



1

Introduction

Ankle diseases

Deformities



Flat foot

Tendon disorders



Achilles tendinopathy

Joint disorders



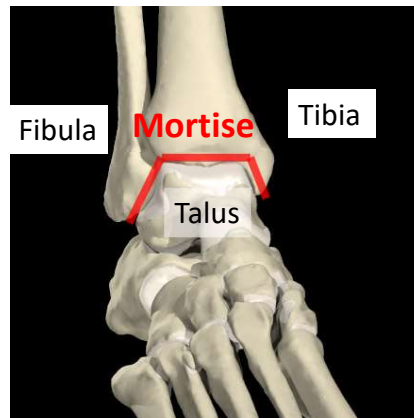
Ankle arthrosis

2

Anatomy

Bone

Ankle joint



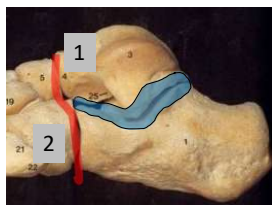
©2003 Primal Pictures Ltd.

3

Anatomy

Bone

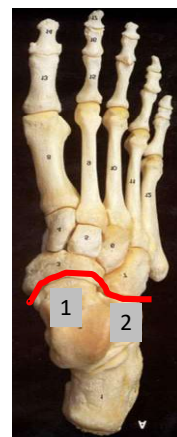
Neighbour joints



Subtalar joint

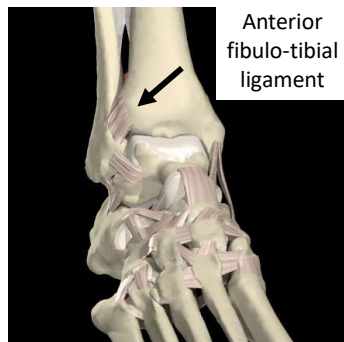
Chopart joint

- 1 Talo-navicular
- 2 Calcaneo-cuboïdal



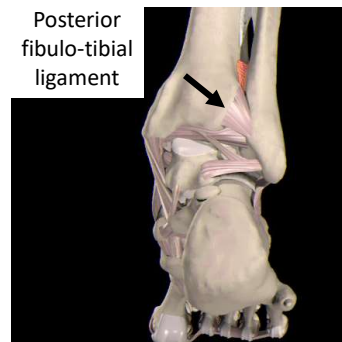
4

Anatomy Ligaments



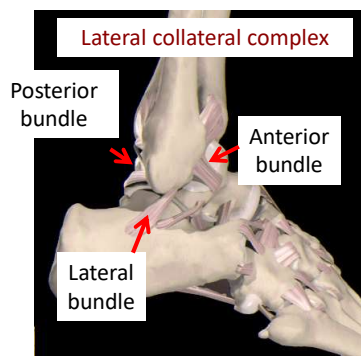
Anterior view

Stabilisators of the mortise



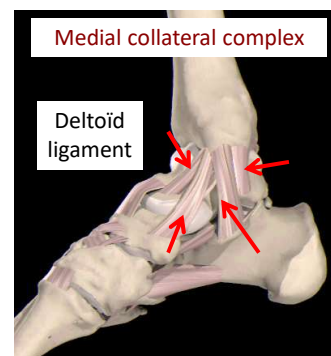
Posterior view

Anatomy Ligaments



Lateral view

Stabilisators of the ankle



Medial view

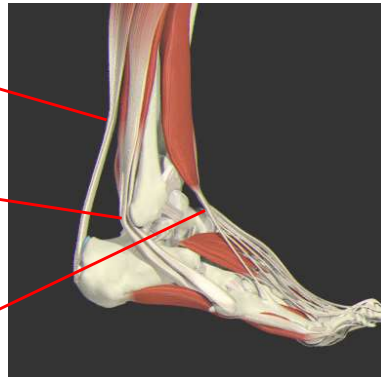
Anatomy

Musculo-tendinous units

Triceps surae
→ Achilles

Long and short
peroneals

EDL
Extensor
Digitorum
Longus



Lateral view

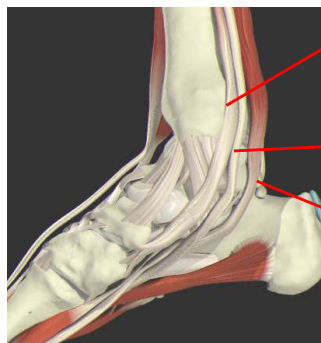
Anatomy

Musculo-tendinous units

Tibialis
posterior

FDL
Flexor
Digitorum
Longus

FHL
Flexor
Hallucis
Longus



Medial view

Function

