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Correction of Deformity

By

Dr Todd Gothelf

Foot, Ankle, Shoulder Surgery

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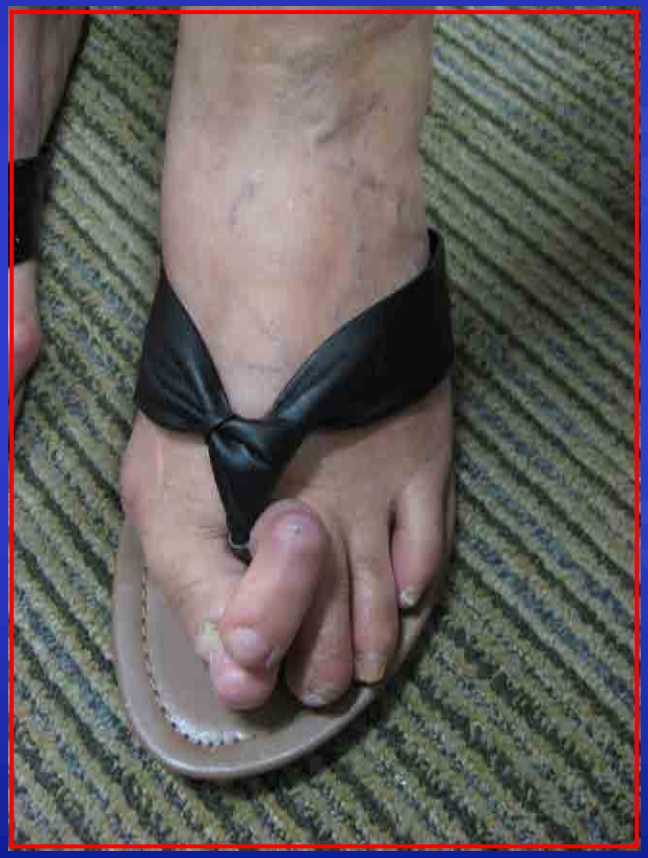
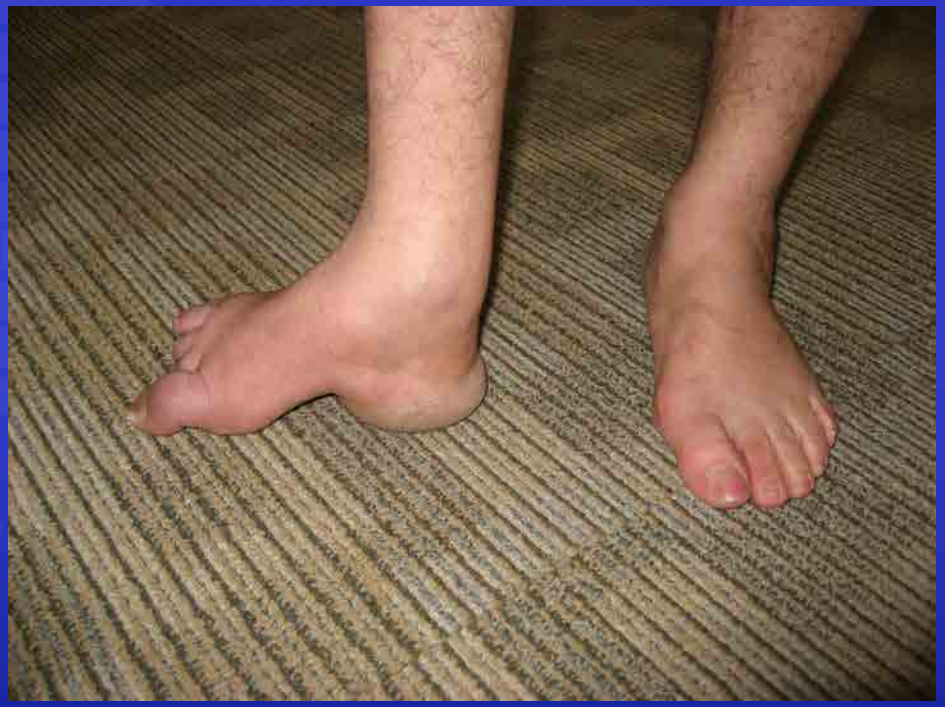
Many Different Deformities





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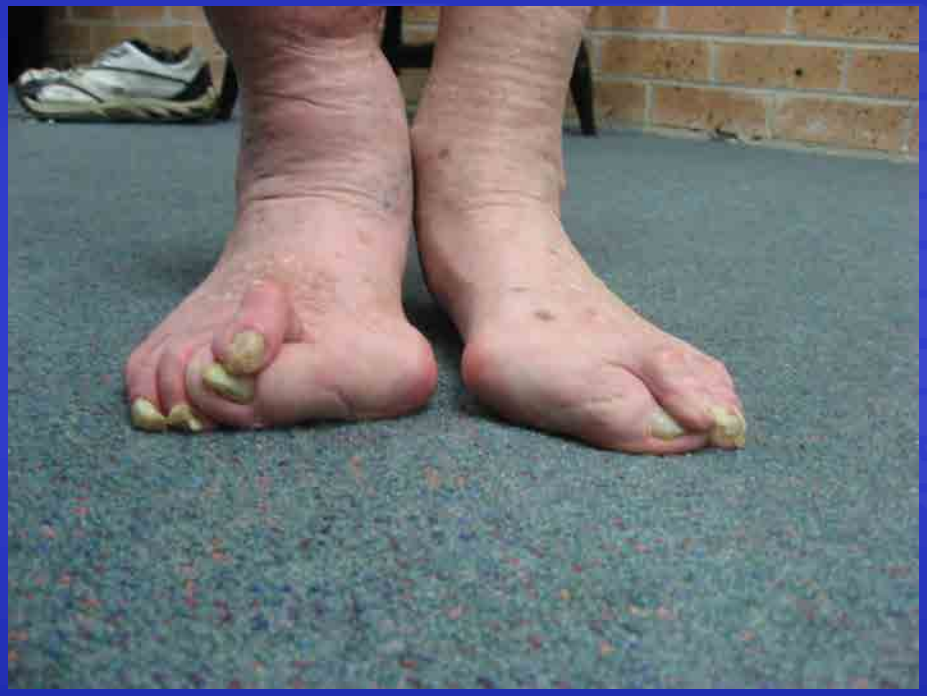
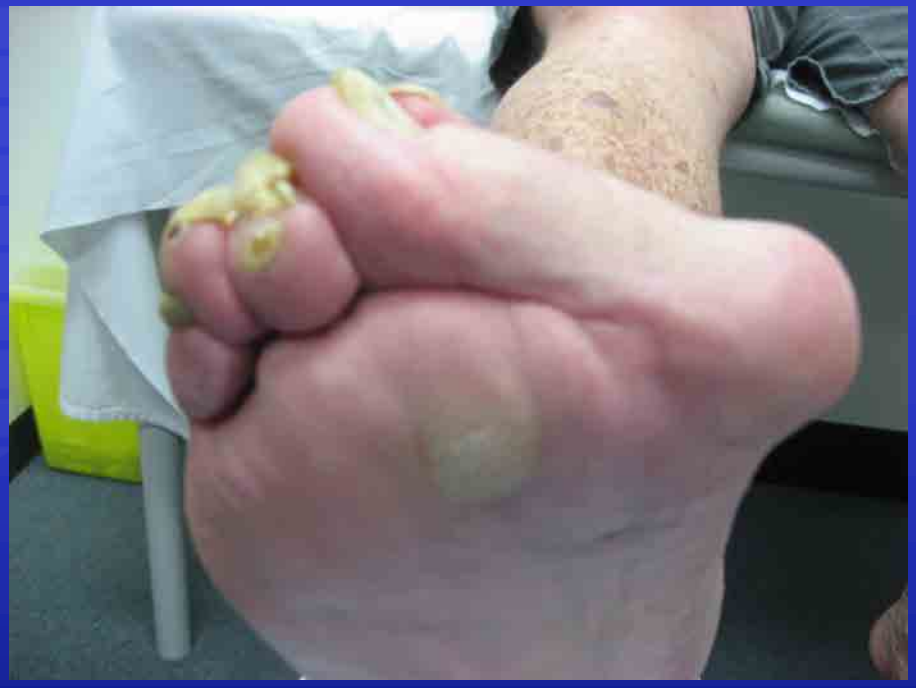
Some are extreme





