Common pathologies of the Foot and Ankle

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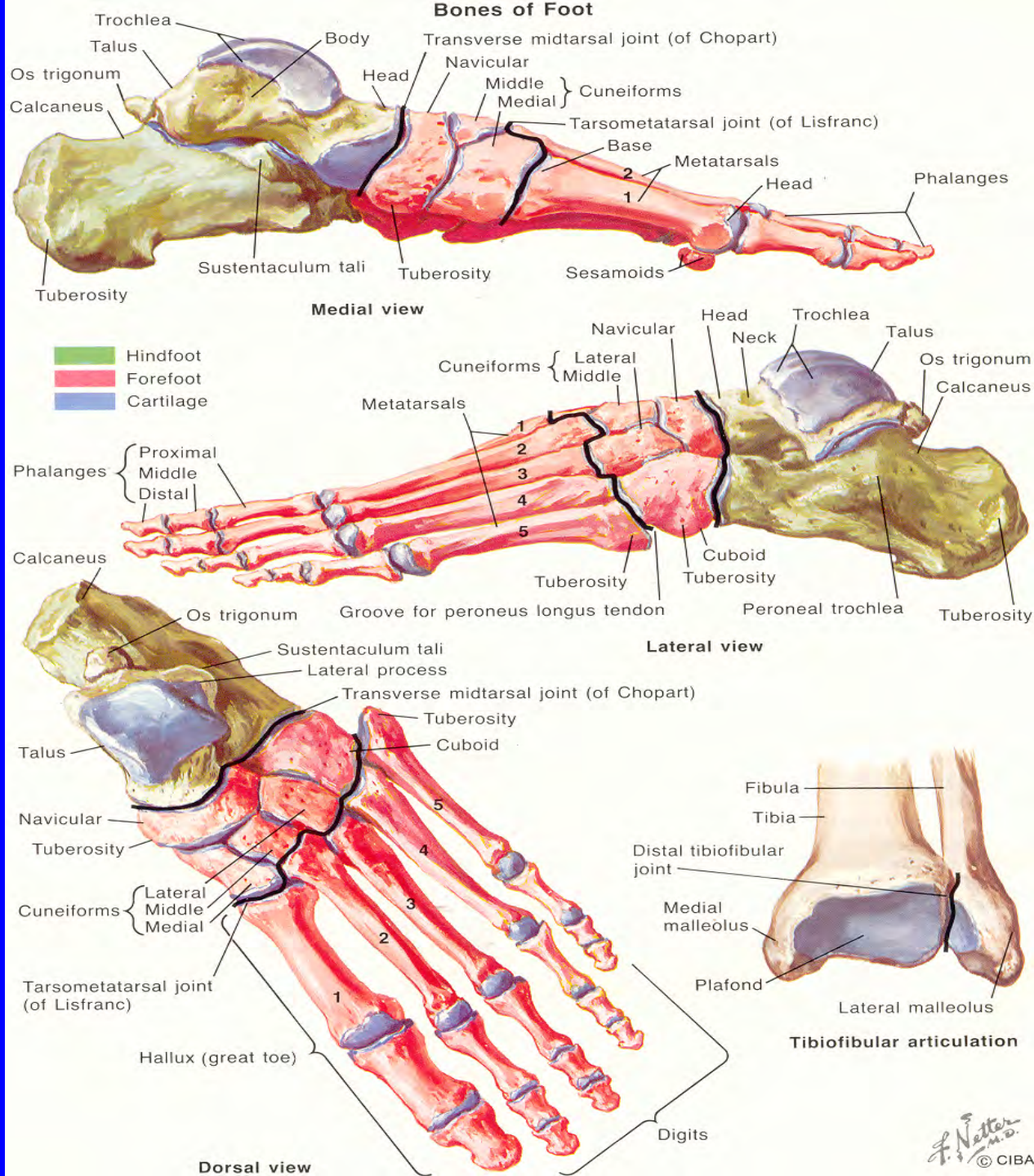
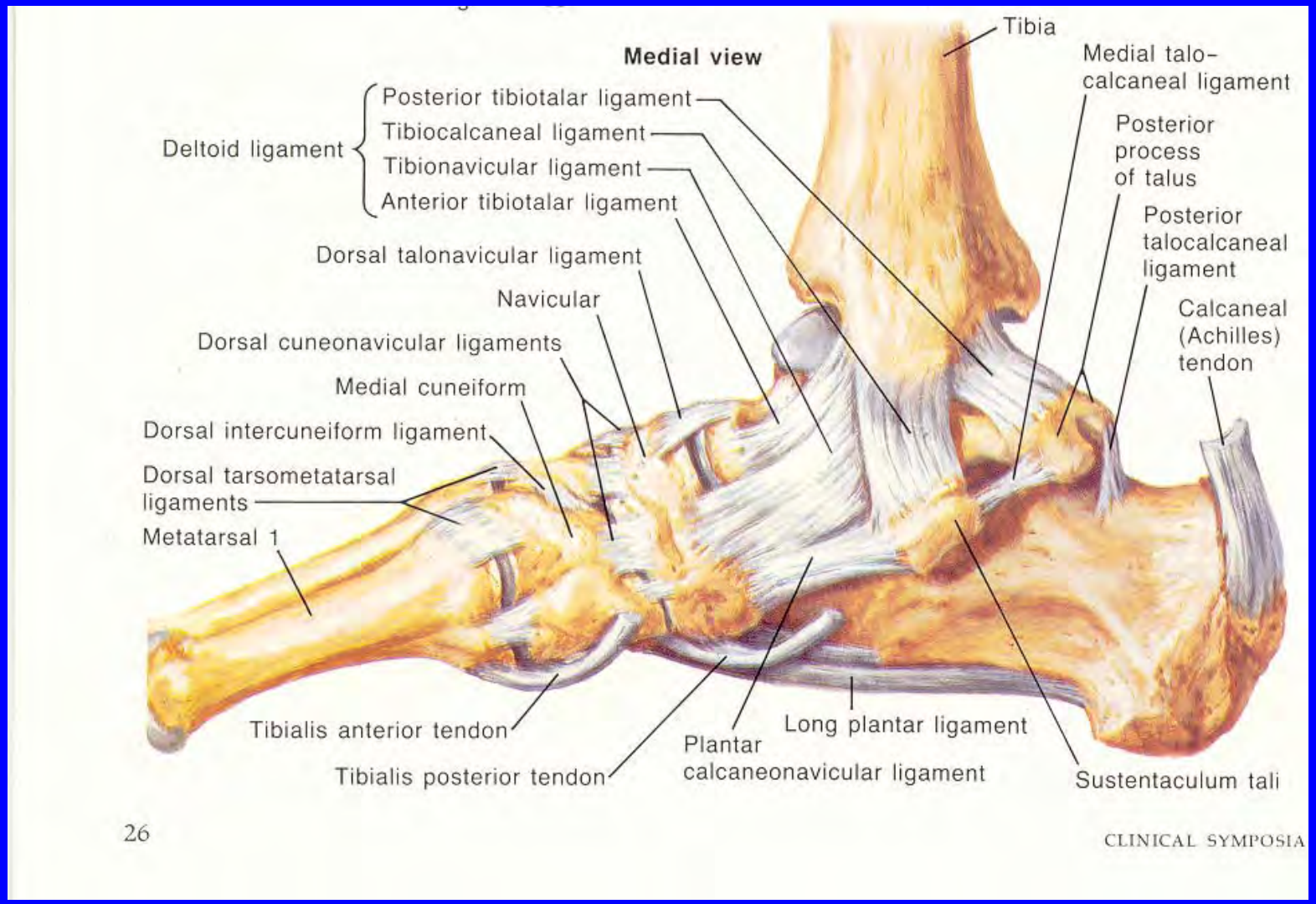
Israel

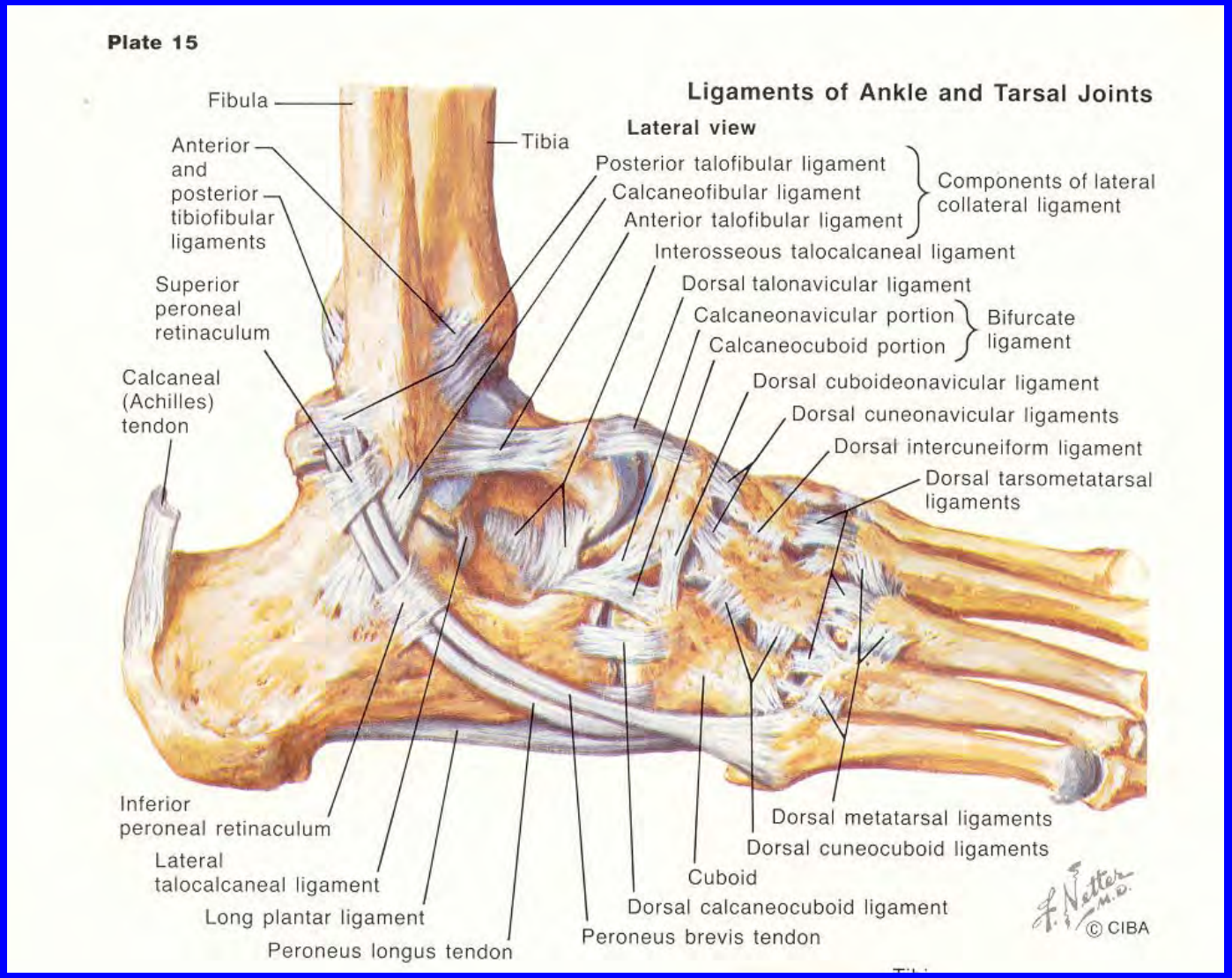
Bony Anatomy



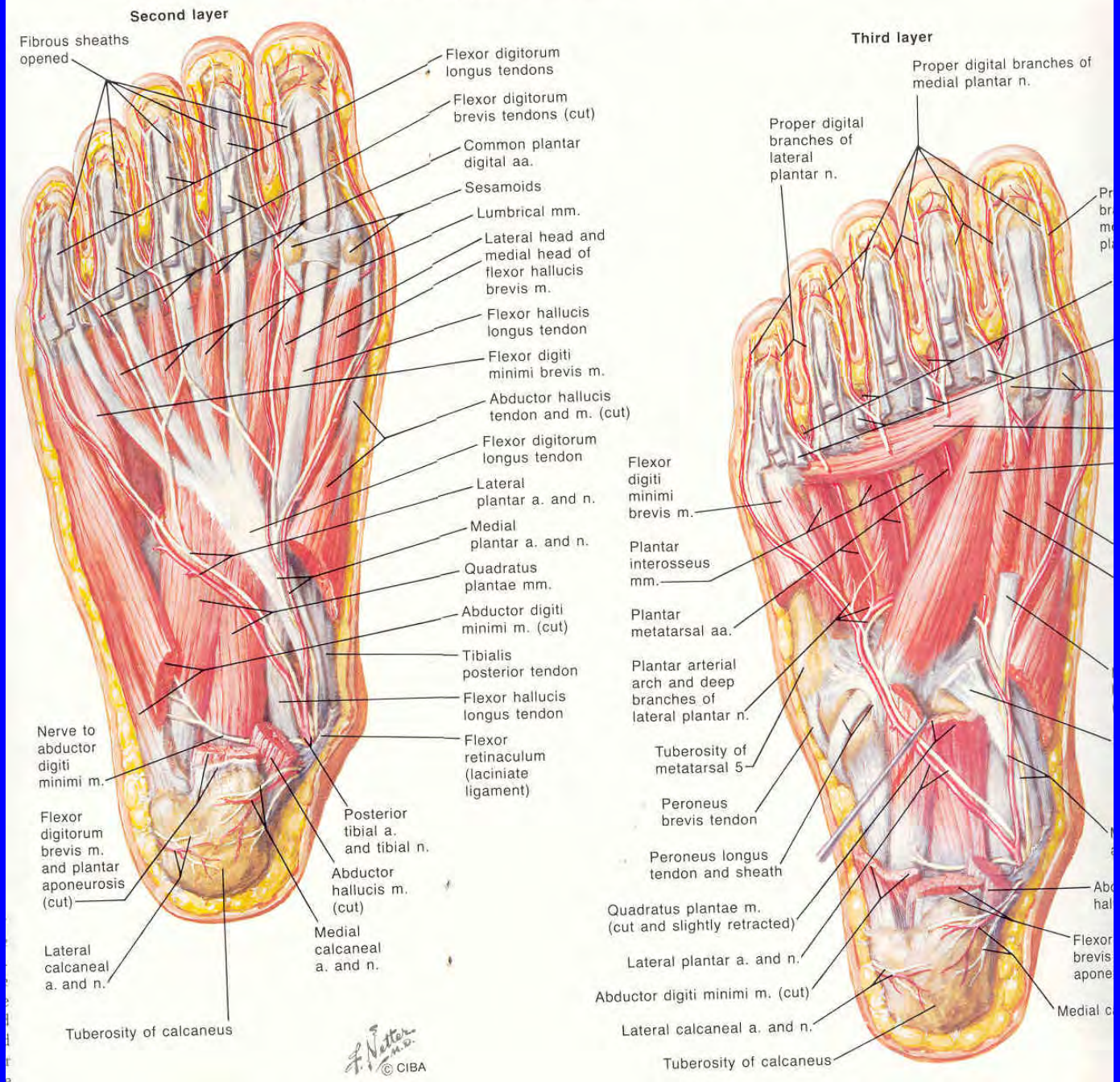
Ligamentous anatomy of the Foot and Ankle



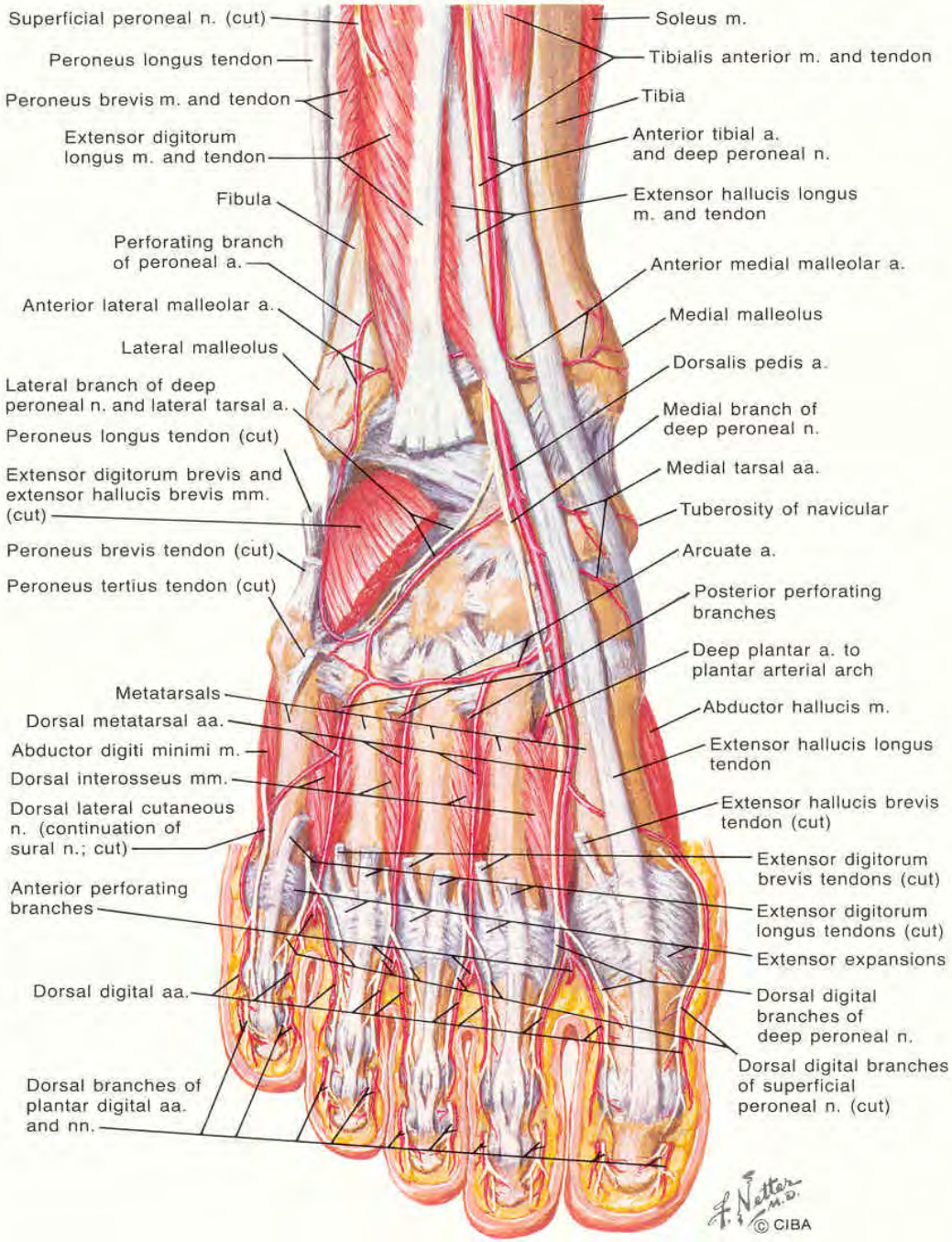
Ligamentous anatomy of the Foot and Ankle



Muscles, Arteries, and Nerves of Sole of Foot: II



Muscles, Arteries, and Nerves of Front of Ankle and Dorsum of Foot: Deeper Dissection



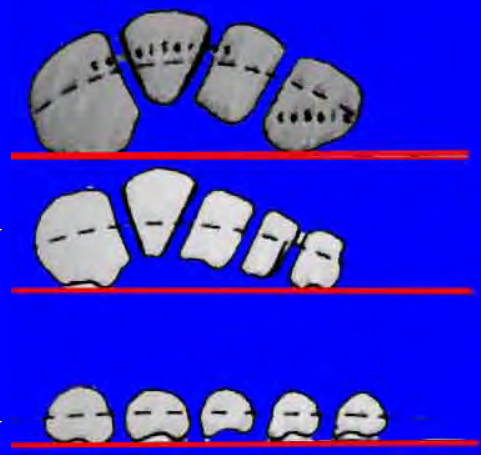
“The Longitudinal Arch”

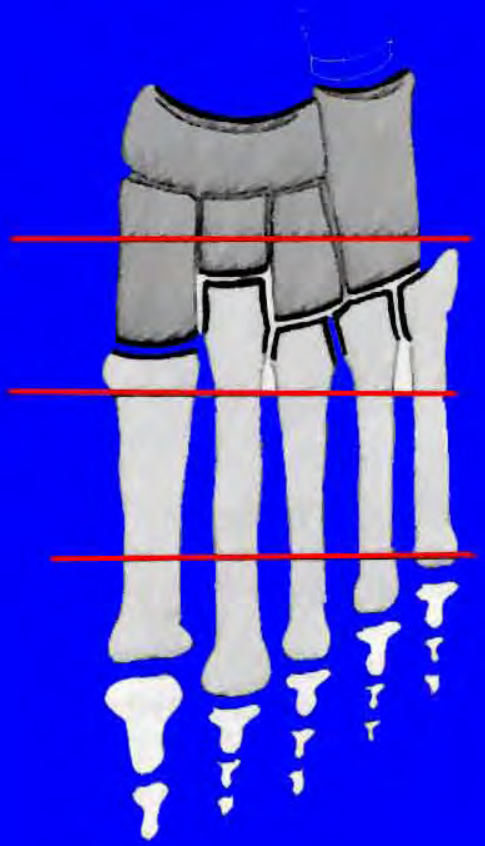
“The Transverse Arches”

Tarsal

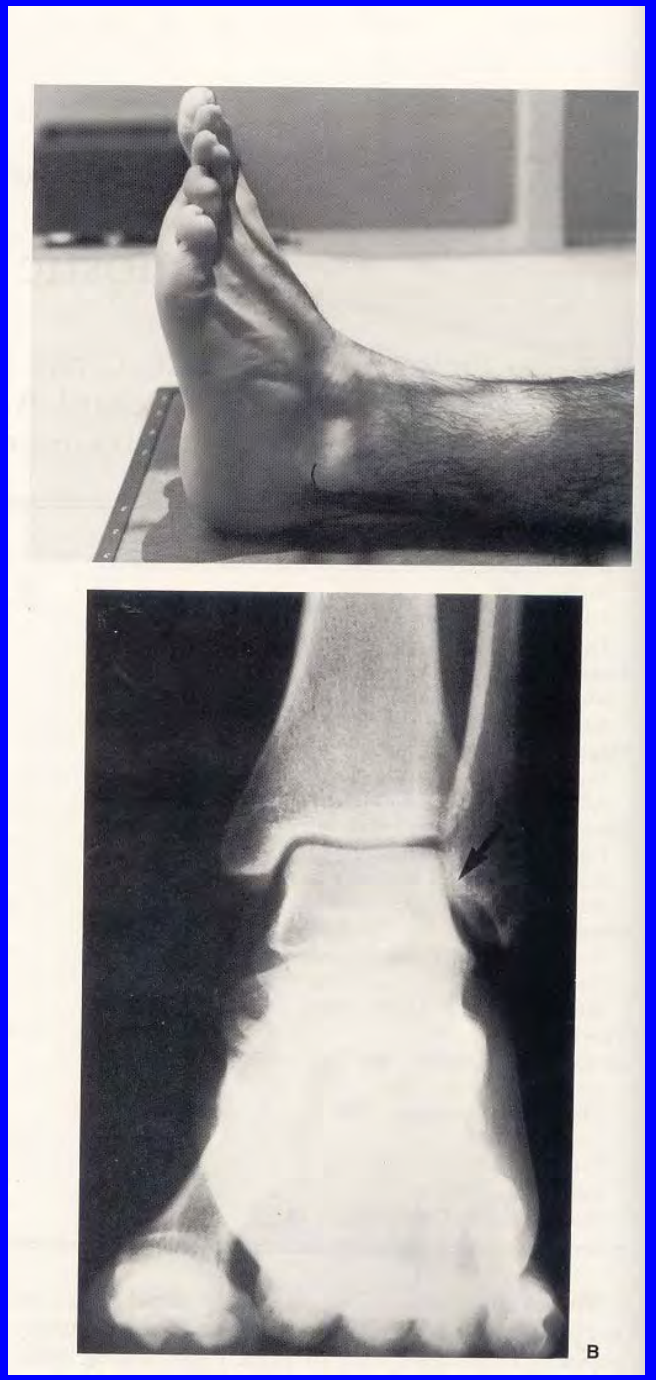
Posterior MetaTarsal

Anterior MetaTarsal





Anterior Posterior View



Lateral View

A

B

C

FIG. 2-2. (**A**) Patient positioned for lateral ankle view (mediolateral) with slight dorsiflexion of ankle. Curved line (() marks the medial malleolar tip. (**B**) Lateral radiograph includes base of fifth metatarsal. Normal pre-Achilles fat pad outlined with *broken lines*. (**C**) Severe sprain with anterior "teardrop" (*arrow*) and posterior soft tissue density due to an effusion (*curved arrow*).

