

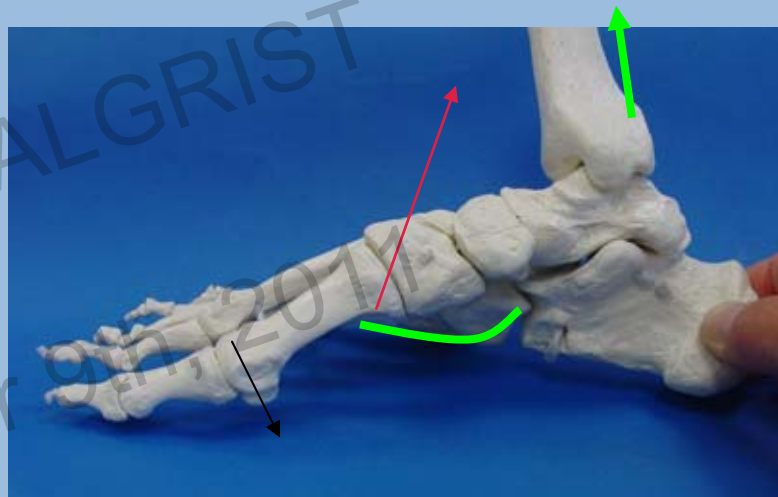
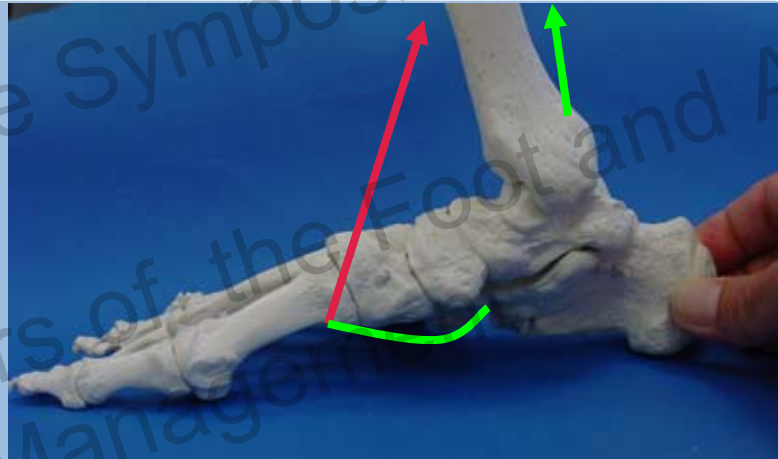
Surgical treatment of the Cavovarus foot

Martin Weber



Cavovarus foot - etiology

- > Muscle imbalance:
 - forefoot cavus:
 - Tibialis anterior-weakness
 - Strong peroneus longus
 - Plantarflexion 1st ray
 - Supination of entire foot
 - Hindfoot varus



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Cavovarus foot - test

- > Plantarflexion of 1st ray
 - Forefoot driven hindfoot varus
 - Reversible in „Coleman block test“



Coleman and Chesnut, CORR 1977, 123:60-2

Cavovarus foot - „surgical“ problems

- > Clawtoes
- > Metatarsalgia
- > Hindfoot instability
- > Ankle arthrosis



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Cavovarus foot – treatment „instruments“

> Operative treatment

— Osteotomies

- Dorsiflexion osteotomy of metatarsals
- Valgus osteotomy of calcaneus
- Valgus osteotomy of distal tibia and fibula

— Soft tissue procedures

- Lateralization of tibialis anterior tendon insertion
- Peroneus longus to brevis tendon transfer
- Lateral ankle ligament reconstruction

„when“ use „which“ instrument

- > Metatarsalgia
 - df osteotomy metatarsal (+toe alignment)
- > Instability, forefoot cavus
 - df osteotomy metatarsal 1 (+2, +3)
 - Peroneus longus to brevis tendon transfer
- > Instability, fixed hindfoot varus
 - Valgus osteotomy calcaneus (or smot)
 - Ankle ligament reconstruction
 - Anterior tibial tendon transfer if weakness of peroneal muscles

„when“ use „which“ instrument

- > Ankle arthrosis + or - instability
 - OT calcaneus (or smot, or both)
 - OT MT1
 - Tendon transfers: anterior tibial, peroneus longus to brevis
 - No ligament reconstruction

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„instruments“ NOT to use

- Tendon lengthening (better: transfer, preserve muscle power)
 - results in weakness
 - Achilles: may increase pain from anterior ankle impingement

- Arthrodeses (better: osteotomy, preserve mobility)
 - Insufficient correction
 - Lose shock absorption capability of „stiff“ joints
 - Stiffness increases load on adjacent joints
 - In neuropathy: risk of adjacent ulceration