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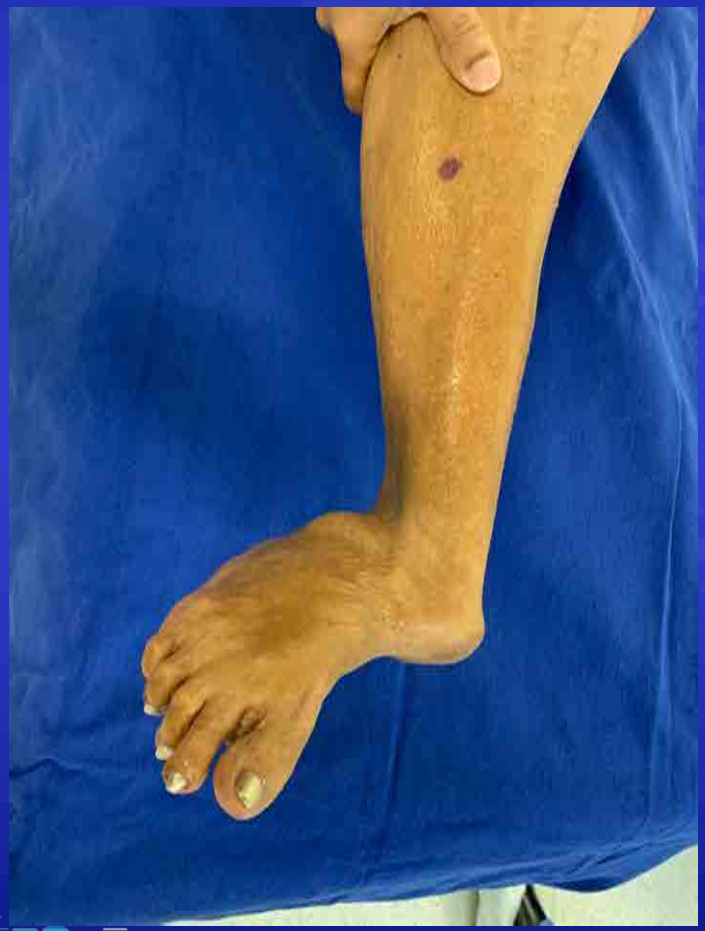
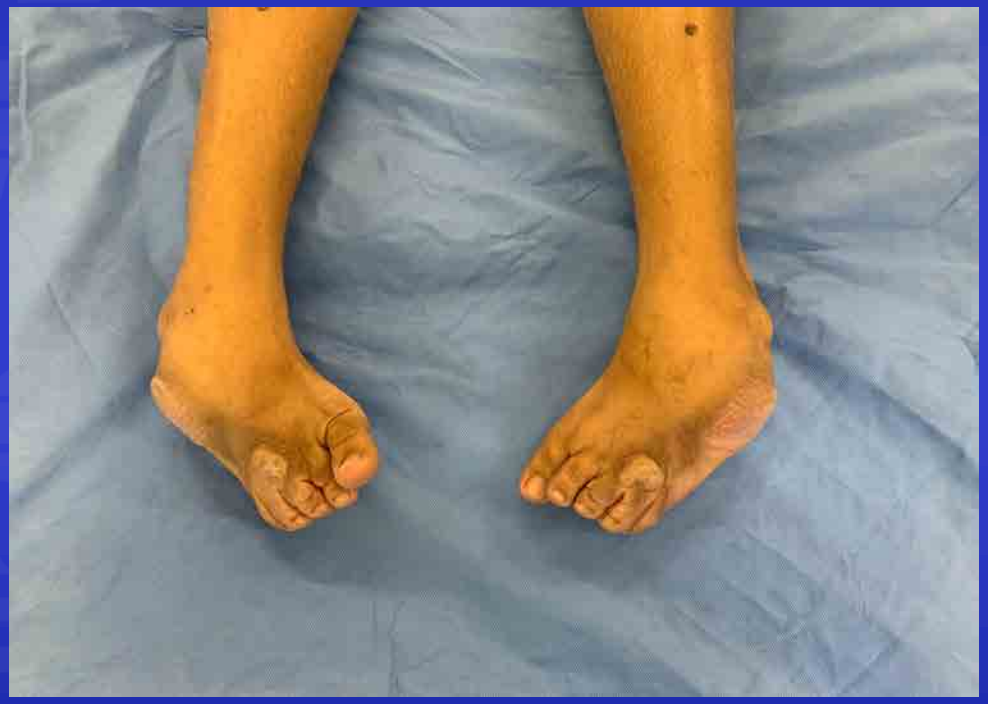
Some are extreme





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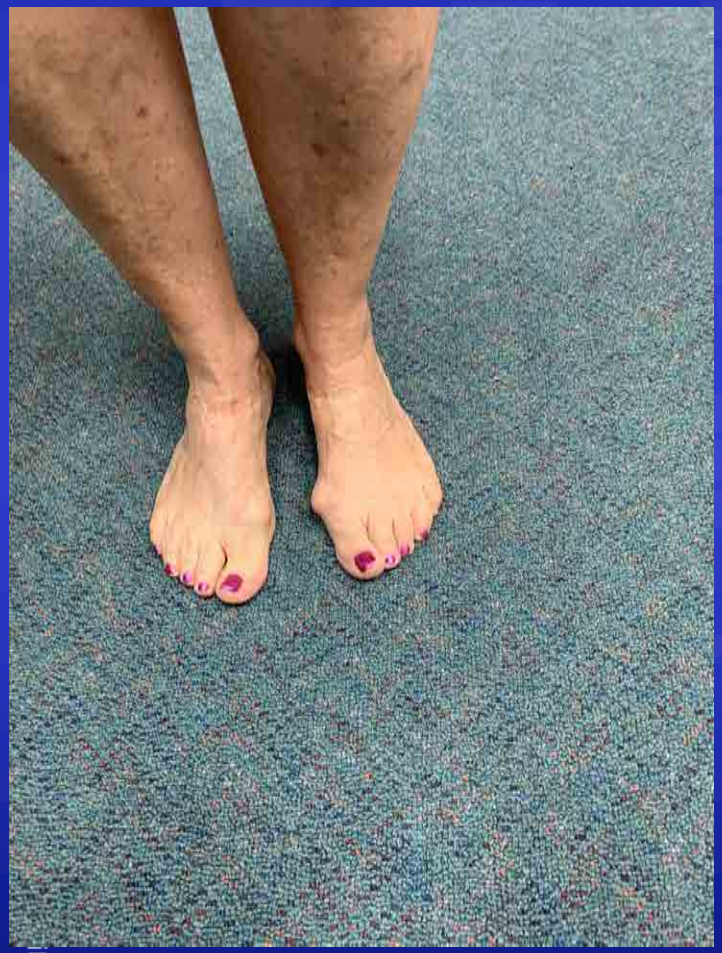
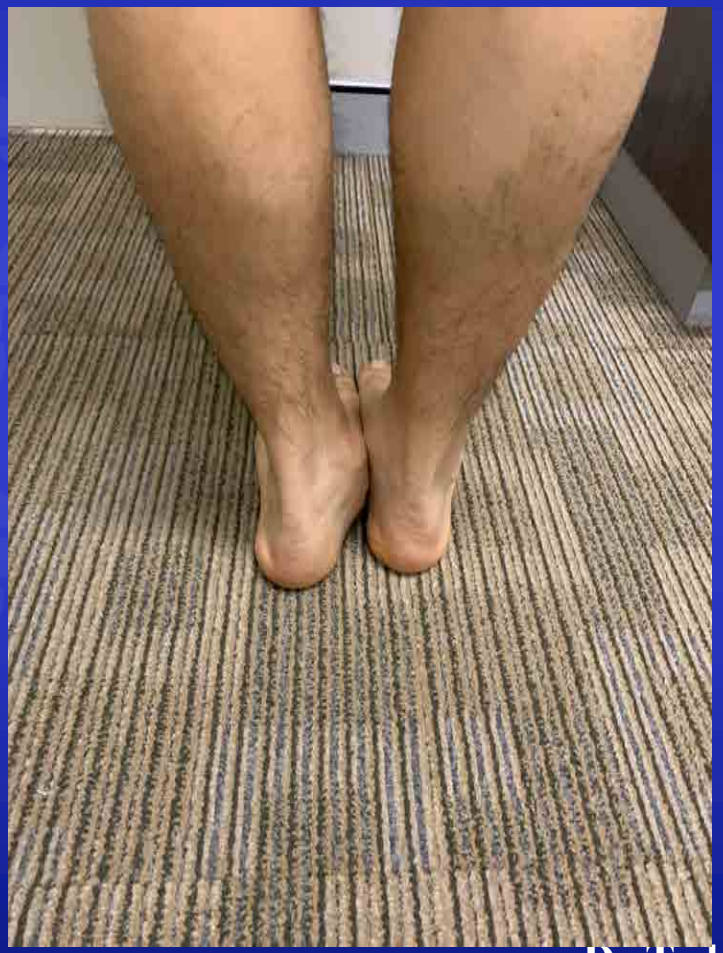
Some are more subtle





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How do we approach deformities?

- Go back to basics
- History
- Physical Examination
- Investigations
- Treatment

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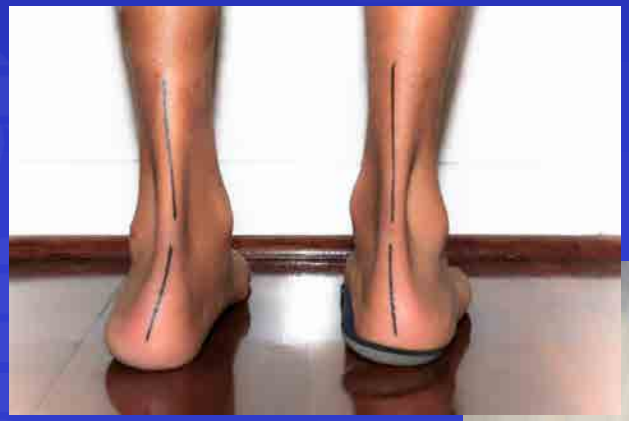
Conservative Treatment

- Not all deformities need to be corrected
- Conservative treatment may do well
- Patients are used to their own feet
- Surgery may be considered when conservative treatments fail to help

Conservative treatment

- Orthotics
- Custom Shoes
- Re-distribute weight and forces around foot
- Can correct a deformity (functional)
- Can support deformity (accommodative)



Articulated AFO

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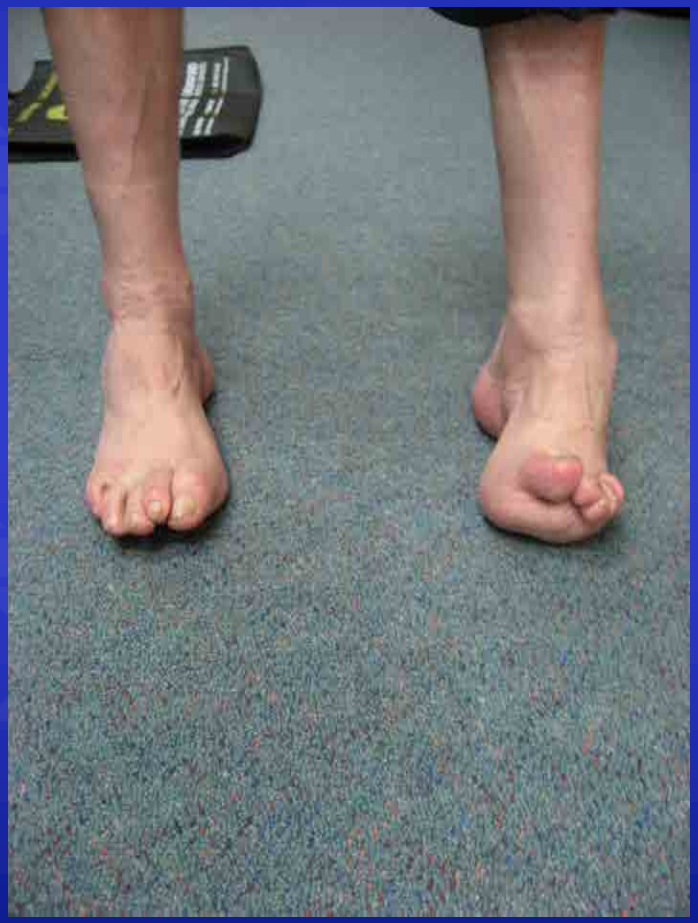
How best to Approach

- Go through a case
- Demonstrate concepts of correction
- Goal to correct deformity and try to preserve joints and motion when possible.