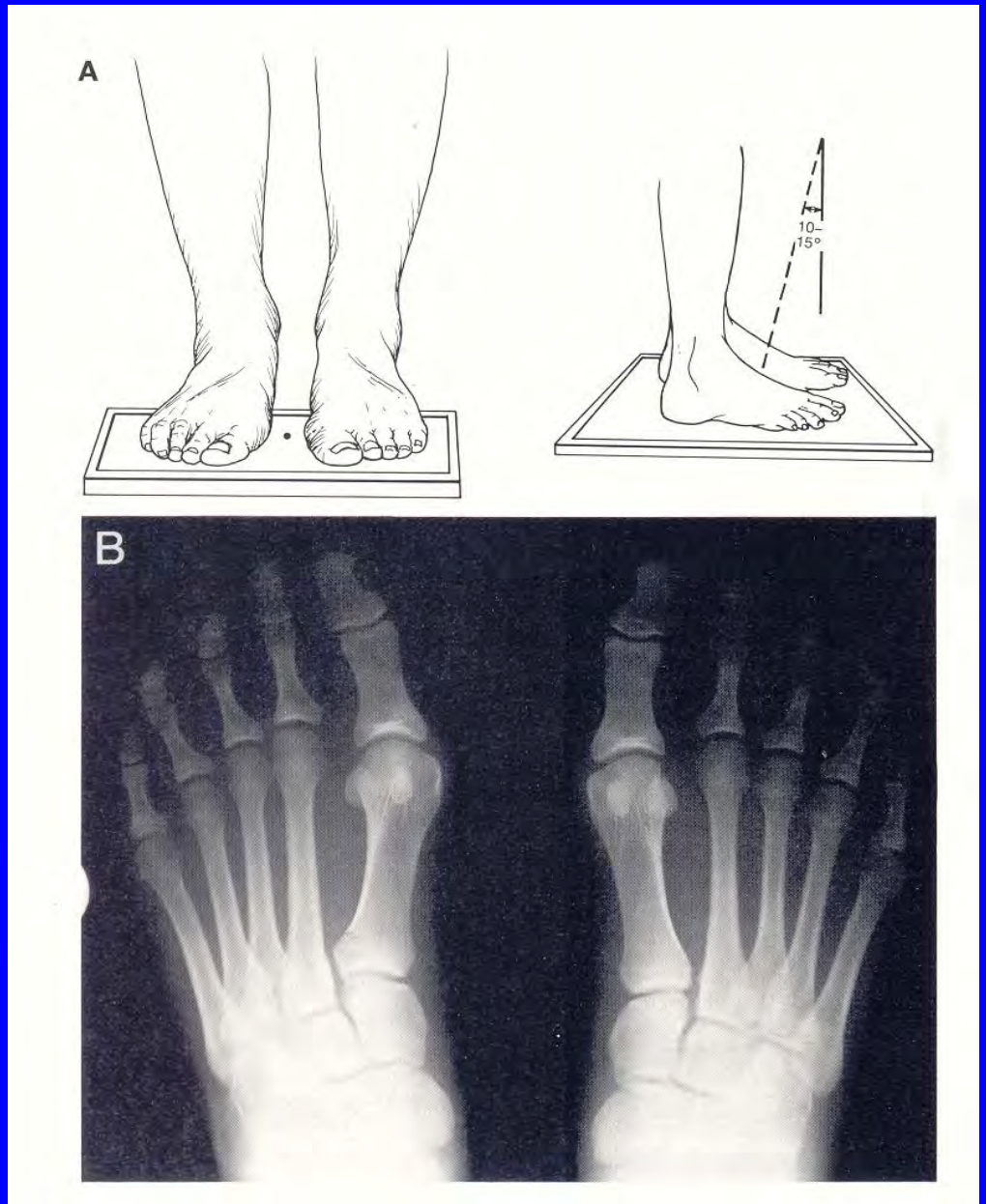
Mortise View

A

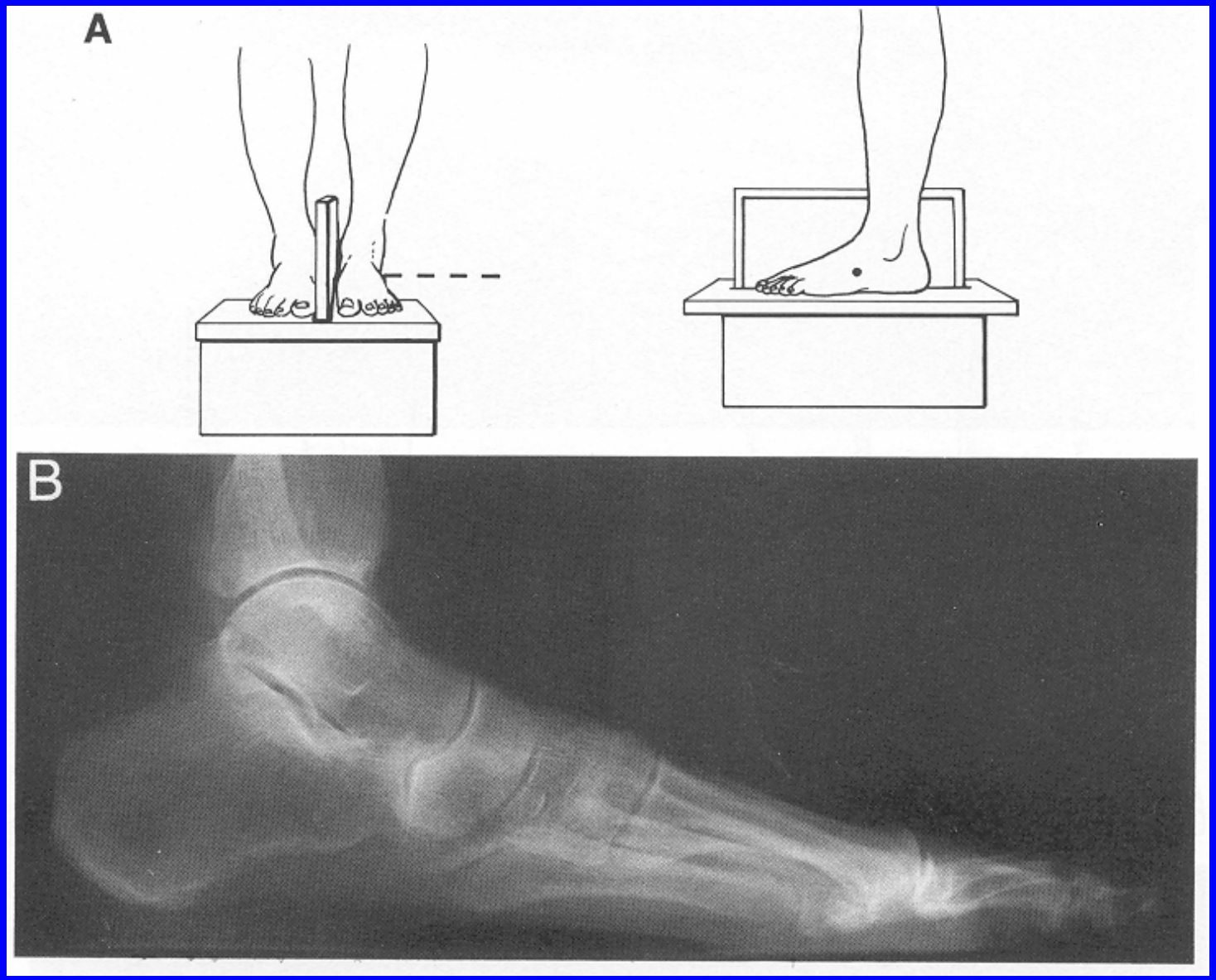
B

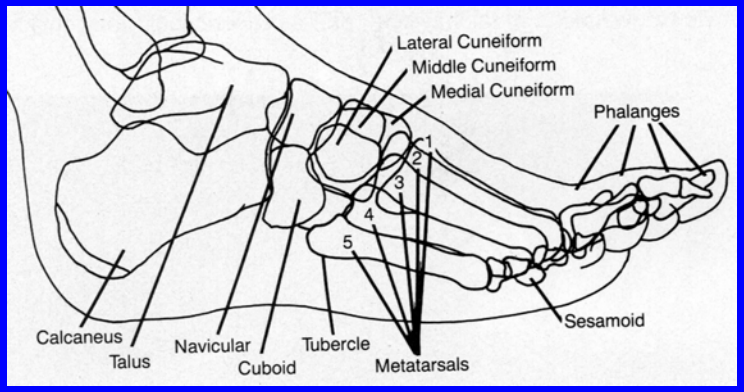
FIG. 2-3. (**A**) Patient positioned for mortise view with 15° to 20° internal rotation of ankle. (**B**) Mortise radiograph defines the entire mortise as well as providing better visualization of the talar dome.

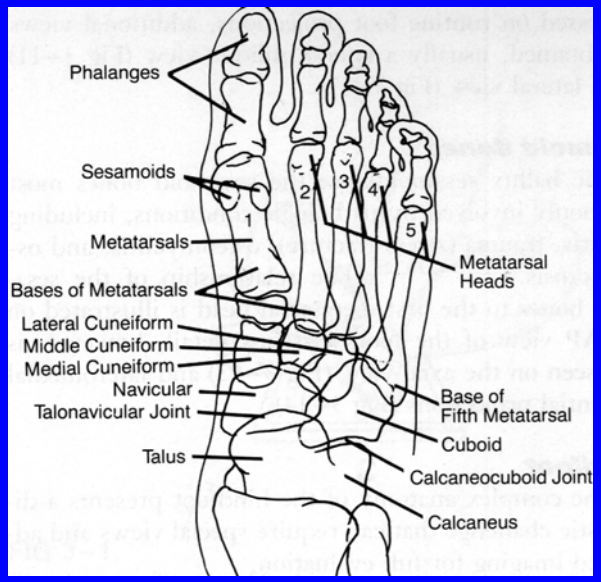
Standing anterior posterior view of the foot

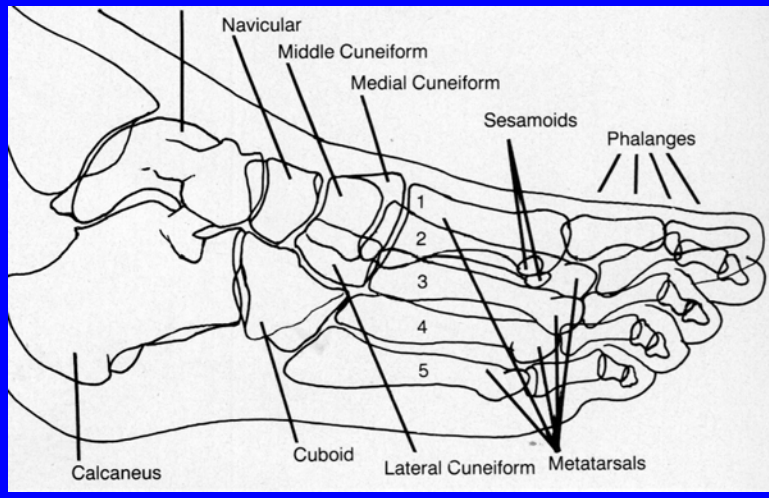


Standing Lateral view of the foot

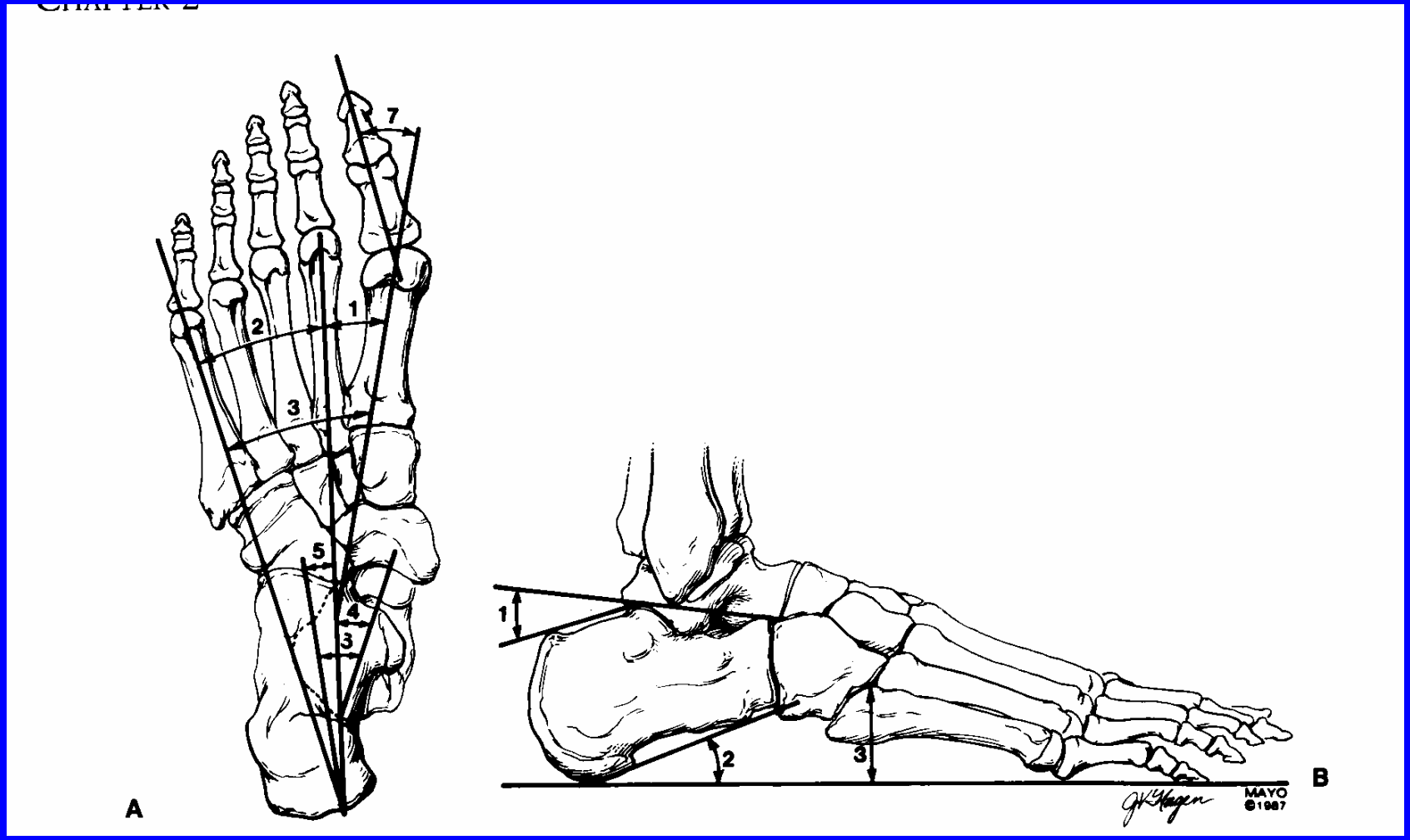



Lateral Cuneiform
Middle Cuneiform
Medial Cuneiform
Phalanges
1
2
3
4
5
Calcaneus
Talus
Navicular
Cuboid
Tubercle
Metatarsals
Sesamoid


Phalanges
Sesamoids
1
2
3
4
5
Metatarsals
Metatarsal Heads
Bases of Metatarsals
Lateral Cuneiform
Middle Cuneiform
Medial Cuneiform
Navicular
Talonavicular Joint
Base of Fifth Metatarsal
Cuboid
Talus
Calcaneocuboid Joint
Calcaneus


Navicular
Middle Cuneiform
Medial Cuneiform
Sesamoids
Phalanges
1
2
3
4
5
Calcaneus
Cuboid
Lateral Cuneiform
Metatarsals

Measurements of the foot




FORE FOOT
MID FOOT
HIND FOOT

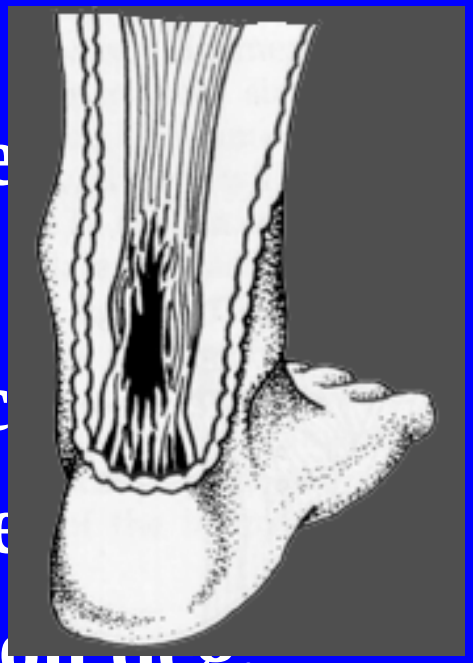
Rupture of the Achilles Tendon

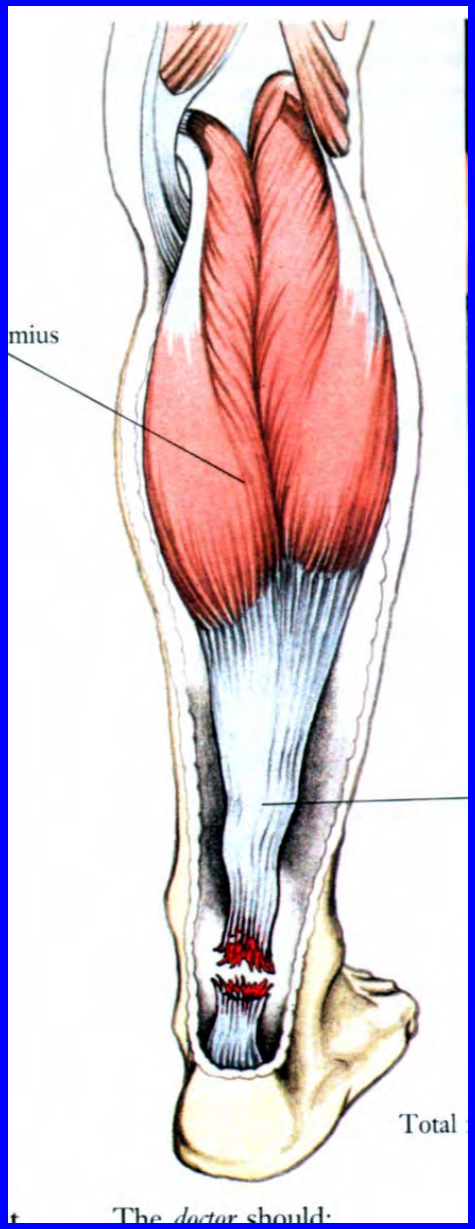
- **Complete Rupture**
- **Symptoms of rupture- sudden pain**
  minimal trauma
- **Signs of rupture- gap in tendon**
  Thompson's Te
- **Partial rupture**

  Natural history (degenerative c

  Conservative management-Stre

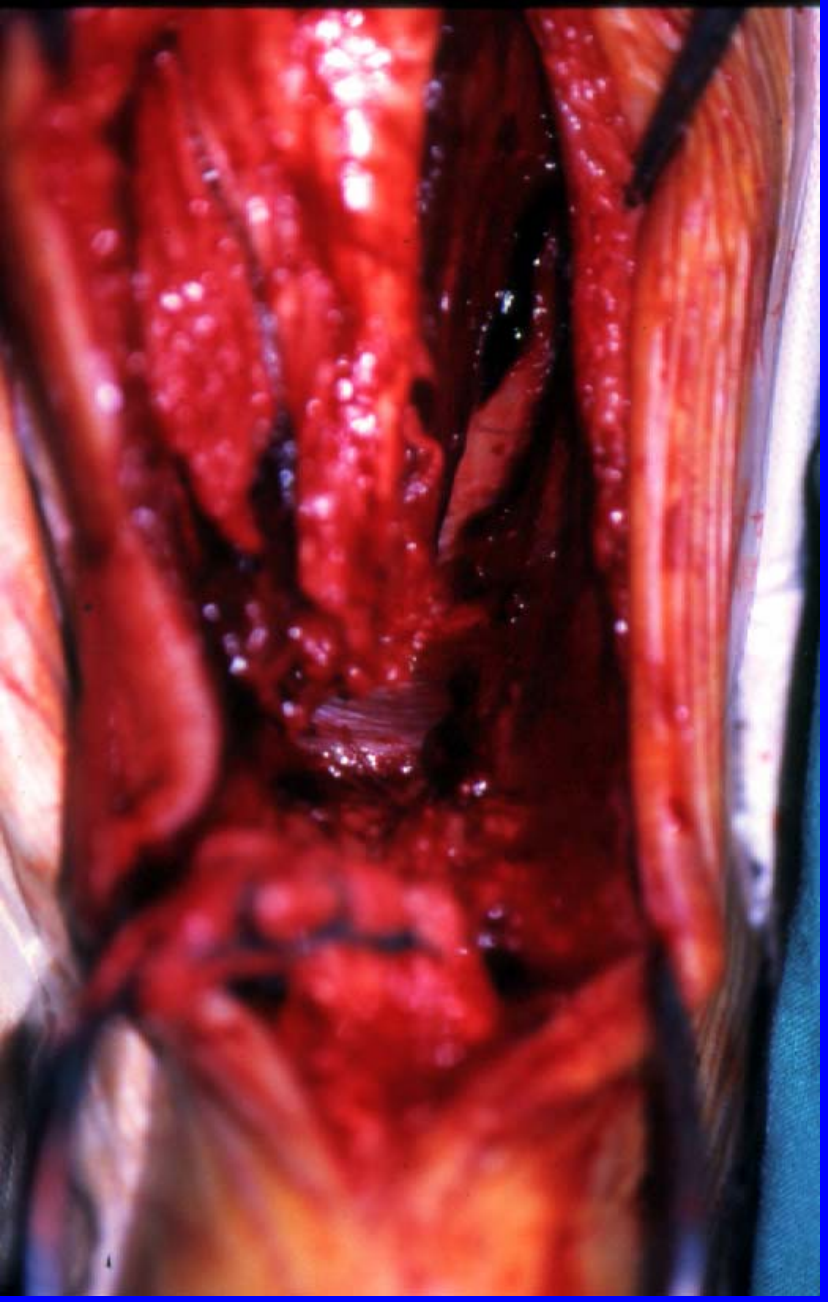
  Operative management- Excision deg.
  tissue

