
Hallux valgus

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overview

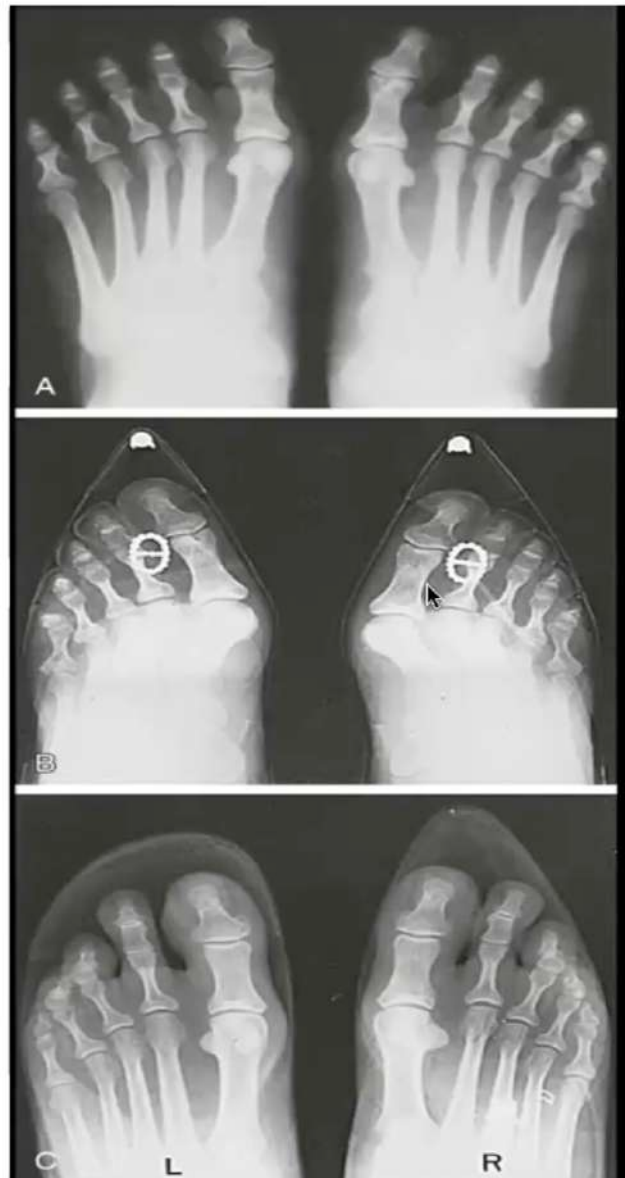
- Bunion : (Latin: turnip)
- Hallux valgus: Carl Hueter
- Static subluxation of 1st MTPJ
- Lateral deviation of great toe
- Medial deviation of 1st MT

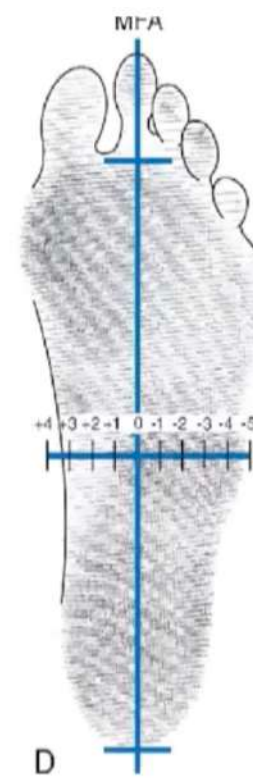
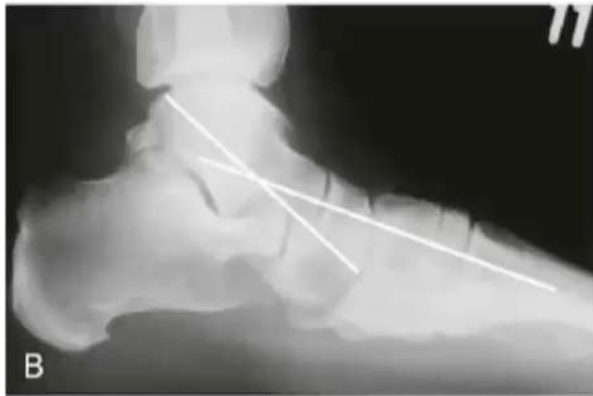
- Abnormal foot mechanics- tight TA, severe pes planus
- Generalized neuromuscular disease- CVA, CP
- Acquired hindfoot deformity: rupture of tib post tendon
- Inflammatory arthritis: RA



