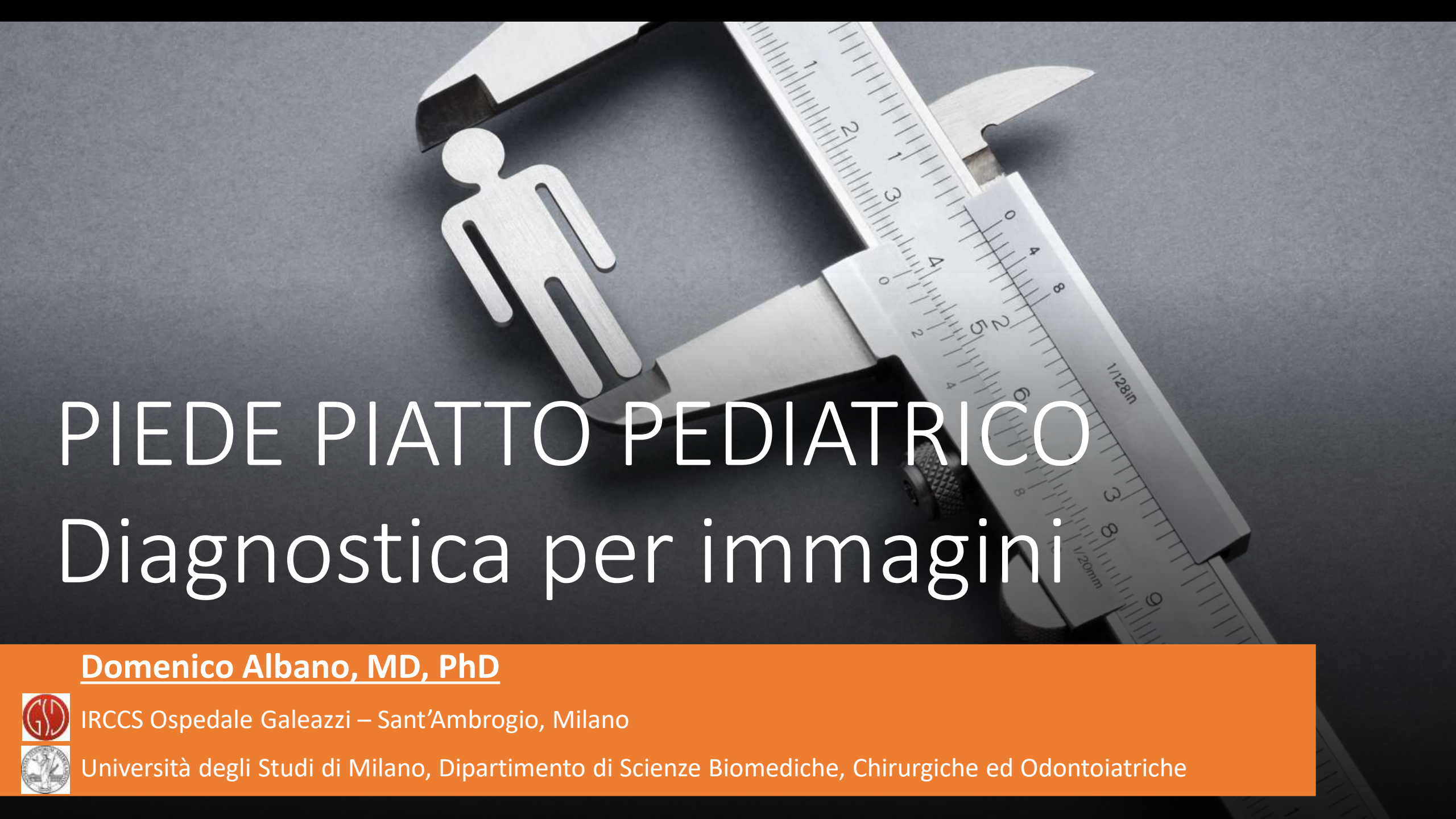

# PIEDE PIATTO PEDIATRICO
# Diagnostica per immagini

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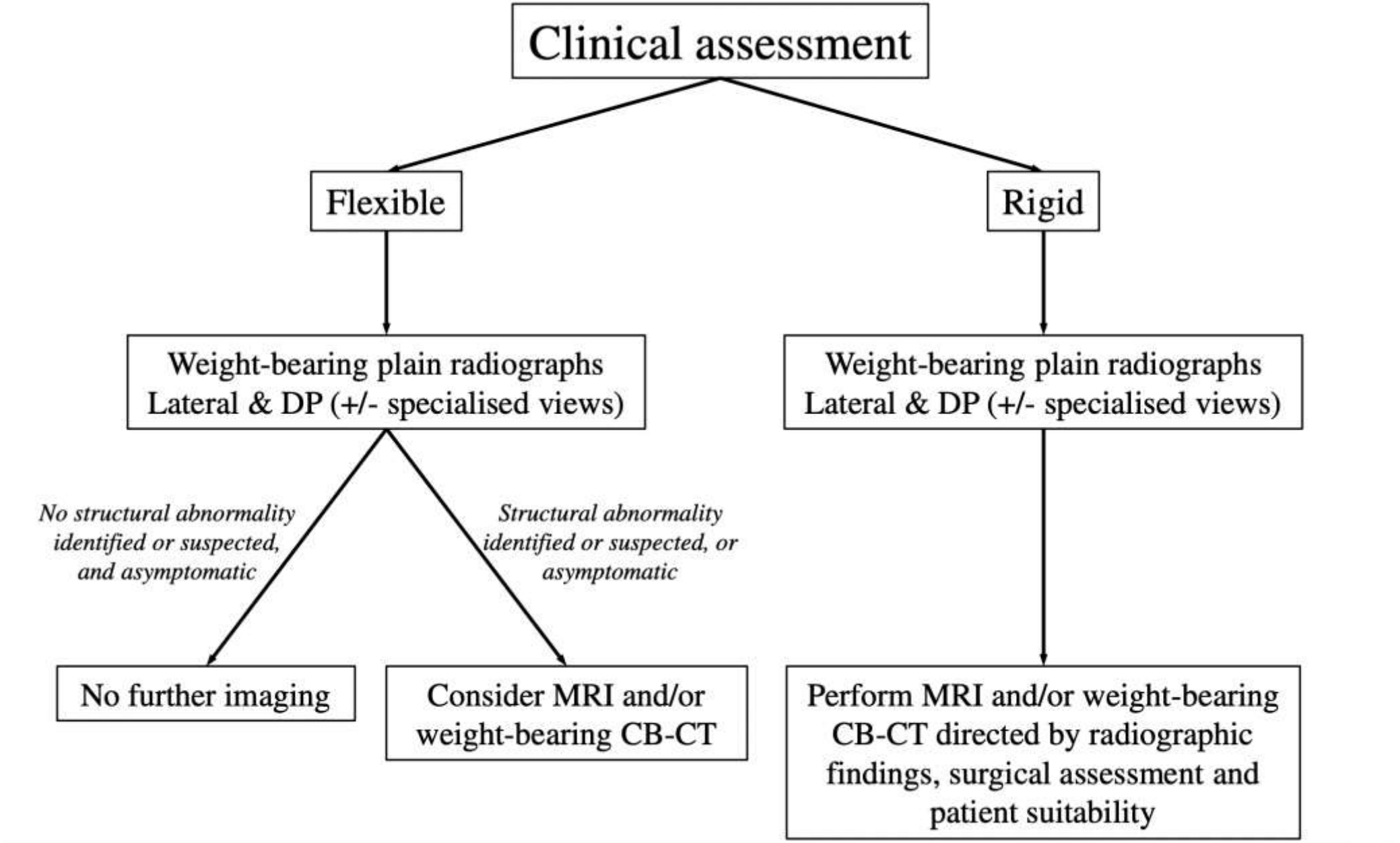