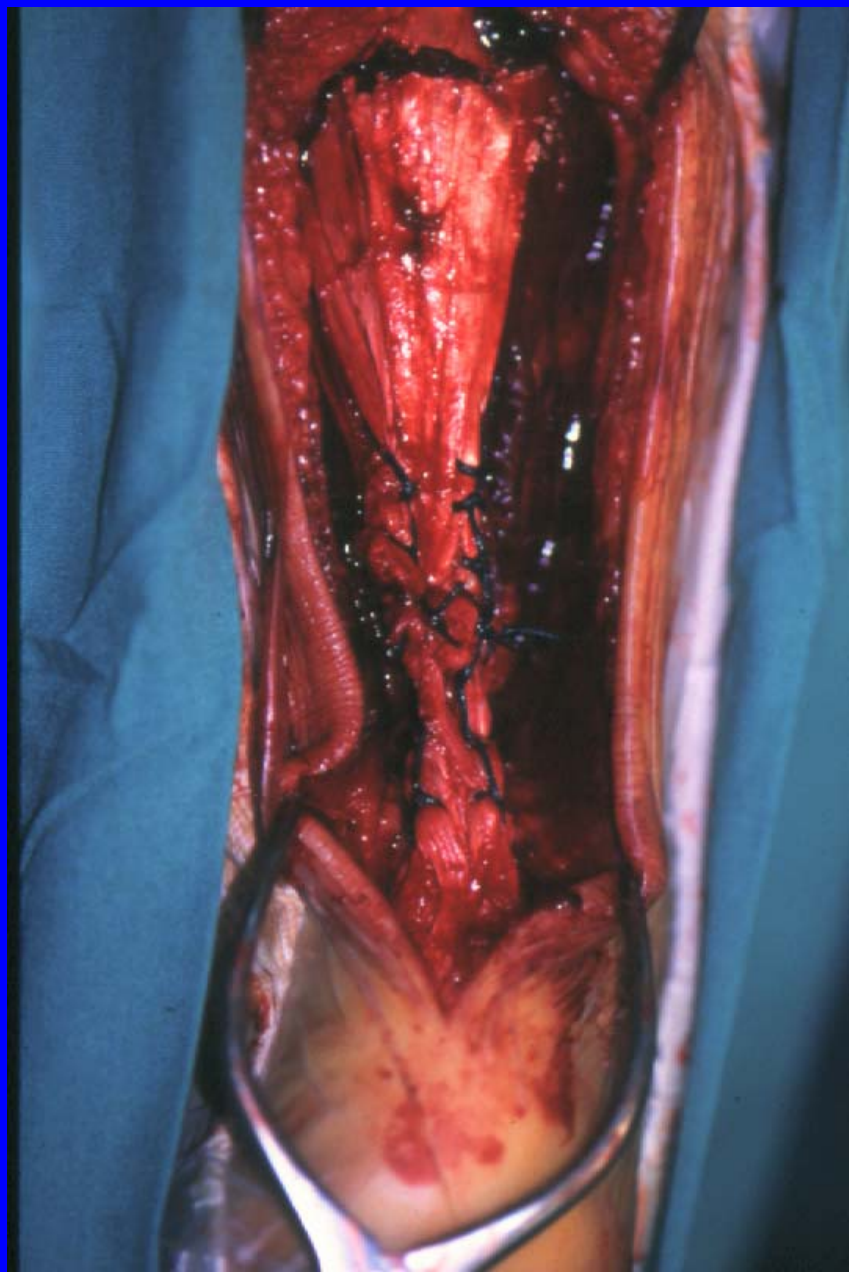


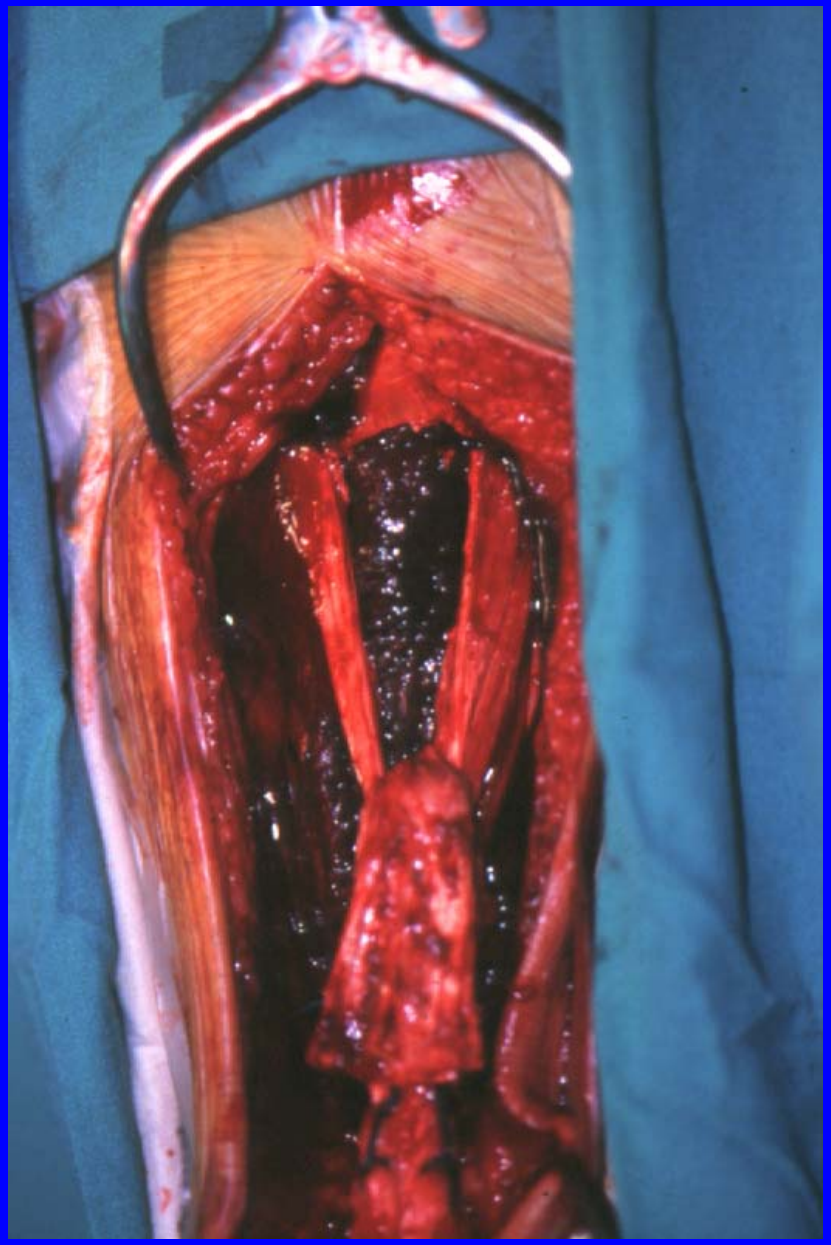


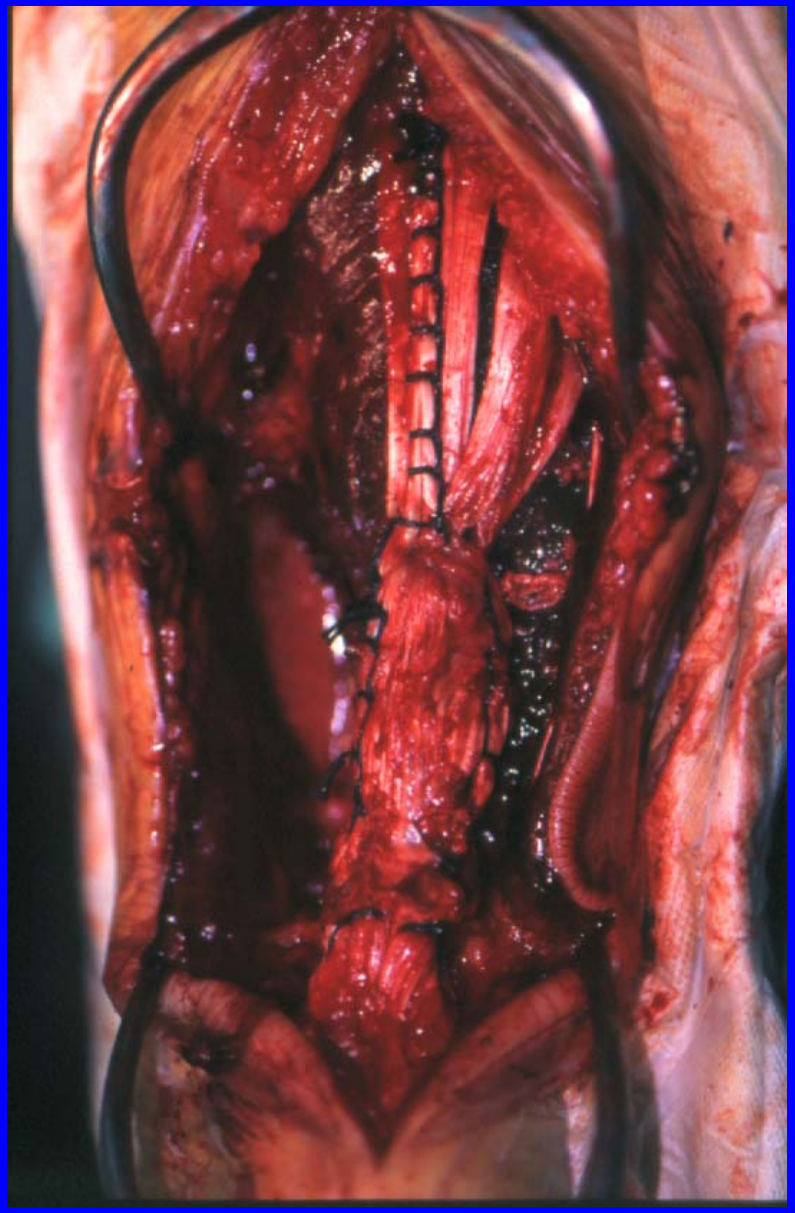
Thompson's test

Complete tear- palpable gap

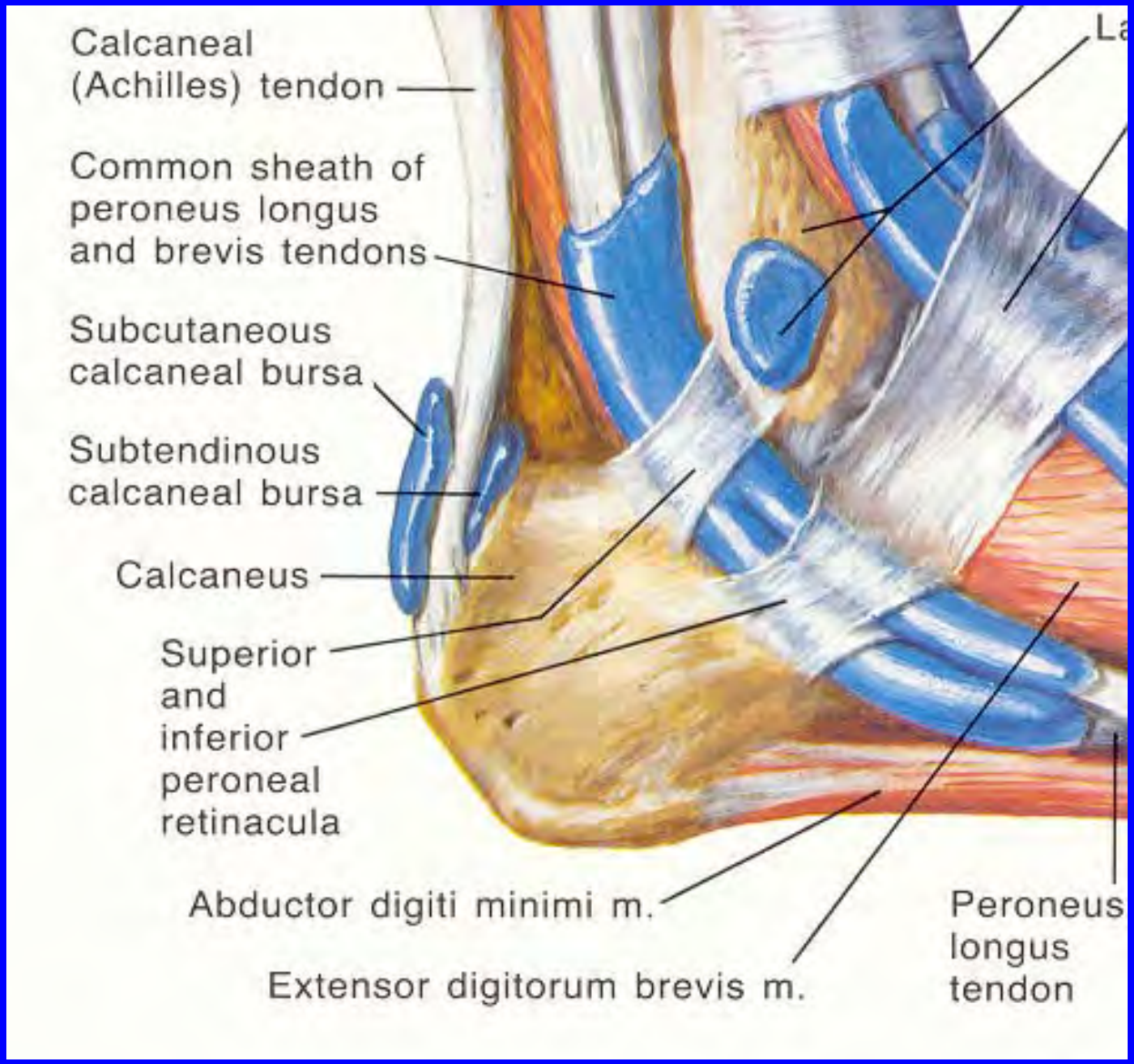




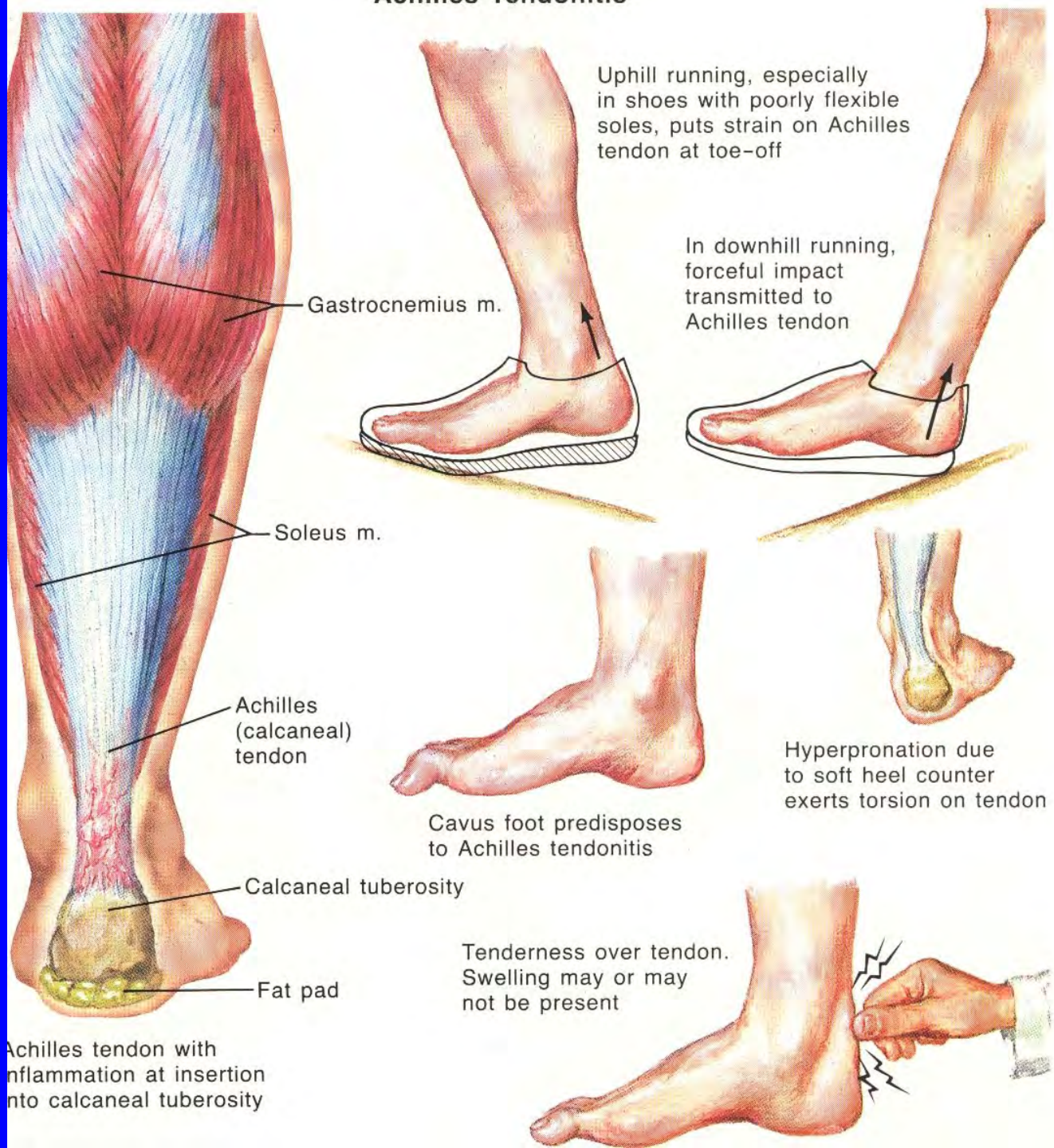




Anatomy of bursa

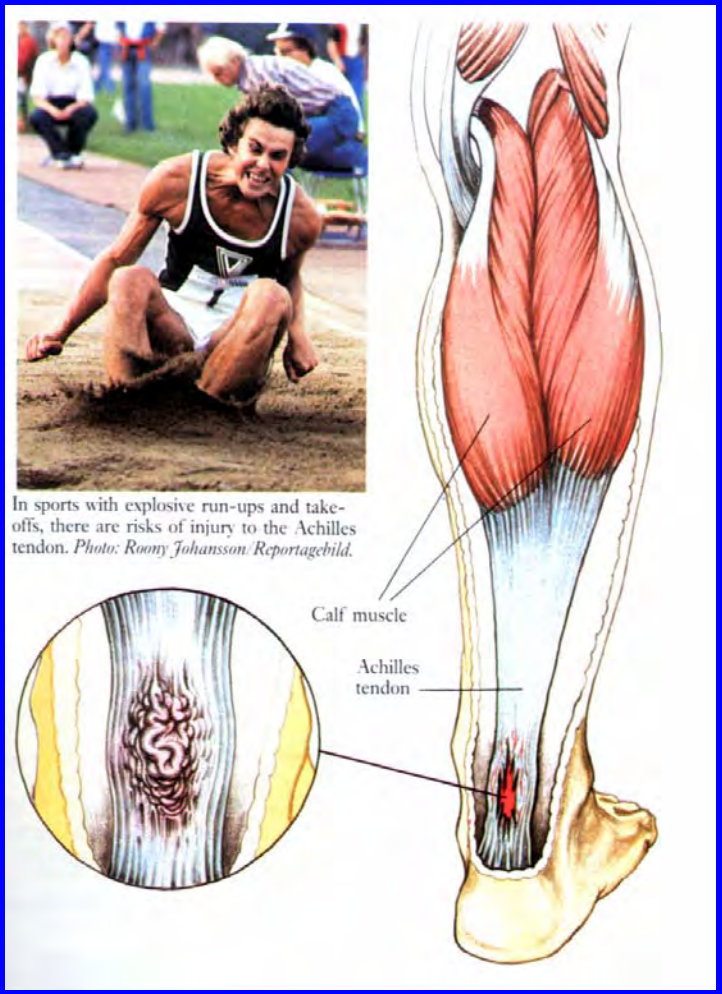


Achilles Tendinosis



Achilles “Tendinosis”

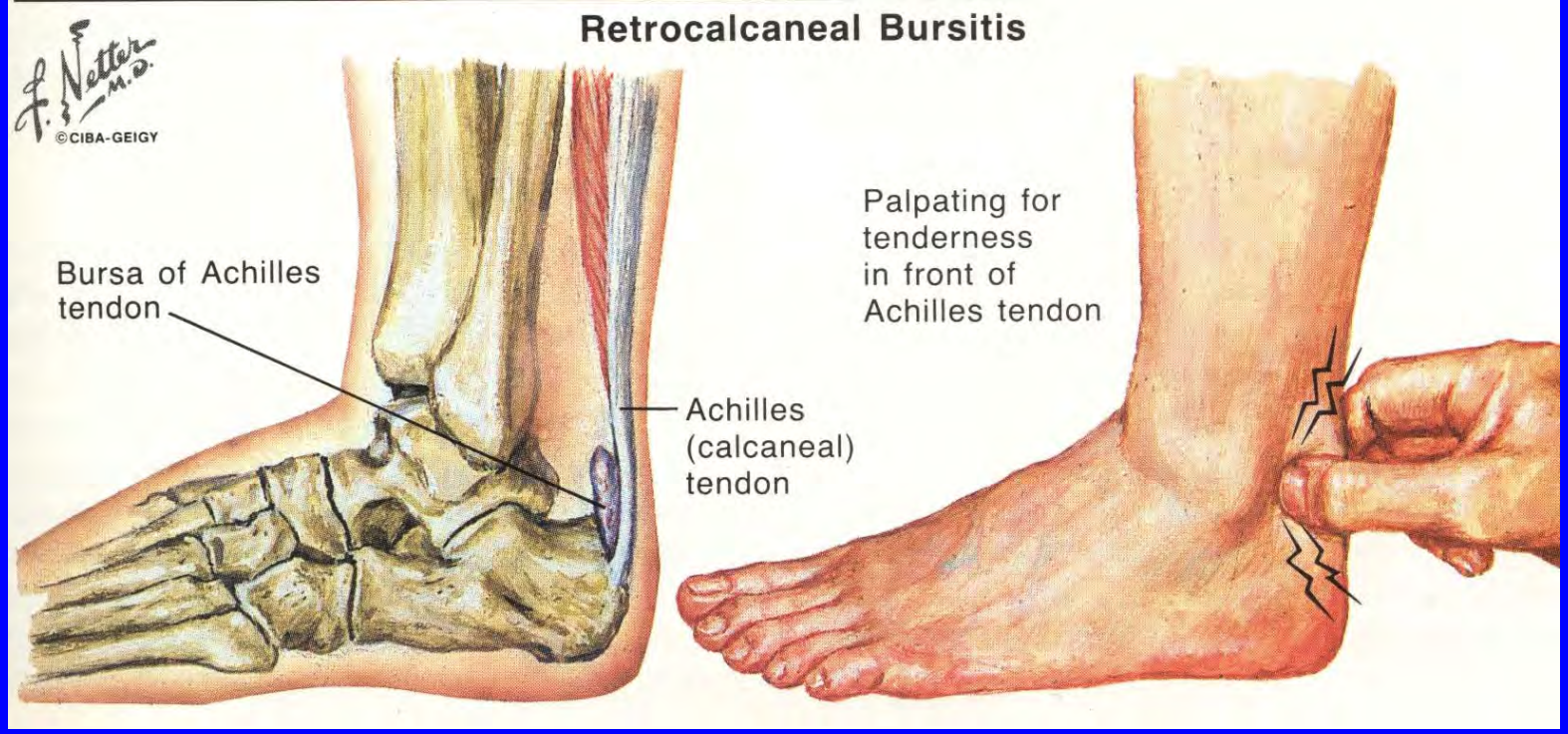
- Acute Achilles “Tendinosis”:
- History
- Symptoms and Signs
- Anti-inflammatory measures
- Preventative measures
- Further Investigations
- Chronic Achilles “Tendinosis”

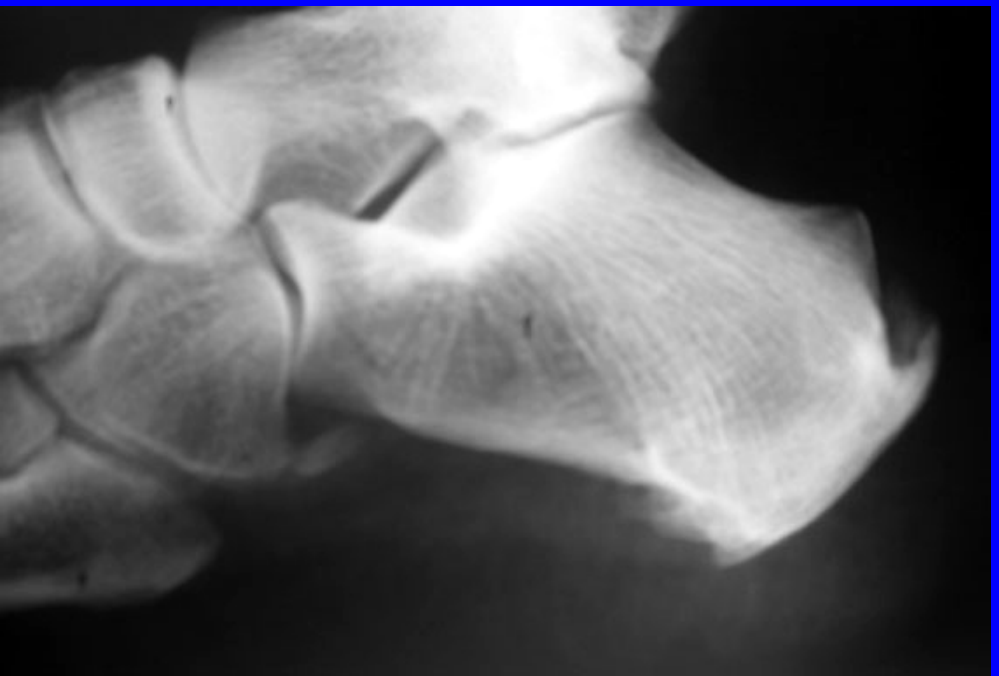


Degenerative partial tear

Retrocalcaneal / Retroachilles Bursitis

- **Etiology:**
  - Repetitive dorsiflexion/plantar flexion of the ankle with friction/traction exerted through the achilles tendon
  - Direct pressure
- **Pathology:**
  - Inflammation of the retrocalcaneal and/or retroachilles bursa
  - This may be with w/out callus formation “pump bump” (Hagelund def.)

