

The Use of Two Fibular Intramedullary Nail Systems as Minimally Invasive Approach for Fibula ORIF

Joseph Bobadilla, DPM FACFAS, Matthew Rementer, DPM, AACFAS; Lucy Barrow, DPM PGY-3; Nikki Migliori, DPM PGY-3

Bryn Mawr Hospital, Main Line Health

Purpose & Literature Review

This case series showcases a minimally invasive approach for fixation of fibular fractures. This is ideal for patients with significant co-morbidities, skin envelope quality, or difficulty remaining non weight bearing.

As a patient's age increases their chances of non-union, wound healing complications, infection, and failure of hardware increase with standard ORIF of fibular fractures. A patient's age and baseline decreased mobility coupled with co-morbidities such as, diabetes, hypertension, CHF, and tobacco use leads to increase risk of complications. (1) Fibular nails reduce the prominence of hardware, size of incision, and time of non-weight bearing. These factors alone decrease the risk of complications for an at-risk patient. (3)

Methodology/Case Presentation

In the cases presented, 2 different fibular nail systems were used for the fixation of 9 fibular fractures. Eight of the nine fibular fractures were SER injuries, the other a PAD injury. 8 out of the 9 patients had significant medical histories while one patient had no co-morbidities. Co-morbidities included: diabetes, end stage renal disease, hypertension, CAD, and stroke. All patients were permitted to weight bear at 2-3 weeks or when the incision had healed.



Pre and Post-Op insertion of fibular nail without talon feature, the syndesmotic hole in the nail was used

Procedures

Two different fibular nail systems were used for fixation. Each system constructed of distal locking screws which differed in orientation and holes proximally for a syndesmotic fixation. One fixation system had the feature of deploying talons that allowed for increased stability of the fixation.

Each system had similar procedural steps only requiring small incisions. The incision made to insert the nail distally only needed to be approximately 2.5 cm in length to access the distal fibula. The fractures were then reduced, guide wire inserted, reamed, nail inserted and then locked into place with the locking screws (both had different screw orientations). Prior to placing the locking screws the talons were deployed in one of the systems.



Pre and Post-Op insertion of fibular nail without talon feature



Pre and Post-Op insertion of fibular nail with talon feature

Results

There were 3 complications total, 2 intra operative. Intra-operative complications included fracture of the fibula and lack of purchase of the syndesmotic screw. The intraoperative fracture occurred in the only case where this was used on young patient. This case was converted to a standard plate and screw construct intraoperatively. One postoperative wound developed which healed without complication, the patient however, months later developed septic arthritis of that ankle. This patient was taken to the OR for removal of the nail, washout, placement of antibiotic beads, and was treated with 6 weeks of IV antibiotics.

There were no differences in outcomes between the systems used, both achieved stable reduction of the fractures. There was no large difference in patient satisfaction between the two systems except for the case that developed septic arthritis.

Discussions

Overall no significant complications occurred with use of the fibular nails. However, the fracture case of a young healthy patient, may pose further investigation for limitations on patient selection for fibular nails. For a patient that is elderly with multiple co-morbidities fibular nails are an excellent choice for fixation that is non-invasive and allows early weight bearing. Although small cohort studies are promising there is a need for retrospective studies to compare conventional plating to fibular nails to determine which method is better for long term functional outcome in the geriatric population.

Resources

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3. Tas, D., Smeeing, D., Emmink, B., Govaert, G., Heitbrink, F., Leenen, L., Houert, R. (2019) *Intramedullary Fixation Versus Plate Fixation of Distal Fibular Fractures: A Systematic Review and Meta-Analysis of Randomized Controlled Trials and Observational Studies.* Journal of Foot and Ankle Surgery, Vol.8, Issue 1, pg 119-126. Doi.org/10.1053/j.jfas.2018.08.028

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