Sagittal motion

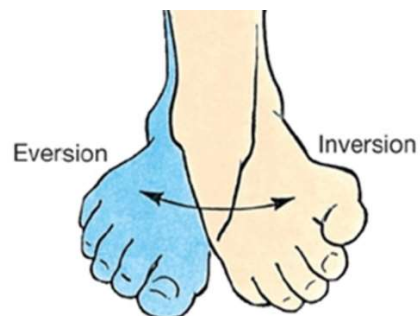
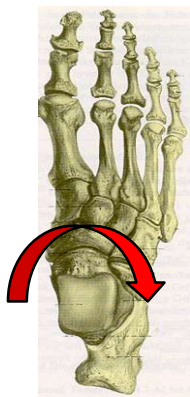


Ankle joint

9

Function

Coronal and transverse motion



Chopart joint

Subtalar joint



Couple of torsion

10

Couple of torsion (subtalar and Chopart joints)



Flatfoot (FF)

Introduction

Acquired FF

- degenerative
- post-traumatic

DISEASED FOOT



Constitutional FF

- familial
- racial

FUNCTIONAL FOOT



Acquired flatfoot

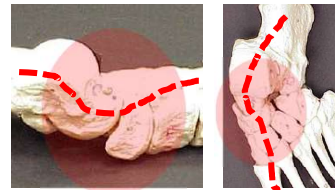
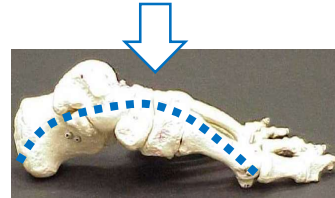
Clinical presentation



Valgus

Planus

Abductus



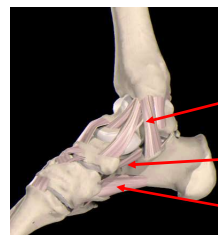
Twisting around the talo-navicular joint

Acquired flatfoot

Weakening of the medial and plantar stabilizing structures



Tibialis posterior tendon



Deltoid

Spring

Long plantar

Ligaments

Acquired flatfoot

Goal of treatment



15

Conservative treatment

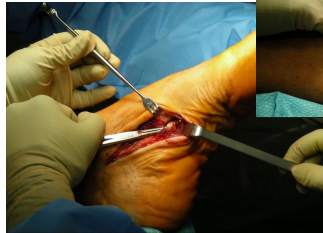
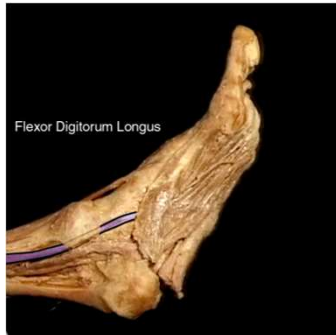
Insoles + shoes



16

Surgical treatment

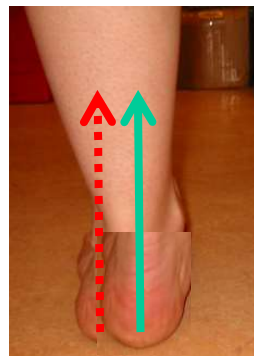
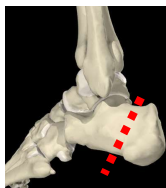
Functional : if deformity is flexible