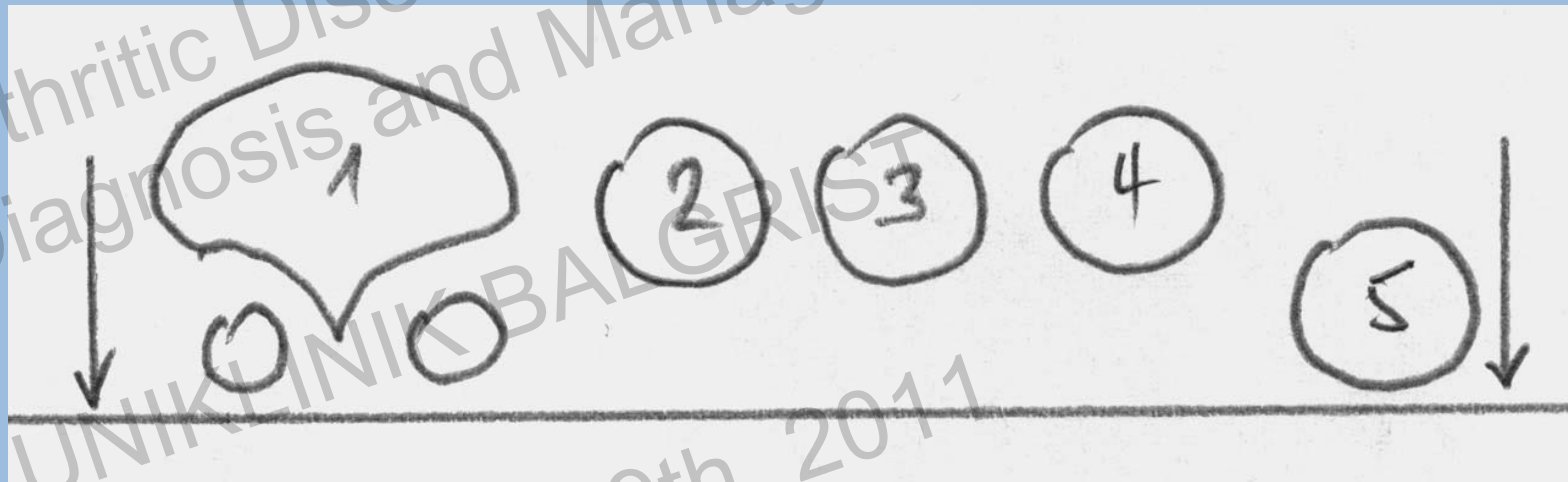
„instruments“ not to use

- > No arthrodeses



Cavus foot - treatment

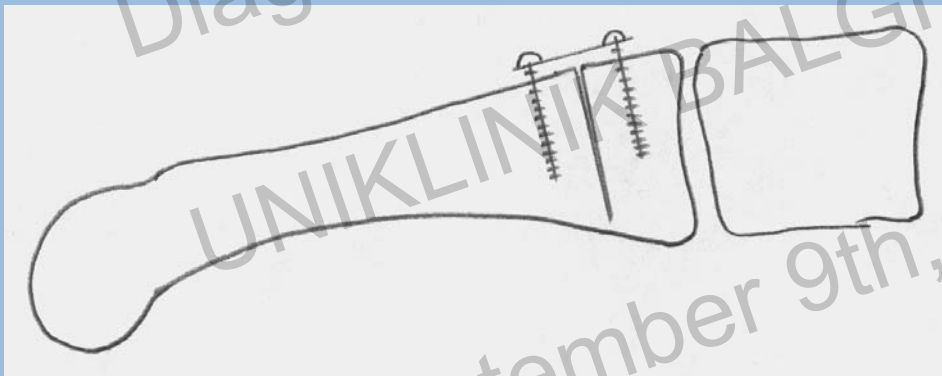
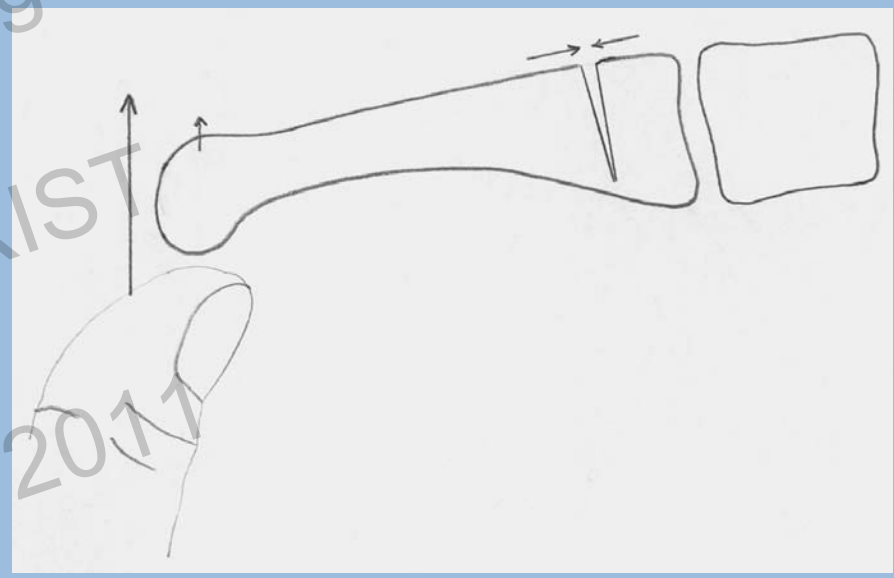
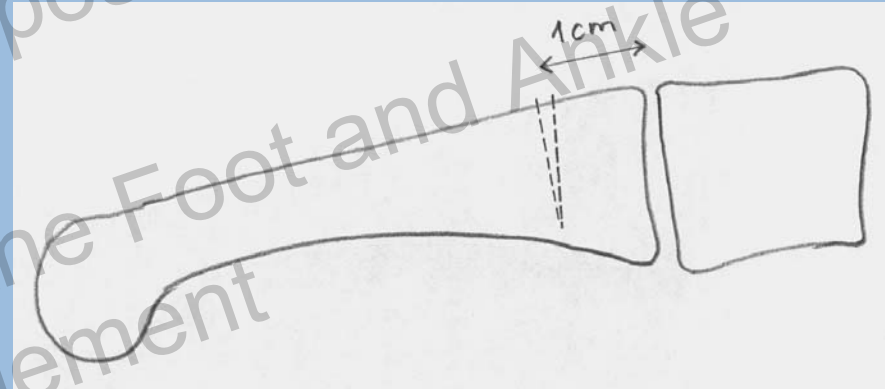
- > Osteotomies
 - Dorsiflexion osteotomy of metatarsals