Causes

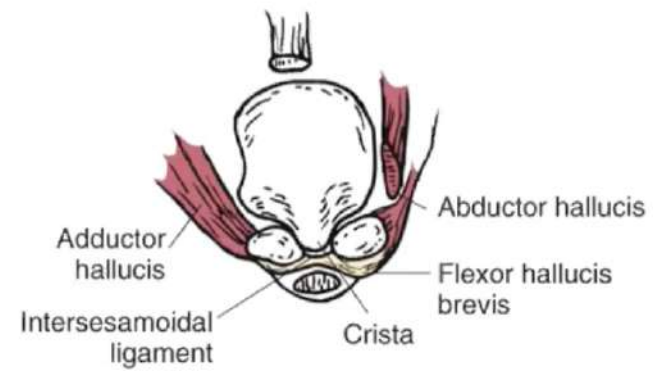
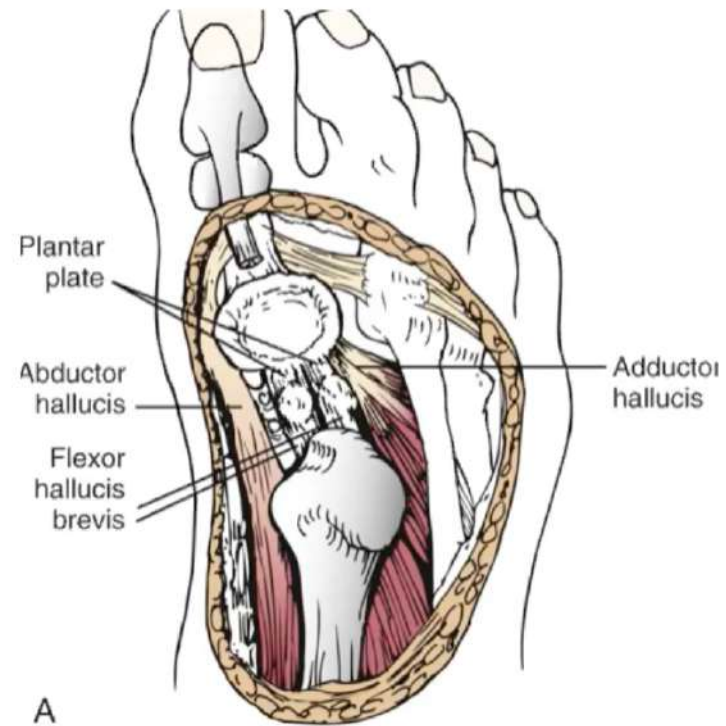
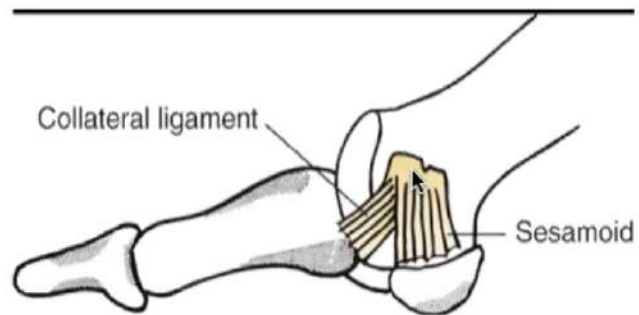
- Extrinsic: footwear, occupation, trauma
- Intrinsic : heredity, pes planus, hypermobility of TMT joint, ligamentous laxity, Achilles contracture
- Miscellaneous: obesity, plantar fasciitis, degenerative arthritis, amputation of 2nd toe, space occupying mass in 1st MT space