Replace tibialis posterior tendon by a neighbour tendon (FDL)

Surgical treatment

Functional : if deformity is flexible

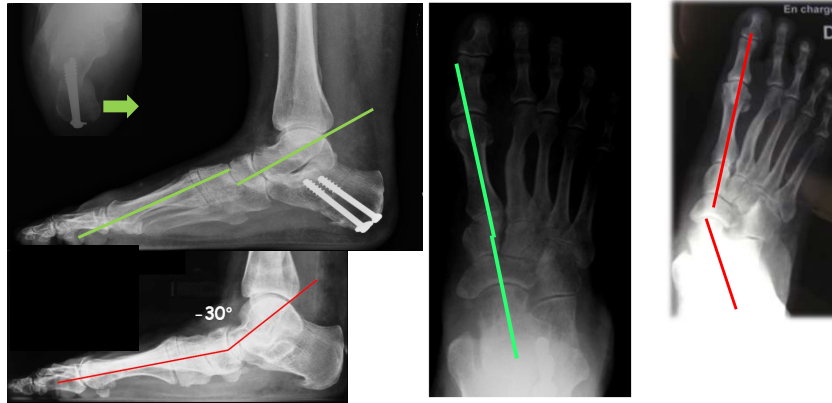


Realign hindfoot

Neutralize valgus traction
of the Achilles tendon

Functional surgical treatment

Result



Surgical treatment

Stabilizing : if deformity is rigid



Double hindfoot arthrodesis

Achilles tendon

Running

Stretched Achilles tendon :
Gives 90% of energy back during propulsion

Forces through Achilles tendon :
6-8 X body weight



Achilles tendinopathy

Introduction

Non inflammatory disease

Intra tendinous lesions - microruptures

- Fibroblasts ↑
- Vascularization ↑
- Desorganization of collagen
- Insufficiency of repair processes