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History

- 36 year old female
- Bilateral cavovarus feet her whole life
- Left ankle has been painful and getting worse

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History taking

- Played netball for 23 years
- Lots of ankle sprains in the past
- Karate instructor
- Training for her black belt

Principle #1: Establish Problem

- Understand baseline activity level, goals
- In this case, She has lived with deformity her whole life
- Only noticed problem recently
- Goal: continue with her activity level

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Principle #2: Where is the deformity?

- Ankle
- Hindfoot
- Midfoot
- Forefoot
- Joints or bone?
- Investigations
  - Weight bearing X-rays
  - CT scan
  - MRI

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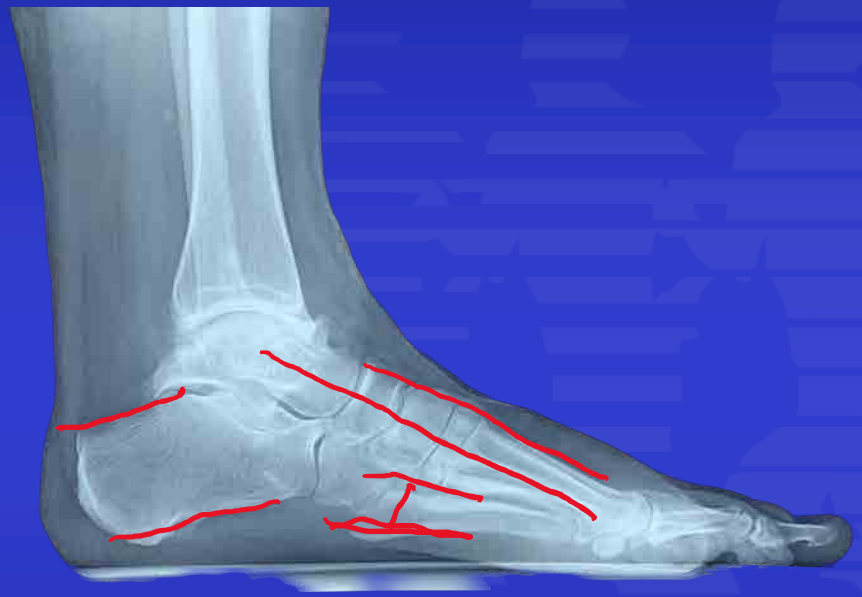
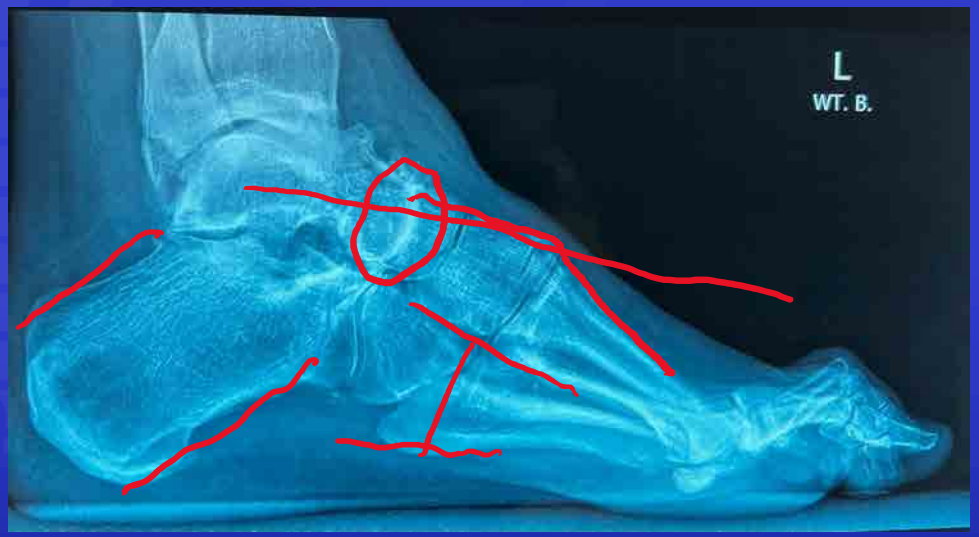
Physical Examination

- Observe ambulation
- Left ankle seems more unstable than right
- Hindfoot is stiff
- Ankle movement but stiff in dorsiflexion
- Ankle lateral instability worse on left than right

Weight Bearing X-rays
Foot





- Talonavicular arthritis
- Deformity at the first TMT joint
- Increased arch height
- Meary's Line
- Increased calcaneal pitch

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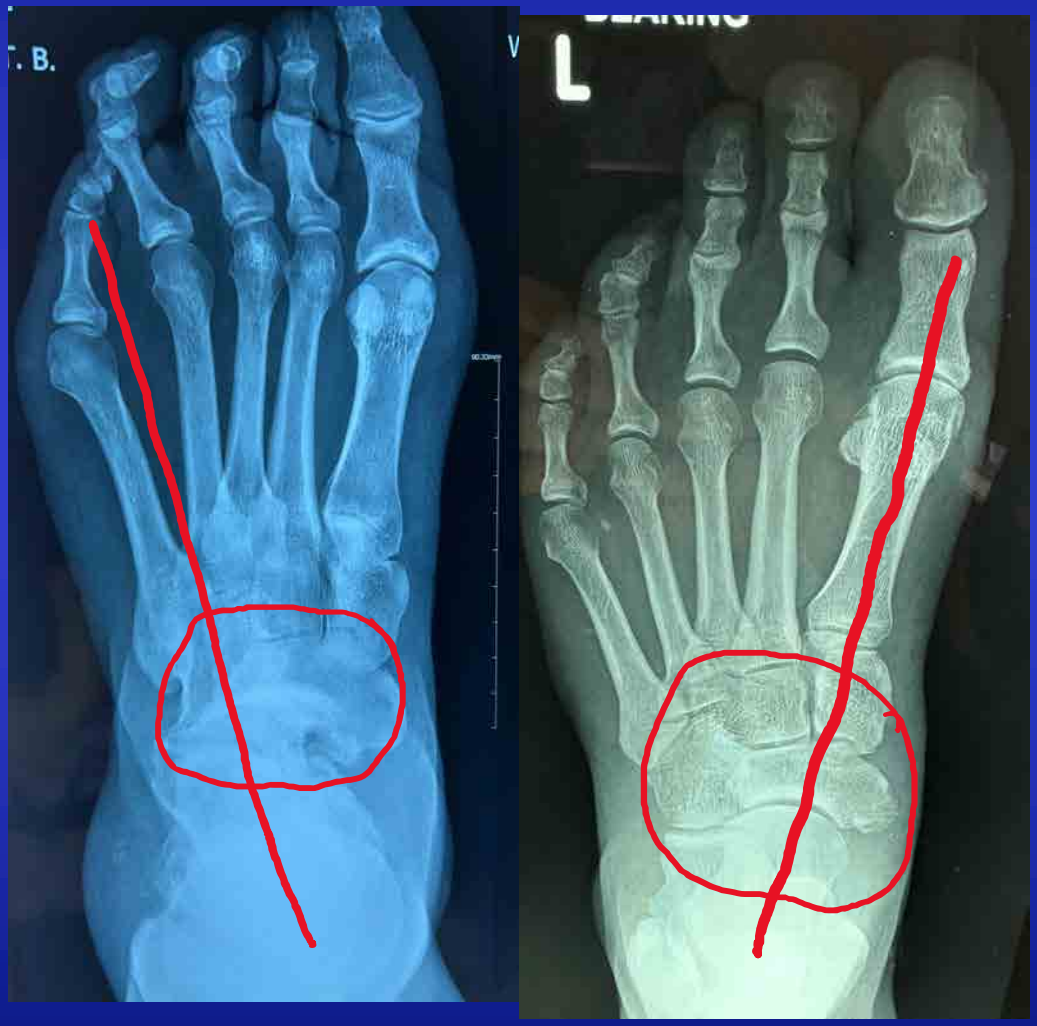
Weight Bearing X-Rays Foot