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Cavus foot - treatment

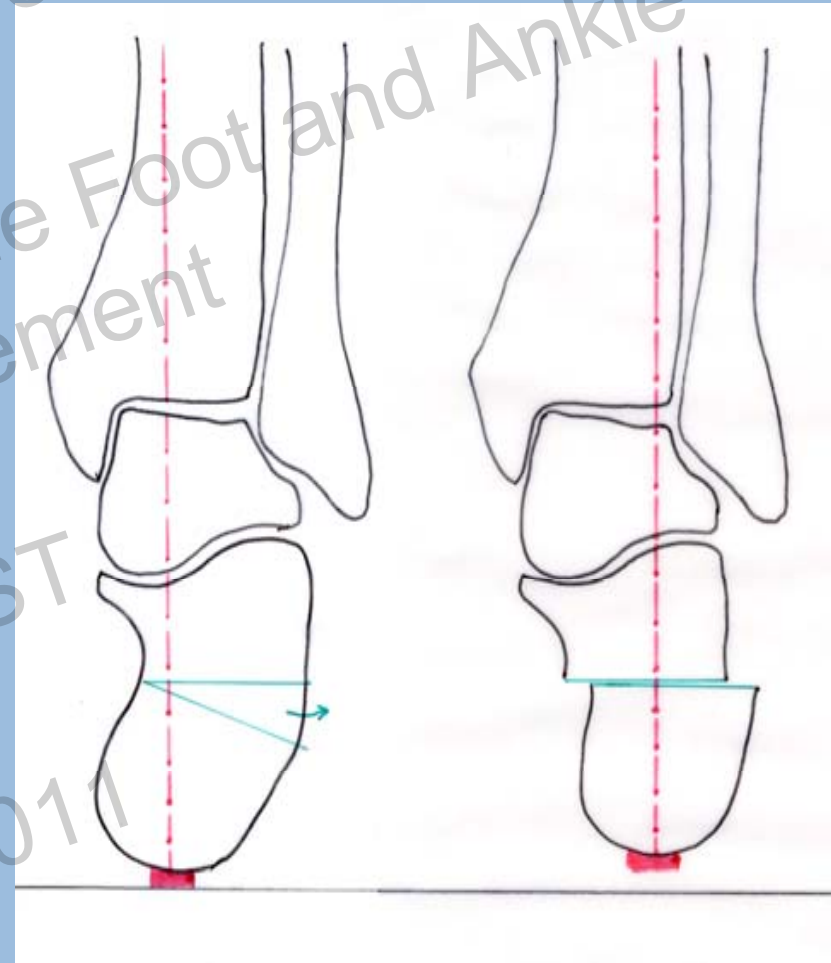
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Cavus foot - treatment

- > Osteotomies
 - Valgus osteotomy of calcaneus



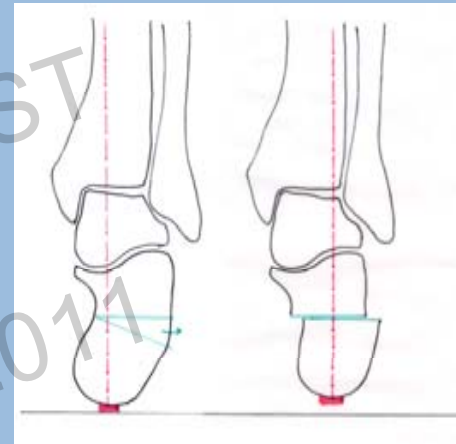
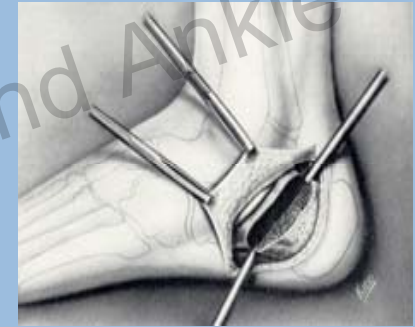
Approaches - incisions

- > Release insertion anterior tibial tendon
- > Rerouting ATT above ankle (+cheilectomy)
- > Bone tunnel lateral cuneiform
- > Osteotomy calcaneal tuberosity
- > Peroneal tenodesis

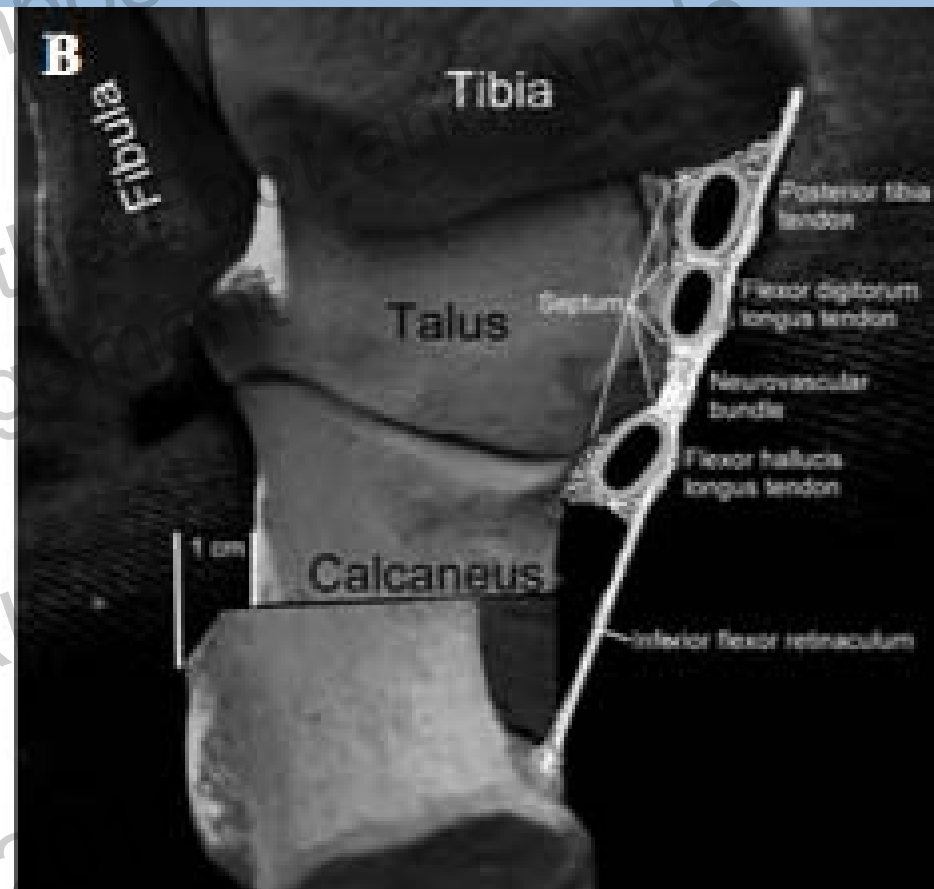
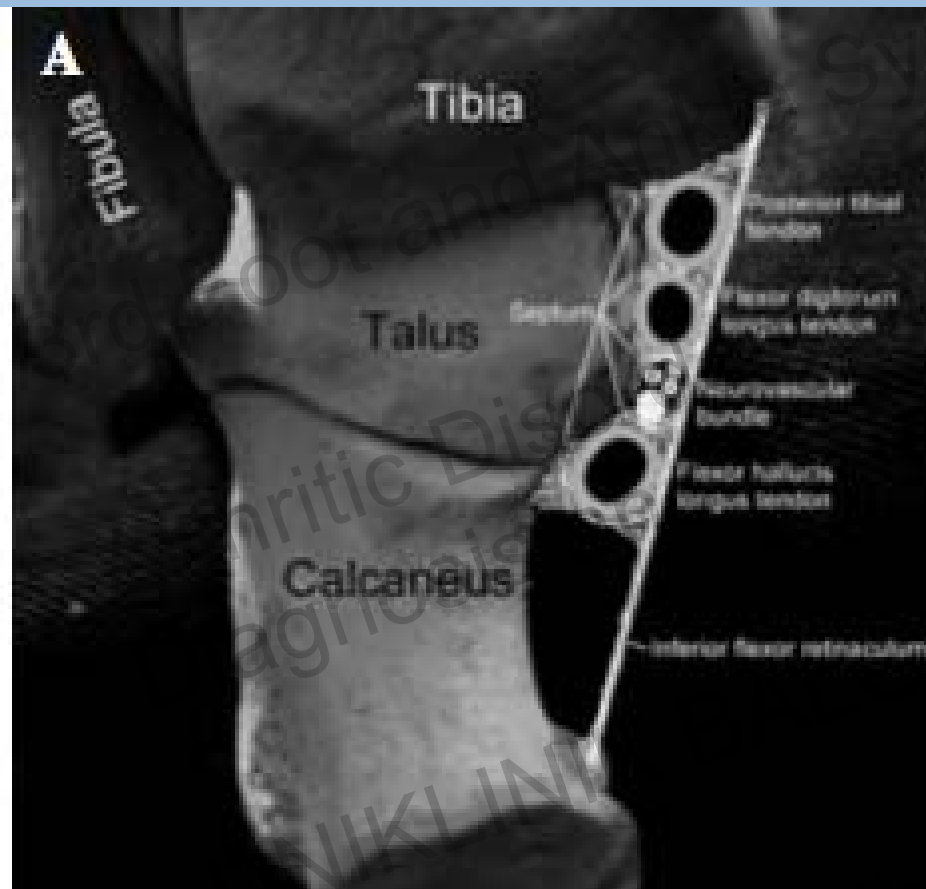