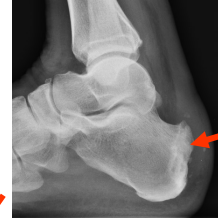
Achilles tendinopathy

Two categories

Non-insertional



Insertional



23

Conservative treatment

For both categories

Stretching & excentric training



Injection of PRP (Platelet Rich Plasma)
under ultrasonographic guidance



24

Insertional tendinopathy

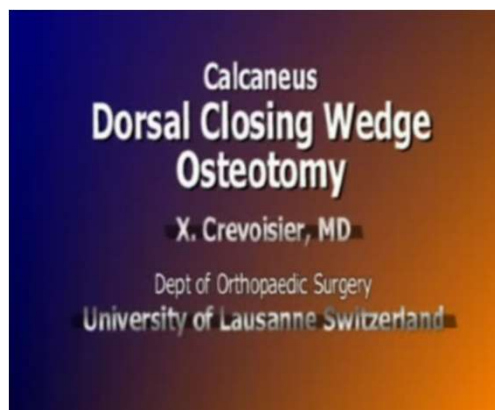
Surgical treatment



Transtendineous resection

Insertional tendinopathy

Surgical treatment



Dorsal closing wedge osteotomy

Non-insertional tendinopathy

Surgical treatment



Tendon lengthening

Non-insertional tendinopathy

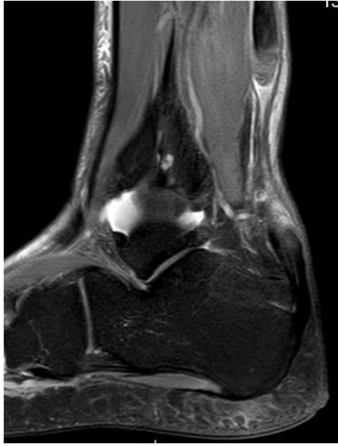
Surgical treatment



Debridement

Non-insertional tendinopathy

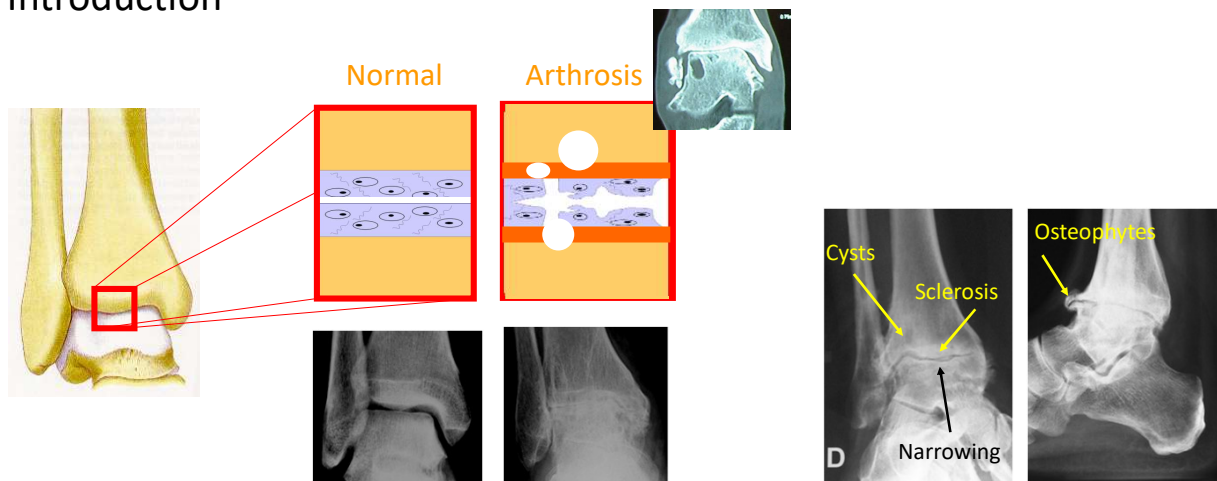
Surgical treatment



FHL transfer

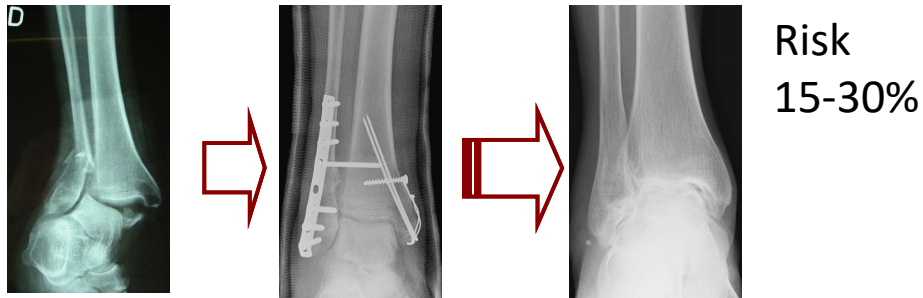
Ankle arthrosis

Introduction



Etiology

Post traumatic in 80 % of cases



31

Conservative treatment



Frontal and sagittal stabilization



Rocker bottom sole
Shock absorbing heel



Painkillers



32

Surgical treatment

- **Conservative surgery**

- Periarticular osteotomies



33

Periarticular osteotomies

Indications

Advanced ankle arthrosis

- Malalignment
- Articular potential
- Young patient
- High functional demand



34

Periarticular osteotomies

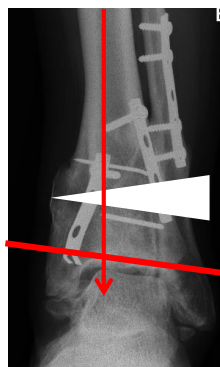
Advantages vs disadvantages

Pain ↓ Function ↑
 Preservation of native joint
 Stabilization of osteoarthritis progression

Does not eliminate osteoarthritis

Periarticular osteotomies

Surgical principle



Surgical treatment

- **Conservative surgery**

- Periarticular osteotomies

- **Stabilizing surgery**

- Ankle arthrodesis (=fusion)

