The Impact of Malunited Volkmann Fragments and their Treatment with Corrective Osteotomies

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My disclosure is in the Final AOFAS Mobile App. I have no potential conflict with this presentation.
The Issue

- Posterior malleolar fractures (Volkmann fragment) are mostly treated non-surgically if the size does not exceed 25% of tibial surface.

- Malunited Volkmann fragment may destabilize the ankle joint $\rightarrow$ asymmetric joint load $\rightarrow$ increased occurrence of subsequent degenerative diseases.
The Idea

- Corrective osteotomy of the malunited Volkmann fragment
- Additional osteotomy of the distal tibia and fibula to restore ankle congruency if necessary
Patients and Methods

- Between 2004 and 2012
- 18 patients with a symptomatic malunion of a Volkmann fragment
  - mean age 39 [22 - 57] years
  - 8 females, 10 males
- X-rays and CT scan to assess obtained articular correction
- AOFAS hindfoot score to assess functional outcome
Radiological Appearance

- Size of Volkmann fragment: 37 (19 - 62)% of articular surface
- Amount of dislocation: 3 (1-6) mm
- Posterior dislocation of the talus in 15 ankles (83%) → loss of joint congruency in the anterior tibiotalar joint → overload at the posterior aspect with joint space narrowing in 12 ankles (67%)
- Increased bone density in subchondral area in 16 ankles (89%)
Surgical Technique

- Corrective OT and plate fixation of the reduced Volkmann fragment

- Medial closing OT of distal tibia (in cases with valgus misalignment)

- Corrective osteotomy of fibula (in cases with malunion of the fibula)
Results

- Follow-up of 5.1 (2-10) years
- Additional tibial osteotomy in 12 ankles (67%), fibular osteotomy in 6 ankles (33%)
- Congruent ankle joint in all but one case
- 15 patients (83%) were satisfied / very satisfied
- AOFAS hindfoot score improved from 54 (44-68) to 84 (74-92) points
Conclusion

- Functional impact of malunited Volkmann fragment seems to be underestimated
- Corrective osteotomies of the malunited fragment may improve the outcome
- However there is often need for additional osteotomies of the distal tibia and the fibula to obtain a well balanced, congruent ankle.
References

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