- Meary's Line through talus
- AP deformity at TN joint

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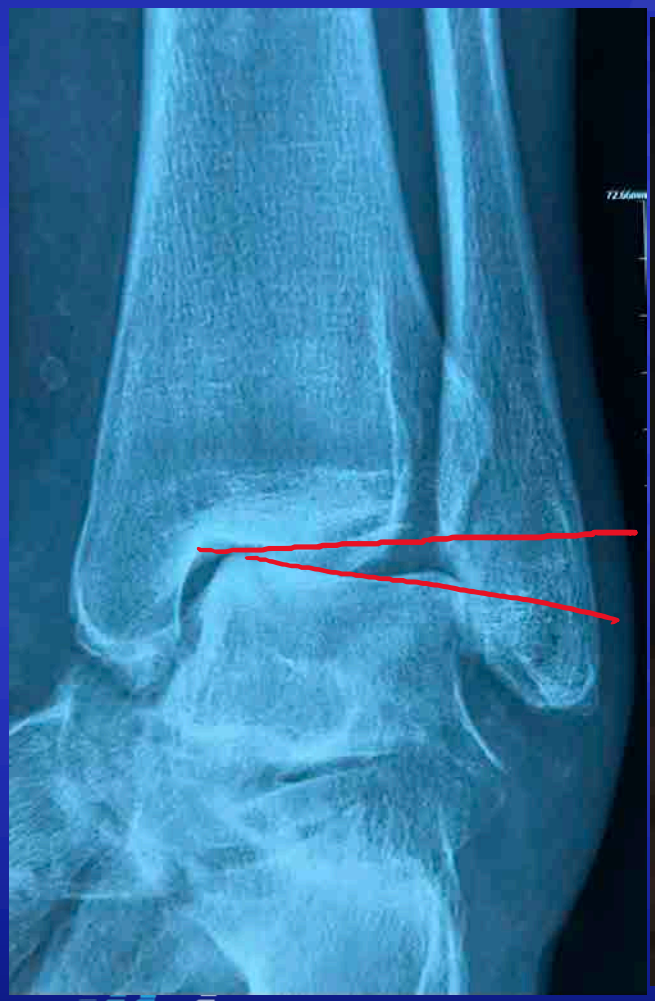
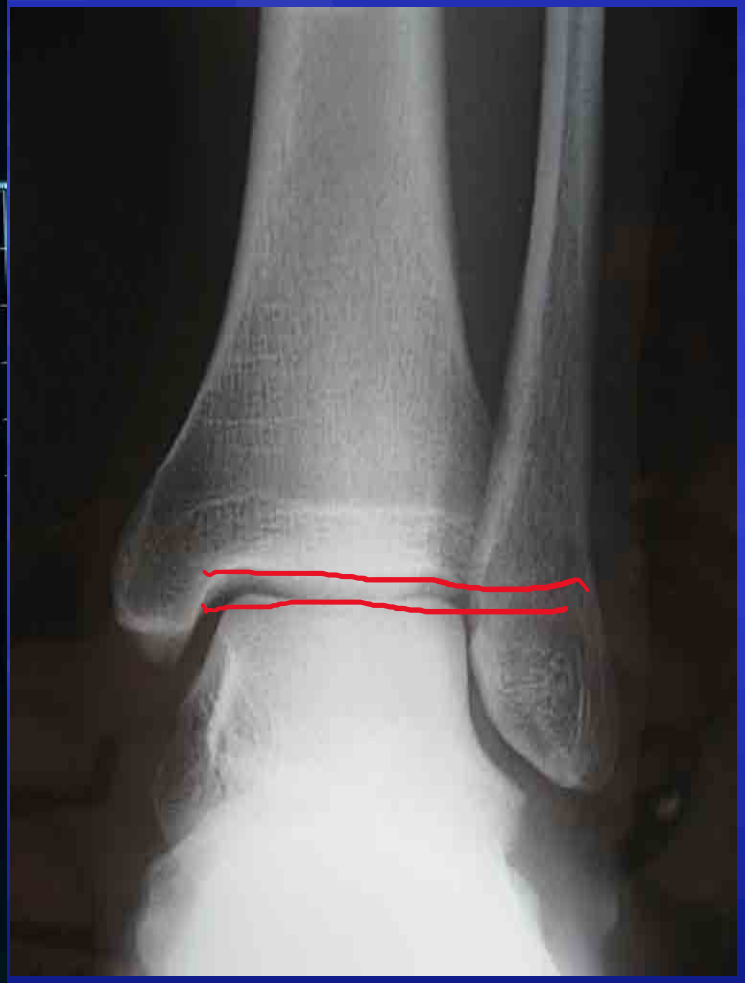
Weight bearing x-rays
Ankle





- Ankle is in varus on standing
- Correctable? Yes

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Principle #3: Are joints Flexible or Fixed?

- Perform Physical examination
- Assess movement
- Fixed??
- Fully correctable?
- Partially correctable?
- Presence of arthritis?

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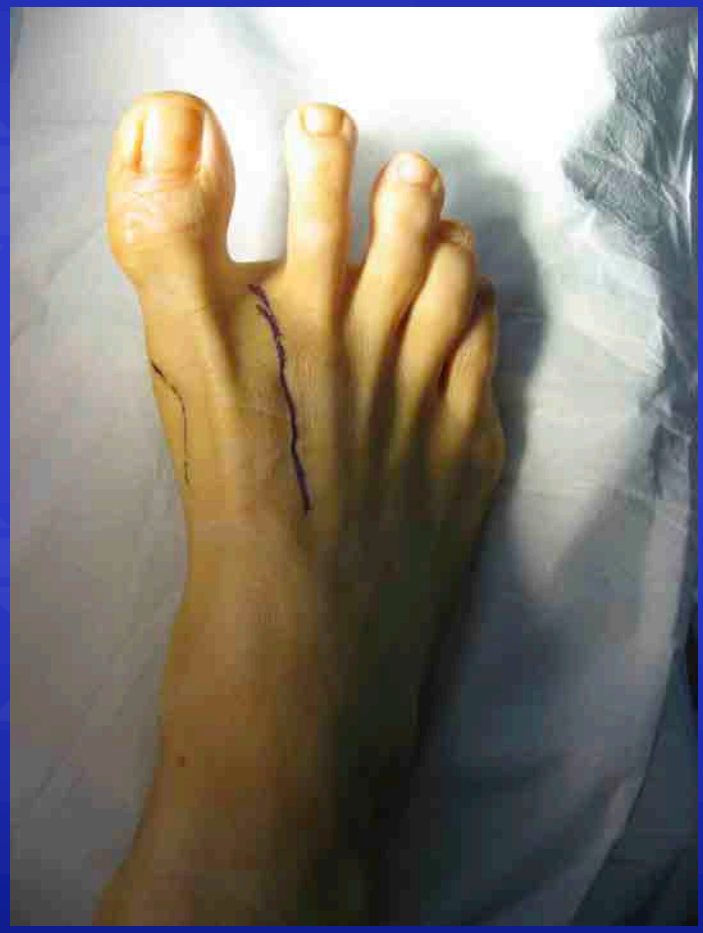
Flexible, correctable Joints

- Try to preserve movement
- Preserve joint
- Soft tissue reconstruction
- Osteotomies around the joint



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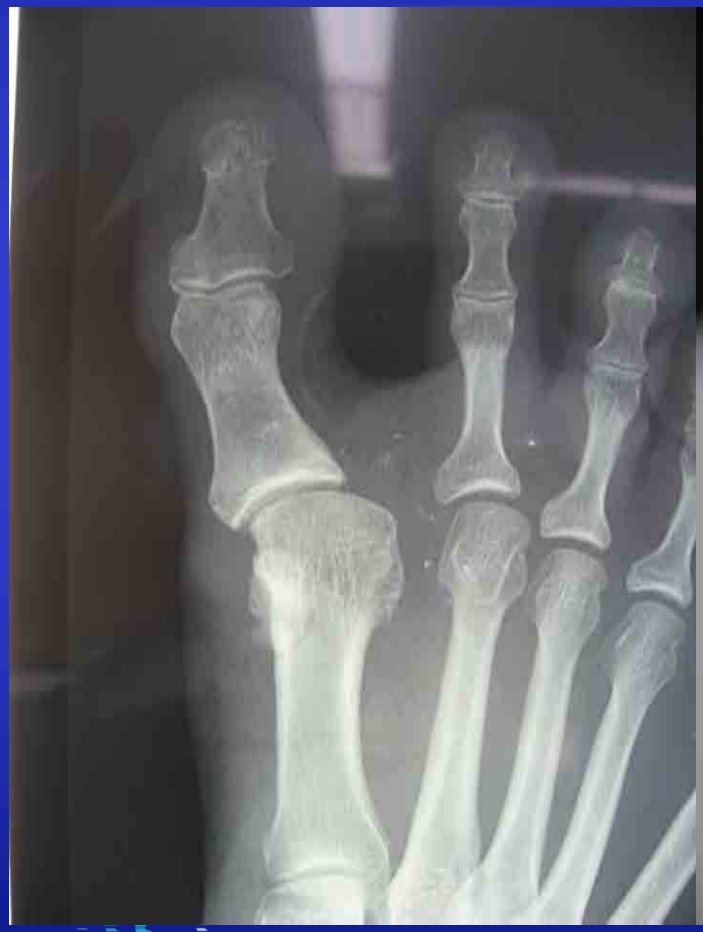
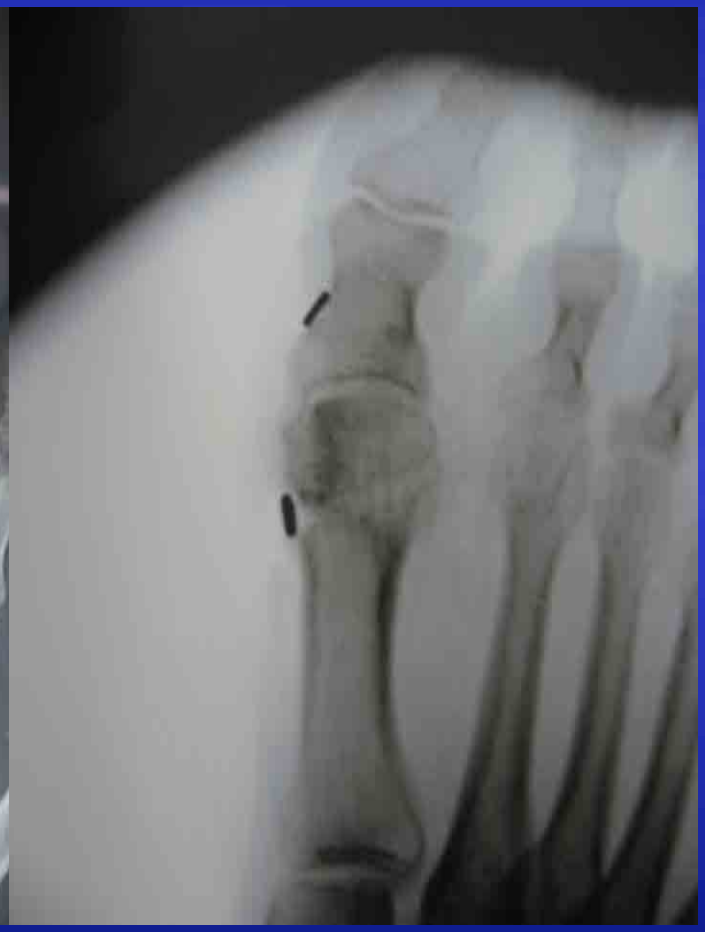
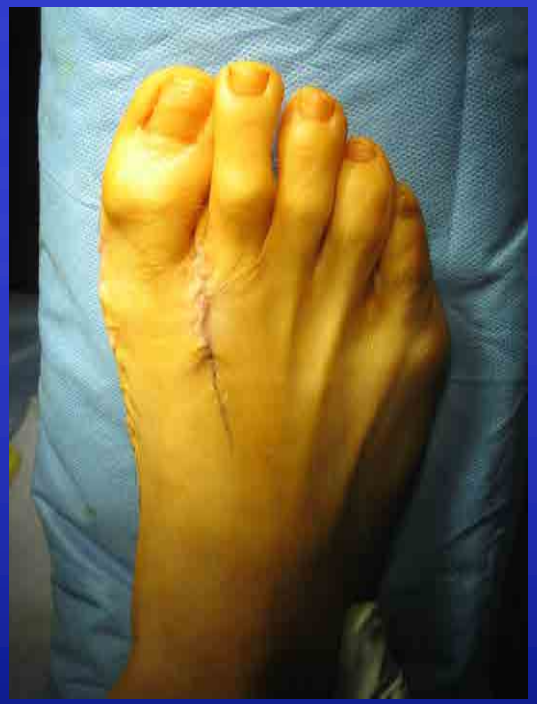
Flexible hallux varus