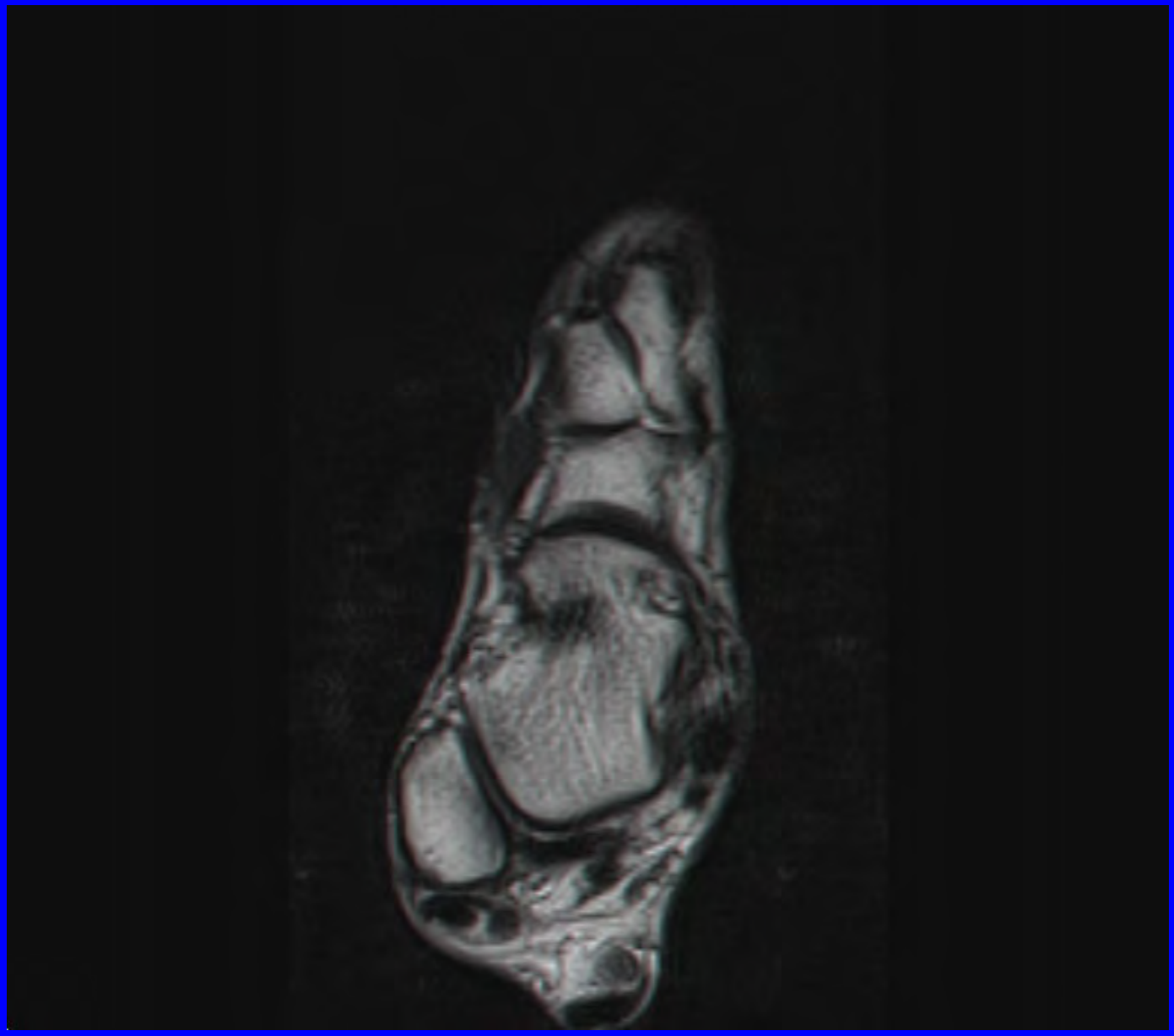




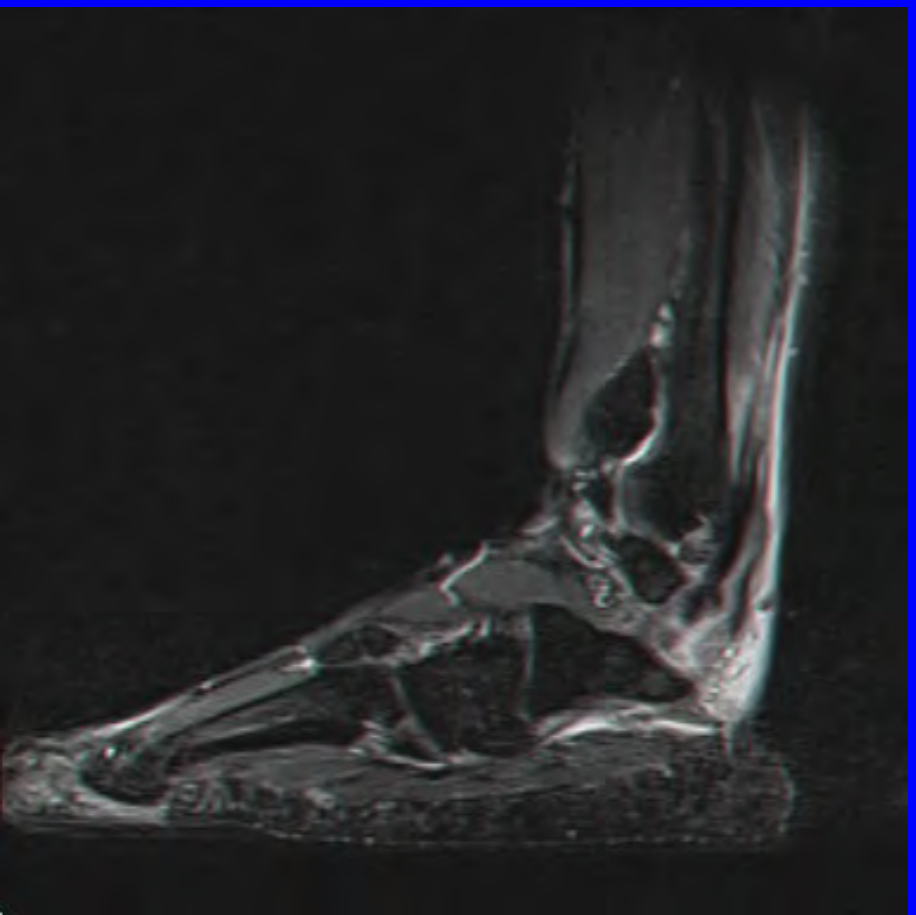
Haglund Deformity

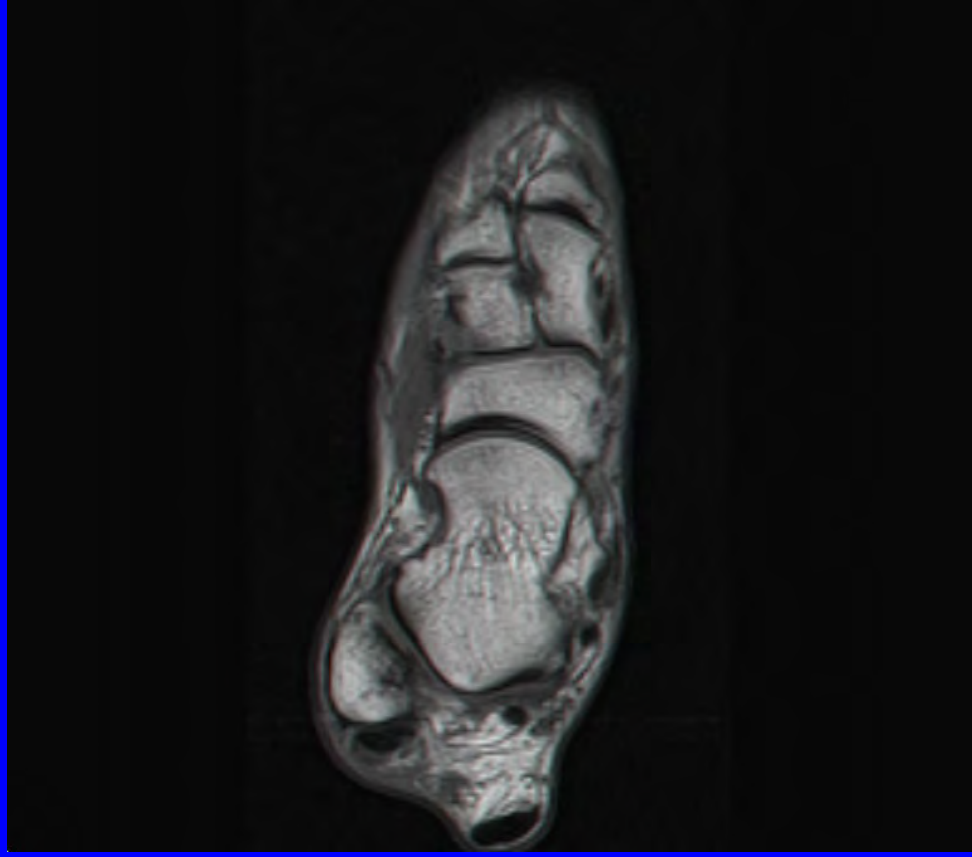
Case 1- Rec. sprain

Case 1



Case 1





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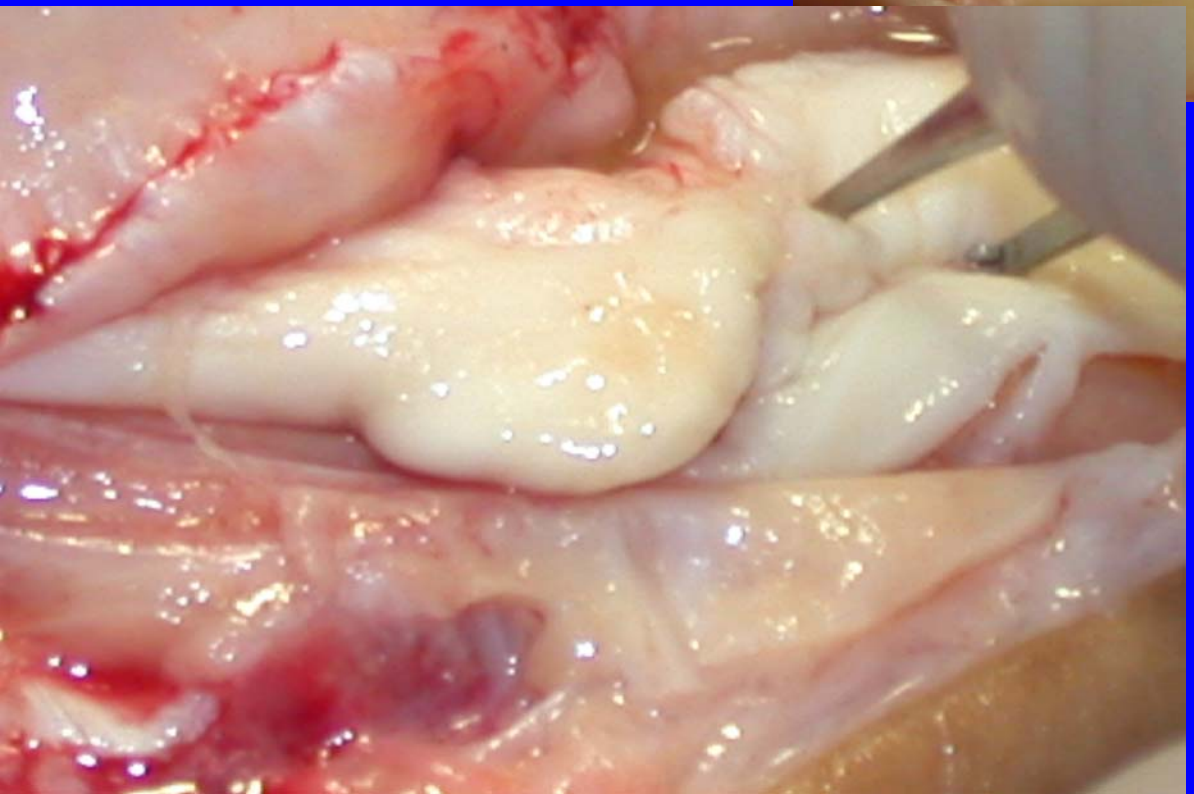
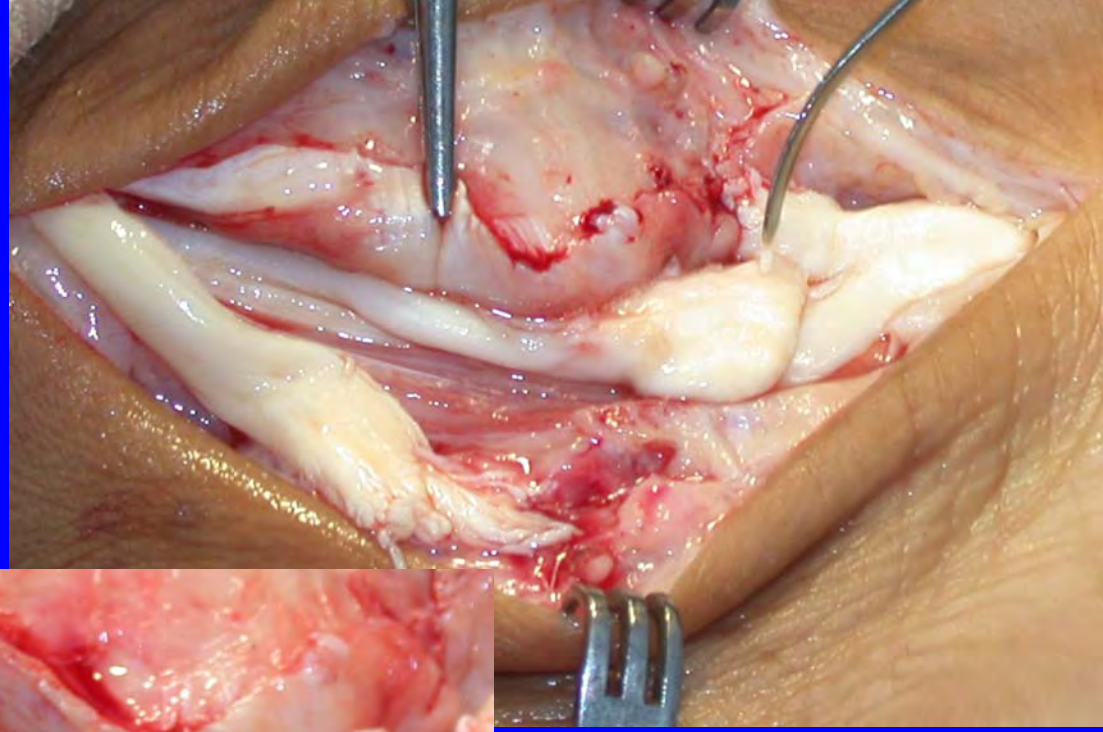
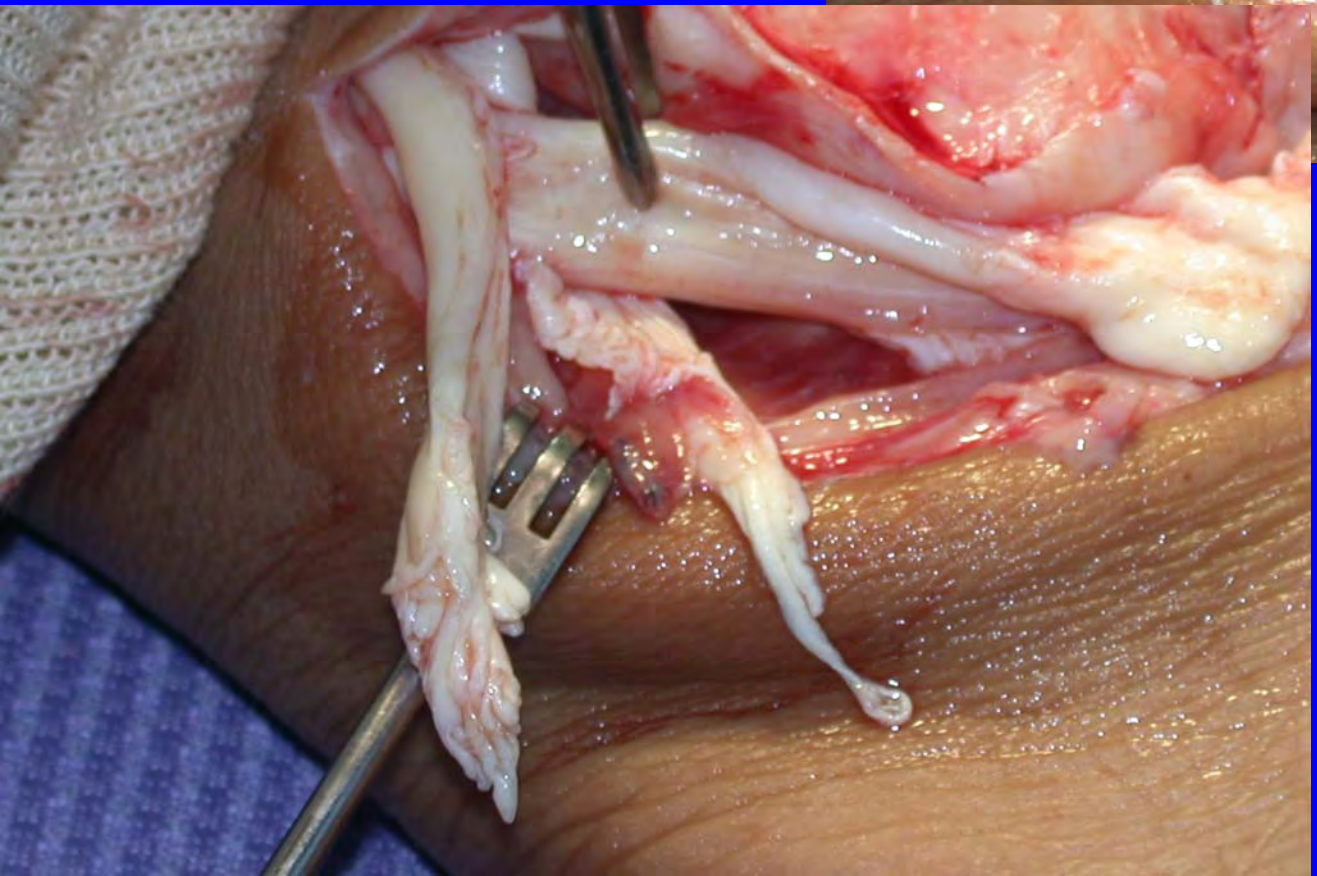


Case 1





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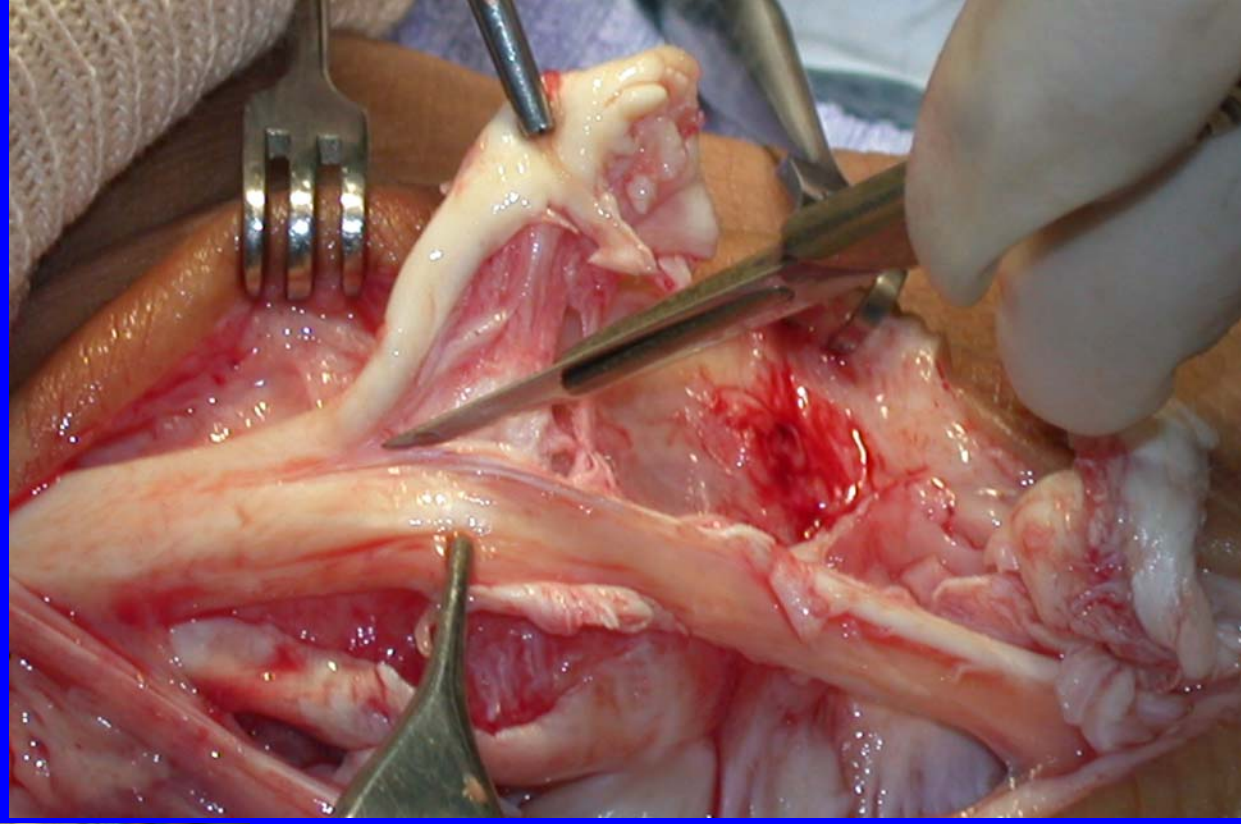

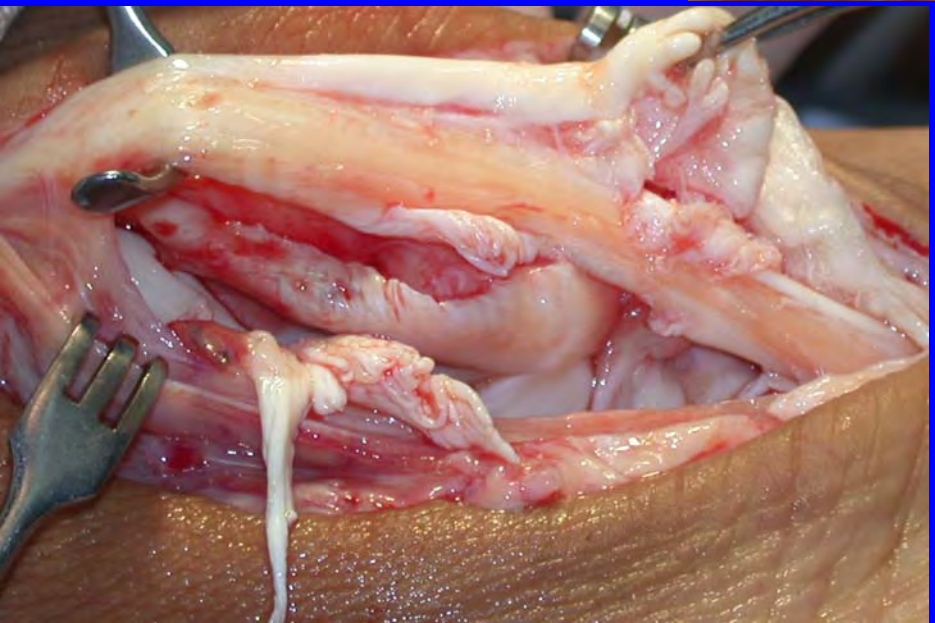

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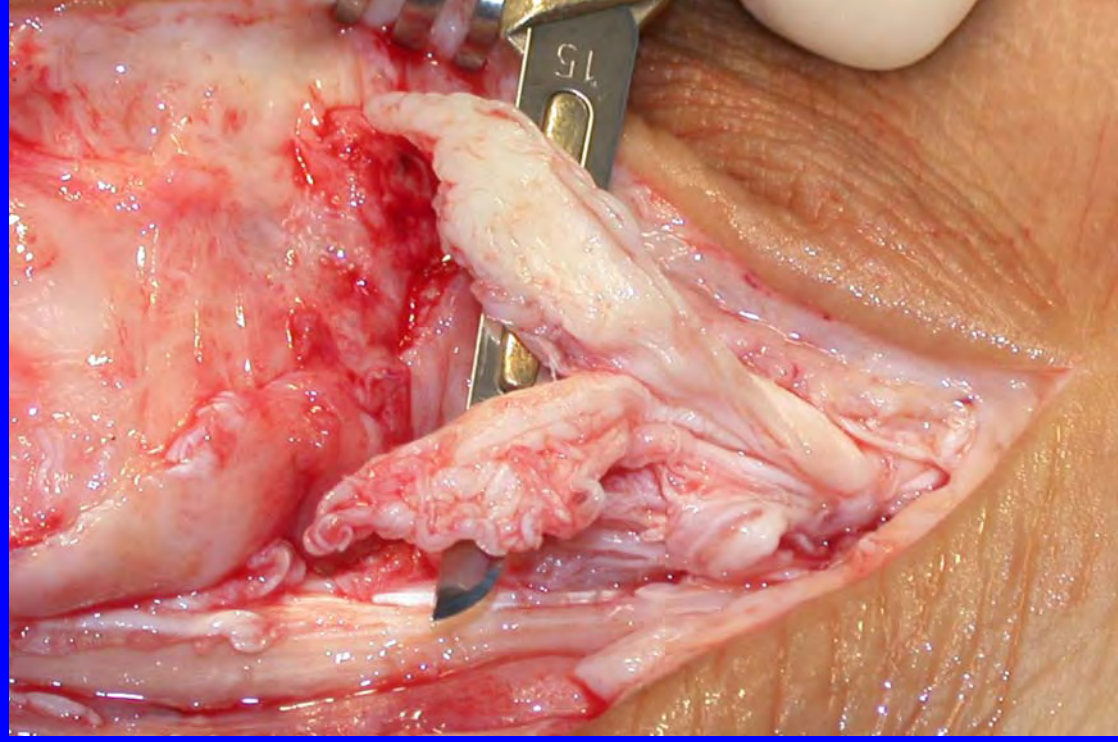
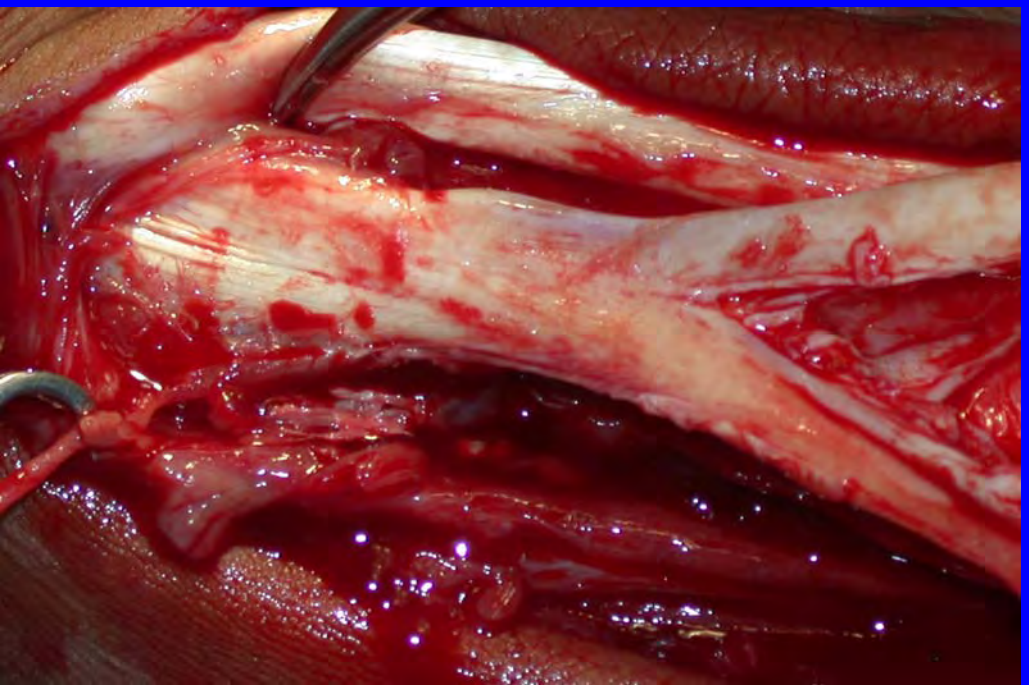
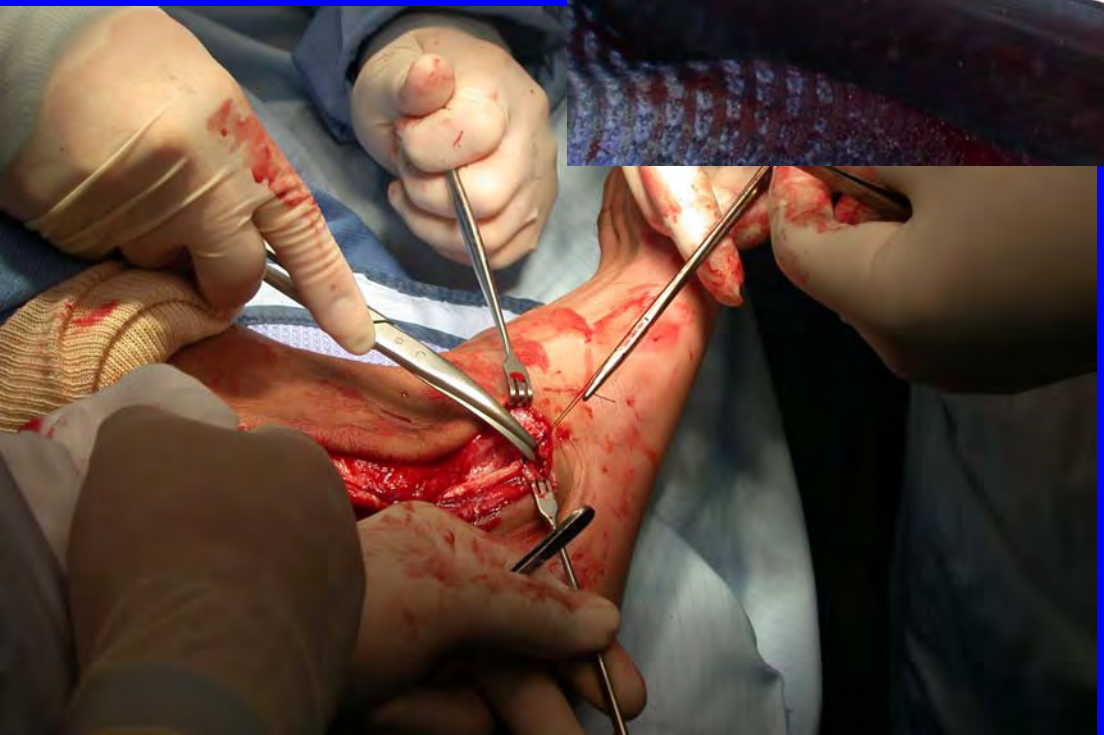
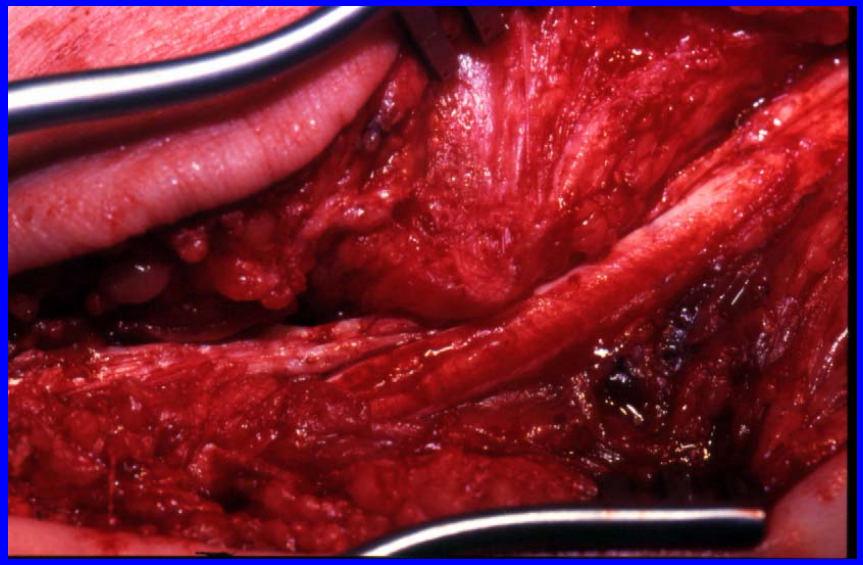
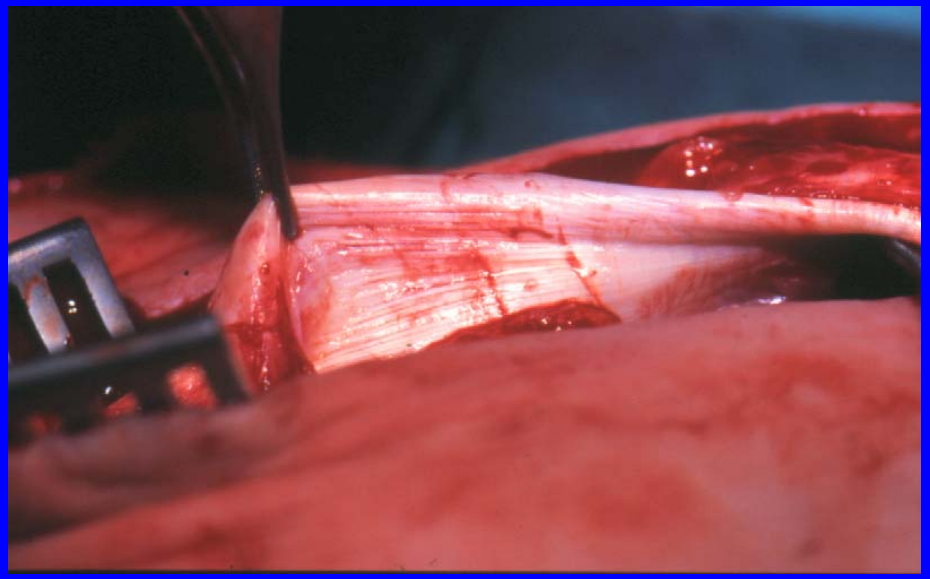


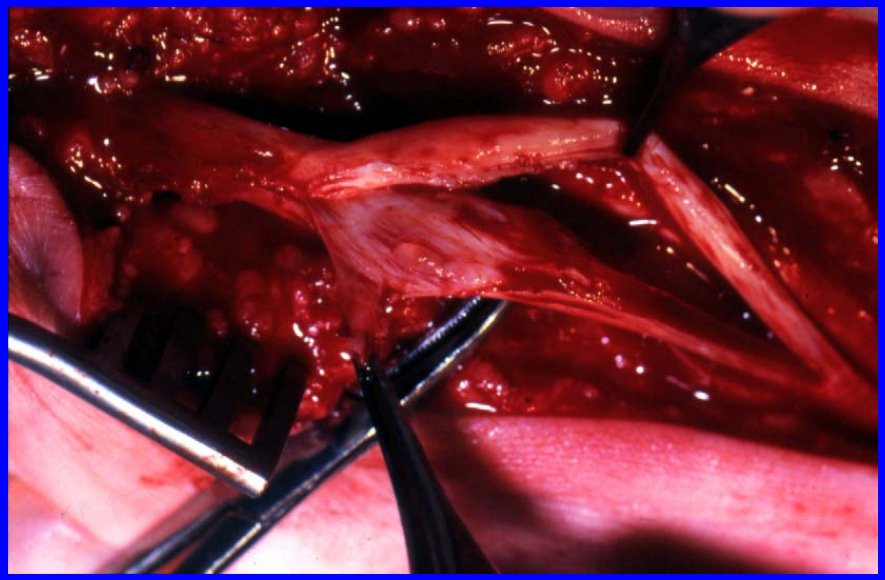


Case 1









Peroneal tendinosis (Chronic tear)