Valgus osteotomy of the calcaneal tuberosity

- > Lateral incision
 - Straight, curved (Dwyer), L-shaped
- > Transverse osteotomy
 - Aiming K-wire
- > Lateral translation + wedge resection
 - CAVE traction injury LPN
- > Fixation with axial screw
 - 1-3 screws



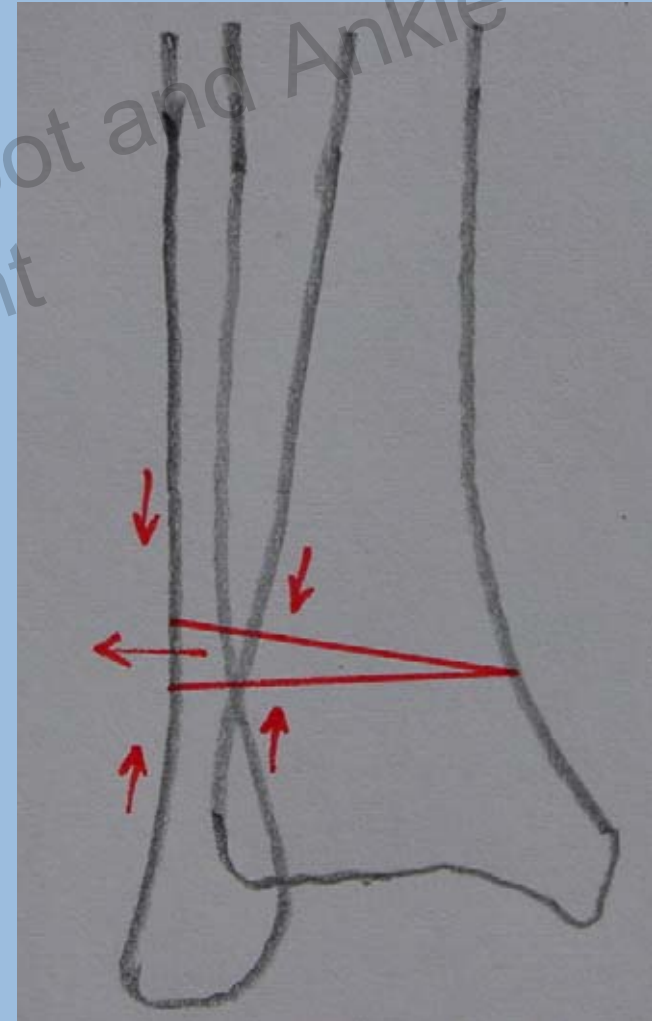
Valgus osteotomy of the calcaneal tuberosity – injury to plantar nerves



Tibial Nerve Palsy Associated with Lateralizing Calcaneal Osteotomy: Case Reviews and Technical Tip

Cavus foot - treatment

- > Osteotomies
 - Valgus osteotomy of distal tibia and fibula



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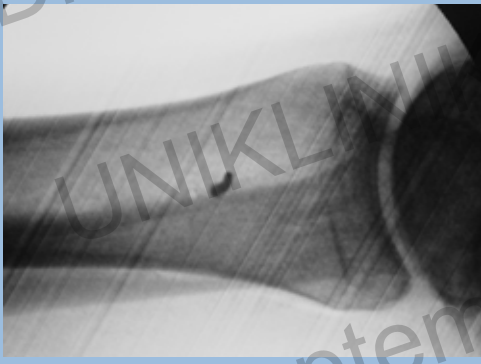
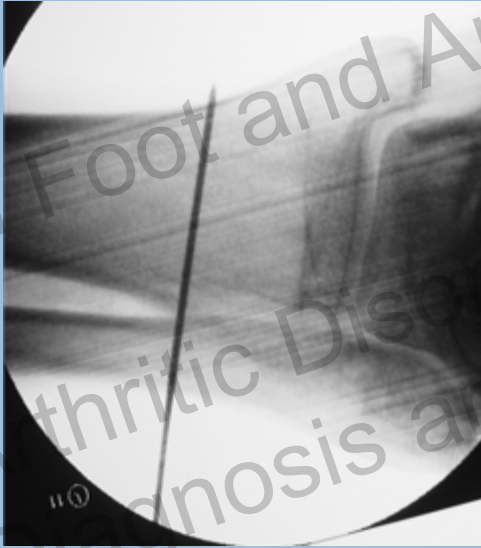
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Lateral closing wedge OT: technique

