

# Sequelae of non-surgical treatment of tibial shaft fracture – Varus Tibial Malunion: corrective medial opening wedge osteotomy to restore alignment and prevent osteoarthritis progression



Centro Hospitalar  
de Entre o Douro e Vouga, E.P.E.  
Portugal

Alexandre Castro, Raquel Cunha, Pedro Atilano, Filipa Oliveira, Manuel Santos Carvalho

## Background

Malunions of tibia fractures are common complications of traumatic injury. Conservative treatment was the mainstay and is specially associated with varus deformation. Angular deformities of the distal tibia are associated with arthritic changes of the ankle and disability due to abnormal distribution of forces through the ankle joint. Supramalleolar osteotomies have been described and used for the treatment of such distal tibial deformities, such as varus or valgus as well sagittal and rotational deformities with good results. The restoration of the limb alignment has been presenting good outcomes in ankles with early degenerative changes and may delay the need for more procedures, such as ankle fusion or total ankle arthroplasty.

## Case Presentation

A 61 year-old man was referred to us with pain in ankle and functional disability. He had a history of tibial shaft fracture submitted to casting 30 years ago. He also had a history of total knee replacement in the ipsilateral limb. Upon presentation, the patient complained of pain with ambulation and decreased range of motion. No family or personal history of relevance. At physical examination no signs of crepitus, bony impingement or instability of ankle and foot. No muscle or tendon contracture. Adequate vascular status and no neurologic deficits. There were no soft-tissue issues or scarring around his ankle and hind foot.

Weightbearing radiographs revealed varus malunion. Lateral distal tibial angle (LDTA) –  $93.8^\circ$ . CORA angle –  $12.6^\circ$  in AP, with no additional malalignment in lateral plane. After failure of conservative treatment he was submitted to a medial opening wedge osteotomy with plate fixation.



Fig.1 (Xray): Weight-bearing antero-posterior and lateral ankle xray (left – pre-op; right – pos-op).

## Results

At 6 months follow-up, he was satisfied with the procedure, with minimal residual pain. X-rays revealed consolidation of the osteotomy.

Weightbearing radiographs revealed an Lateral distal tibial angle (LDTA) –  $88.2^\circ$  and CORA angle –  $2.7^\circ$  in AP after osteotomy. Therefore we had a residual deformity but asymptomatic.

Before surgery, VAS score was 7/10 and AOFAS SCORE was 52/100. At 6 months VAS score was 1/10, and AOFAS score was 84/100.

## Discussion

Ankle arthritis still has fewer treatment options than arthritis in other joints. Therefore, we must prevent it whenever we can and we know that restoration of ankle malalignments is important to prevent progression of arthritis.

Supramalleolar osteotomies, despite being challenging procedures, can address deformities of the distal tibia and restore normal mechanics of the foot and ankle. A restored equal distribution of functional forces may prolong or prevent the progression of ankle arthritis and improve function.

## Conclusions

Supramalleolar osteotomy is a joint-preserving surgical treatment for patients with asymmetric valgus or varus ankle arthritis that improves functional outcomes in patients with altered biomechanics associated with asymmetric arthritis.

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