TALAR DOME FRACTURES

Symptoms:

locking, instability, weakness, discomfort

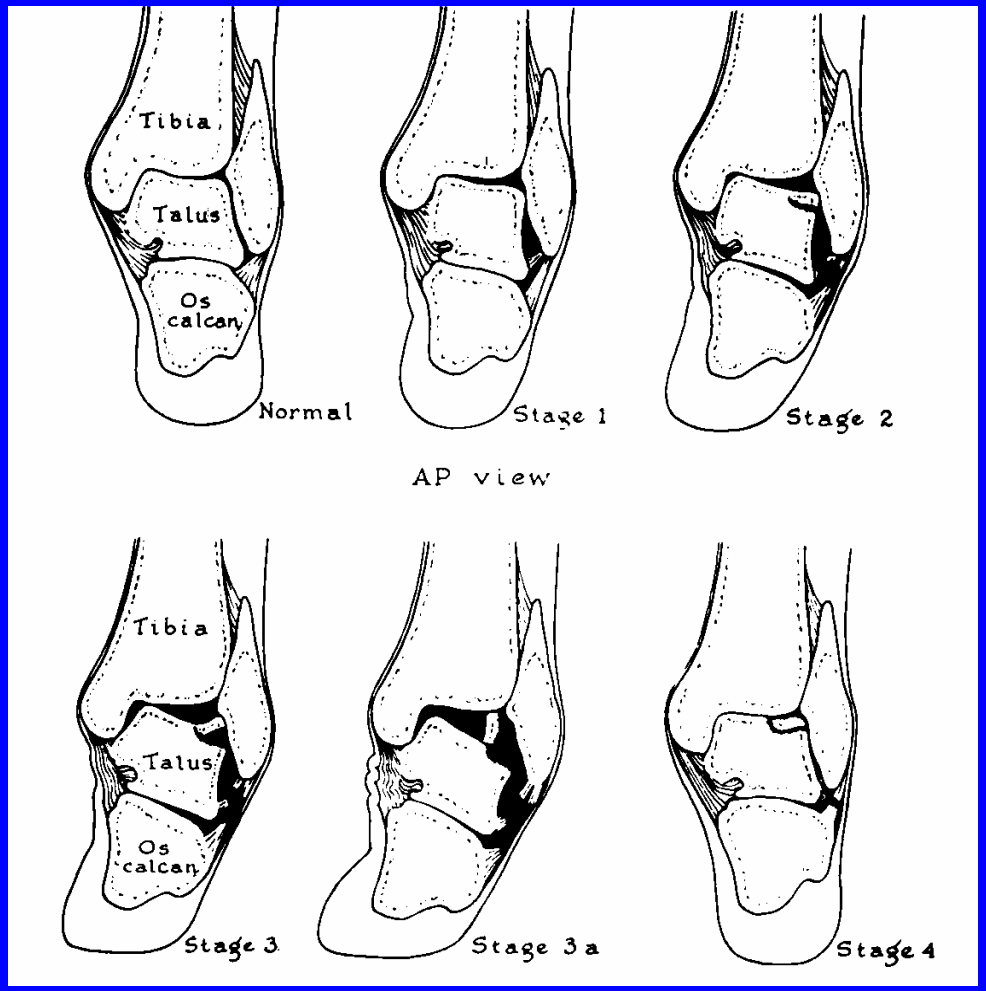
Diagnosis:

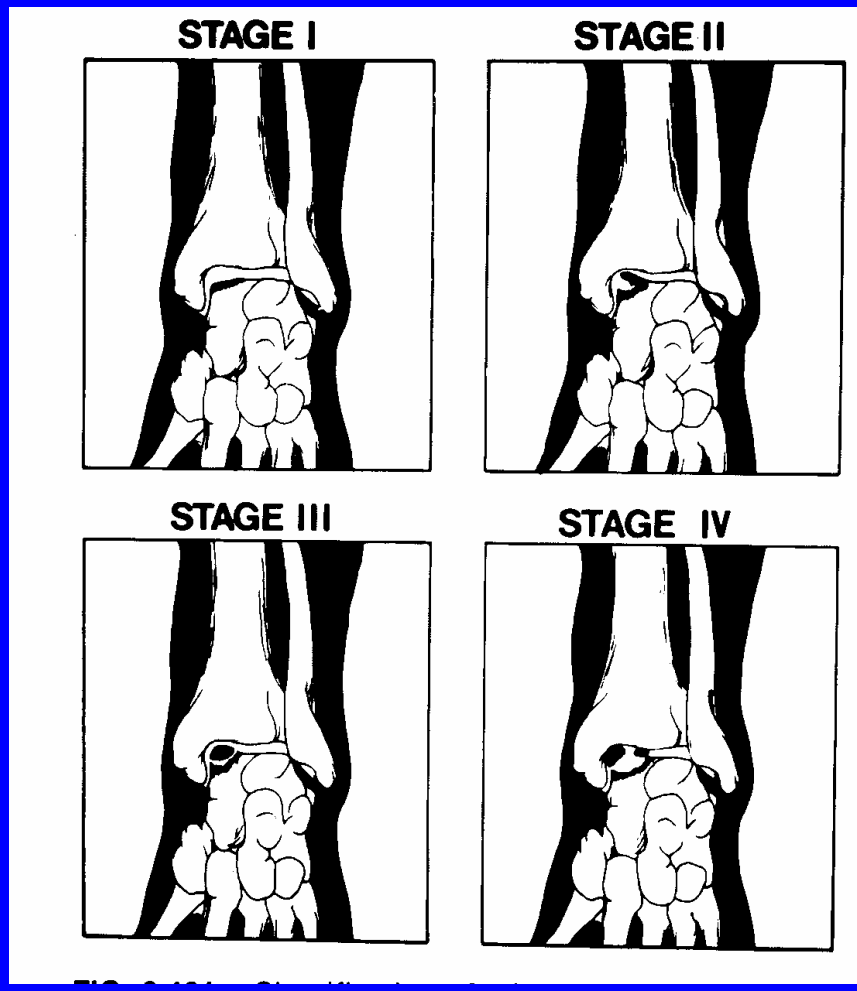
x-rays in 6 weeks, bone scan, MRI scan

Treatment:

removal of loose body and defect curettage

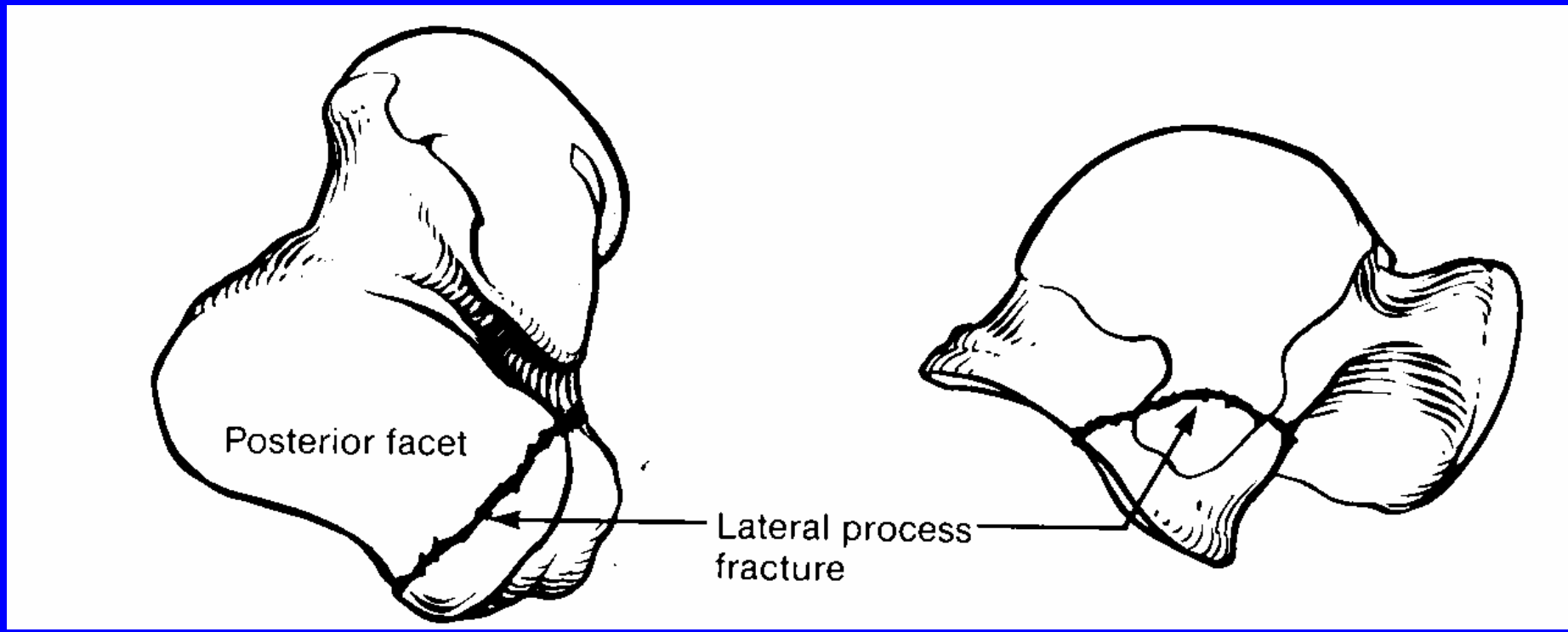
Talar osteochondral fractures



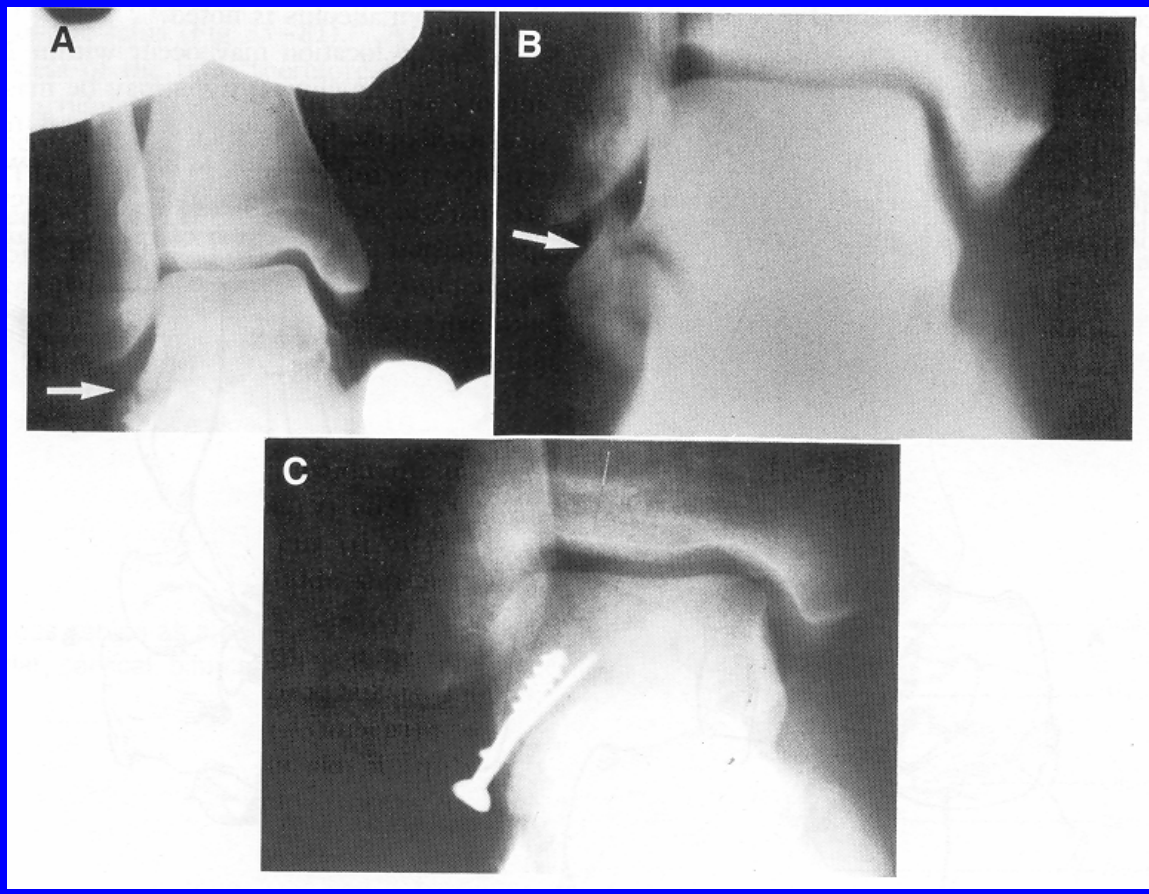


Talar osteochondral fractures

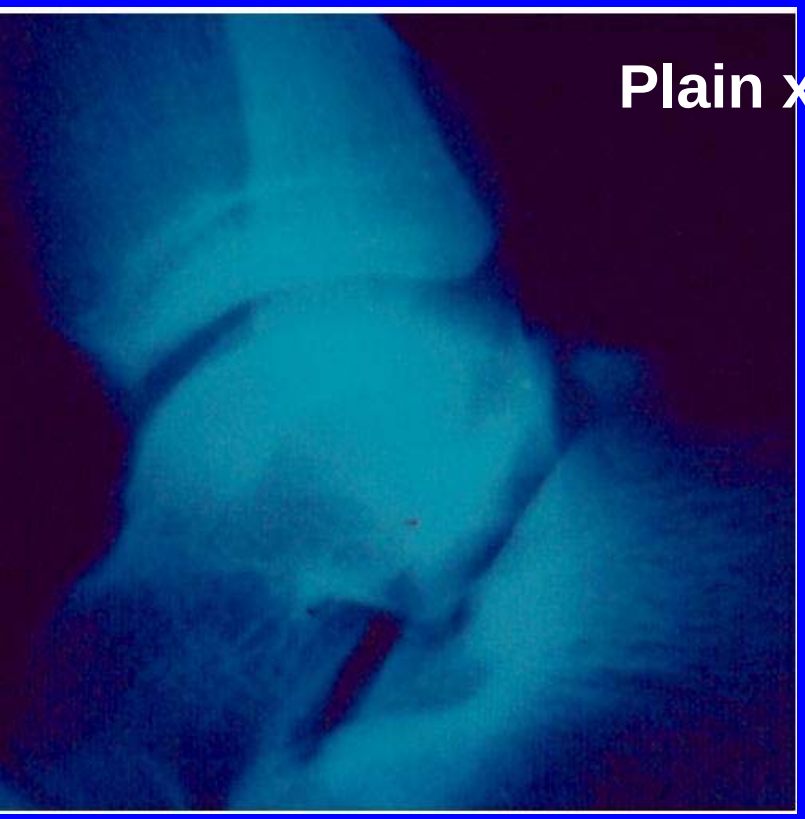
Fractures of Lateral Process of the talus



Fractures of Lateral Process of the talus

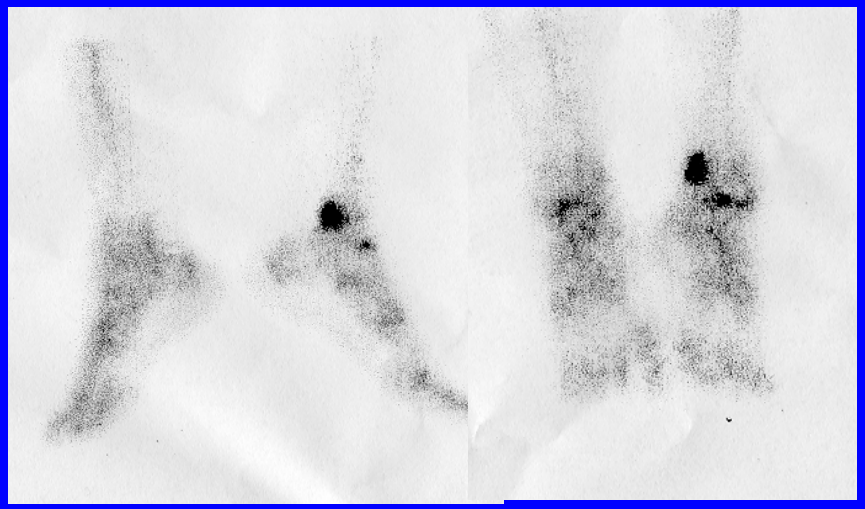


Os Trigon Fracture

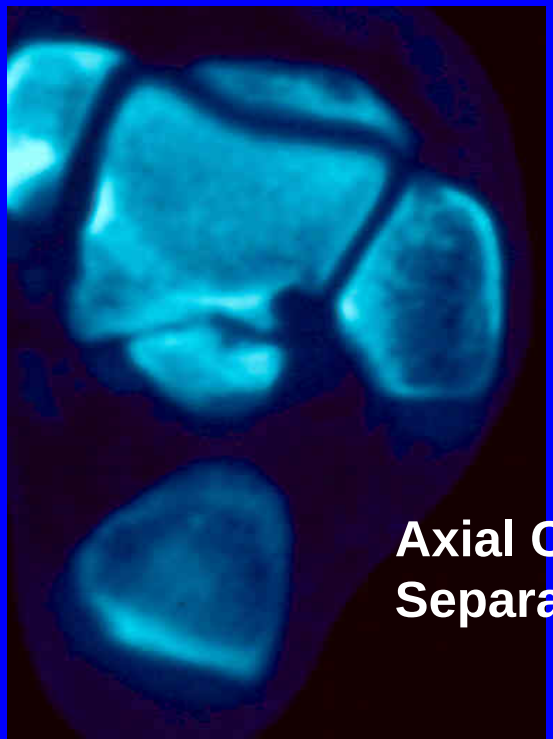


Plain x ray

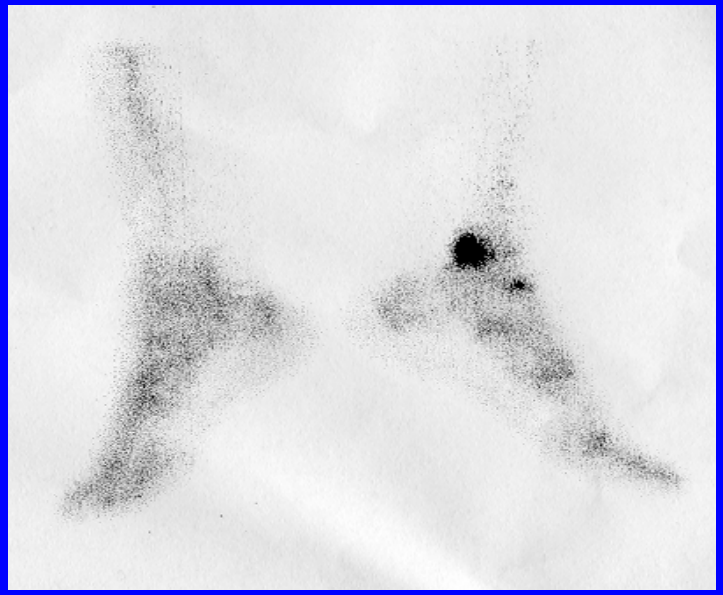
Bone Scan- Increased uptake posterior talus

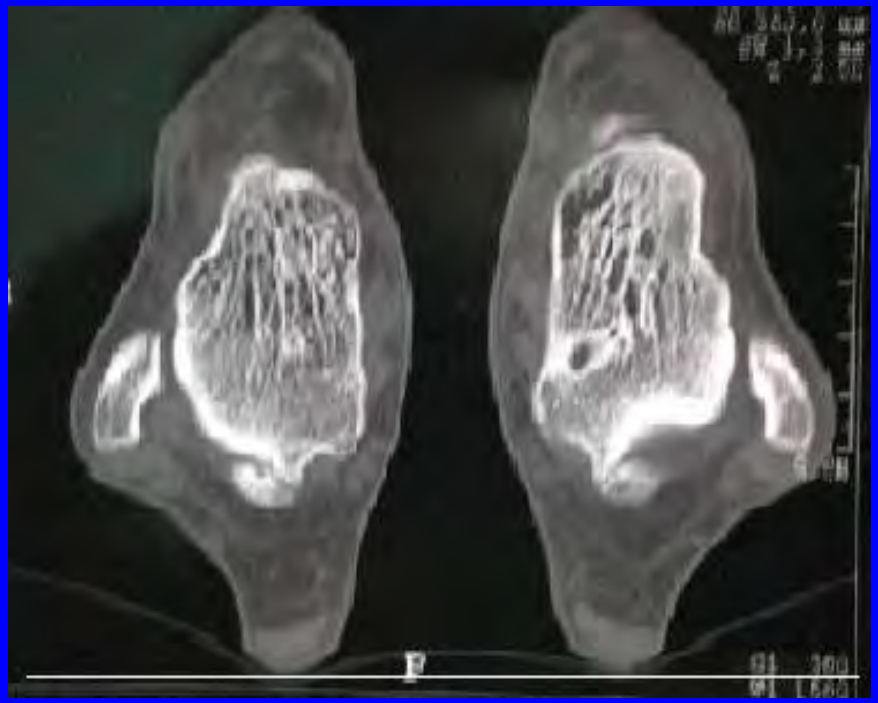


Imaging of The Os-Trigon



Axial CT- Complete Separation, Deg. Changes





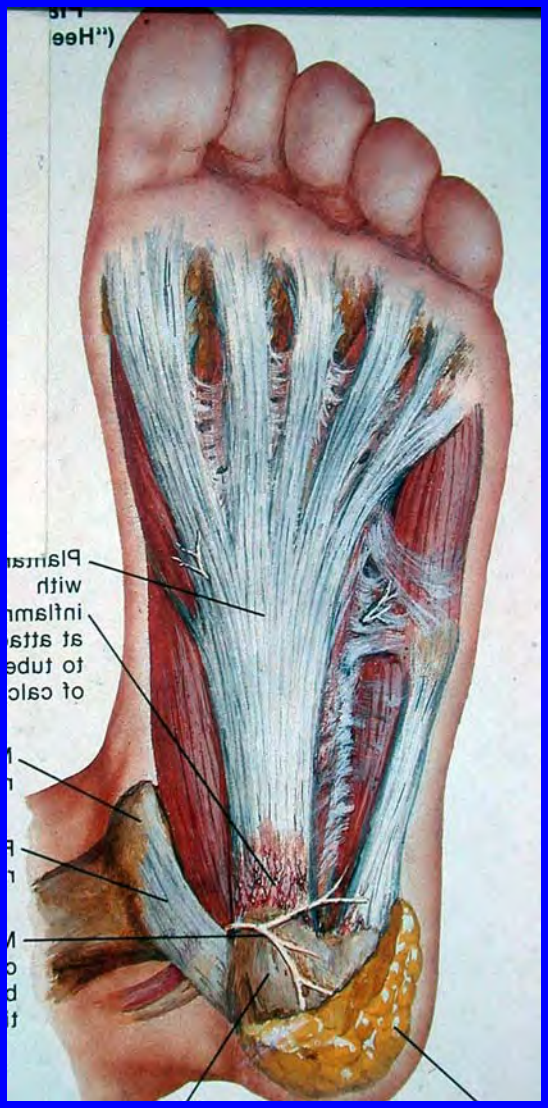
Inflammatory conditions- plantar fasciitis

- **Clinical**- obese women, runners, or seronegative arthritis w/ heel pain
- **Etiology**- chronic, repetitive stress or inflammation
- **Pathology**- tears, myxoid degeneration, inflammation
- **MRI**- thickened w/ high signal (T1, T2) at calcaneal attachment

  - perifasciitis (edema around thickened fascia)

  - marrow edema/erosions, plantar aspect of calcaneal tuberosity

Plantar Faciitis



Clinical presentation

Night pain
First step pain
Anteromedial pain and tenderness

Pes Cavus

Tethered cord-

Diastematomyelia, intradural lipoma, Tumors

Muscle imbalance-

Polio, MMC, CP, Friedrich's ataxia, Charcot Marie Tooth

Pes Plano valgus

Tibialis Posterior Dysfuction
Tarsal coalition
Midfoot Diabetic Charcot
Trauma- Lisfranc fracture dislocation
Muscle imbalance- MMC

Tibialis Posterior Dysfunction

Clinical Presentation

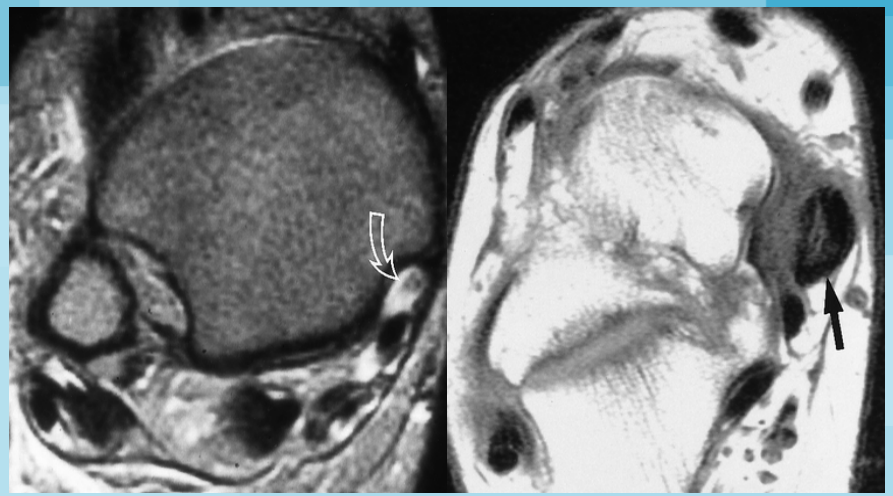
Medial ankle and Midfoot pain
Medial ankle and Midfoot Swelling
Pes Planus
Calcaneovalgus
Forefoot abduction