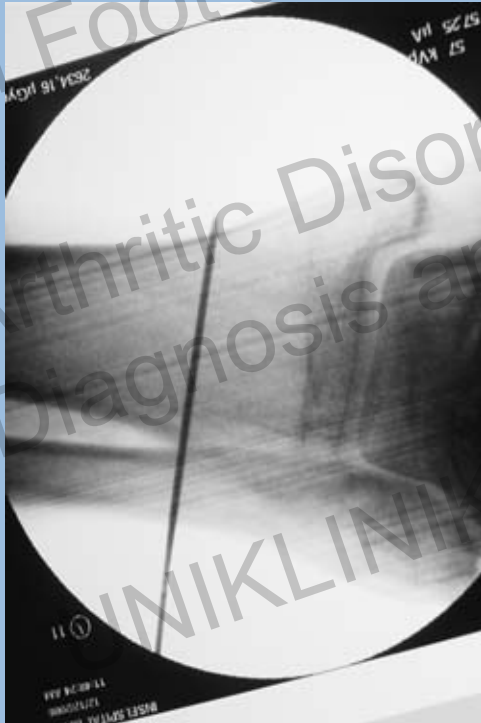
Guide wire parallel to joint



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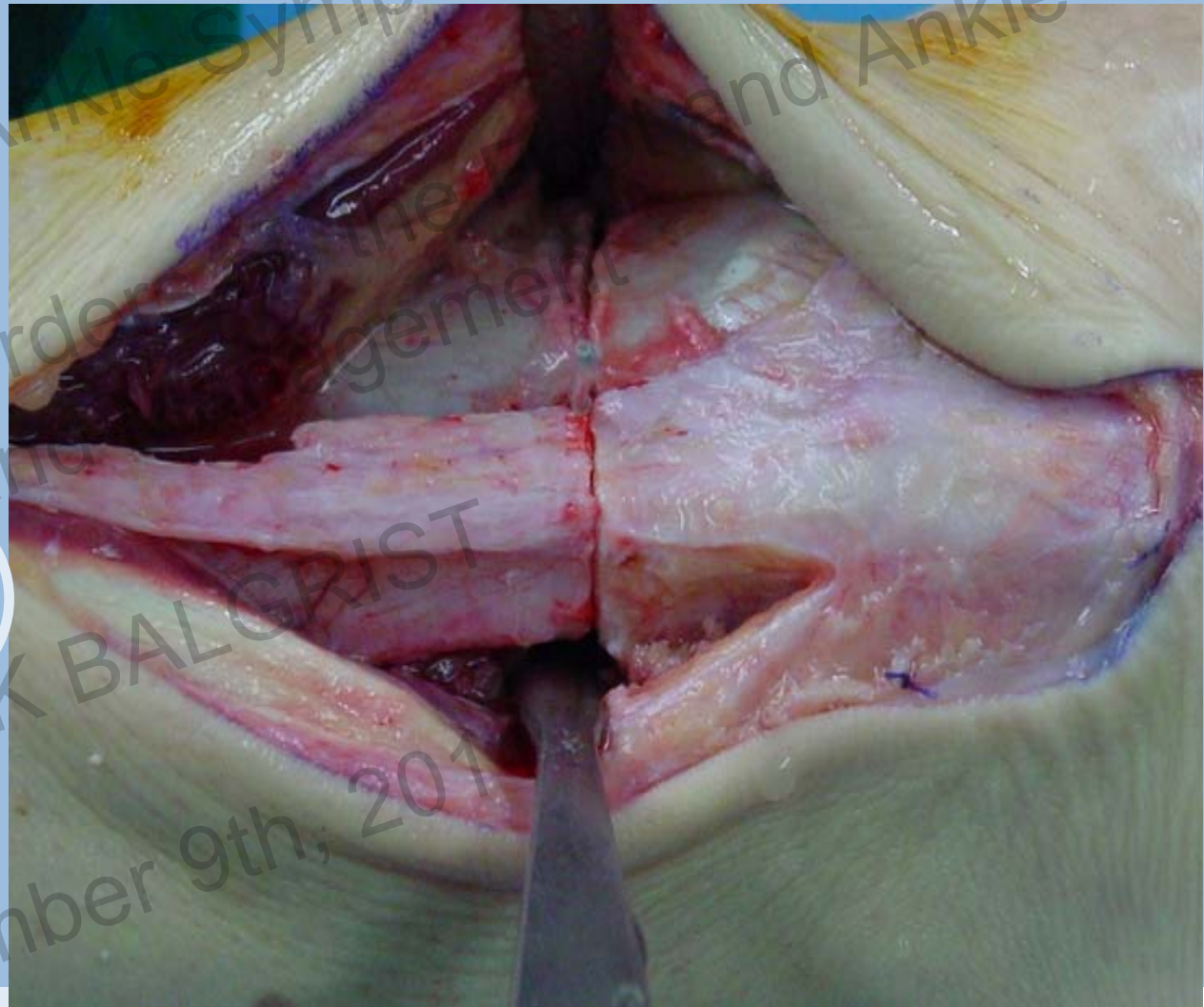
Lateral closing wedge OT: technique

Osteotomy - stop 5 mm short of medial cortex
Resect wedge of planned length
Weaken medial cortex if needed



