. Its percutaneous, minimally invasive, zero-profile design minimizes surgical dissection and can aid in faster surgical delivery, thereby reducing risks of wound breakdown, infection, and hardware prominence—ultimately helping improve overall patient satisfaction in outcomes due to its accelerated recovery, reduced risk of wound-related complications and improved cosmetic outcomes.

Fibula Nail 2 Fracture Repair
with Acu-Sinch[®] Knotless for Flexible Syndesmotic Fixation



References

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