Tibialis Posterior Dysfunction

Too many toes sign

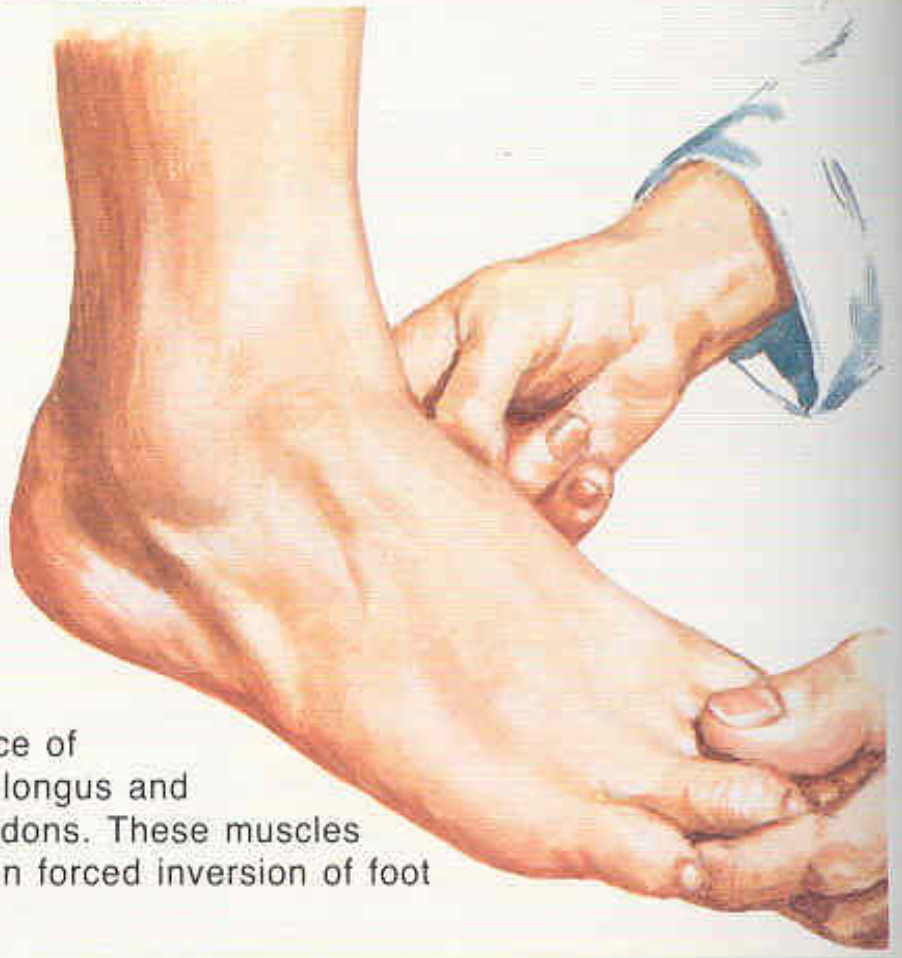
Unable single heel rise test

Complete vs partial tear of the P.T. tendon



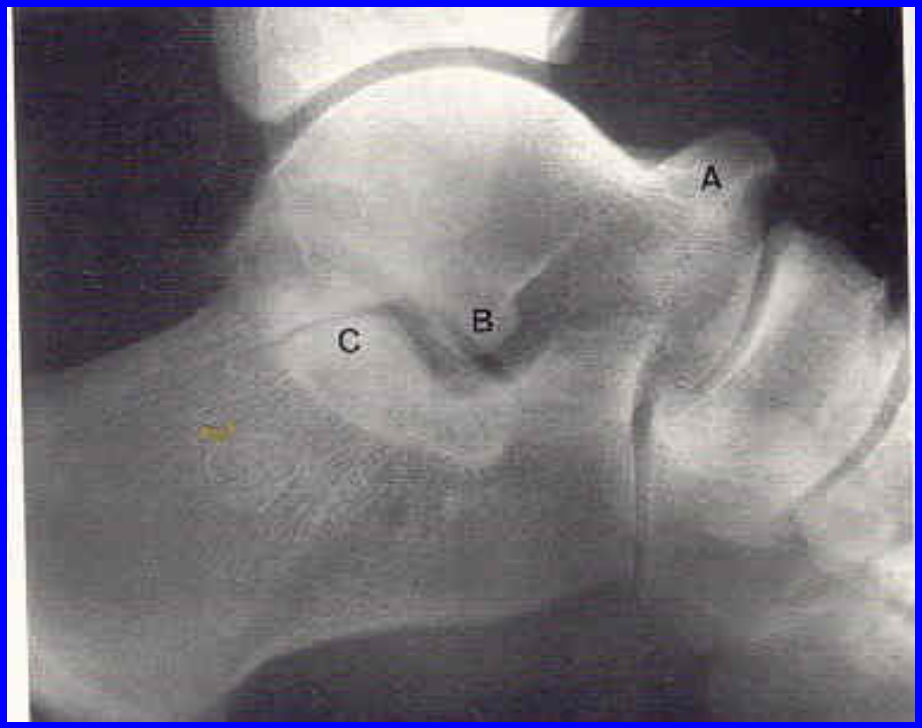
Tarsal Coalition

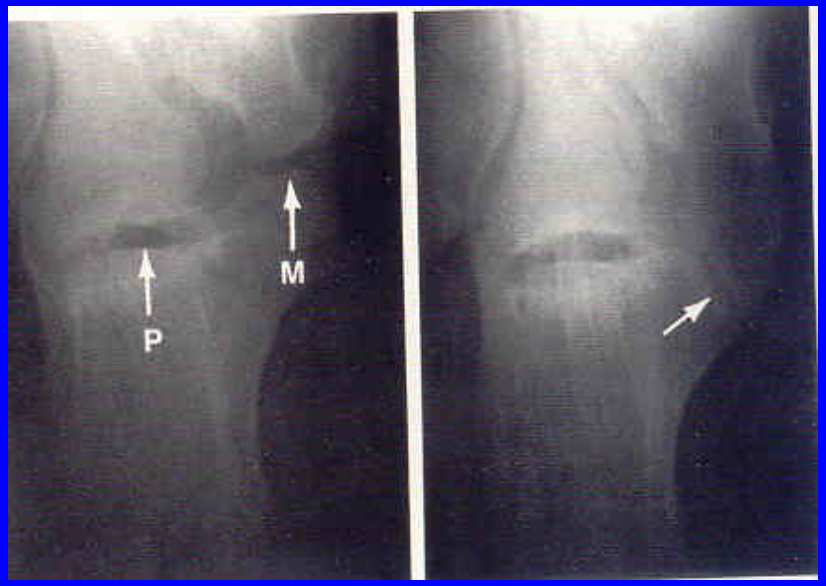
Rigid, painful flatfoot (pes planus) with hind part of foot in valgus position, characteristic of tarsal coalition



Prominence of peroneus longus and brevis tendons. These muscles contract on forced inversion of foot

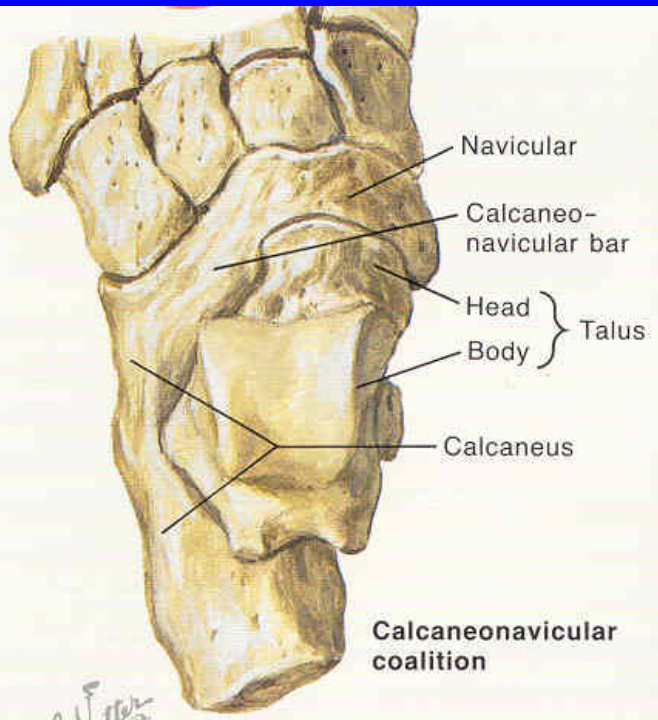
Talocalcaneal coalition (medial facet)





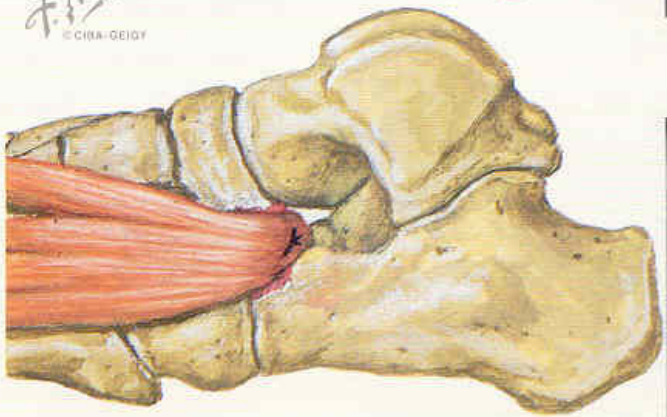
Talocalcaneal coalition (medial facet)

Calcaneonavicular coalition



Solid, bony calcaneonavicular coalition evident on oblique radiograph

Cartilaginous calcaneonavicular coalition visible but poorly defined on lateral radiograph

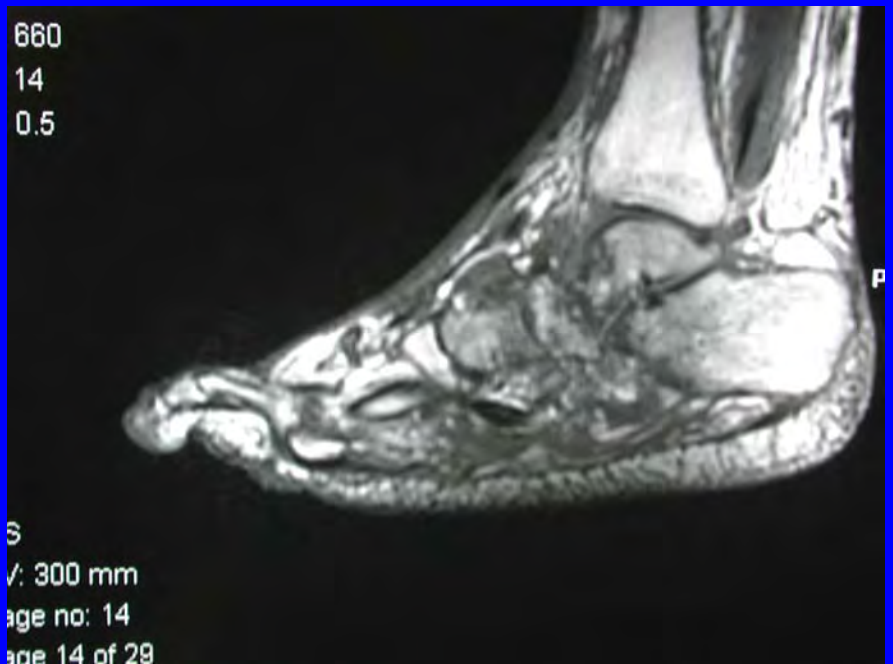


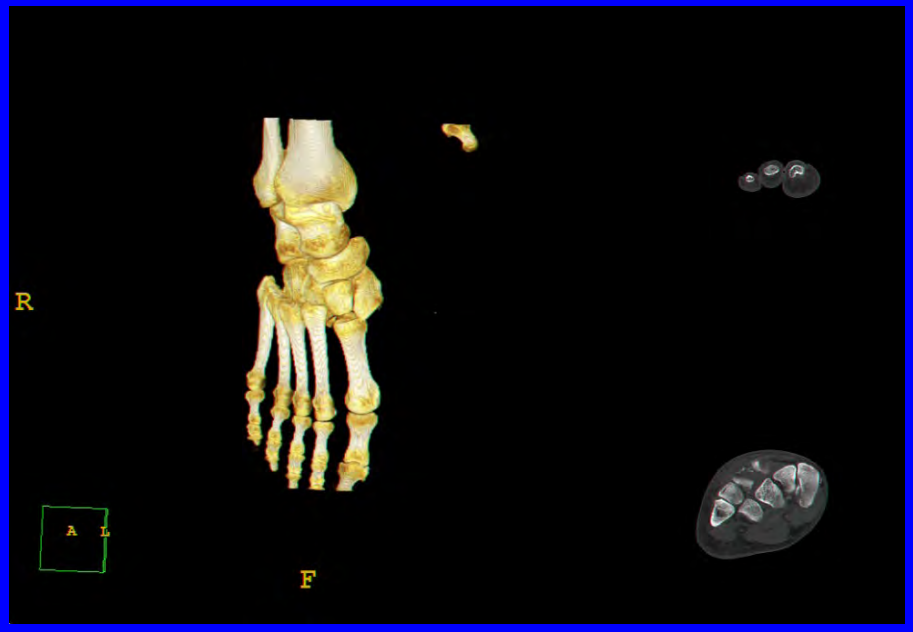
Calcaneonavicular bar resected and extensor digitorum brevis muscle interposed to prevent reformation of coalition

Postoperative radiograph

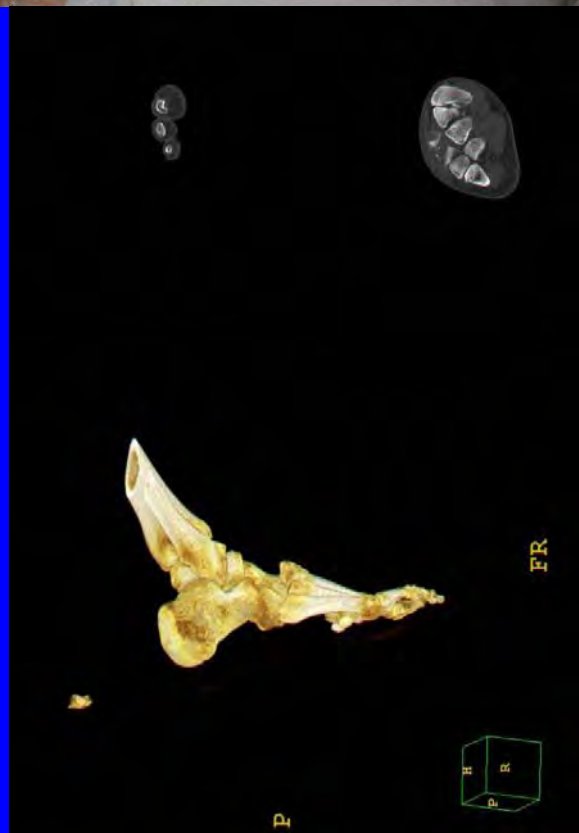
Charcot Mid-foot collapse

Mid foot Charcot





LisFranc # Dis.



Calc

Calc

Hallux Valgus Deformity

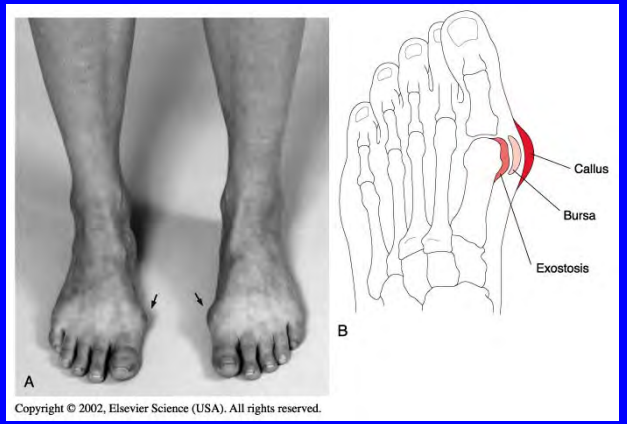
Hallux Valgus

- Great toe deviated laterally at MTP joint and pronated
- First metatarsal is deviated medially
- Long flexor and extensor muscles have bowstring effect as they are displaced to the lateral side of the joint
- Callus develops over medial side of the head of the metatarsal bone, bursa becomes thickened and inflamed – bunion
- Development of OA of MTP joint secondary to malalignment

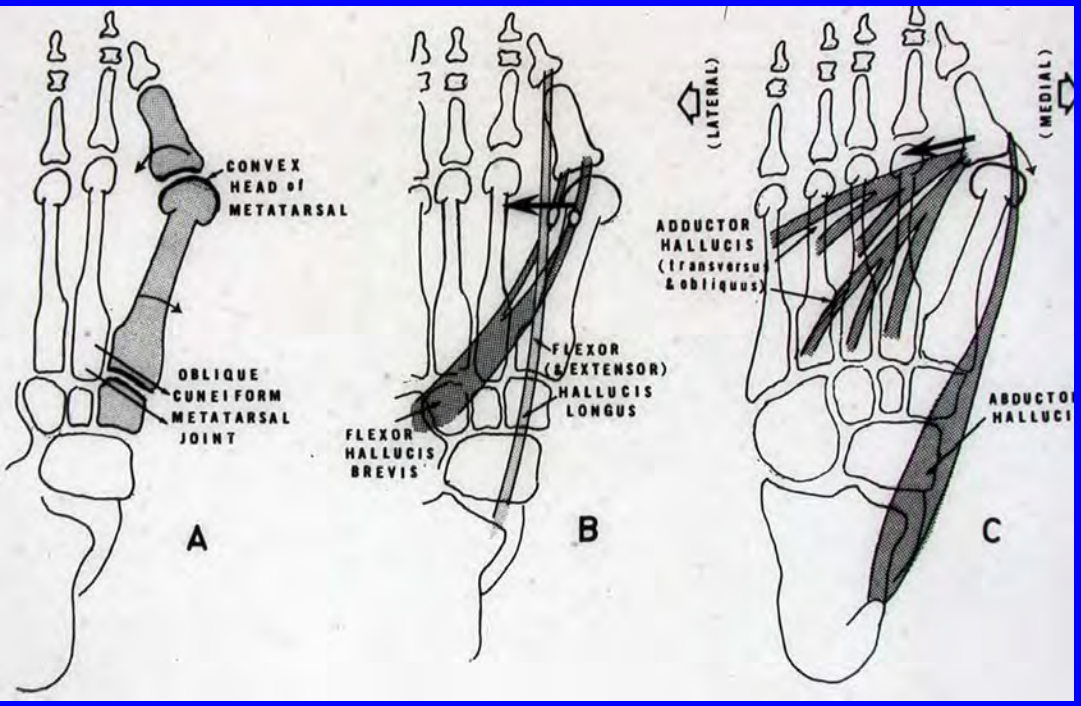
Hallux Valgus Deformity

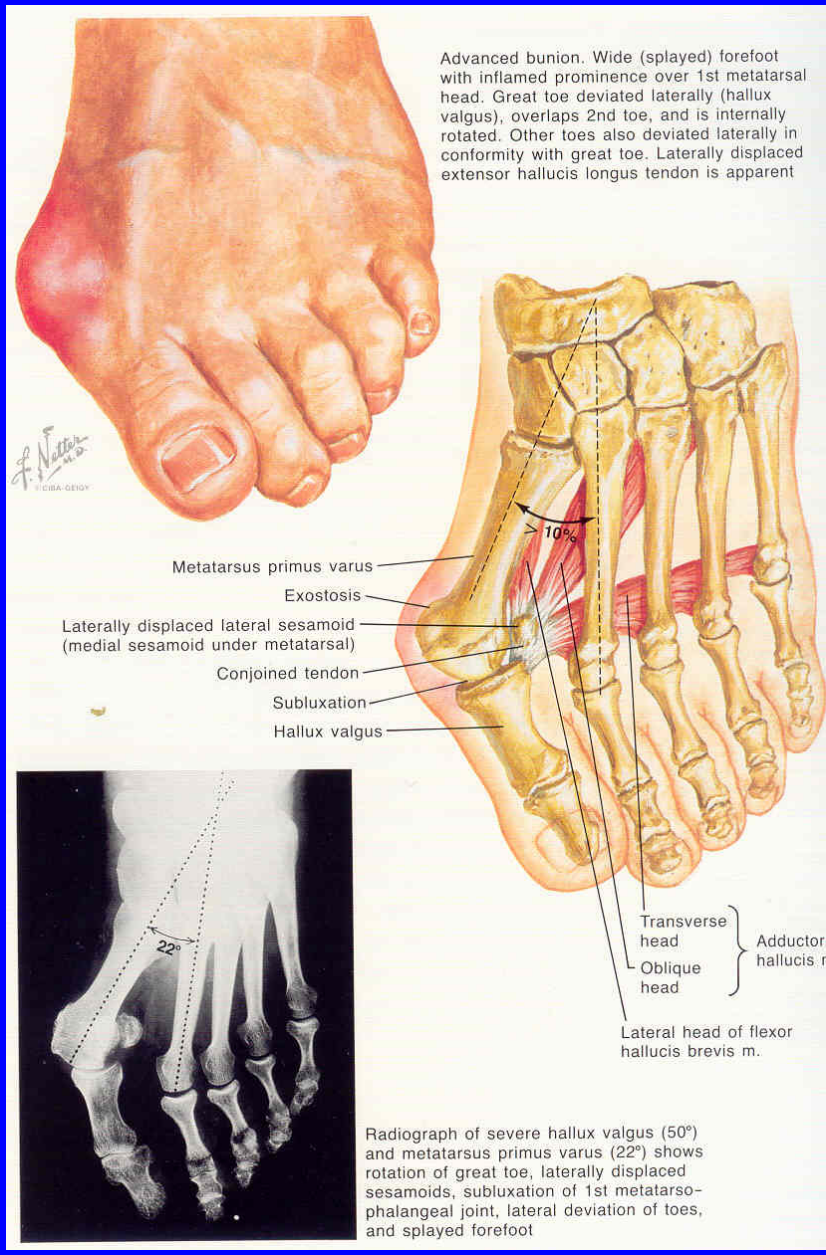
Causes

- Hypermobility of first MT
- Forefoot adductus (congenital)
- Excessive pronation of the forefoot
- RA
- Muscle imbalance

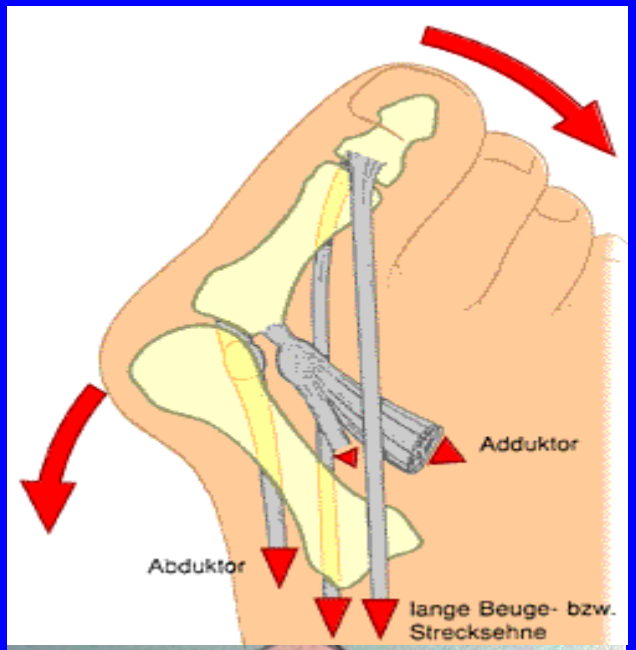


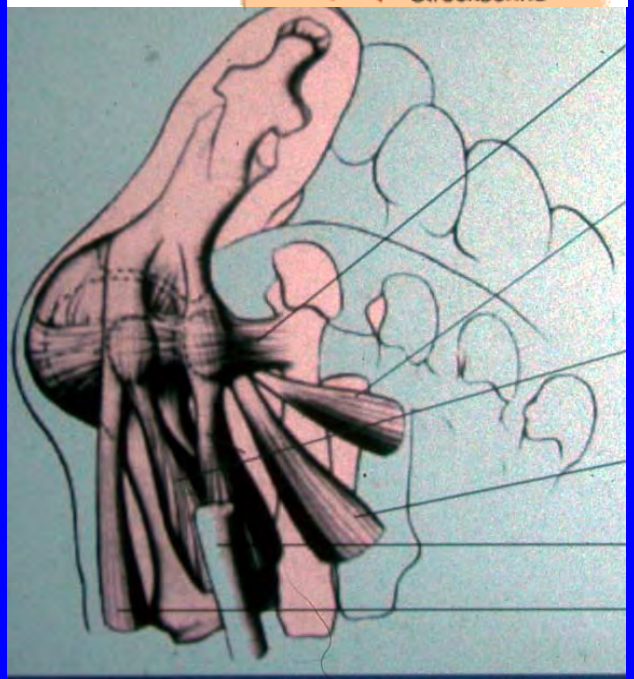
Hallux Valgus

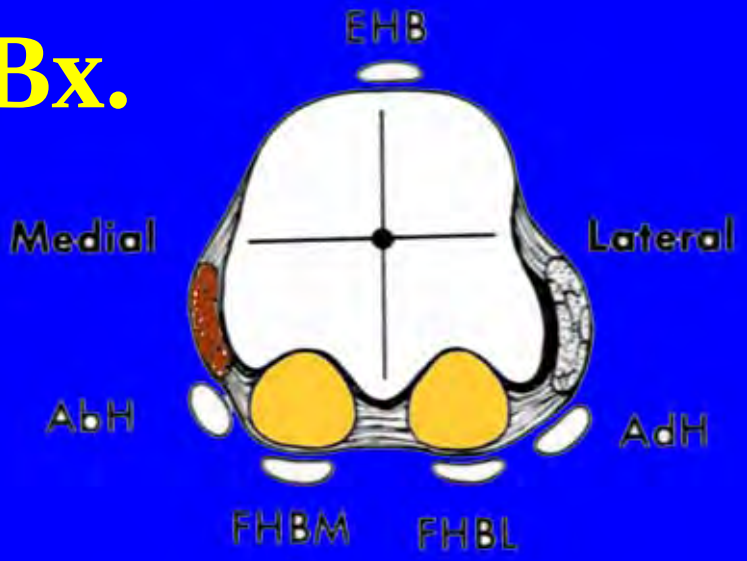


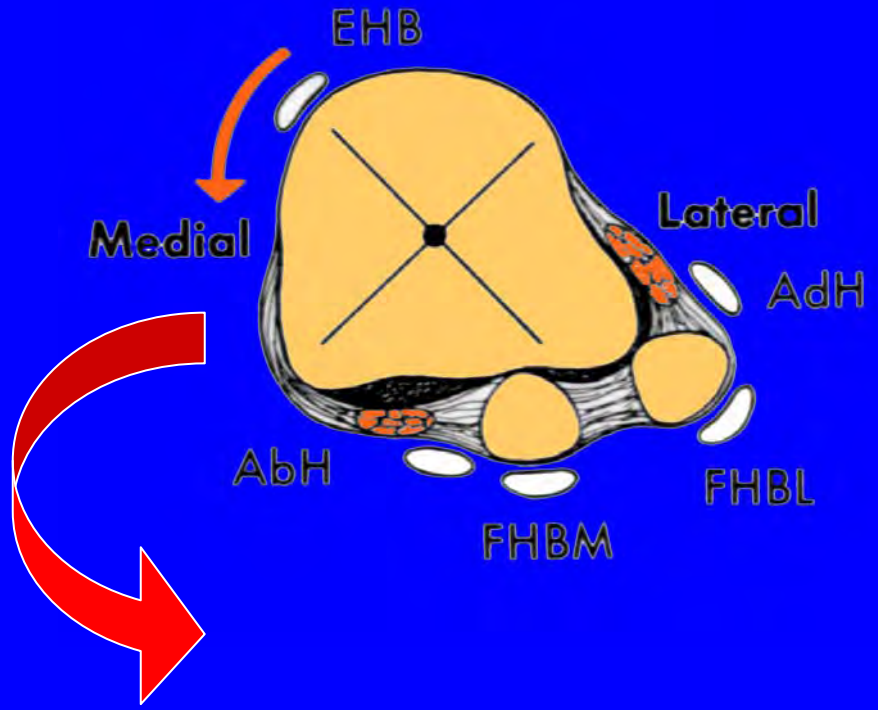


Hallux Valgus Bx.





