Realignement Osteotomy in Fibular Malunion

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Disclosure

- No conflict to disclose
Distal Fibula Malunions

- Exact incidence of distal fibula malunions after fibula Fx is now know ⇒ up to 33%\(^1\)
- The most frequent malunions of the fibula are shortening and malrotation:
  - widening of the ankle mortise and talar instability\(^{1,2}\)
- Fibula malunion as a risk factor for development of ankle osteoarthritis:
  - biomechanical cadaver study\(^3\)
  - clinical long-term studies\(^{4,5}\)
Our Study

- Patients with symptomatic posttraumatic fibula malunion:
  - our treatment algorithm and surgical technique
  - intra- and postoperative complications
  - mid-term radiographic outcomes
  - mid-term clinical outcomes including quality of life
Patients

- 19 consecutive patients (19 ankles):
  - posttraumatic non-union or mal-union of fibula
  - 11 ♂, 8 ♀, mean age 42 ± 9 years (range, 19 – 67 years)

- Initial injury:
  - type Weber B Fx (n = 7), type Weber C Fx (n = 12)
  - mean time latency 14 months (range, 6 – 101 months)
Surgical Technique

- Z-shaped corrective fibular osteotomy
Surgical Technique

- Z-shaped corrective fibular osteotomy
- Pathological medial distal tibial angle:
  - supramalleolar corrective tibia osteotomy ($n = 4$)
- Inframalleolar malalignment:
  - corrective calcaneal osteotomy ($n = 8$)

Radiographic Assessment

- Assessment of the distal fibula length:
  - Weber Criteria

**Images:**
- Equal joint space
- Shenton’s line
- Weber’s circle
Results

- There were no intraoperative complications
- Perioperative complications:
  - 2 patients with early wound healing problems
  - both resolved with i.v. antibiotics
- Osseous healing:
  - in all ankle within 10 weeks after surgery
- Length and rotation of the fibula:
  - improved in all ankles
  - according to 3 Weber criteria
Results

- Mean follow-up 4.9 years:
  - range, 3.2 – 6.7 years
  - no patients were lost for follow-up

- Significant functional improvement:
  - AOFAS: 48.4 ± 14.5 ⇒ 85.7 ± 7.4 (p < 0.001)
  - ROM: 37° ± 6° ⇒ 46° ± 5° (p < 0.001)

- Substantially improved quality of life:
  - 8 SF-36 score subgroups

- Hardware removal:
  - in 11 patients
  - mean time 11.8 months (range, 7.2 – 22.8 months)
Conclusions

- **Fibula mal-union:**
  - is not rare!
  - exact incidence is not known

- **Negative effects on ankle biomechanics**

- **Important long-term predictor for ankle osteoarthritis development**

- **Reconstructive fibula osteotomy:**
  - exact planning important for appropriate correction
  - well-promising mid-term results
  - may avoid or at least postpone ankle osteoarthritis
  - long-term studies are needed
References

2. van Wensen et al., Strat Traum Limb Recon, 2011
4. Horisberger et al., J Orthop Trauma, 2009
5. Lübbeke et al., Int Orthop, 2012