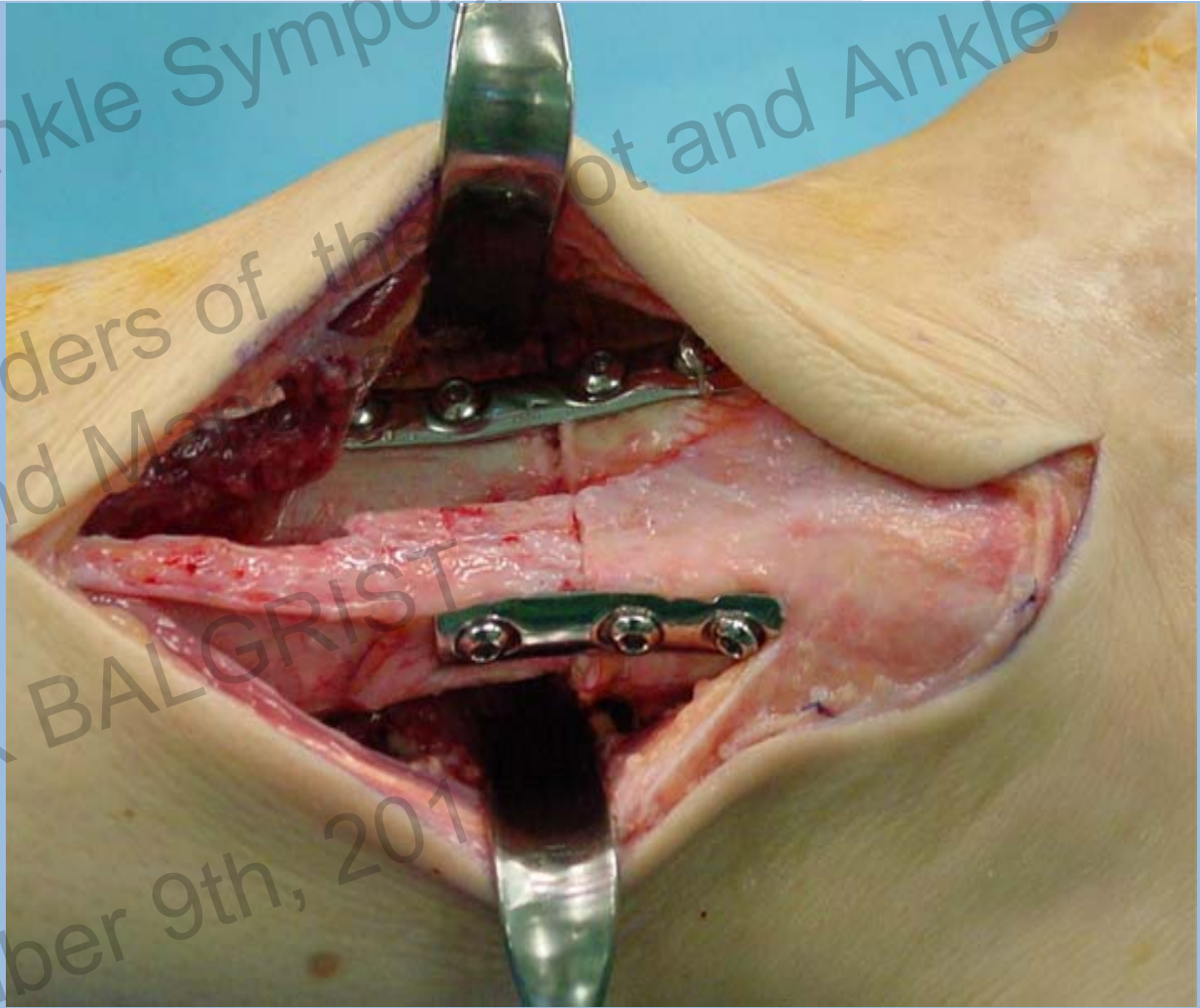
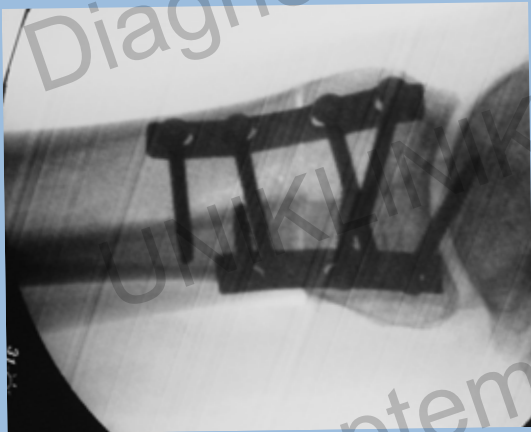
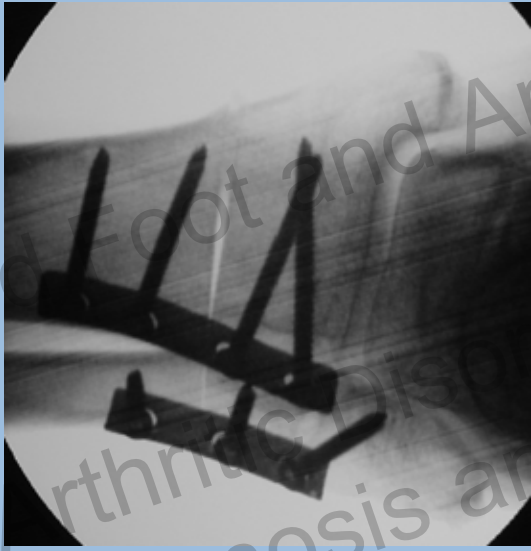
Lateral closing wedge OT: technique

„bend“ medial cortex to close osteotomy



Lateral closing wedge OT: technique

fixation



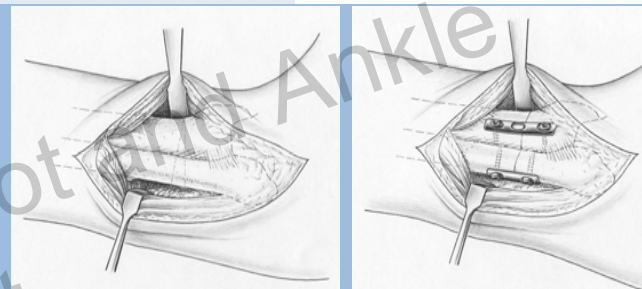
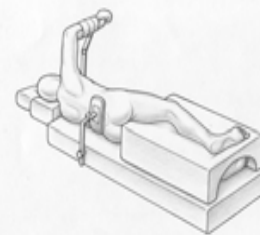
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Lateral closing wedge osteotomy in medial ankle arthrosis

9 patients, f-up 56m (16-88)
Supramalleolar lateral approach
Lateral closing wedge OT
No arthroscopy
No osteophyctectomy
Correction to neutral (+ / - 3°)
All improved (AOFAS score 48□74)
2 patients later progression (1 fused)

Harstall, Weber; Foot and Ankle International 2007, 28(5): 542-8

Lit: -Weber BG:Unfallheilkunde 80:191,1977
-Takakura JBJS 77B:50, 1995
-Stamatis FAI 24:754, 2003