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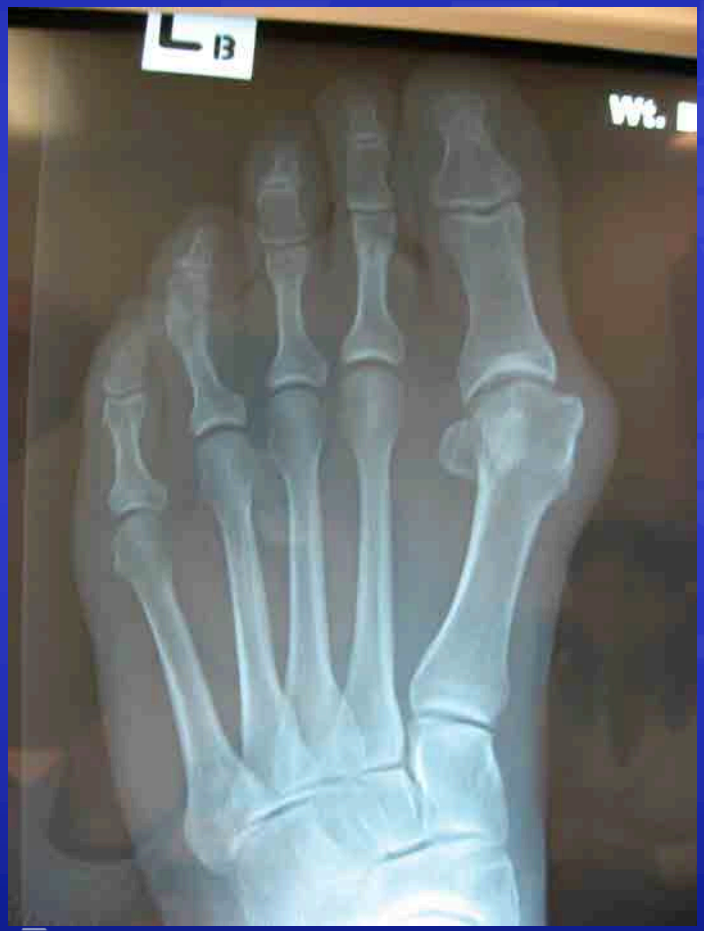
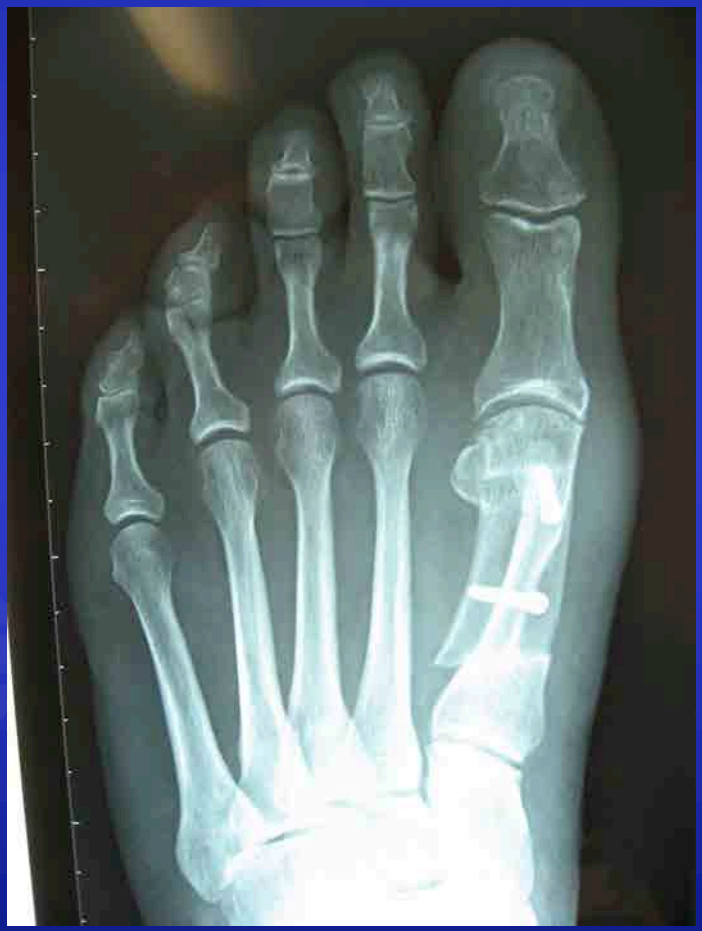
Flexible Deformity, Osteotomy





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Physical Examination

- Determine what joints are correctable and what joints are fixed.

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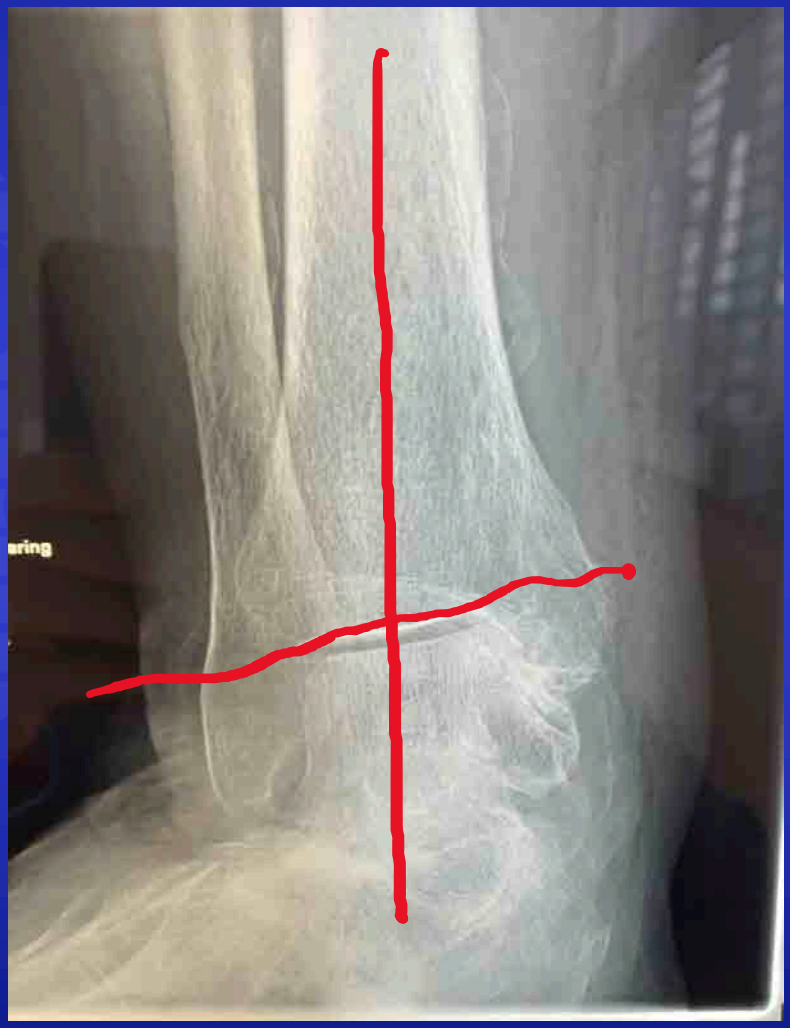
Fixed Deformities

- Ankle joint if flexible and preserved but in varus
- Not correctable
- Can perform osteotomy around joint to correct joint alignment
- Preserve motion.



