

## Double wedge osteotomy and subtalar arthrodesis for rockbottom malunion after calcaneal fracture

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**Introduction/Purpose:** The pathoanatomy characteristics of the rockbottom malunion after calcaneal fracture include severe loss of calcaneal height, which result in the horizontal of the talus in the ankle mortise and anterior ankle impingement. This study was carried out to evaluate the clinical results of double wedge osteotomy and subtalar arthrodesis for rockbottom malunion after calcaneal fracture.

**Methods:** From February 2014 to February 2015, 9 cases of calcaneal rockbottom malunion after calcaneal fracture were treated with wedged osteomy and subtalar arthrodesis. And 8 patients get final followup. Weight bearing X ray were taken before the surgery and at final followup. Talar declination, lateral talocalcaneal angle, lateral talo-first metatarsal angle and Bohler's angle were used to evaluate the correction of the malunion. The American Orthopaedic Foot and Ankle Society (AOFAS) ankle-hindfoot scale and visual analog scale (VAS) for pain were collected. SPSS 22.0 software was used for Statistical analysis.

**Results:** The average time for bone union was 17.1 weeks (12weeks~22weeks). The talar declination was improved from  $2.5^{\circ}$  ( $-6^{\circ}\sim 13^{\circ}$ ) preoperatively to  $13.25^{\circ}$  ( $5^{\circ}\sim 19^{\circ}$ ) postoperatively ( $P<0.001$ ); the lateral talocalcaneal angle was improved from  $-0.25^{\circ}$  ( $-15^{\circ}\sim 10^{\circ}$ ) preoperatively to  $0.25^{\circ}$  ( $7^{\circ}\sim 25^{\circ}$ ) postoperatively ( $P<0.001$ ); the talo-first metatarsal angle was improved from  $21.13^{\circ}$  ( $10^{\circ}\sim 30^{\circ}$ ) preoperatively to  $9.88^{\circ}$  ( $5^{\circ}\sim 14^{\circ}$ ) postoperatively ( $P<0.001$ ); and the calcaneal Bohler's angle was improved from  $-25.6^{\circ}$  preoperatively to  $22.4^{\circ}$  postoperatively ( $P<0.001$ ). The AOFAS scale was 26.63 (12~53) preoperatively, and 79.75 (72~89) at final followup ( $P<0.001$ ); the VAS scale for pain was 7.5 (6~9) preoperatively, and 2.6 (2~3) at final followup ( $P<0.001$ ).

**Conclusion:** Wedge osteomy and sutalar arthrodesis can effectively correct the malunion, restore the calcaneal height and hindfoor alignment. Pain was relieved after correction, and the function of the ankle and hindfoot was restored.

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