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# RX IN CARICO

# RX IN CARICO


Non avvicinare
il collimatore
a meno di 15cm
dalla pelle del paziente

# PIEDE PIATTO

FOREFOOT ABDUCTION

- AP: **Talonavicular coverage angle**
- AP: 1st metatarsal talar angle

COLLAPSE OF LONGITUDINAL ARCH

- Lateral: **1st metatarsal talar angle**
- Lateral: **Calcaneal pitch**

HINDFOOT VALGUS

- Lateral: Talo-calcaneal angle
- AP: Talo-calcaneal angle

OTHER SIGNS

- AP & Lateral: CYMA line

RadioGraphics 2019; 39:1437–1460c

# PIEDE PIATTO

FOREFOOT ABDUCTION

- AP: **Talonavicular coverage angle**
- AP: 1st metatarsal talar angle

COLLAPSE OF LONGITUDINAL ARCH

- Lateral: **1st metatarsal talar angle**
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HINDFOOT VALGUS

- Lateral: Talo-calcaneal angle
- AP: Talo-calcaneal angle

OTHER SIGNS

- AP & Lateral: CYMA line

RadioGraphics 2019; 39:1437–1460c

# ANGOLO DI COPERTURA TALO-NAVICOLARE



V.N. < 7°

Sublussazione laterale del navicolare

# ANGOLO ASTRAGALO-I MTT


L’asse dell’astragalo dovrebbe passare per la base del I mtt

-28° < V.N. < - 3°

# PIEDE PIATTO

FOREFOOT ABDUCTION

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- AP: 1st metatarsal talar angle

COLLAPSE OF LONGITUDINAL ARCH

- Lateral: **1st metatarsal talar angle**
- Lateral: **Calcaneal pitch**

HINDFOOT VALGUS

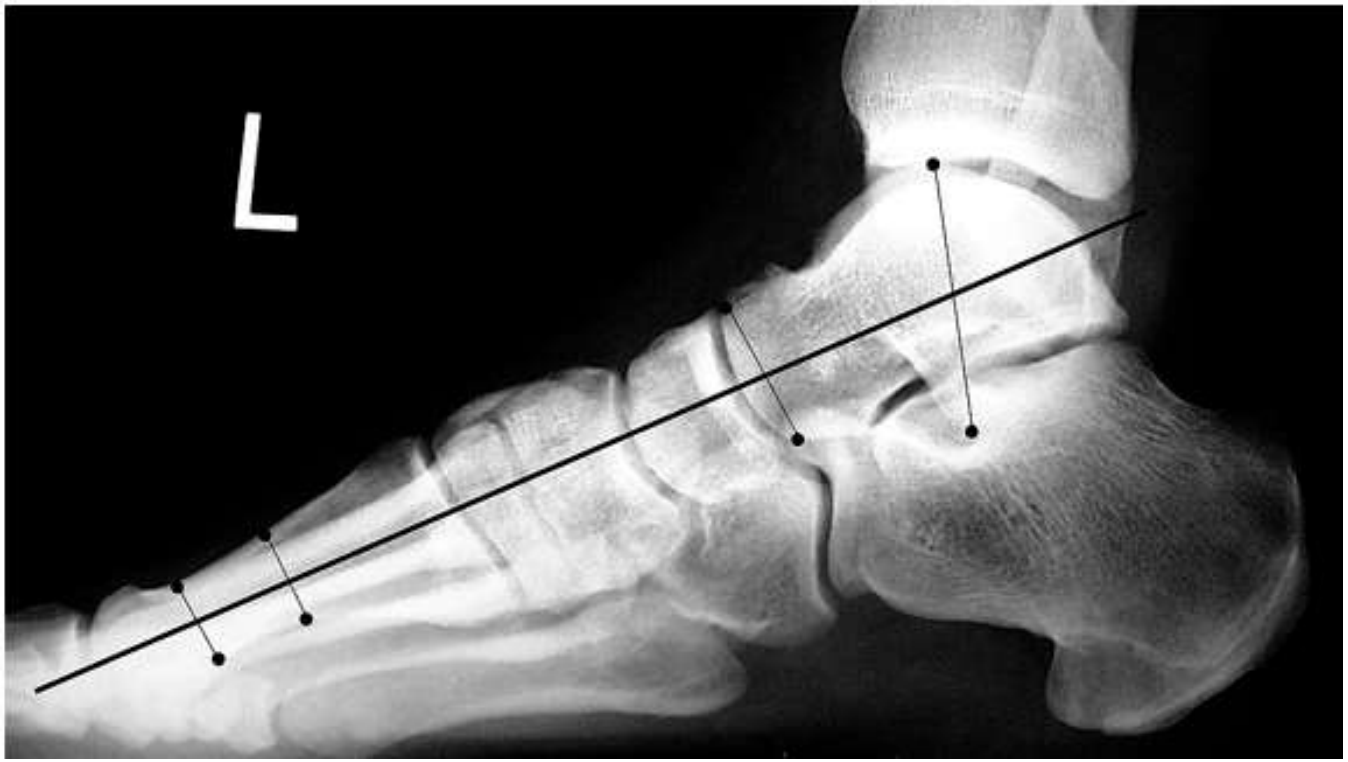
- Lateral: Talo-calcaneal angle
- AP: Talo-calcaneal angle