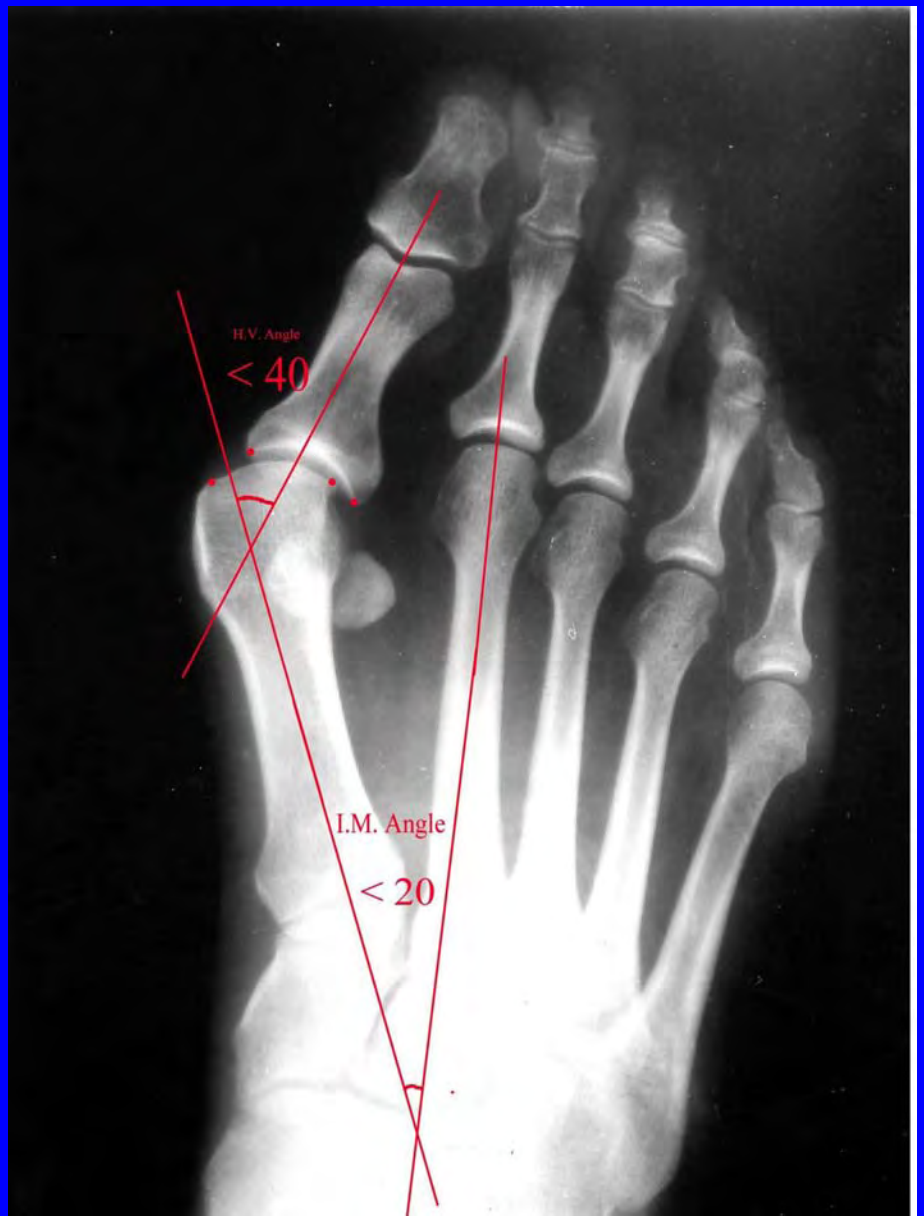


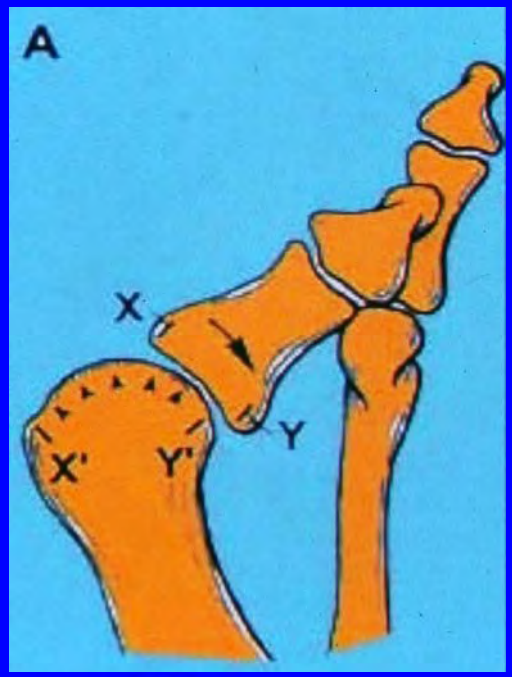


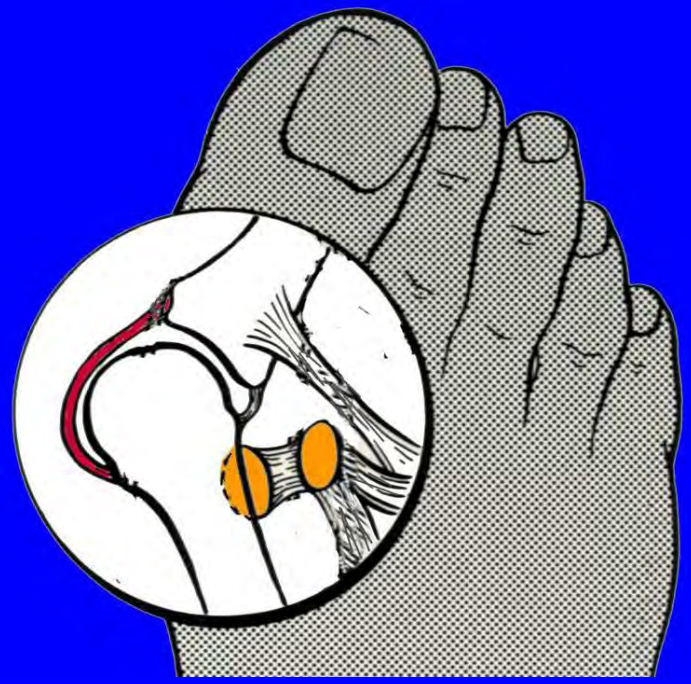
Main Deformities of Hallux-Valgus

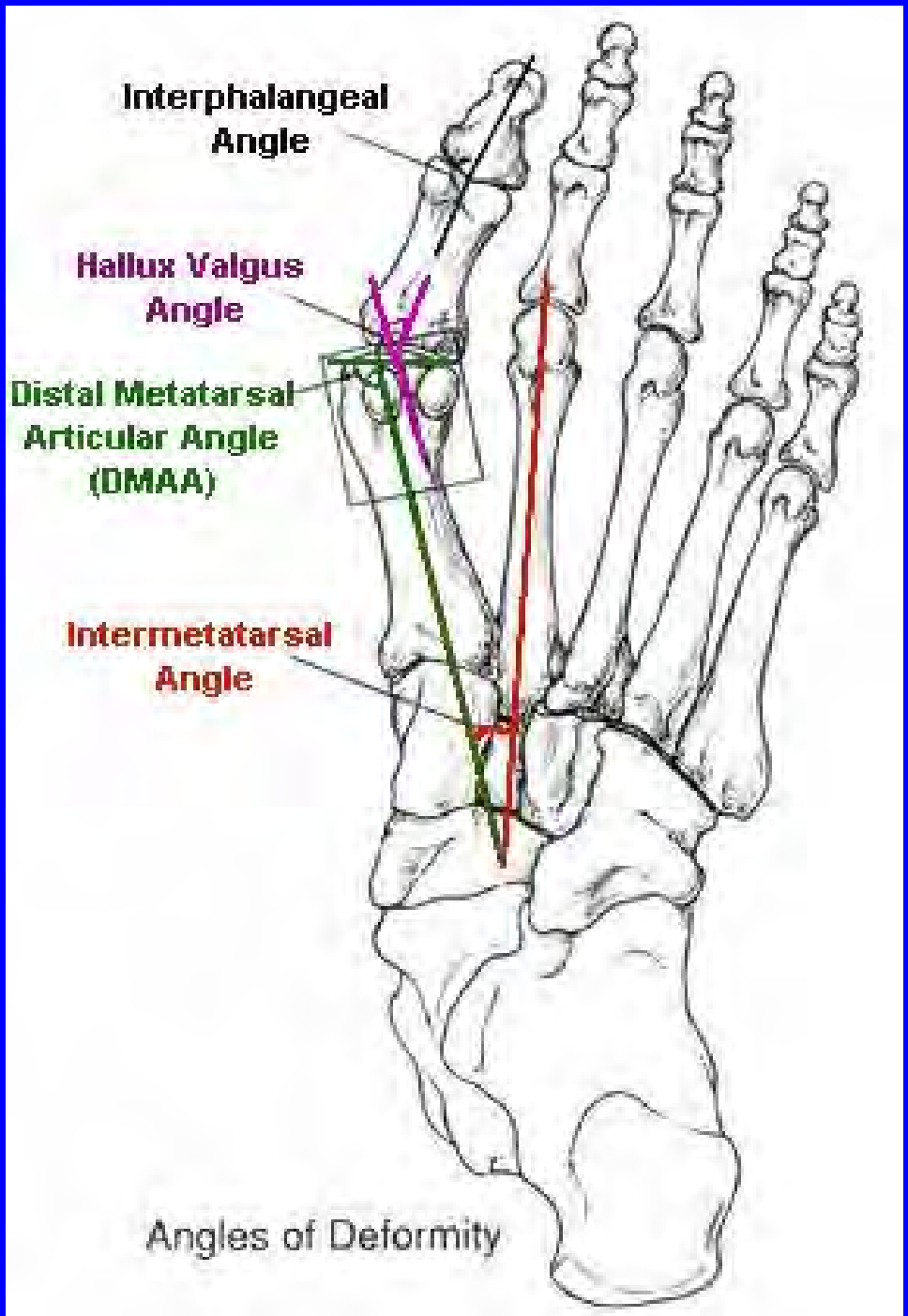
- Ist metatarsal Varus
- Lateral deviation of the hallux
- Pronation of the hallux
- Lateral inclination of the metatarsal head (DMAA)
- Pronation of the metatarsal head

Measurements- IM and HV angle Congruency, DMAA





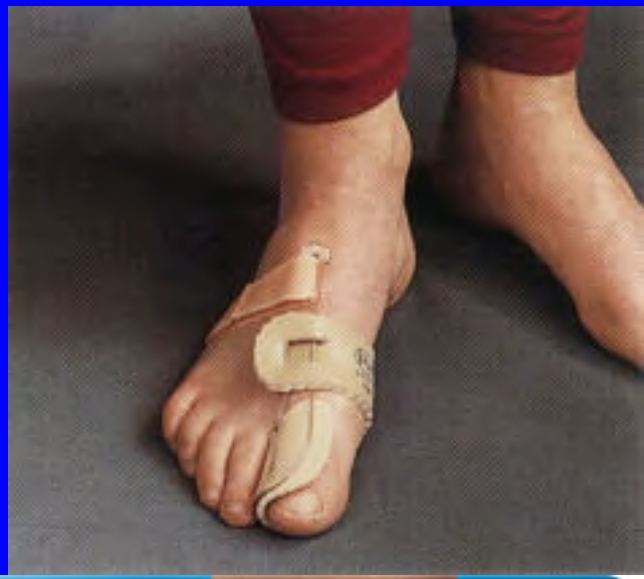



Interphalangeal Angle
Hallux Valgus Angle
Distal Metatarsal Articular Angle (DMAA)
Intermetatarsal Angle
Angles of Deformity

Treatment

- **Conservative – orthotics, toe wedge, custom made shoes, intrinsic exercises**
- **Surgical –osteotomy, arthrodesis, excision arthroplasty**

Conservative treatment

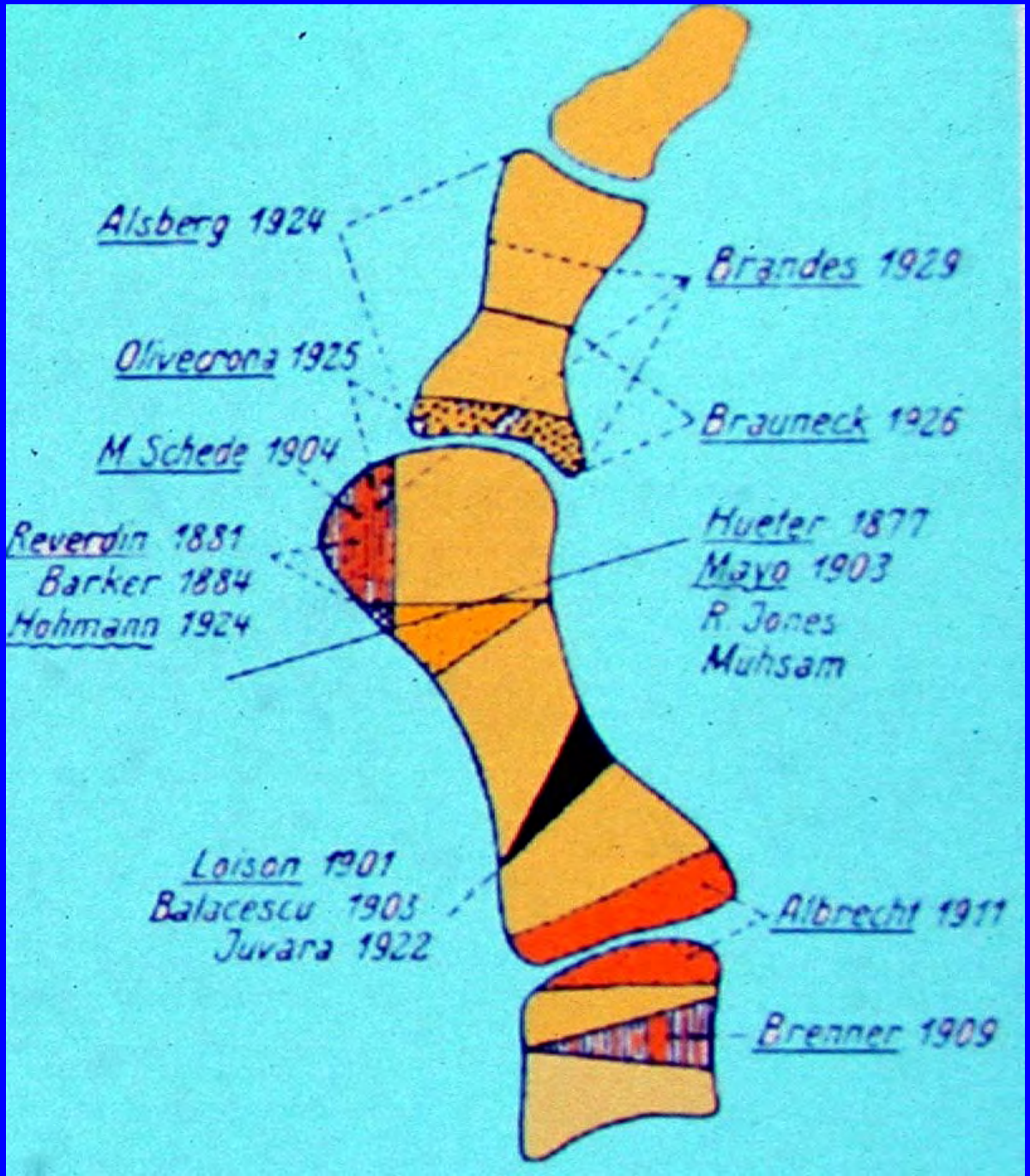


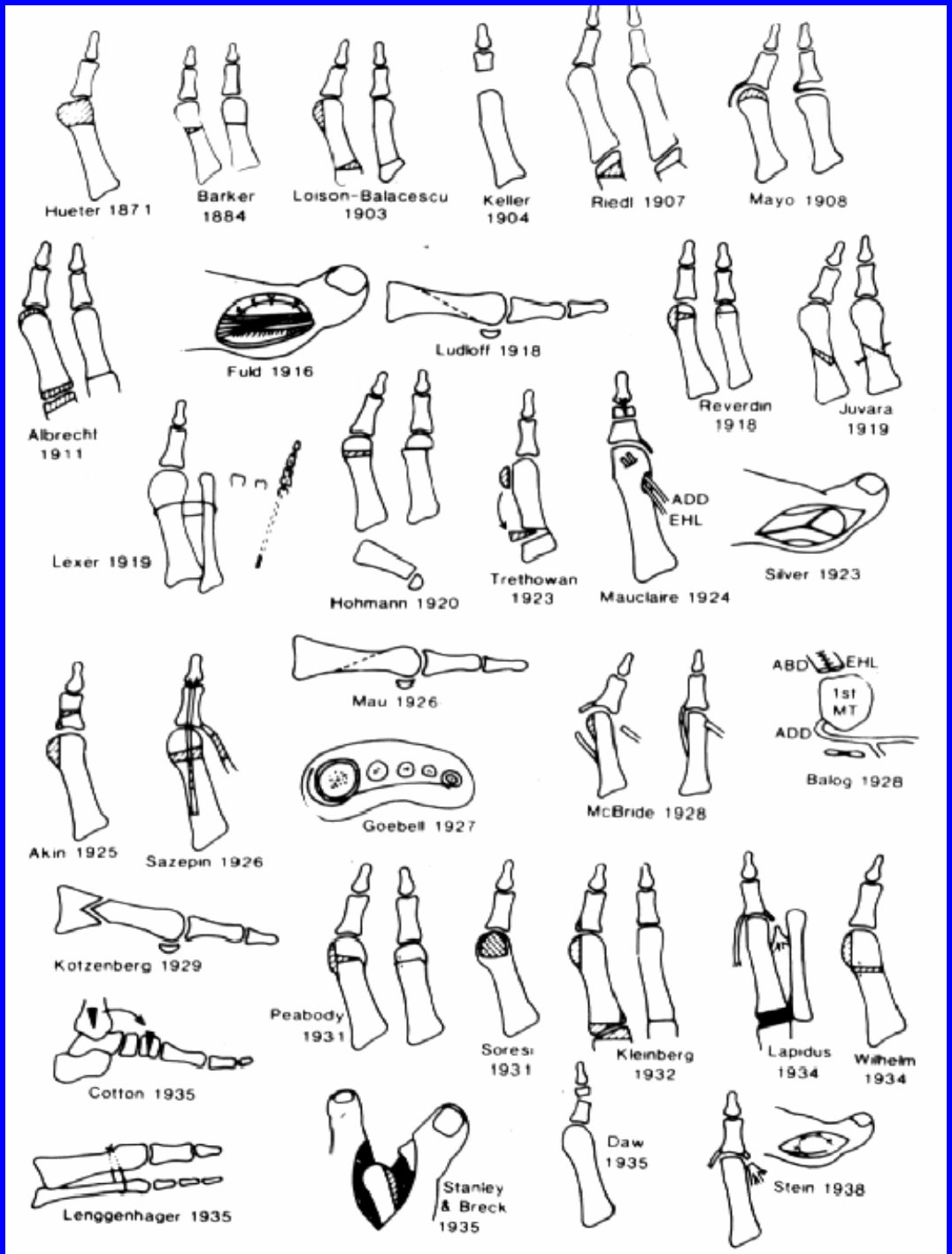
Ideal Osteotomy

- **Correction of I-II intermetatarsal angle**
- **Correction of valgus of the toe**
- **Avoiding shortening**
- **Avoiding elevation of the Ist. MT.**
- **Transfer metatarsalgia MT head II**

Ideal Osteotomy

- No evidence for Correction
- pronation of the toe
- No evidence for Correction
- pronation of the MT head.
- Minimal evidence for Correction
- of the DMAA


Alsberg 1924
Brandes 1929
Oliveorora 1925
Brauneck 1926
M Schede 1904
Reverdin 1881
Barker 1884
Hohmann 1924
Hueter 1877
Mayo 1903
R. Jones
Muhsam
Loison 1901
Balacescu 1903
Juvara 1922
Albrecht 1911
Brenner 1909


Hueter 1871
Barker 1884
Loison-Balacescu 1903
Keller 1904
Riedl 1907
Mayo 1908
Albrecht 1911
Fuld 1916
Ludloff 1918
Reverdin 1918
Juvara 1919
Lexer 1919
Hohmann 1920
Trethowan 1923
ADD
EHL
Mauclaire 1924
Silver 1923
Mau 1926
Akin 1925
Sazepin 1926
Goebell 1927
McBride 1928
ABD
EHL
1st MT
ADD
Balog 1928
Kotzenberg 1929
Peabody 1931
Soresi 1931
Kleinberg 1932
Lapidus 1934
Wilhelm 1934
Cotton 1935
Lenggenhager 1935
Stanley & Breck 1935
Daw 1935
Stein 1938

Types of Ist. MT. Osteotomies

- **Distal osteotomies**

  Chevron, Mitchell, Wilson

- **Proximal osteotomies- Crescentic, Closing wedge, Chevron, Ludloff, Scarf**

Types of Ist. MT. Osteotomies

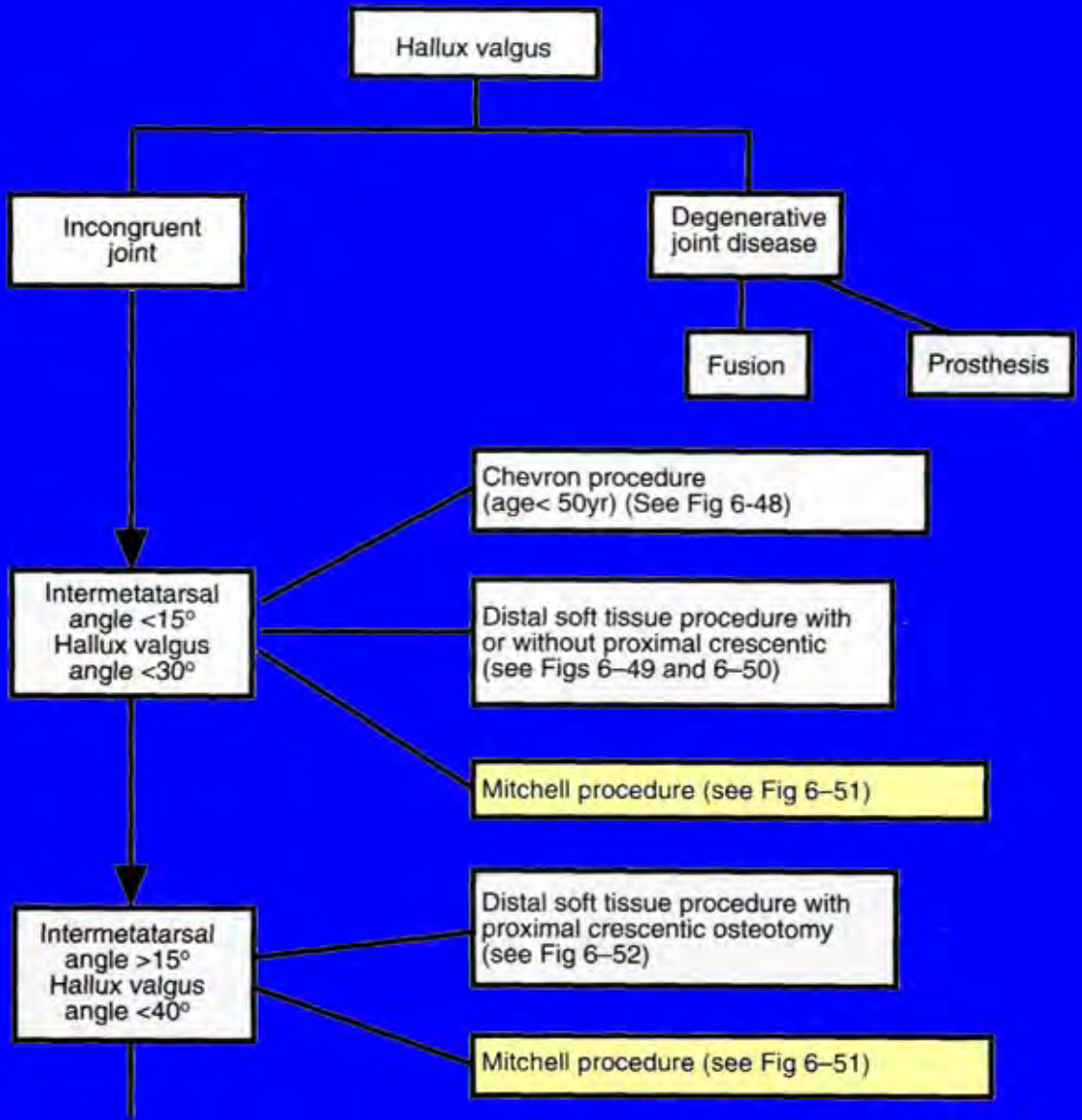
- **Displacement osteotomies**

  Chevron, Mitchell, Wilson, Scarf

- **Angular osteotomies-**

  Mau, Crescentic, Closing wedge, Ludloff,

Algorythm for Hallux Valgus Surgery (Roger Mann)



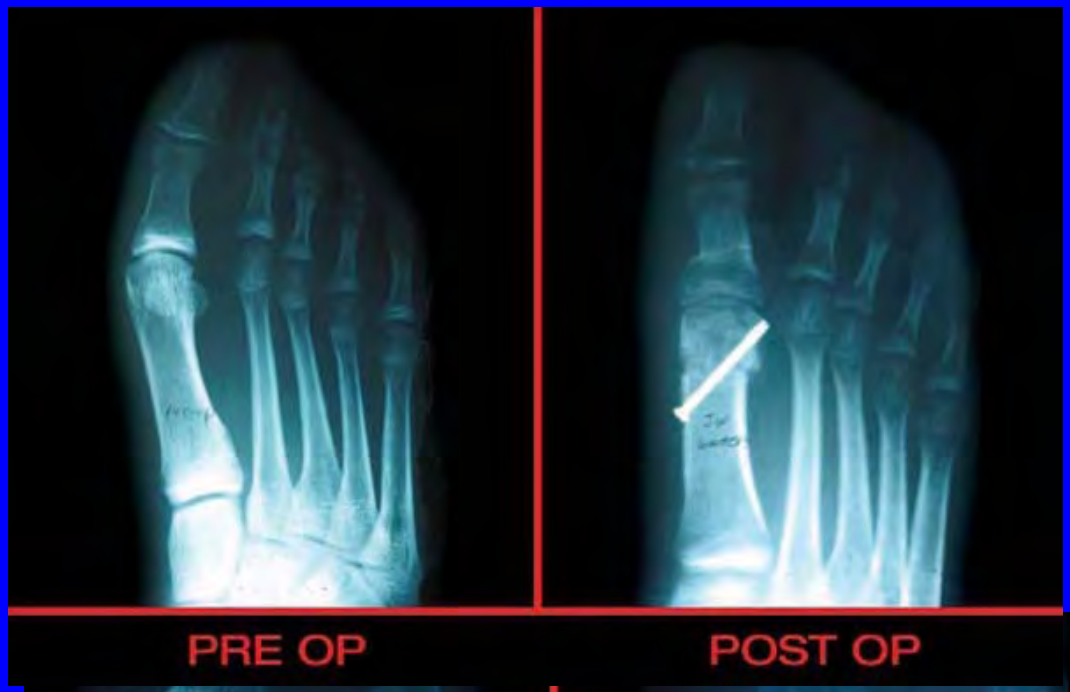
Decision making in HV surgery

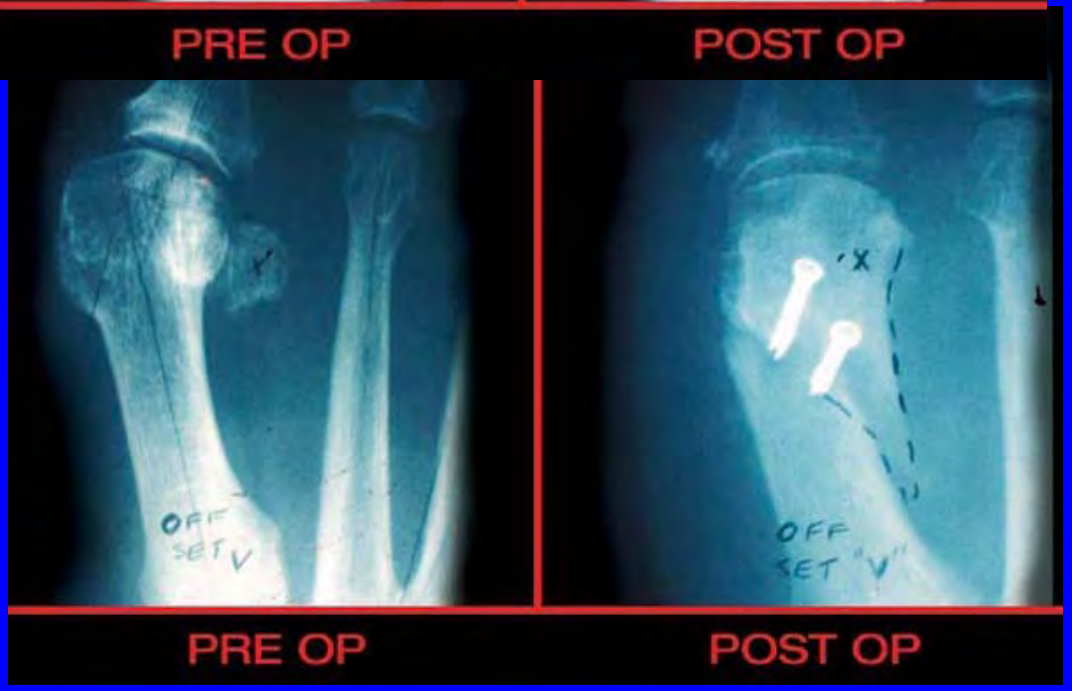
Type deformity	I-II M.T. angle	H.V. angle	D.M.A.A. angle	Sugg. Osteotomy
Mild	<15	<30	<8	Chevron Mitchel
Inter mediate	15-18 (20)	30-40	8-15	Scarf Prox Chevron
Severe	>18	>40	>15	combinations

