Intramedullary fibular fixation in the operative management of fractures of the distal tibia and fibula

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Disclosure

• Michael Smith has no conflicts to disclose
• Zuned Hakim has no conflicts to disclose
• Anjani Singh has no conflicts to disclose
Introduction

- Ankle and distal tibial fractures have a spectrum of severity
- The soft tissue envelope has to be treated carefully
- Conventional open reduction and internal plate osteosynthesis is associated with risk of infection and wound healing problems in high risk patients
- Intramedullary fixation of the fibula is proposed as a minimally invasive option, providing relative stability
- It has predominantly been described in ankle fractures
- We present our experience of this device in non-ankle fractures.
Method

• Retrospective study
• Patients identified on departmental trauma database
• All fibular nails used in acute fractures included
• Acumed Fibular nail was the device used
• Casenote, operation note and radiographic analysis
• Devices were used between April 2012 - October 2016
Results

- 18 cases
- 8 male, 10 female
- Median age 66 (Range 23 - 83)
  - Seven smokers (38%)
  - One diabetic (5%)
  - Three polytrauma (16%)
- Five open injuries (28%) (3 distal tibia/fibula, 2 ankle)
Summary of Fractures

Figures taken from AO/OTA Classification

1. 44-B2
2. 44-B3
3. 42-B2
4. 43-A1
5. 43-A3
6. 43-C2
7. 43-C3
Summary of Operations

- **ORIF Tibia with bridging plate, IM fixation of fibula** (33%)
- **Percutaneous tibial fixation, IM fixation of fibula** (Including six AO type 44 fractures) (39%)
- **IM Fixation of Tibia and Fibula** (22%)
- **Percutaneous tibial fixation, application of circular Frame to tibia, IM fixation of fibula** (6%)
Reason for Using Fibular Nail

- Not Specified: 17%
- Poor Soft Tissues (Host): 44%
- Open Wound/Blistering in area of standard fibular approach: 33%
- Need to FWB immediately: 6%
Results

- Syndesmosis screw used in 12 cases (66%)
- Locked distally in all cases
- Proximal ‘blocking’ screw in four cases (22%)
- Median follow-up 5 months (Range 1 month - 4 years)
  - One explant - To allow compression of tibial fracture
  - No revisions. No issues with migration/collapse.
- All fractures united with no progressive malunion
- One superficial wound infection, one prominent locking screw removed
• This device has classically been used in ankle fractures\(^1\) in elderly\(^2\) and diabetic\(^3\) patients

• Plate vs nail RCT found significantly fewer wound infections in fibular nail group, with no difference in functional outcomes\(^2\)

• A cadaveric biomechanical study has shown fibular rods to maintain syndesmotic reduction with lower external rotation stiffness in an ankle fracture model\(^4\)

• Another study identified the peroneal tendons and superficial peroneal nerve are most at risk\(^5\)
Discussion

• We have expanded the use of the device beyond that described originally

• Conventional ORIF still is the gold standard and should be used if soft tissues permits

• Used as a minimally invasive device across a spectrum of ankle and distal tibial fractures

• This offers relative stability, permitting non-anatomical reduction

• In distal tibia fractures it acts as a lateral buttress preventing progressive valgus deformity
References


2. White TO, Bugler KE, Appleton P, Will E, McQueen MM, Court-Brown CM. A prospective randomised controlled trial of the fibular nail versus standard open reduction and internal fixation of ankle fractures in elderly patients. Bone Joint J (2016); 98-B(9): 1248-52