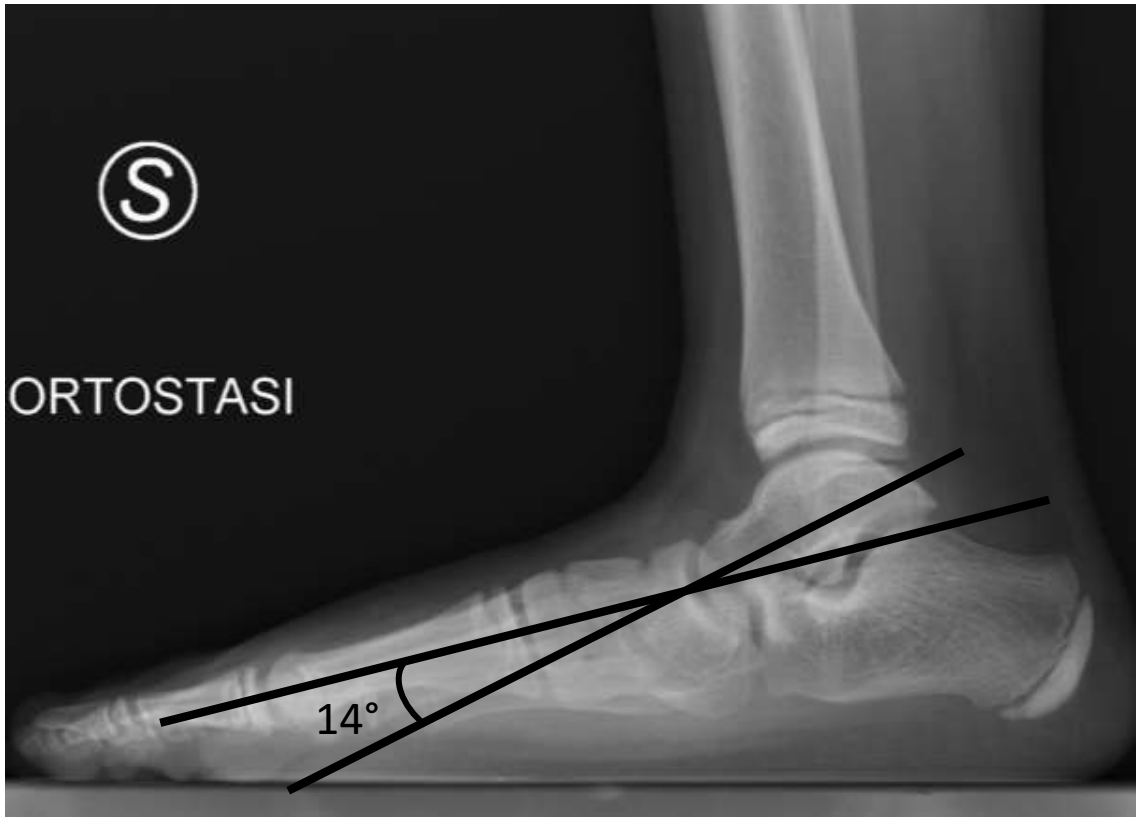
OTHER SIGNS

- AP & Lateral: CYMA line

RadioGraphics 2019; 39:1437–1460c

# ANGOLO DI MEARY

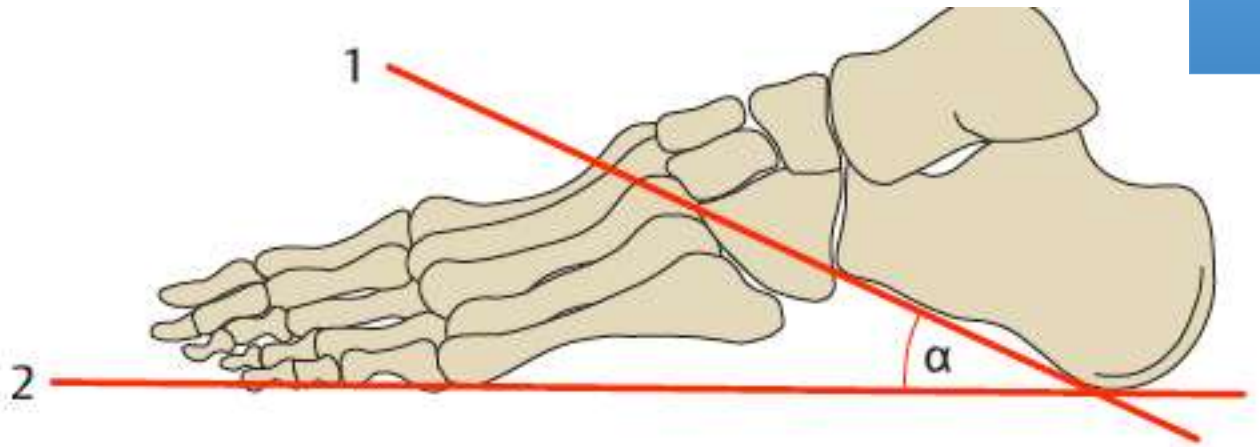


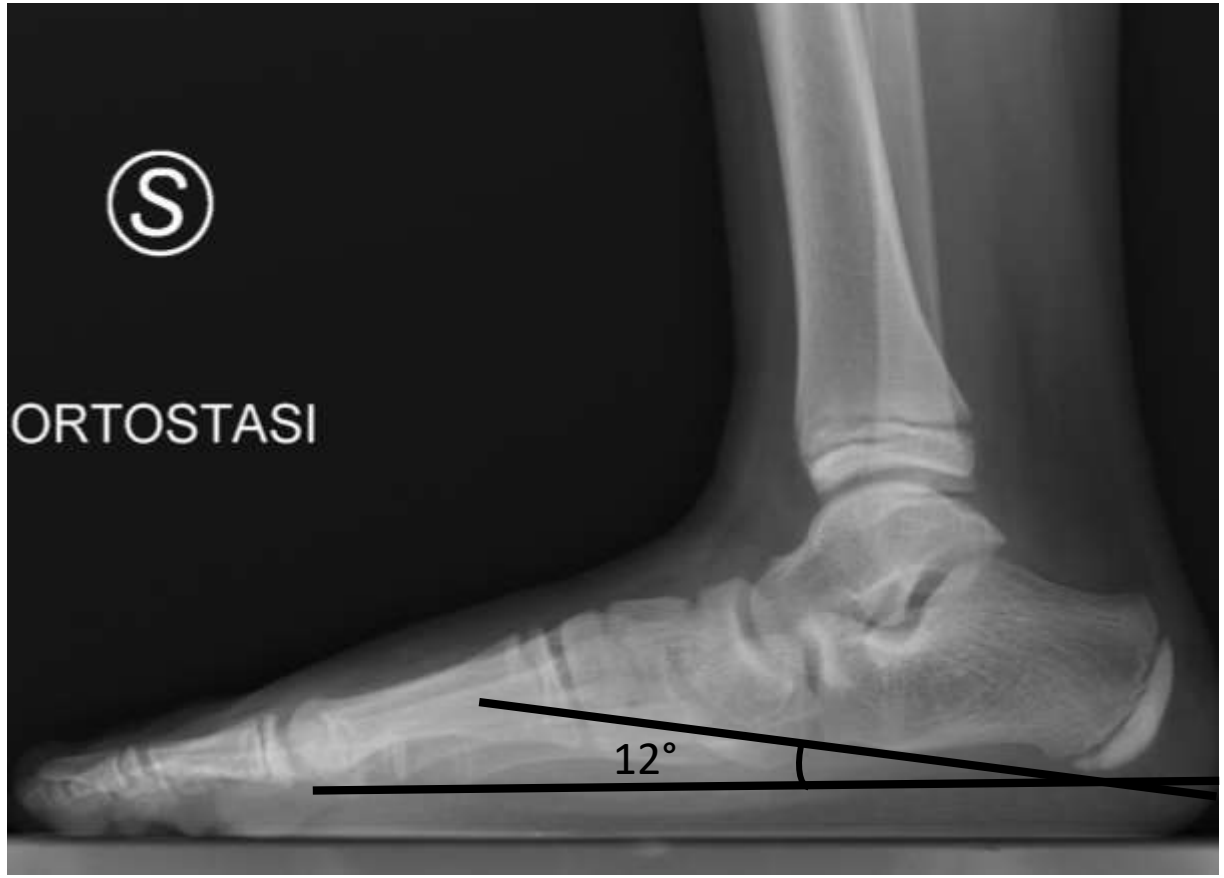

-4° < V.N. < + 4°

# CALCANEAL PITCH

| | |
|---|---|
| V.N. | 18-30° (10-20°) |
| PIATTO | < 18° |
| CAVO | > 30° |








RadioGraphics 2019; 39:1437–1460

Measurements and Classifications in Musculoskeletal Radiology, 2014. Waldt and Woertler

# PIEDE PIATTO

FOREFOOT ABDUCTION

- AP: **Talonavicular coverage angle**
- AP: 1st metatarsal talar angle

COLLAPSE OF LONGITUDINAL ARCH

- Lateral: **1st metatarsal talar angle**
- Lateral: **Calcaneal pitch**

HINDFOOT VALGUS

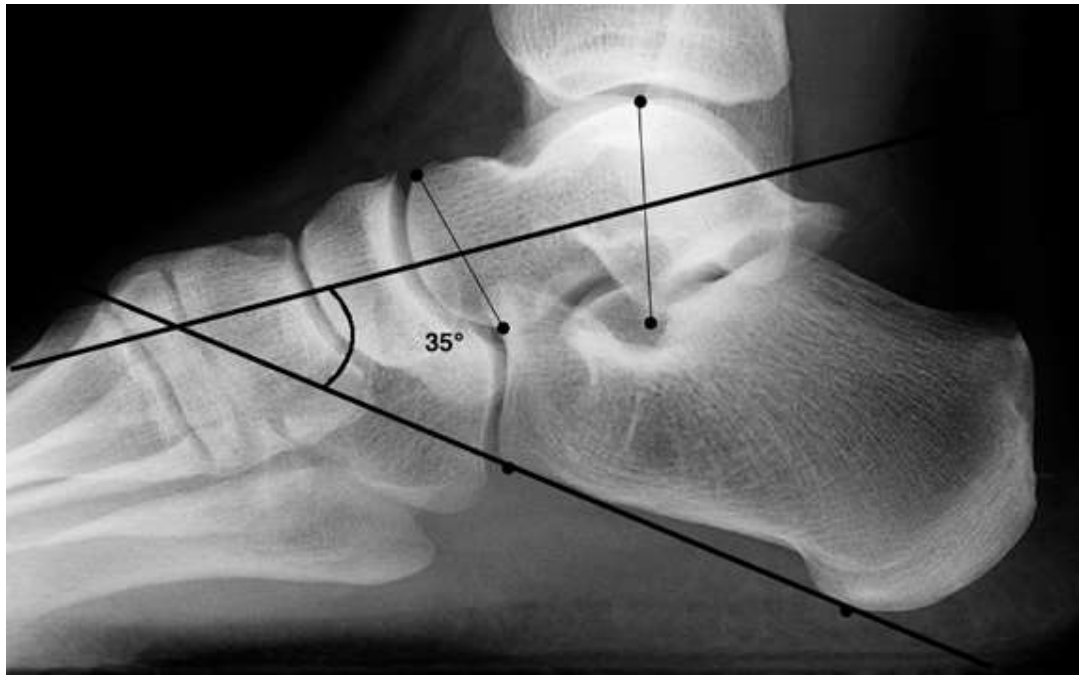
- Lateral: Talo-calcaneal angle
- AP: Talo-calcaneal angle