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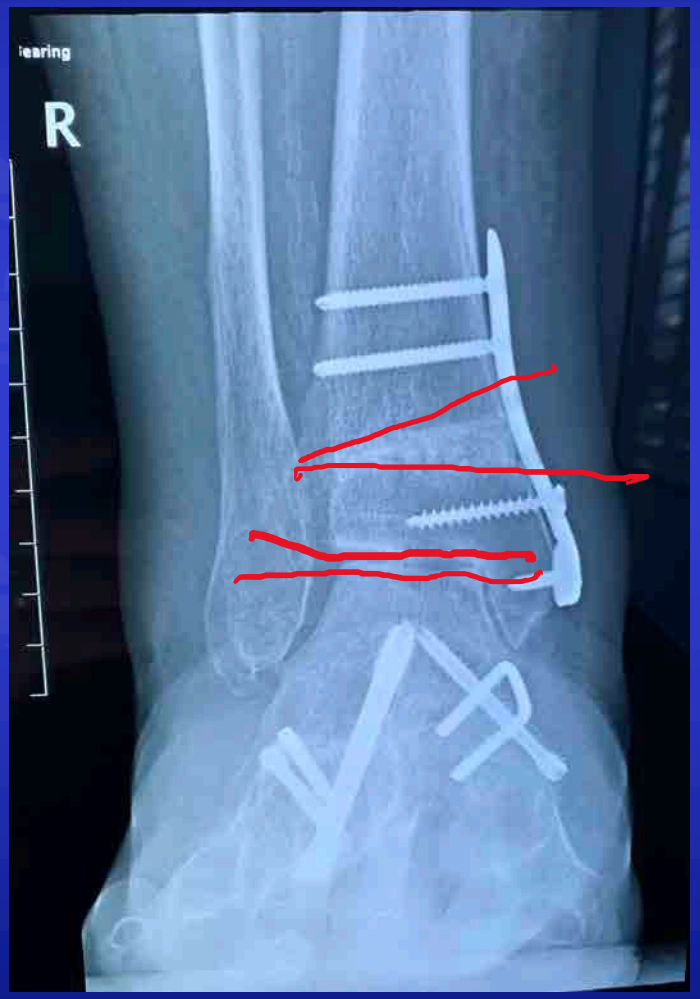
Supramalleolar Osteotomy

- Ankle Joint realigned above.
- Open wedge osteotmy
- Realigns the joint
- Preserves joint movement
- Prevent or slow joint deterioration



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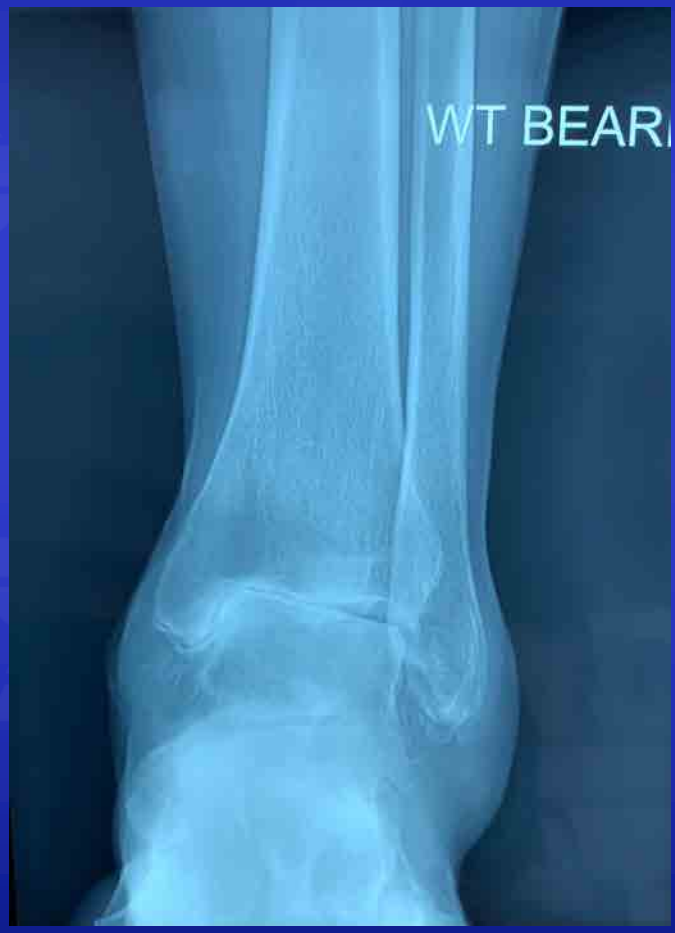
Fixed Deformity

- Not correctable
- Joint degeneration
- Arthritis



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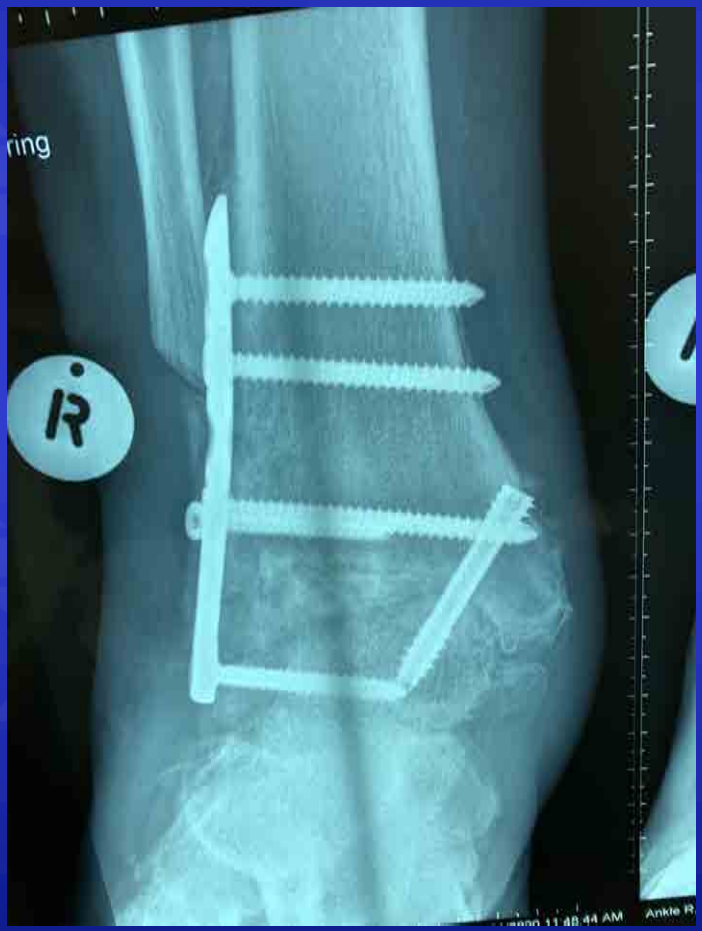
Fixed Deformities

- Fusion
  - Joint degeneration
  - Arthritis
- Joint is correctable through the fusion
- Restore alignment within the joint.



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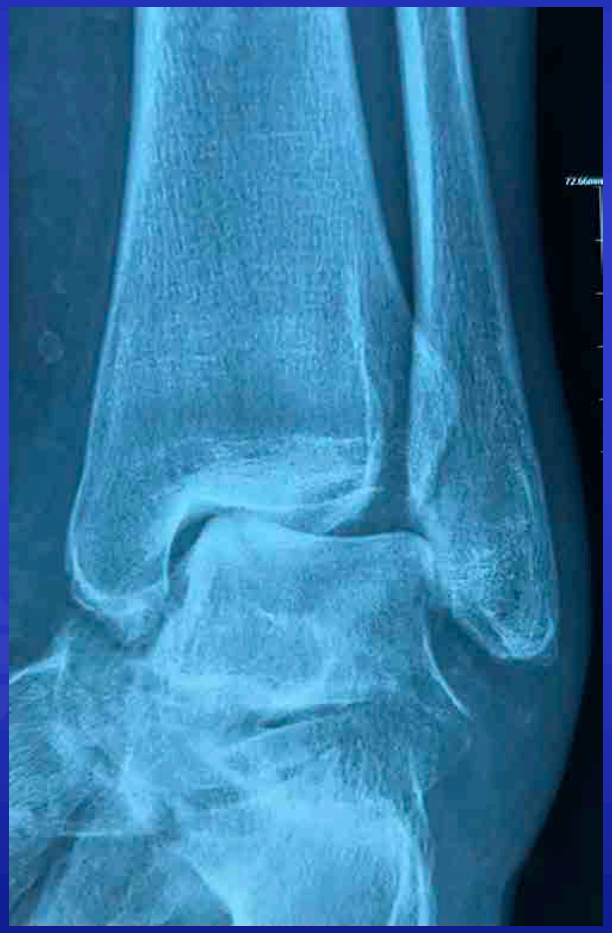
Our Case- Ankle Correction