Ankle arthrodesis

Indications

End stage ankle arthrosis

- High functional demand
- Young patient
- Severe deformity



Ankle arthrodesis

Residual mobility



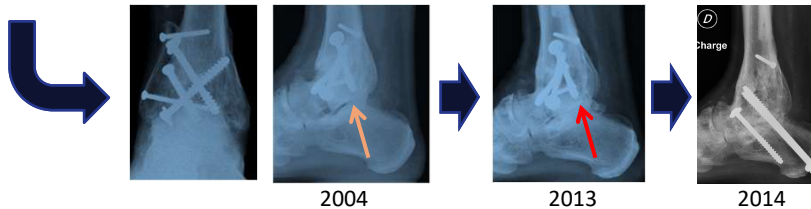
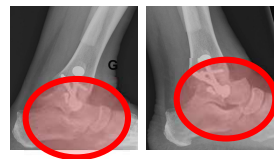
39

Ankle arthrodesis

Advantages vs disadvantages

Pain ↓ Function ↑

Overload of neighbour joints
→ arthrosis of neighbour joints



2004

2013

2014

40

Surgical treatment

- **Conservative surgery**

- Periarticular osteotomies

- **Stabilizing surgery**

- Ankle arthrodesis (=fusion)

- **Prosthetic surgery**

- Total ankle replacement (TAR)

Total ankle replacement (TAR)



Total ankle replacement (TAR)

Indications

End stage ankle arthrosis

- Low functional demand
- Older patient (>60Y)
- Good alignment
- Good bone quality



43

Total ankle replacement (TAR)

Advantages vs disadvantages

Pain ↓
Function ↑
Preservation of neighbour joints

Implants survival rate : 90% at 10 years
Revision rates : up to 30% at 10 years



44

Total ankle replacement (TAR)

Last generation

- Fixed bearing
- Non-cemented
- Economic bone resection

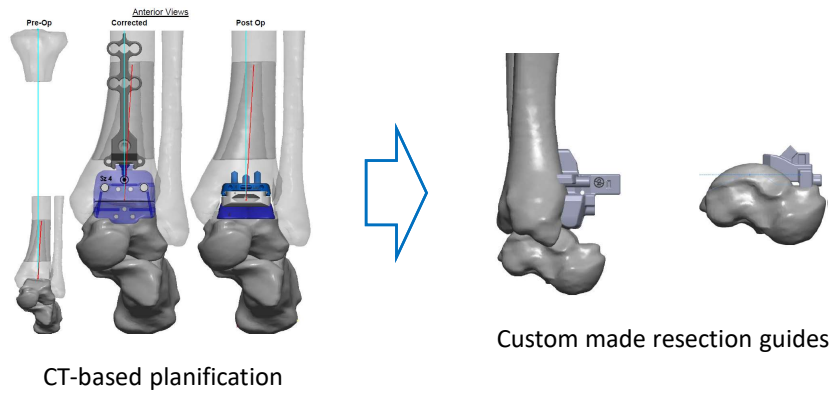


Total ankle replacement (TAR)

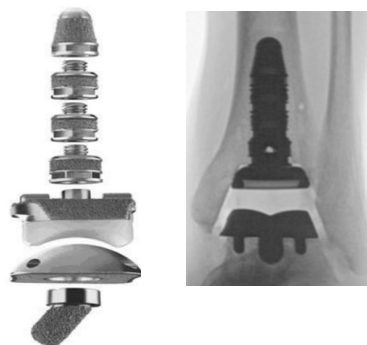
Implantation



Enhancing surgical precision



Challenge : solutions for revision



INBONE

Conclusion

Basic knowledge in foot & ankle anatomy

Typical foot & ankle pathologies

Insight into conservative & surgical treatments

Welcome in the OR



49

Thank you

Prof. X. Crevoisier
UNIL - CHUV - Lausanne
xavier.crevoisier@chuv.ch

Photo : Rita Szency

50