OTHER SIGNS

- AP & Lateral: CYMA line

RadioGraphics 2019; 39:1437–1460c

# ANGOLO TALO-CALCANEARE





| | |
|---|---|
| V.N. | 30°-50° (25°-45°) |
| RETROPIEDE VALGO | > 55° (45°) |
| RETROPIEDE VARO | < 30° (25°) |

# ANGOLO DI KITE



V.N. 15°-30° (25°-40°)
VALGO > 30° (40°)
VARO < 15° (25°)

# PIEDE PIATTO

FOREFOOT ABDUCTION

- AP: **Talonavicular coverage angle**
- AP: 1st metatarsal talar angle

COLLAPSE OF LONGITUDINAL ARCH

- Lateral: **1st metatarsal talar angle**
- Lateral: **Calcaneal pitch**

HINDFOOT VALGUS

- Lateral: Talo-calcaneal angle
- AP: Talo-calcaneal angle

OTHER SIGNS

- AP & Lateral: CYMA line

RadioGraphics 2019; 39:1437–1460c

# CYMA LINE


# PIEDE PIATTO

FOREFOOT ABDUCTION

- AP: **Talonavicular coverage angle**
- AP: 1st metatarsal talar angle

COLLAPSE OF LONGITUDINAL ARCH

- Lateral: **1st metatarsal talar angle**
- Lateral: **Calcaneal pitch**

HINDFOOT VALGUS

- Lateral: Talo-calcaneal angle
- AP: Talo-calcaneal angle

OTHER SIGNS

- AP & Lateral: CYMA line

| Projection | Parameter | Normal value |
|---|---|---|
| Lateral | Lateral talus-1st metatarsal angle (Meary's) | Mean 13° (1 SD ± 7.5°; range 1°–35°) [16] |
| | Calcaneal pitch | Mean 17° (1 SD ± 6°; range 5°–32°) [16] |
| | Lateral talocalcaneal angle | Mean 33° (range 25°–45°) [17]<br>Mean 49° (1 SD ± 6.9°; range 36°–61°) [16] |
| | Navicular index | Median 5.48 [18] |
| Dorsoplantar (DP) | Talonavicular coverage angle | Mean 20° (1 SD ± 9.8°; range 5°–39°) [16] |
| | DP talar-1st metatarsal angle | Mean 10° (1 SD ± 7.0°; range − 3°–28°) [16] |
| | DP talocalcaneal angle (Kite's angle) | Range 25°–45° [12] |

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# PIEDE PIATTO - CHECKLIST

| | |
|---|---|
| Technical factors | Weight-bearing vs non-weight-bearing |
| | Two projections (lateral and DP) +/− specialised views |
| | Rotation |
| Important observations | Accessory ossicle (especially os naviculare) |
| | Direct or indirect signs of tarsal coalition |
| | Vertical or oblique talus* |
| | Acute or old fracture |
| | Rare causes: osteochondral lesion, erosive arthropathy, focal bone or soft tissue lesion |
| Quantitative parameters** | Lateral talus-1st metatarsal angle (Meary's) |
| | Calcaneal pitch |
| | Lateral talocalcaneal angle |
| | Navicular index |
| | Talonavicular coverage angle |
| | DP talar-1st metatarsal angle |
| | DP talocalcaneal angle (Kite's angle) |

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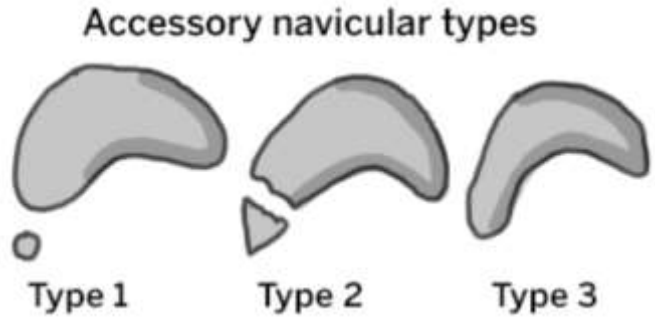
# OSSA ACCESSORIE

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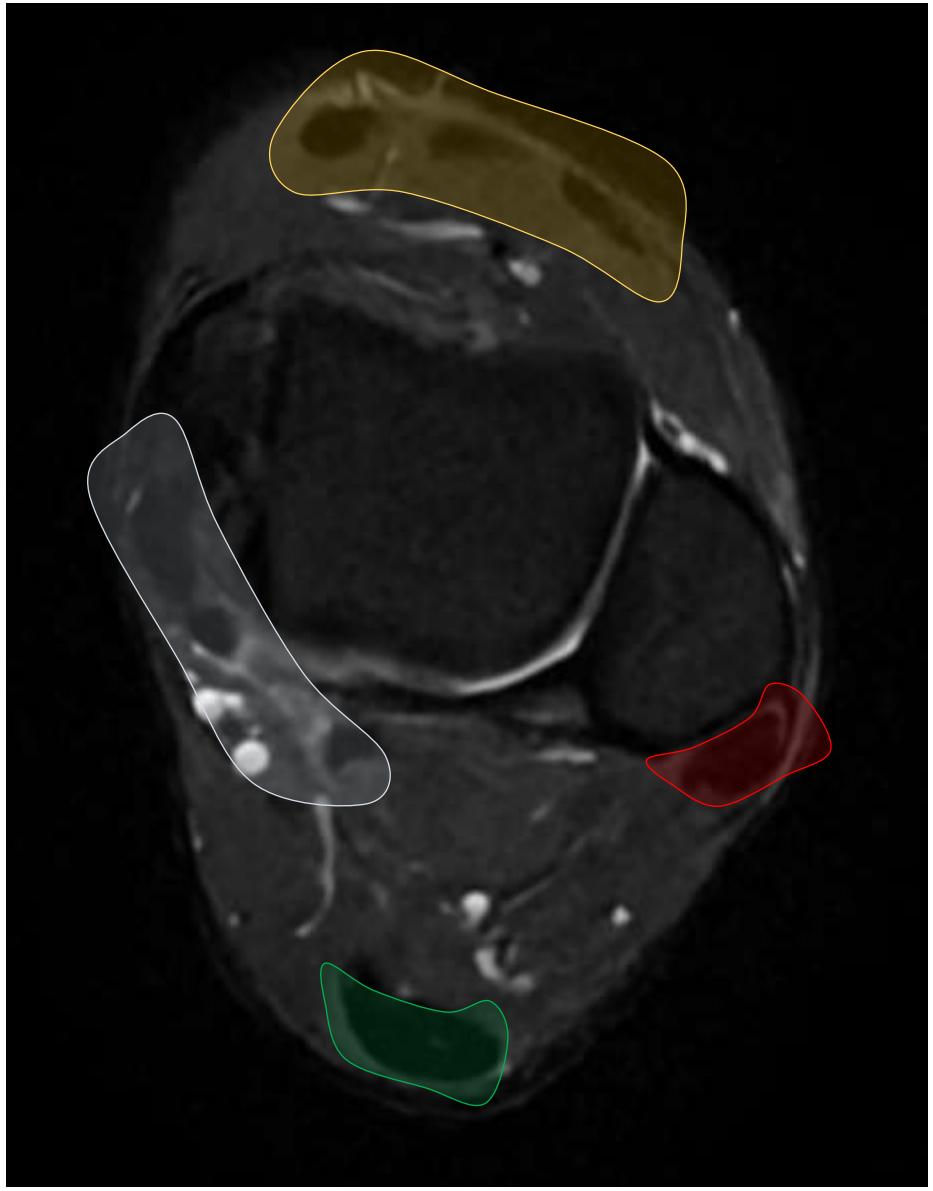
# PATOLOGIA TENDINEA