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Cavus foot - treatment

> Soft tissue procedures

- Lateralization of tibialis anterior tendon insertion
- Peroneus longus to brevis tendon transfer
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Approaches - incisions

- > Release insertion anterior tibial tendon
- > Rerouting ATT above ankle (+cheilectomy)
- > **Bone tunnel lateral to medial cuneiform**
- > Osteotomy calcaneal tuberosity
- > Peroneal tenodesis



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Tendon transfer - ATT

65 y

Resection peroneal muscles
because of synovial sarcoma



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Tendon transfer - ATT

65 y

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preop



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Tendon transfer - ATT

65 y

Resection peroneal muscles
because of synovial sarcoma

Transfer ATT insertion
from C1 to C3

4 m postop



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Tendon transfer - ATT

65 y

Ankle arthrosis, instability

Transfer ATT insertion
from C1 to C3

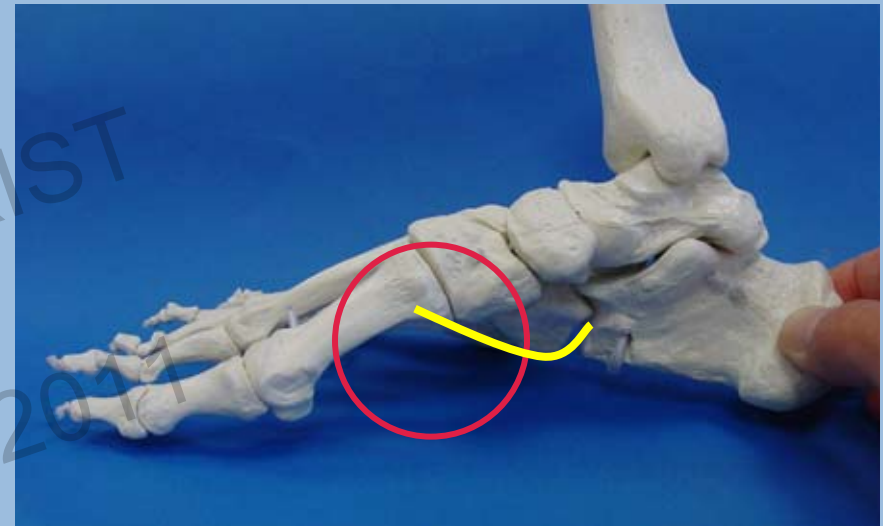
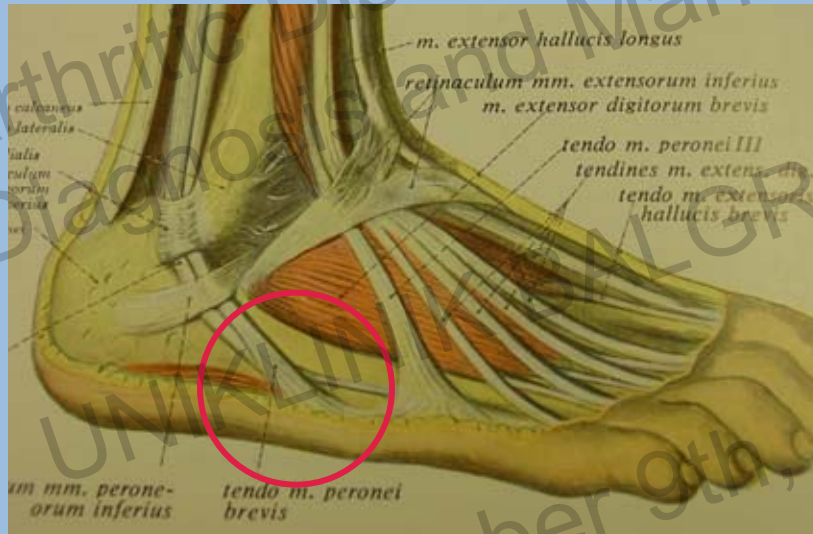
24 m postop



Cavus foot - treatment

> Soft tissue procedures

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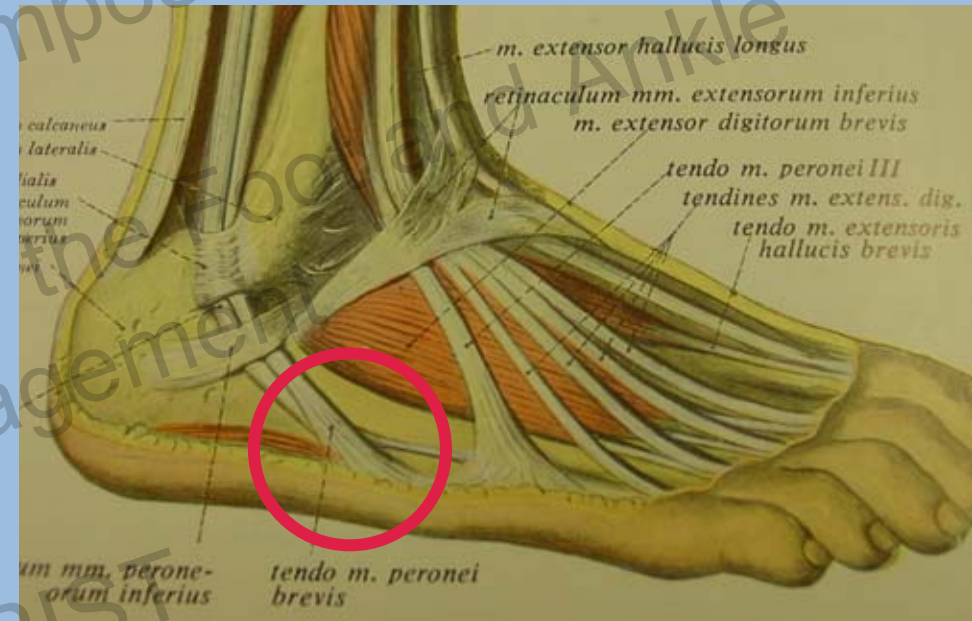
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Tendon transfer – Peroneus longus to brevis

- > Tendons intact:
 - Distal tenotomy (at os peroneum) of longus, Pulvertaft weave into brevis
- > Longus ruptured:
 - Side to side-tenodesis in proximal rupture of longus
 - Weave in distal rupture
- > Brevis ruptured:
 - Proximal + distal tenodesis of Longus to Brevis to bypass ruptured zone of brevis



