



Calcaneal fracture fixation using a new interlocking nail reduces complications compared to standard locking plates

Thomas Mittlmeier, Anica Herlyn

Disclosure

Thomas Mittlmeier, Prof. Dr. med. is co-owner of the Calcaneal patent

Anica Herlyn, PD Dr. med. habil. has no potential conflicts with this presentation

Please find the disclosure in the Final AOFAS Mobile App.

Challenge



Gold standard ORIF using an extensive lateral approach

- Excellent visualisation, direct reduction of the depressed posterior facet fragment
- Problem wound healing complications, infections, haematoma

Minimal invasive locking nail (Calcanail®)

- Intrafocal reduction, channel created in the calcaneal tuberosity which is simultaneously used as *through-heel approach* for the nail
- Approach places the system away from the localization of complications of a classical lateral approach



Advantages

- Locked nail with cannulated screws holds reduction of the talar surface
- Option to convert from osteosynthesis to subtalar fusion

Aim of the study



- Prospective matched-pairs clinical study
- Evaluates the new calcaneal interlocking nail in terms of reduction capacity and functional outcome compared to a standard locking plate fixation
- If the *through-heel approach* is able to reduce the high complication rates

Methods

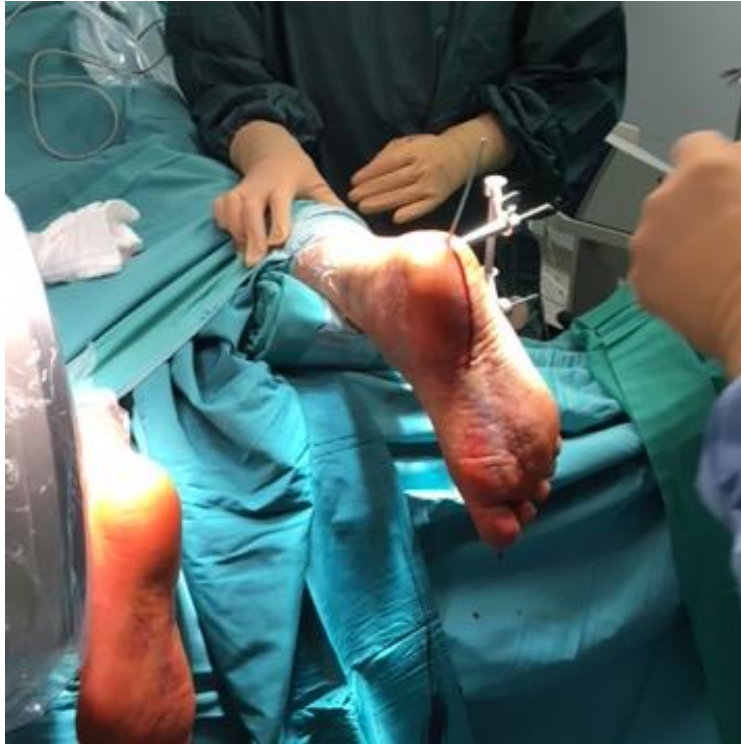
- 40 feet (20 patients/group, mean age 53 y, range 27-78 y)
- Displaced intraarticular calcaneal fractures (modal value Type Sanders IIb/IIIab)

Group LN: Minimally-invasive fracture reduction and fixation using intramedullary calcaneal locking nail (Calcanail®, FH Orthopedics)

Group LP: Standard fracture reduction using locking plate (Synthes)

- Follow-up 1.6 y postoperatively
- Clinical and radiological assessment, incl. CT based analysis
- Functional evaluation according to the AOFAS Ankle-Hindfoot-Score and Foot Function Index

Operational procedure



Intraoperative situation

→ Talocalcaneal distractor facilitates reduction and corrects tuberosity varus

Operational procedure



Intraoperative reduction

→ Bone pushers for articular surface reduction

Results

1. General results

- **Length of inpatient treatment significantly reduced in nailing group**
LN 7.6 d
LP 11.0 d
- **Operation time did not differ in both groups**
LN 93 min
LP 96 min

2. Complications

- **No intraoperative complications in either group**
- **Reduced wound healing complications in nailing group**
LN none
LP n=2 (10%)

Results

3. Functional results

- **AOFAS hindfoot score with better results for the nailing group**
 - LN 71.6 points
 - LP 66.1 points
- **Modified revised Foot Function Index (Long Form) with better results for the nailing group**
 - LN 27.3 points
 - LP 30.8 points

4. Radiological results

- **Adequate restoration of the calcaneal body in both groups**
- **Remaining defect of the posterior facet significantly smaller in the nailing group**
 - LN 0.7 mm
 - LP 1.6 mm

Conclusion

- **Minimal invasive technique using the new calcaneal interlocking nail provided safe and reliable intrafocal reduction**
- **Low complication rates due to new *through-heel* approach compared to plate fixation**
- **Superior function compared to plate fixation**
- **Further studies are needed to reveal long term results**



PD Dr. med. habil. Anica Herlyn
Department for Trauma, Hand and Reconstructive Surgery
University of Rostock, Medical Center
anica.eschler@med.uni-rostock.de