- **Tendini di scorrimento**
  - Comparto mediale
  - Comparto laterale
  - Comparto anteriore
- **Tendini di ancoraggio**
  - Comparto posteriore (Achille)

- Tenosinovite
- Tendinosi
- Rotture



# COMPARTO MEDIALE

Tendine del tibiale posteriore

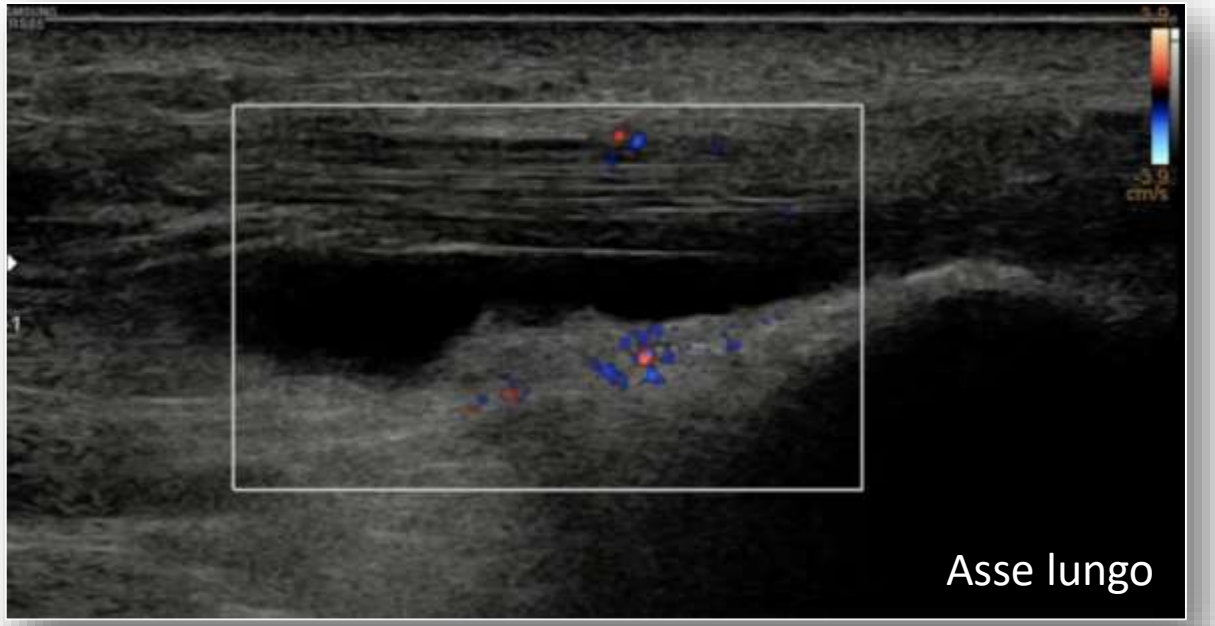
## Tenosinovite

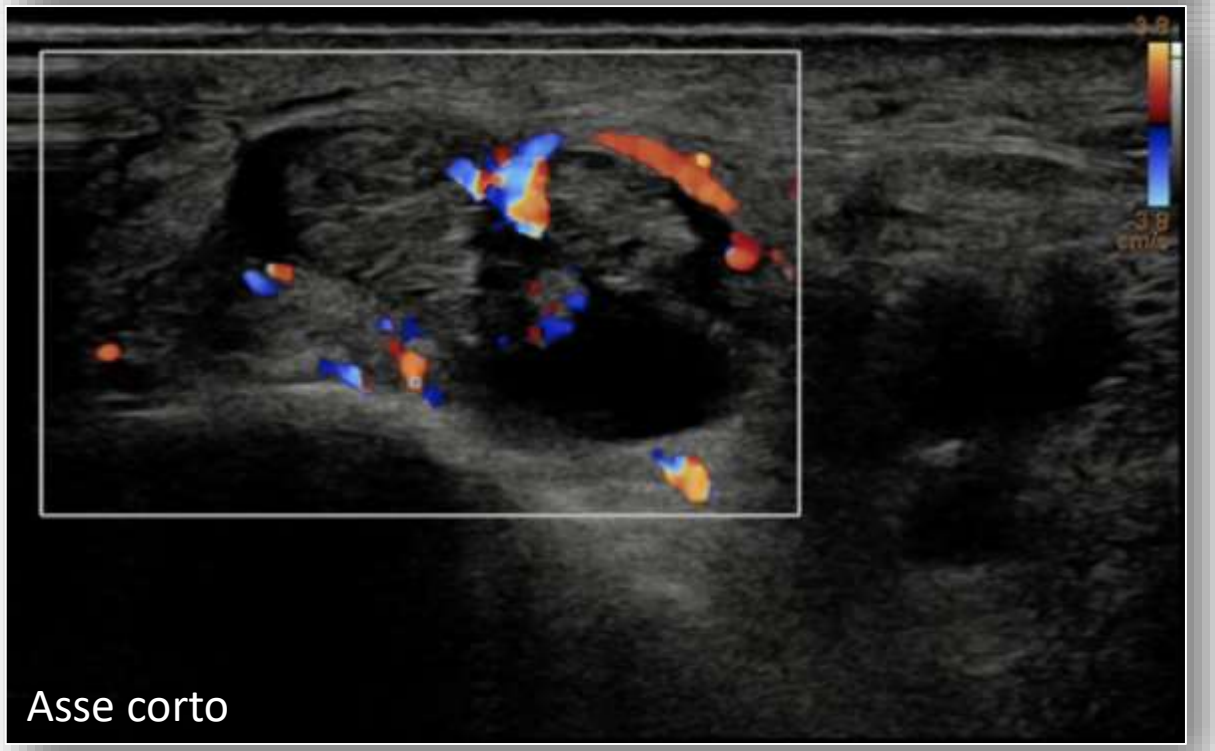
- Solitamente a livello malleolare
  - +++ Meccanica o traumatica
  - --- Flogistica (reuma) o infettiva

- Distensione guaina tendinea
  - Fluido semplice (ipoecogeno)
  - Fluido complesso (ipertrofia sinoviale)

- *Fino a 2-3 mm reperto normale → pressione con sonda!*

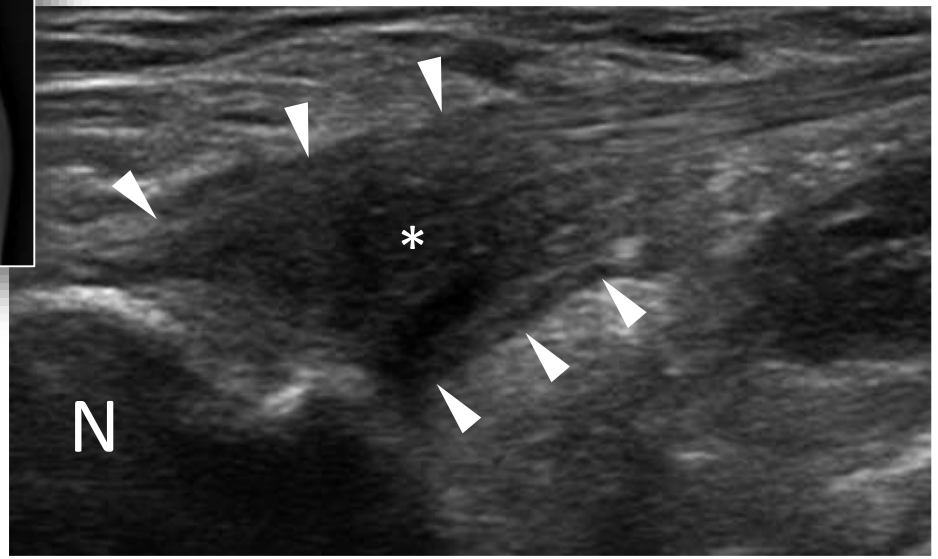
- *Guaina sinoviale assente 1-2 cm dall'inserzione sul navicolare (peritenonio)*