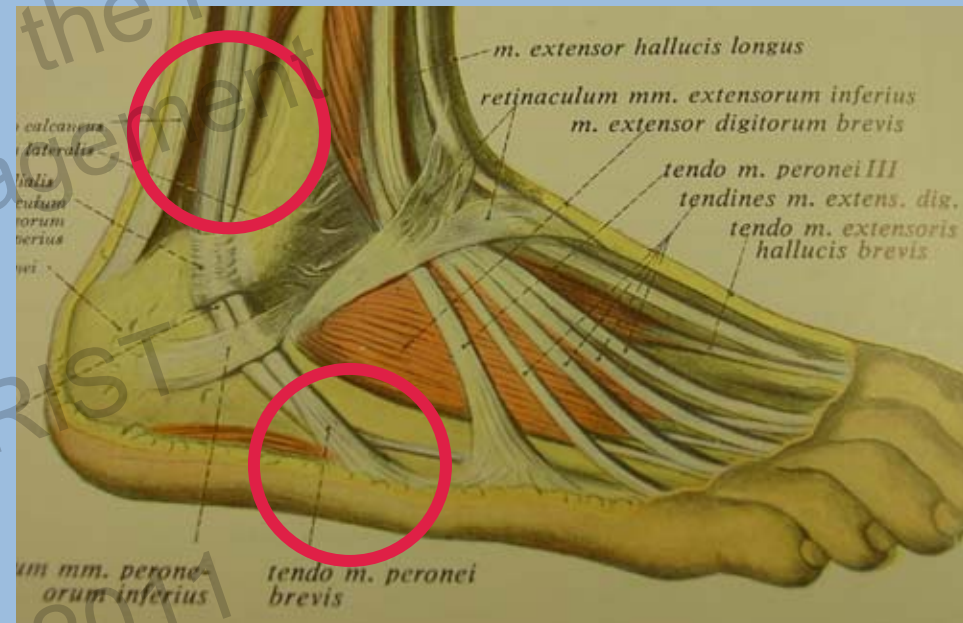
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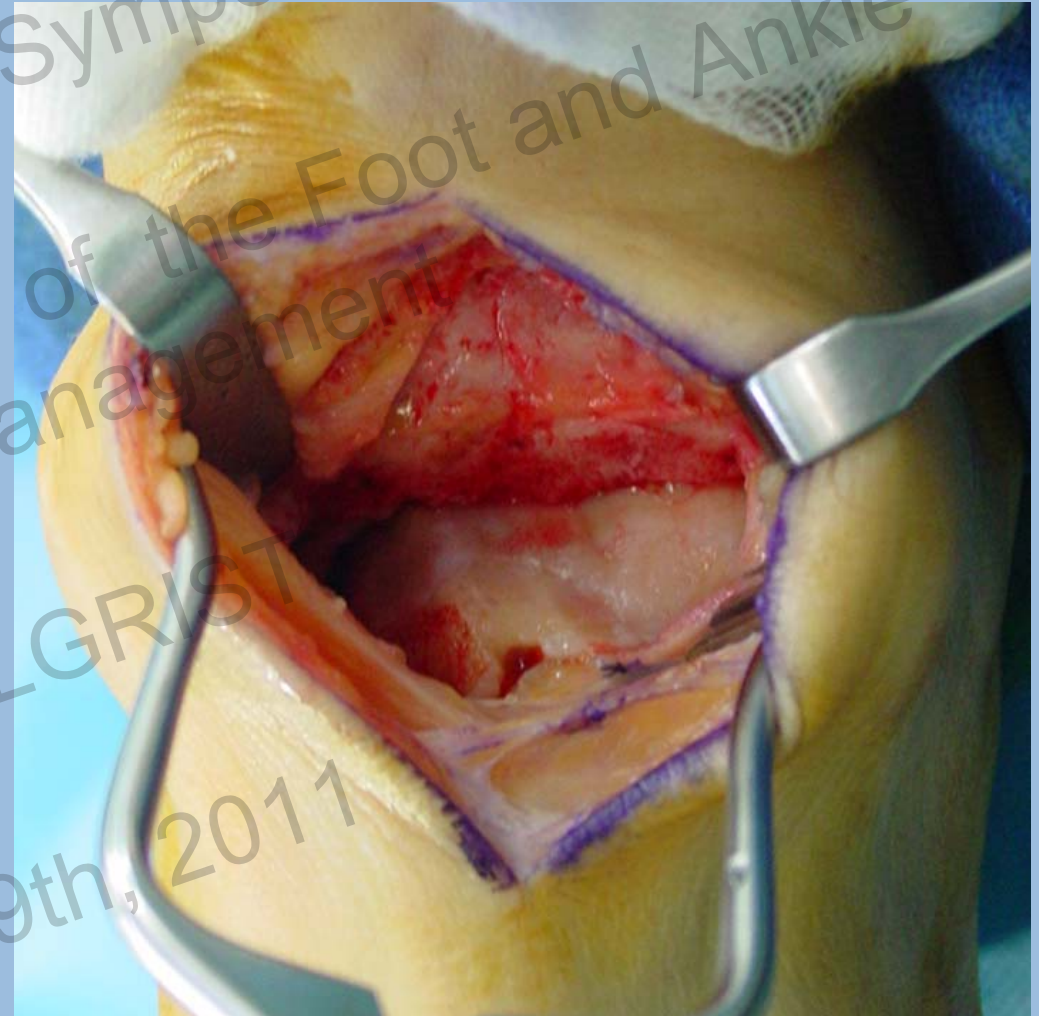


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Anterior ankle cheilectomy



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Cavus foot - treatment

> Soft tissue procedures

- Lateralization of tibialis anterior tendon insertion
- Peroneus longus to brevis tendon transfer
- Lateral ankle ligament reconstruction



Cavovarus foot – surgical treatment

- > Combination of static and dynamic realignment
- > Extent of procedure tailored to individual deformity
 - OT supramalleolar, calcaneus, MT1
 - Tendon transfer: ATT, PL to PB
- > Avoid tendon lengthening (increases weakness)
- > Avoid fusions (insufficient correction, new problems)



bern
capital impressions