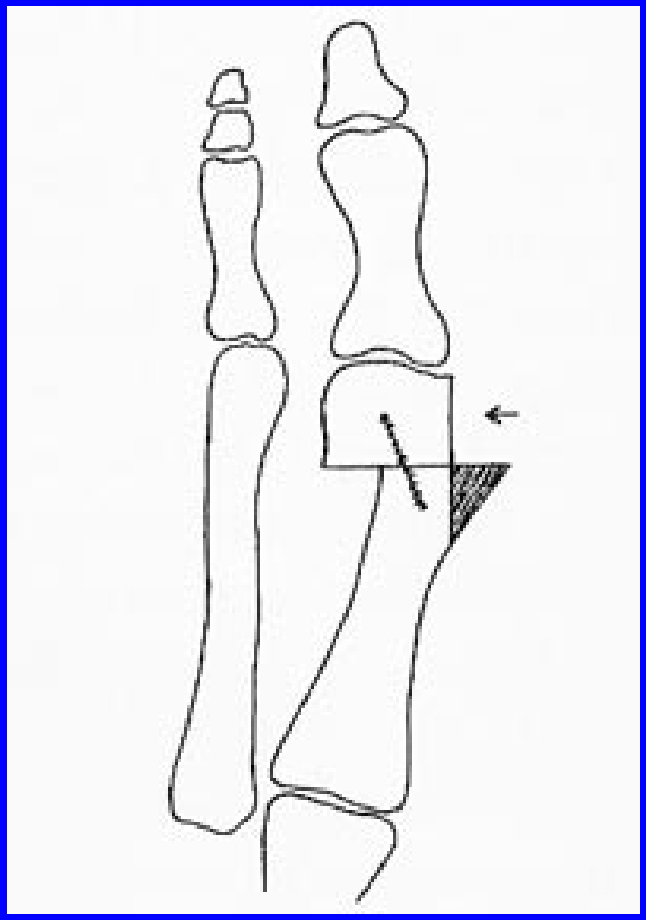

a
b
c
d

Vor der Operation

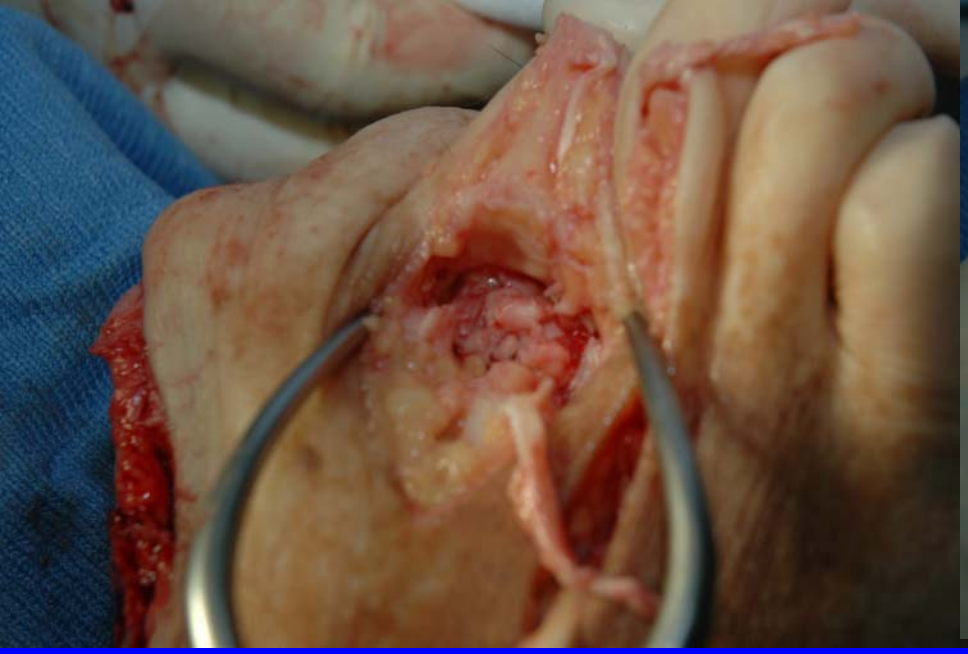
Nach der Operation


PRE OP
POST OP


OFF SET V
OFF SET "V"
PRE OP
POST OP



Hallux Valgus,
Dilocated Hammer toes II-III
Metatarsalgia

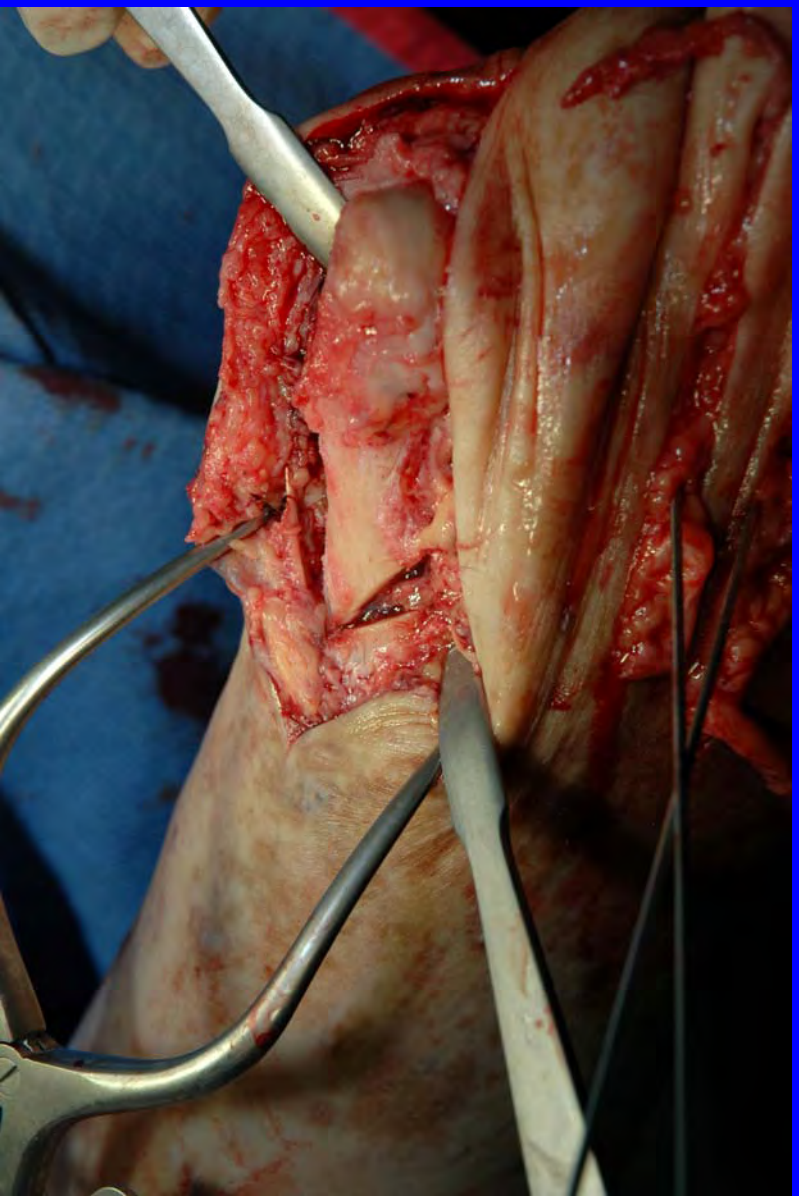



Weil proc.



Correction of Hammer toe

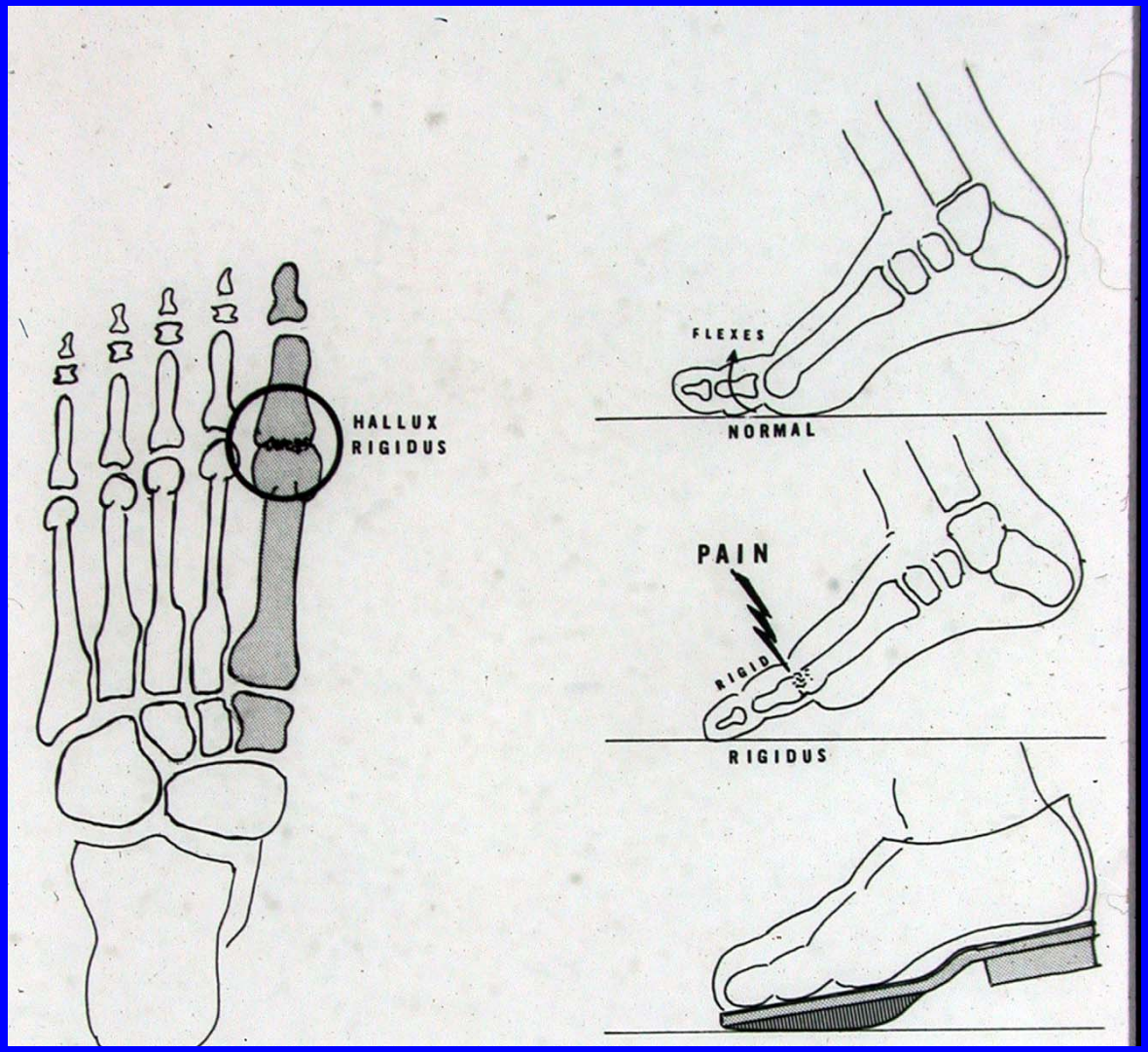
Correction of HV

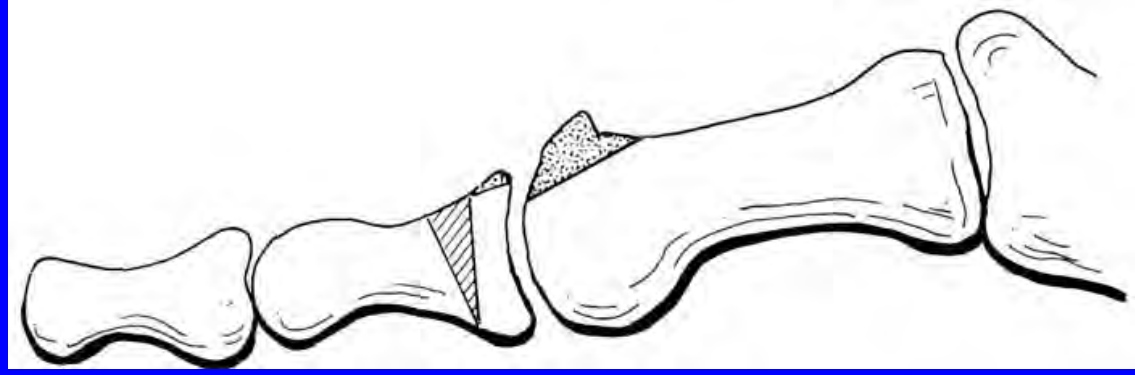


Hallux Rigidus

Hallux Rigidus

Conservative treatment

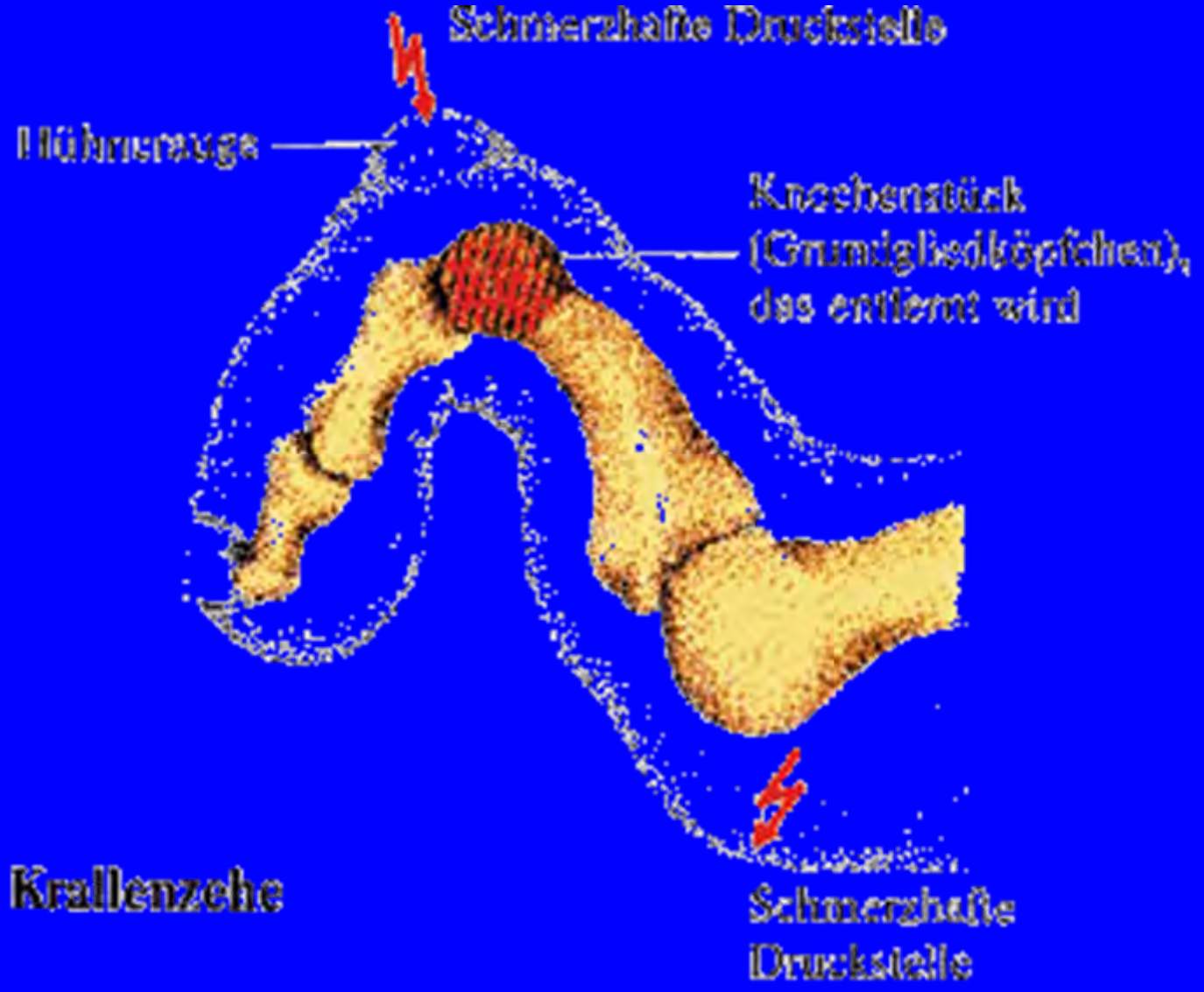




Surgical Treatment

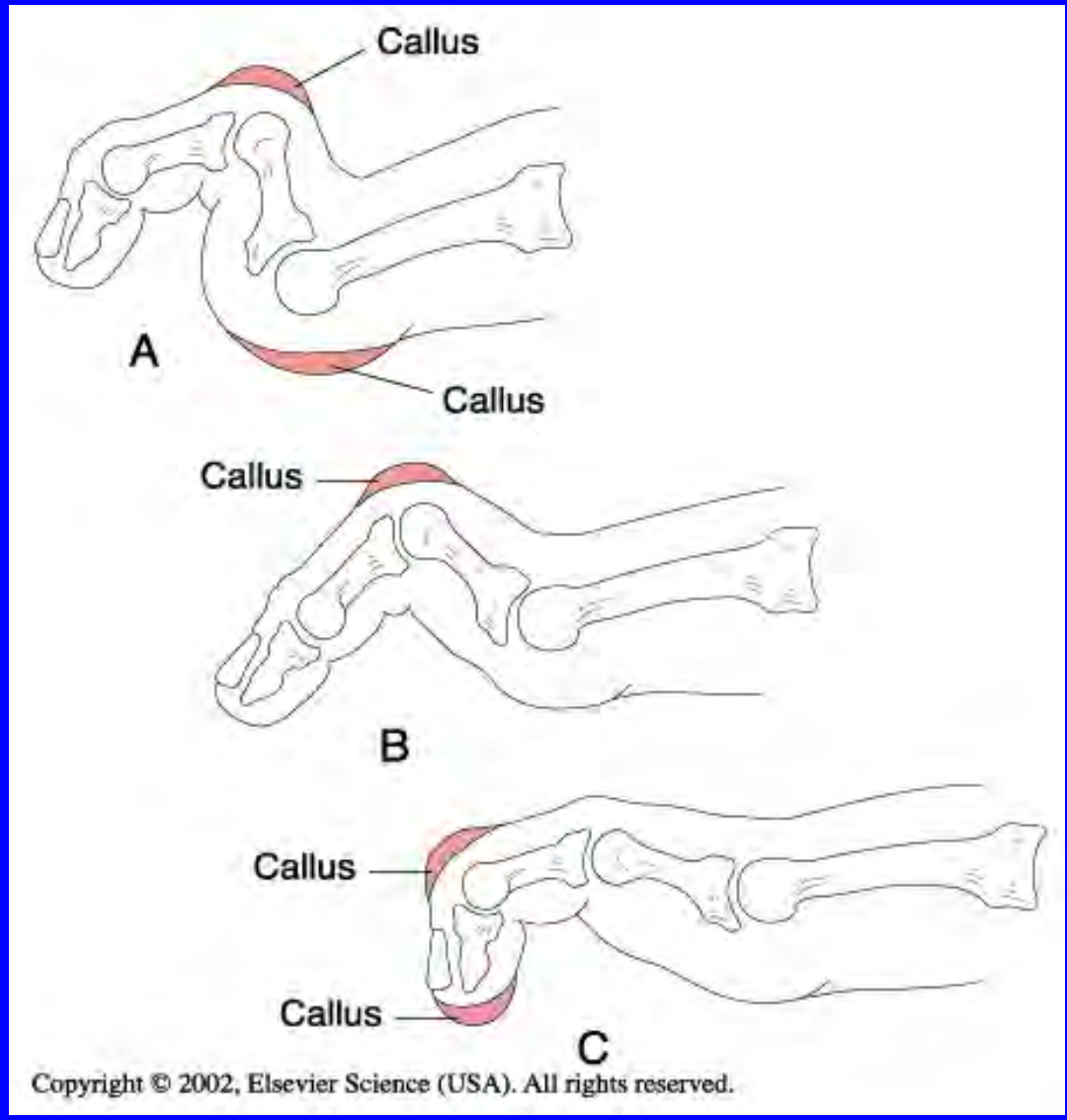
- Cheilectomy
- Dorsal wedge osteotomy
- Fusion
- Total toe replacement

Hammer Toe


Schmerzhafte Druckstelle
Hühnerauge
Knochenstück
(Grundgliedköpfchen),
das entfernt wird
Krallenzehe
Schmerzhafte
Druckstelle

Other Toe Deformities

- Claw toes – MTP ext, DIP and PIP flex (A)
- Hammer toes – MTP, DIP ext, PIP flex (B)
- Mallet toe – flexion of DIP (C)



Freiberg's Disease

Metatarsalgia (pain in forefoot)

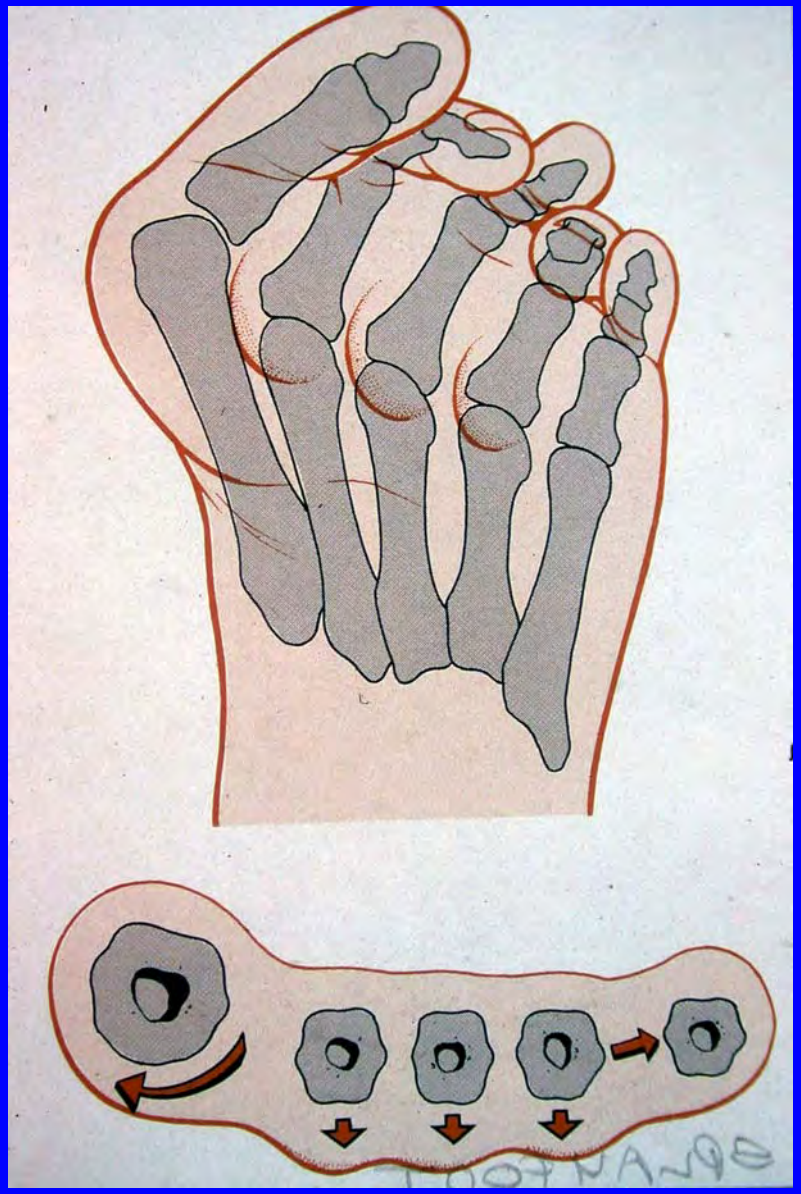
Causes

- Subluxation/dislocation MTPJ with HT. (RA, Idiopathic, Seronegative)
- Anterior flat foot (dropped transverse arch)
- Subluxation of the fat pad
- Thinning of the fat pad (Diabetes, RA)

Symptoms

- **Pain on plantar surface of MTP heads**
- **Callouses over the plantar surface of MTP heads**
- **Unable to arch the toes and lift the MTP heads off the floor**

Metatarsalgia



Treatment

Conservative

- Corrective foot wear, orthotics, metatarsal pads
- Strengthening intrinsics

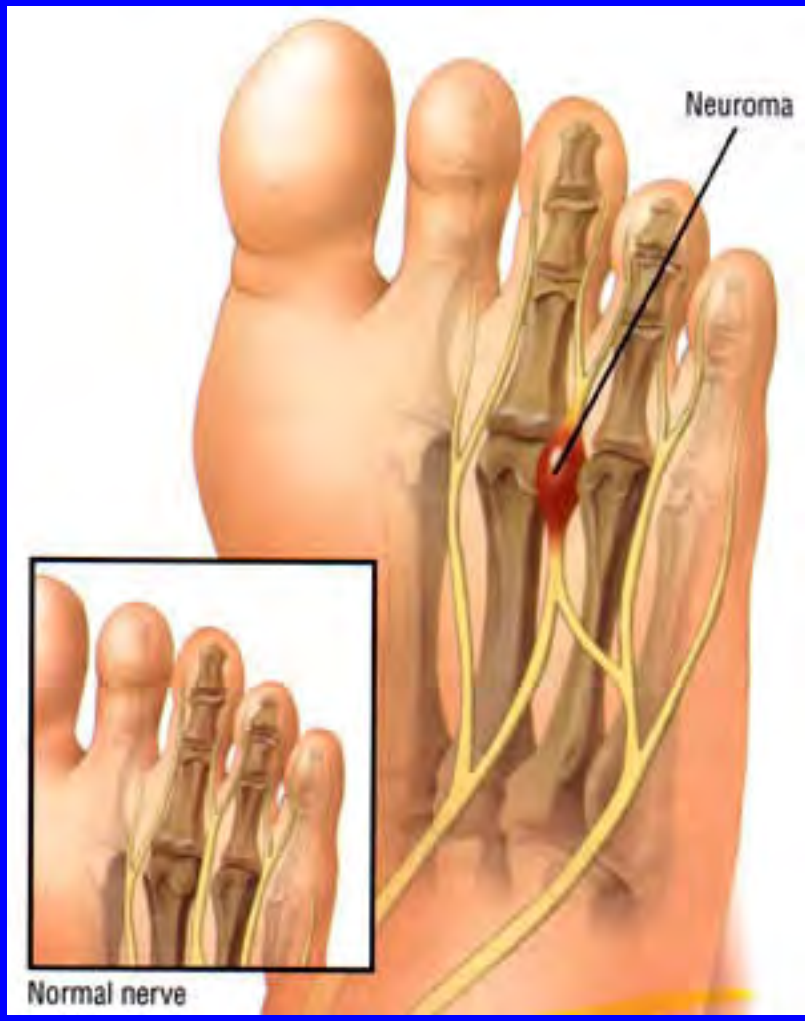
Surgical

- Elevating osteotomies
  - Distal- Weil, Hellal
  - Proximal wedge osteotomy
- Excision

Morton's Neuroma

Signs & Symptoms –

- "cramp-like pain during running
- Tingling/numbness in lateral third and medial 4th toes
- pain relief on removal of shoe and/or pressure
- point tenderness
- callus
- positive compression test may have (clicking)
- positive sensory test


Neuroma
Normal nerve