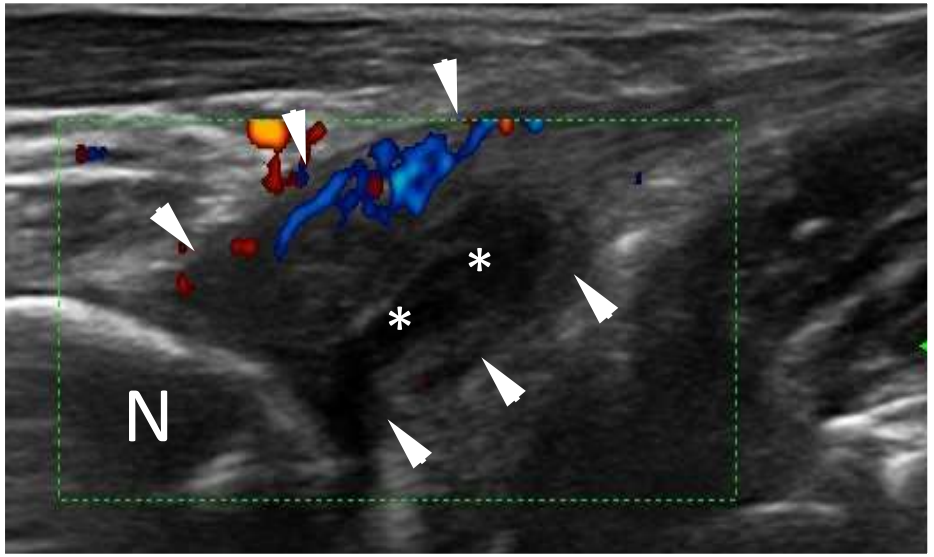


# COMPARTO MEDIALE

Tendine del tibiale posteriore



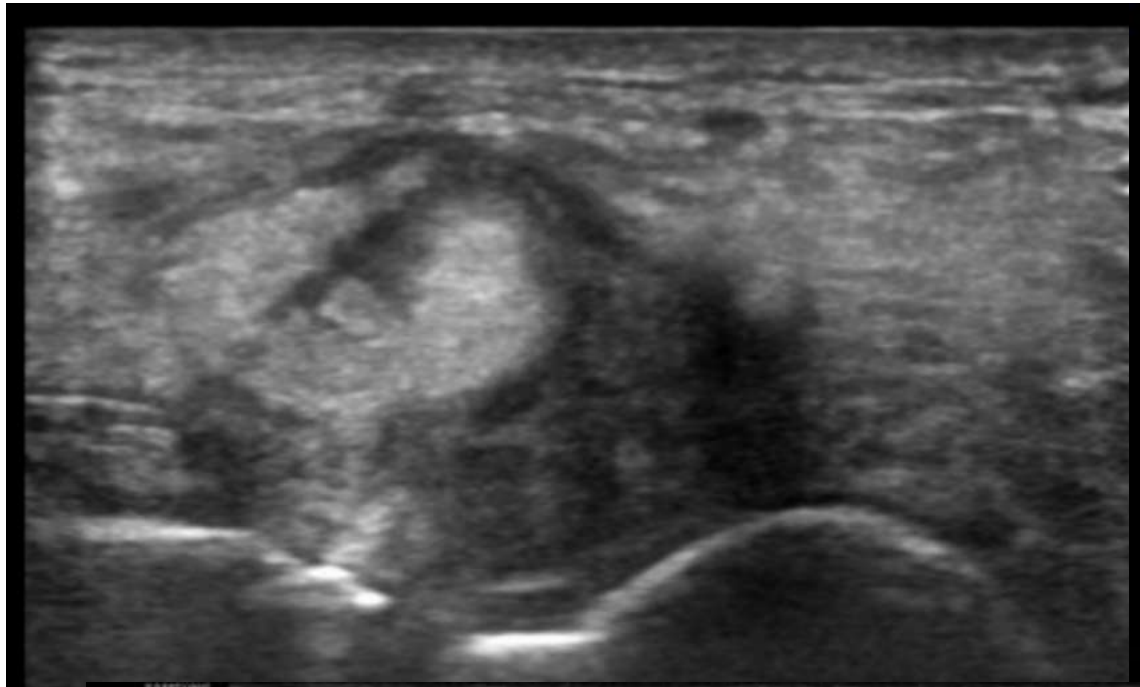



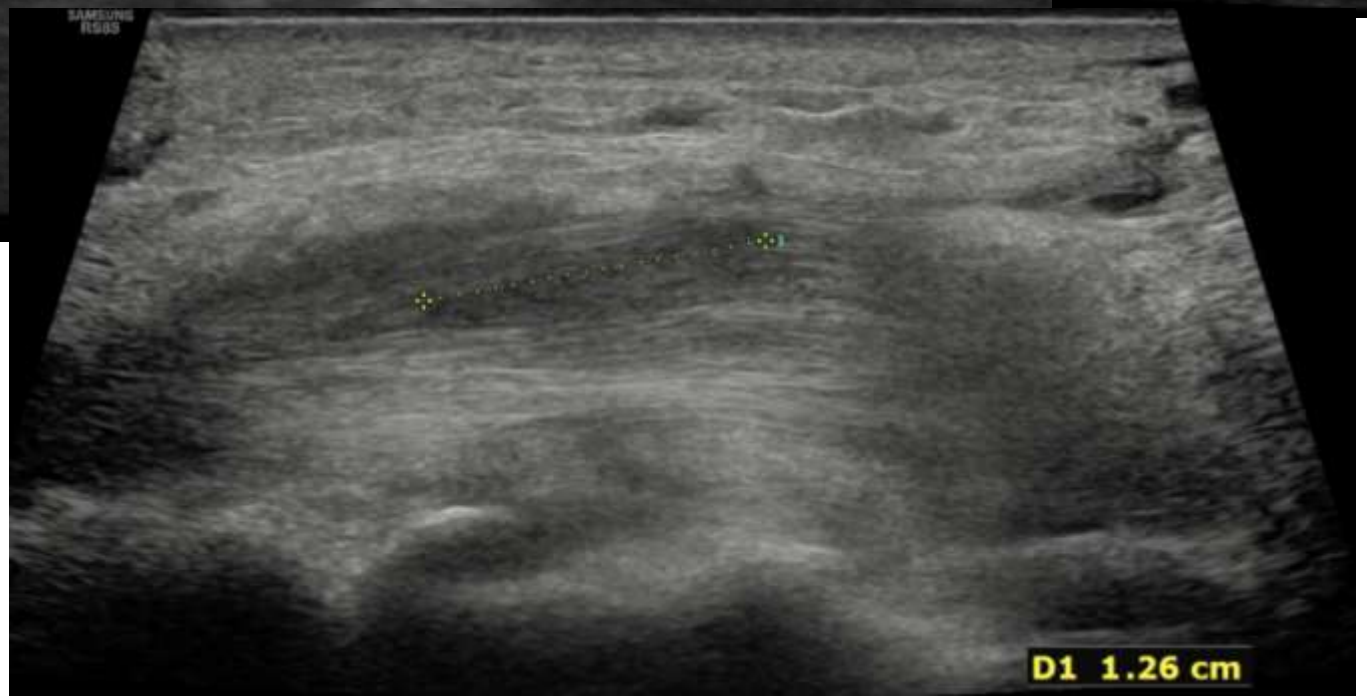

## Tendinopatia

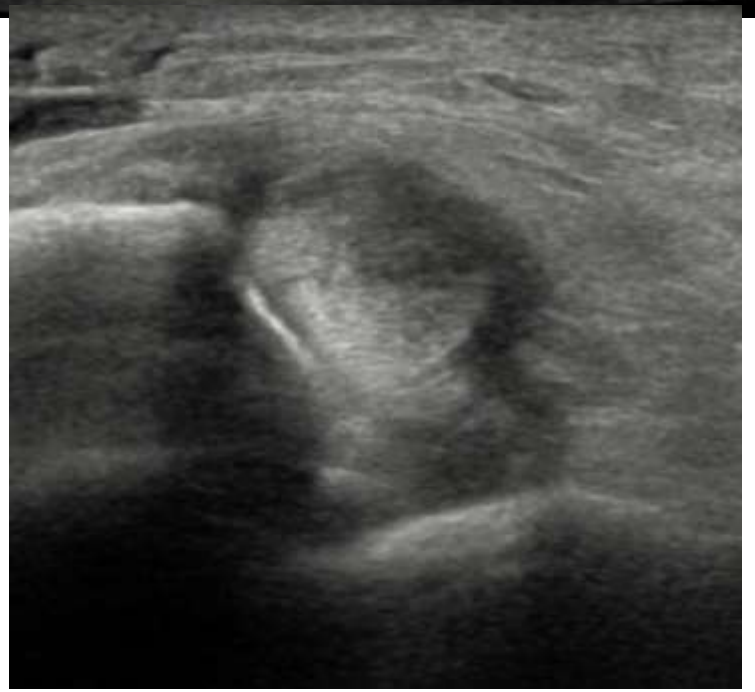
- Frizione cronica (malleolo)
- Sovraccarico cronico  (piattismo piede, obesità)

- **Ipoecogenicità**
- **Possibile ispessimento**
  - **Calibro normale 7-11 mm**
- **Assenza di lesione**