- Flexible
- Correctable
- Soft tissue reconstruction



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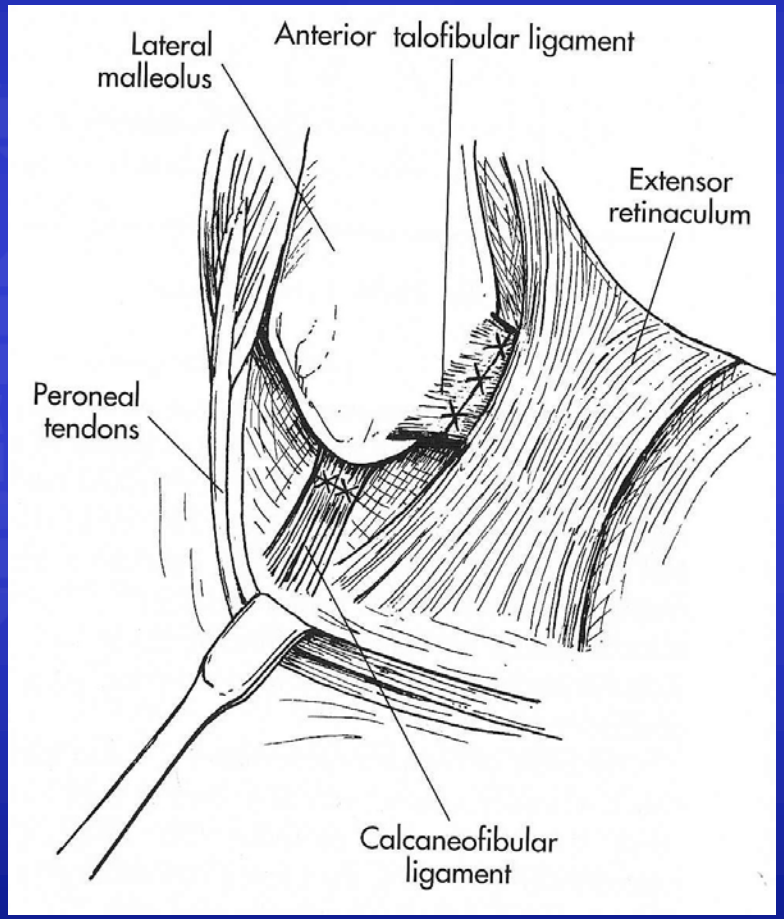
Our Case- Ankle Correction

- Ankle Stabilisation
- Considered a supramalleolar osteotomy if needed.



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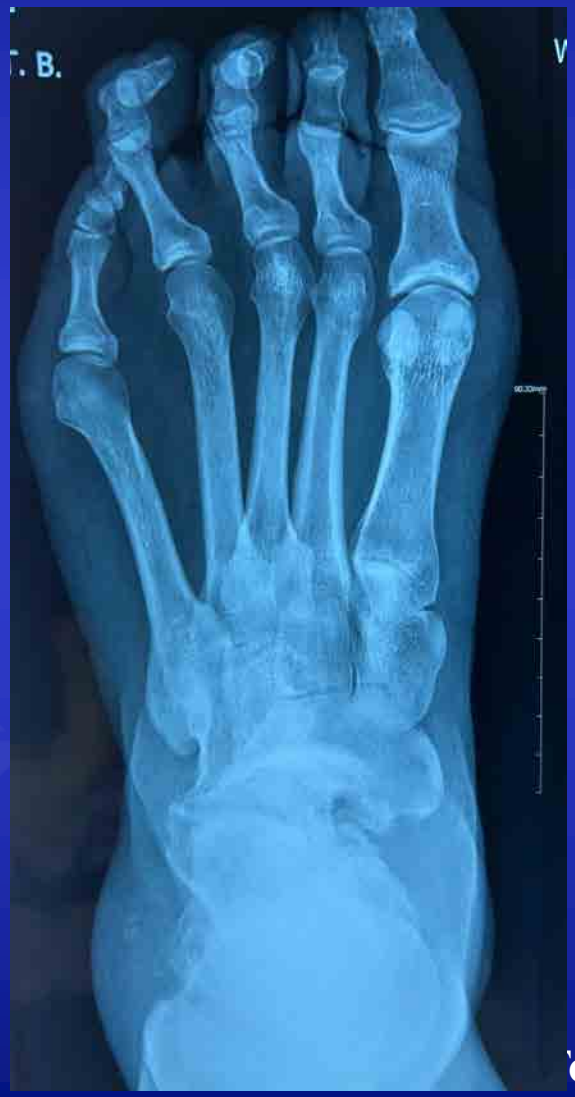
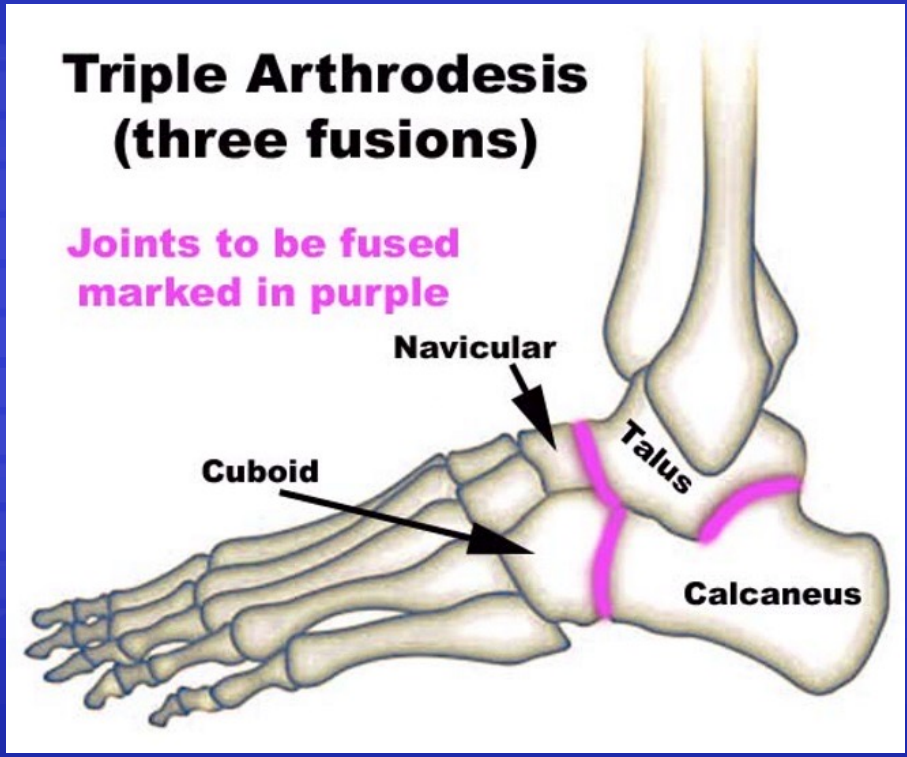
Our Case- Hindfoot Correction

- Hindfoot is fixed
- Talonavicular arthritis
- Cavovarus foot- needs correction when fusing
- Triple arthrodesis



Triple Arthrodesis

- Correct Three hindfoot joints
  - Talonavicular
  - Subtalar joint
  - Calcaneocuboid joint
- Work in concert for inversion and eversion



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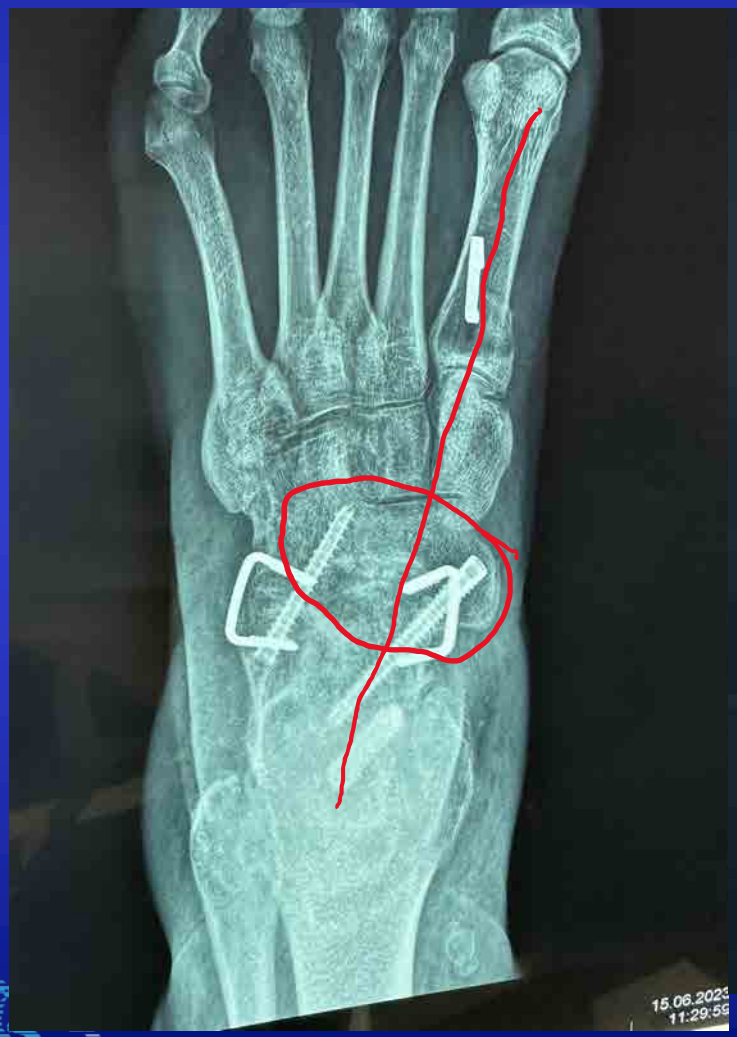
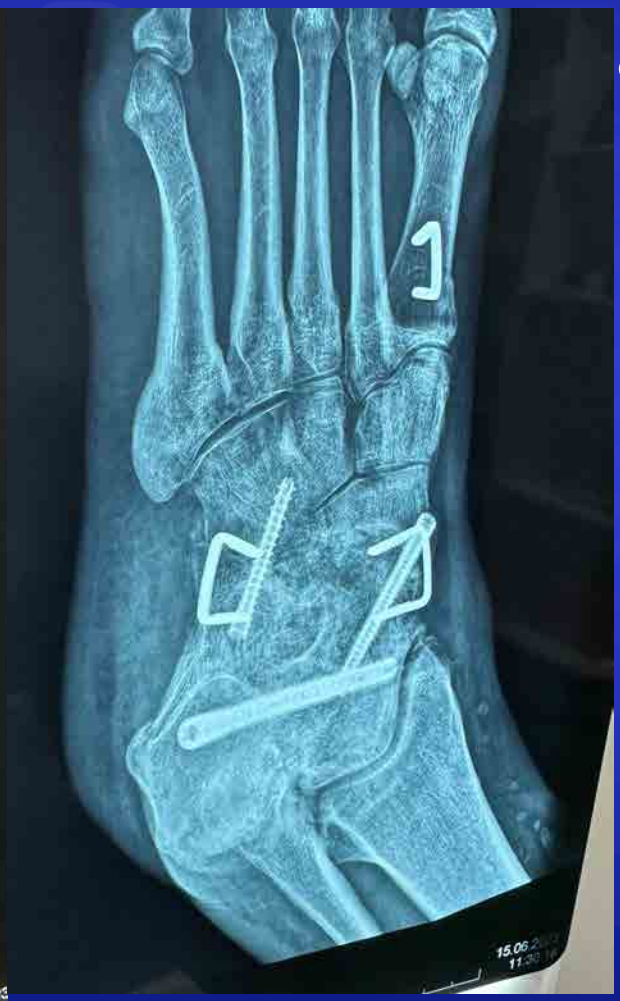
Our Case- Triple Arthrodesis