- **Ipervascolarizzazione tendinea**

- *AREA CRITICA AVASCOLARE: posteriormente al malleolo mediale (1-2 cm)*

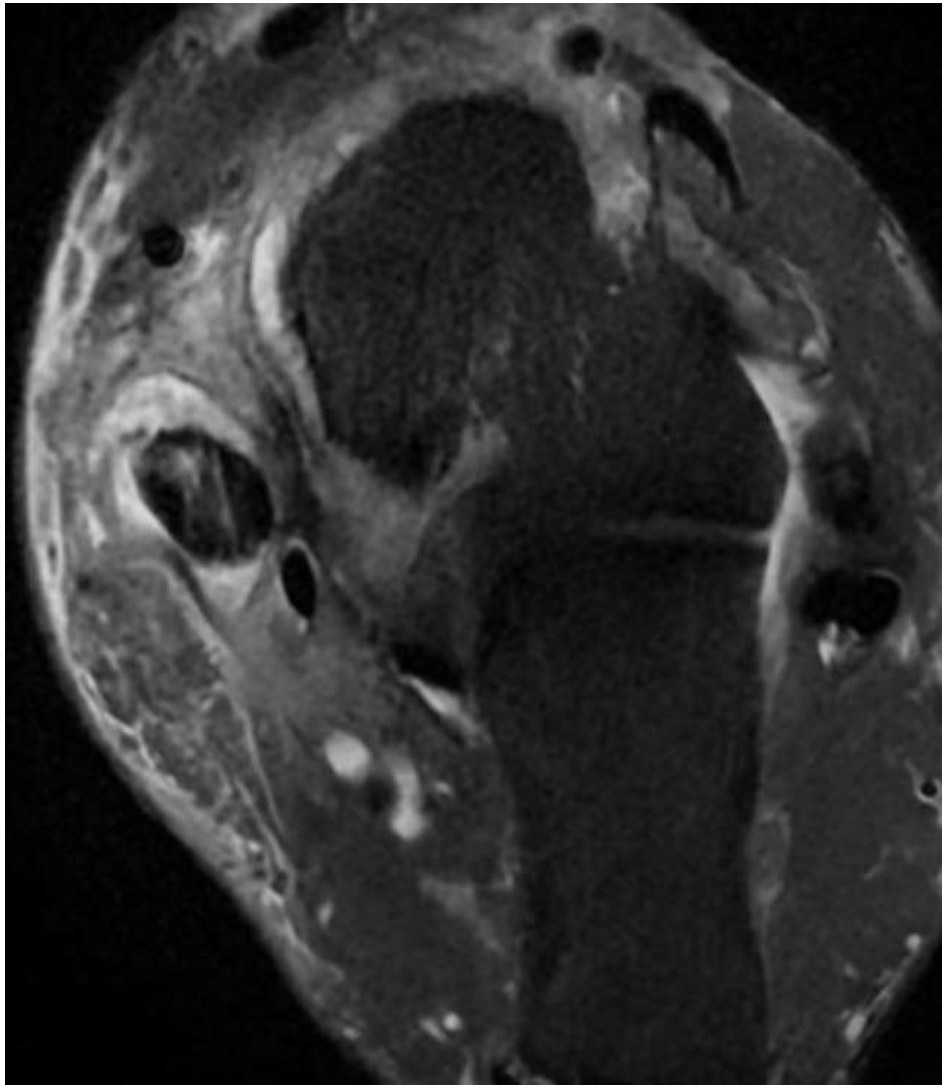


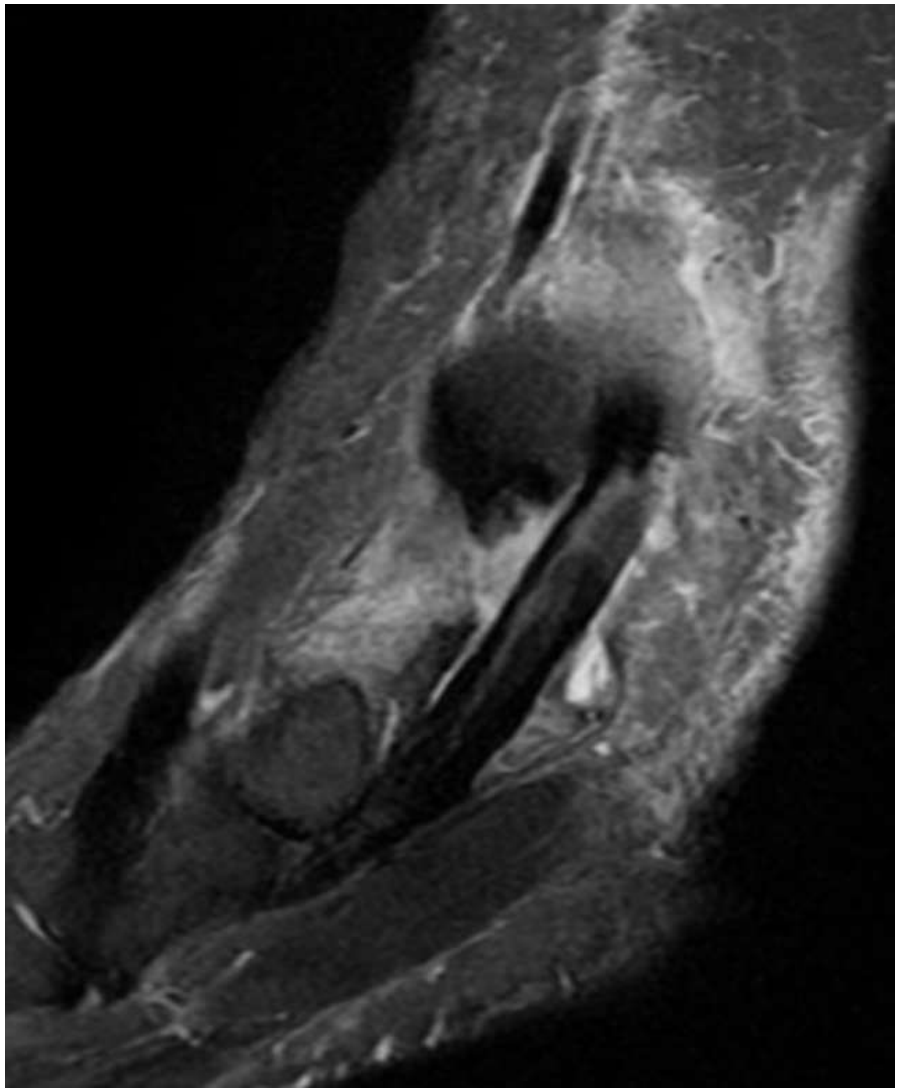

D1 1.26 cm



# RISONANZA MAGNETICA

Tendine del tibiale posteriore





# COALIZIONI

- 1°causa di piede piatto rigido, 50% bilaterali
- 90% calcaneo-navicolari (sintomatiche a 8-12y) e talo-calcaneari (12-16y)
- Fibrocartilaginee e ossee