- Alignment of TN joint restored on AP

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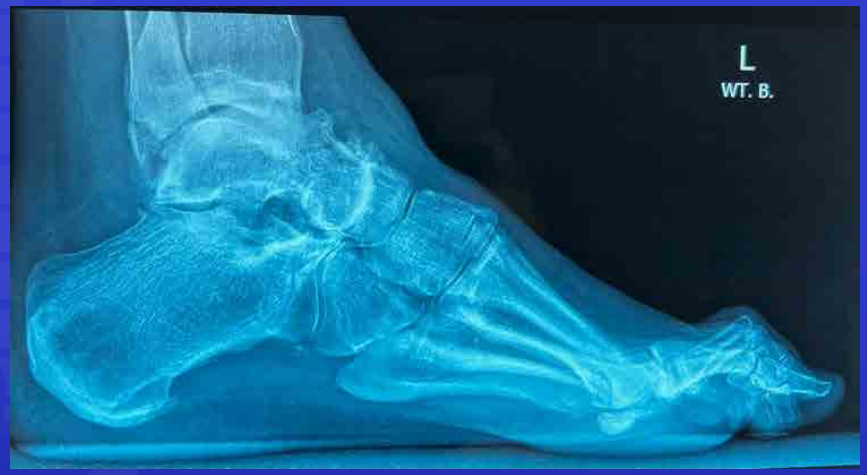
Midfoot

- Flexion deformity at the tarsometatarsal joint (first)
- Joint preserved
- Fixed
- Osteotomy
- Dorsiflexion osteotomy



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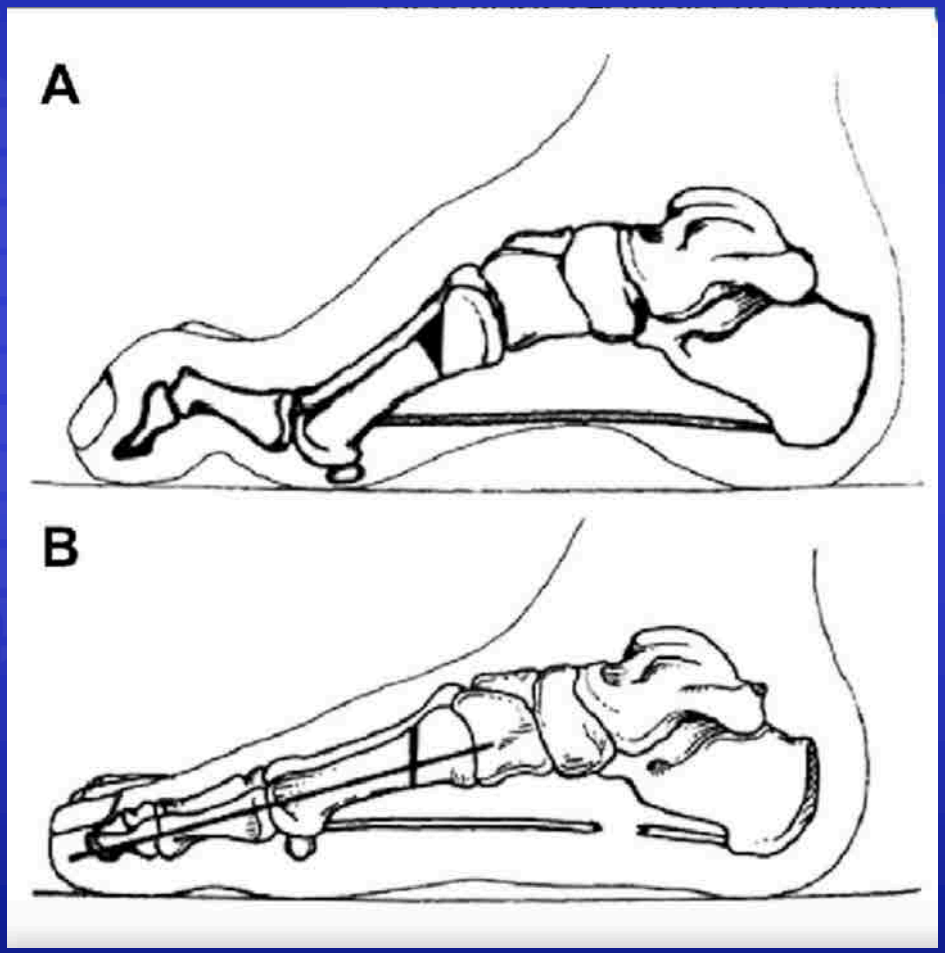
First metatarsal dorsiflexion osteotomy

- Closed wedge osteotomy
- Lifts first metatarsal
- Realigns foot
- Preserves first TMT joint.
- May need a plantar fascia release



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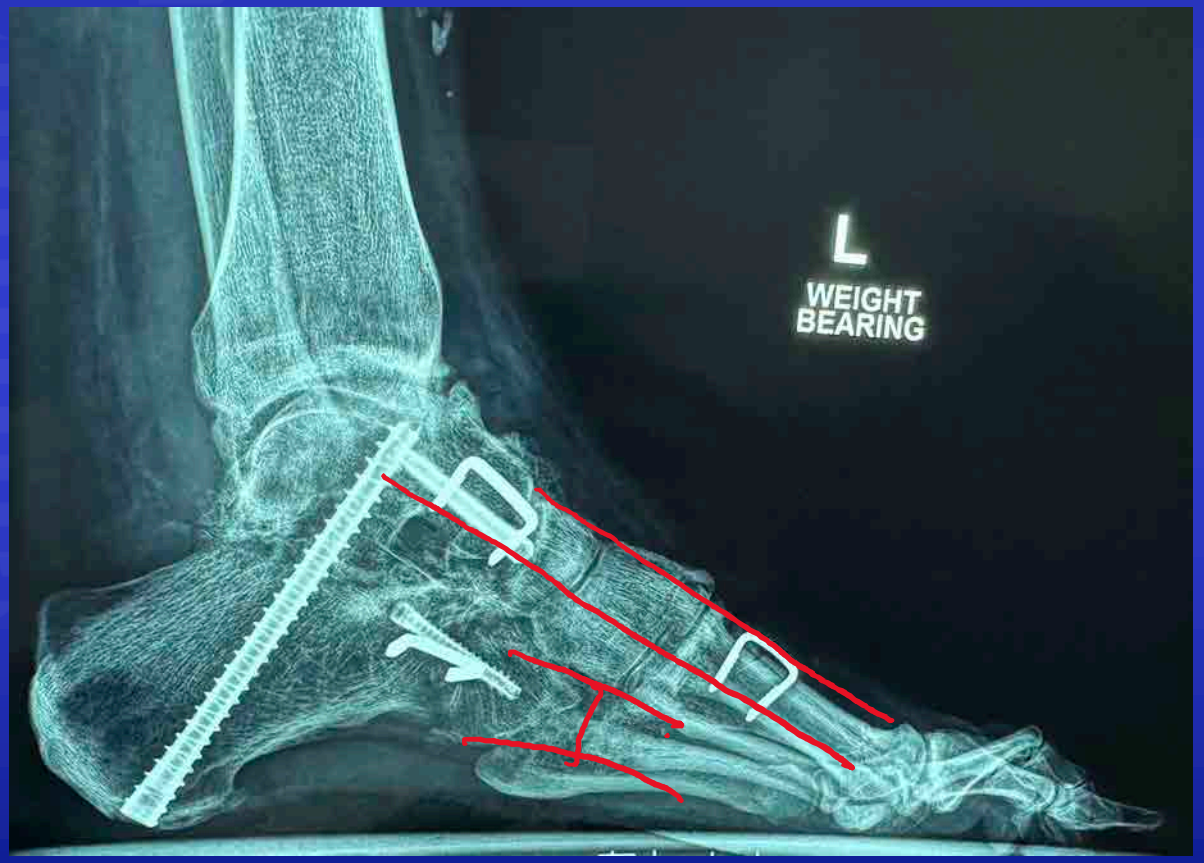
First Metatarsal Dorsiflexion Osteotomy

- The osteotomy restored midfoot alignment
- Triple arthrodesis restore Meary's line
- Restored arch



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Our Case

- Now 9 months from surgery.
- Doing well
- Returned to karate

Summary

- Where is the deformity?
  - Weightbearing x-rays ankle and feet
- Physical examination- Fixed or flexible
- Non-operative treatment- Orthotics
- Surgery

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