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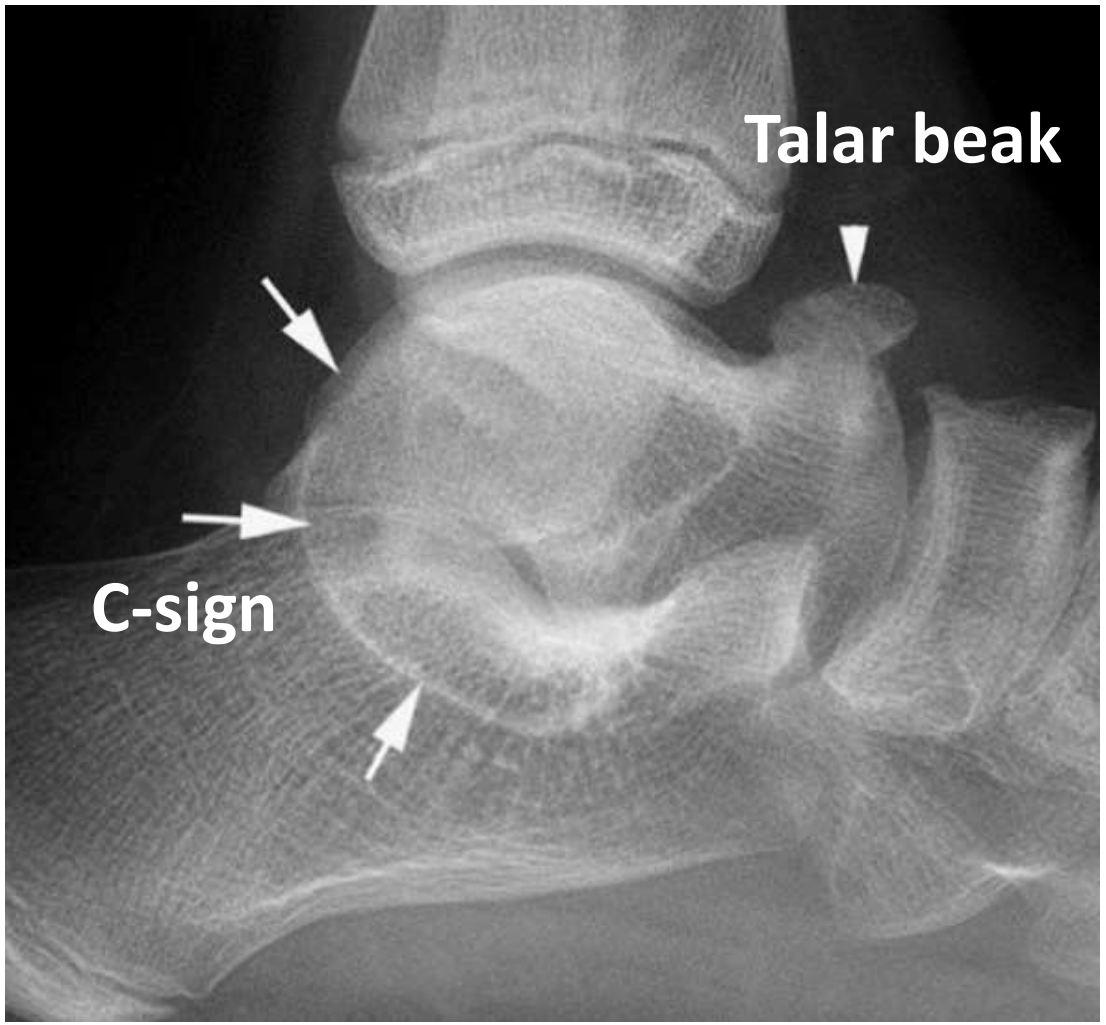
# COALIZIONI

*Calcaneo-navicolare*


*Talo-calcaneare*

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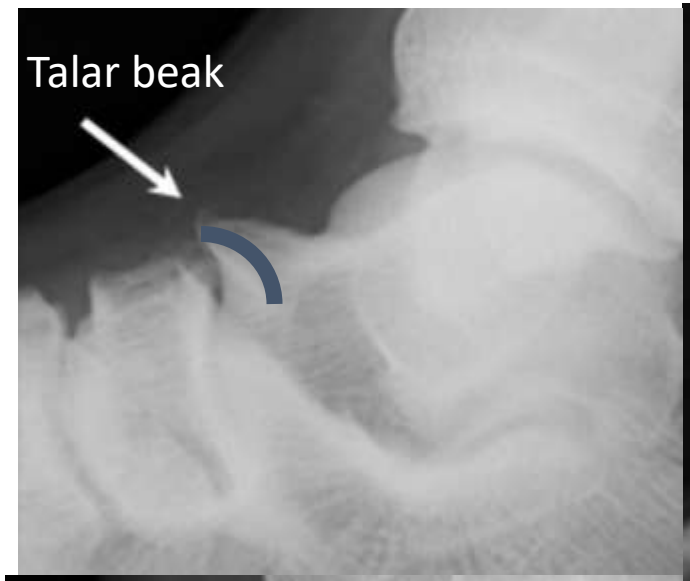
# COALIZIONI

*Talar beak*





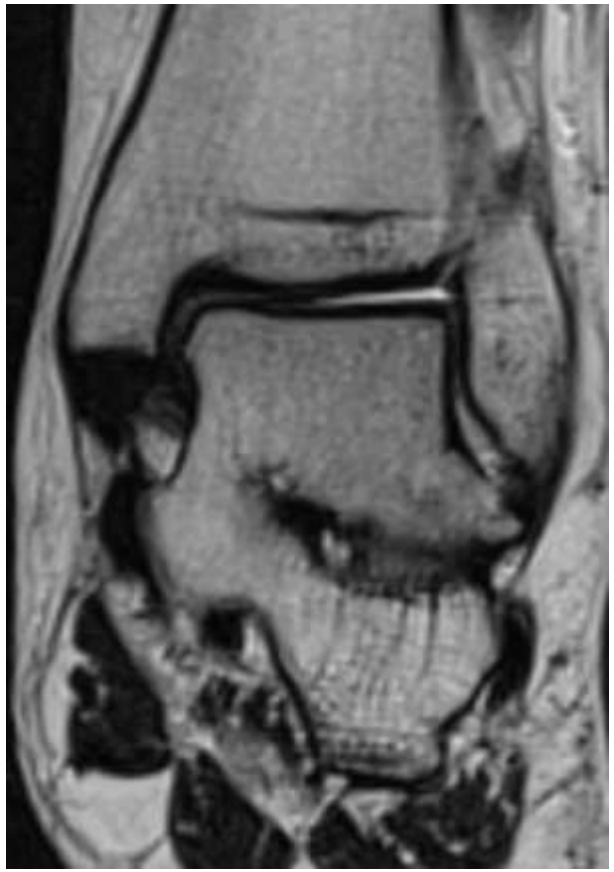
# COALIZIONI

*Coalizione fibrosa (sindesmosi) astragalo-calcaneare*

# COALIZIONI

*Coalizione ossea (sinostosi) astragalo-calcaneare*






# TAKE HOME MESSAGE


- Misurazioni radiografiche
- Ecografia per studio tessuti molli
- Imaging di II livello (TC/RM) per studio osseo soprattutto del piede piatto rigido e pianificazione chirurgica

# GRAZIE PER L'ATTENZIONE

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domenico.albano@unimi.it