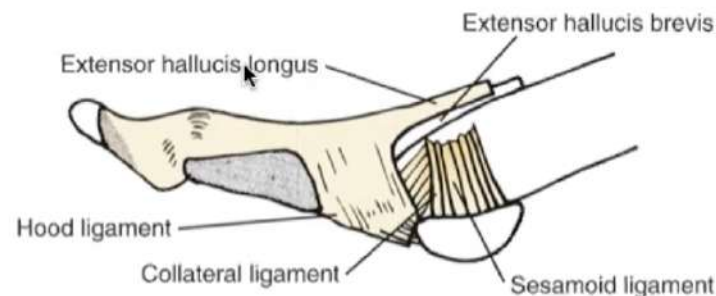




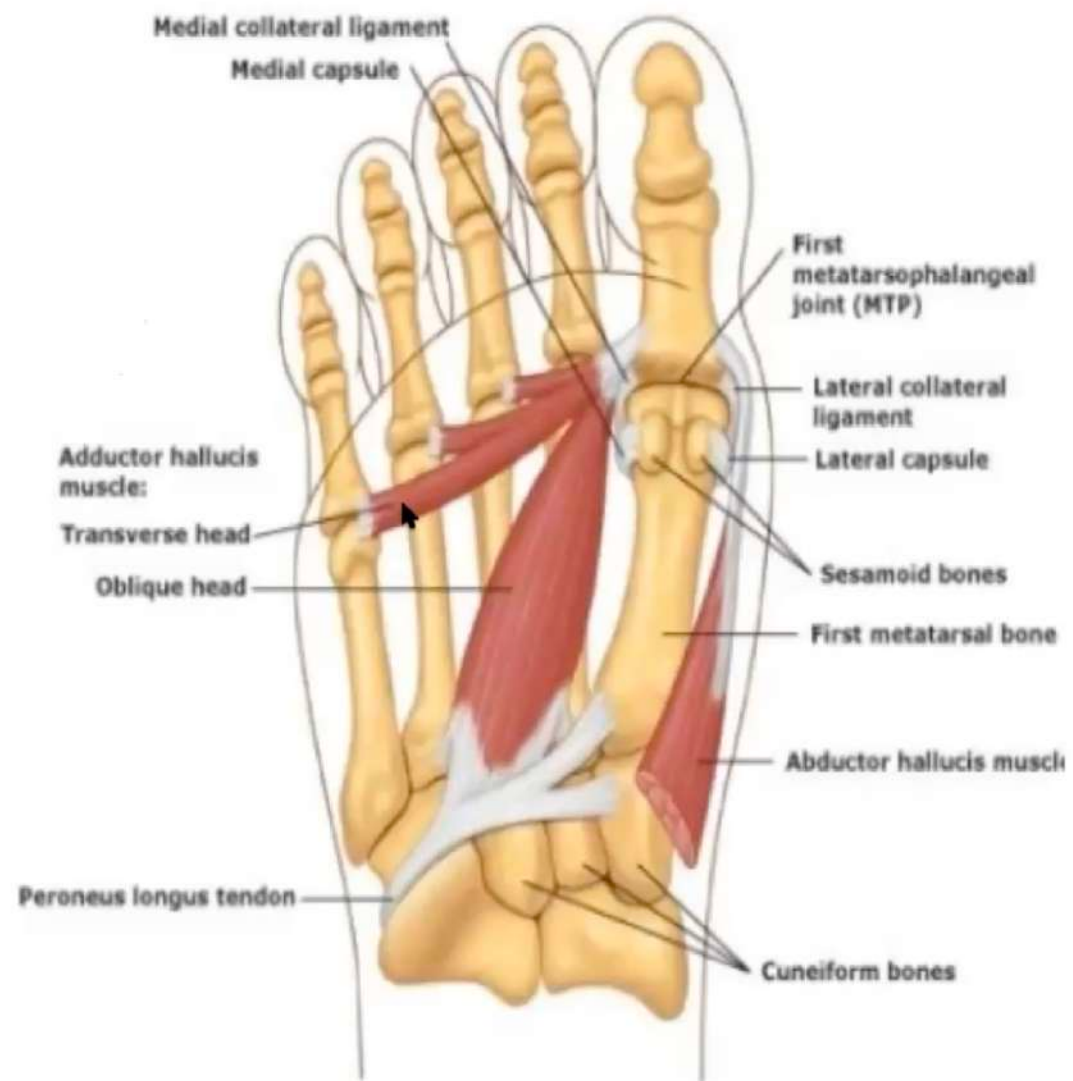
Anatomy



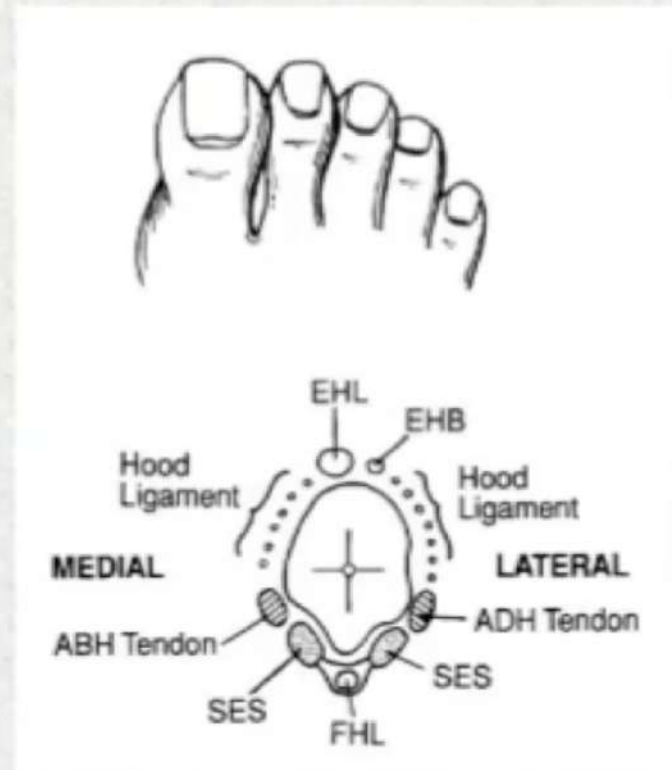
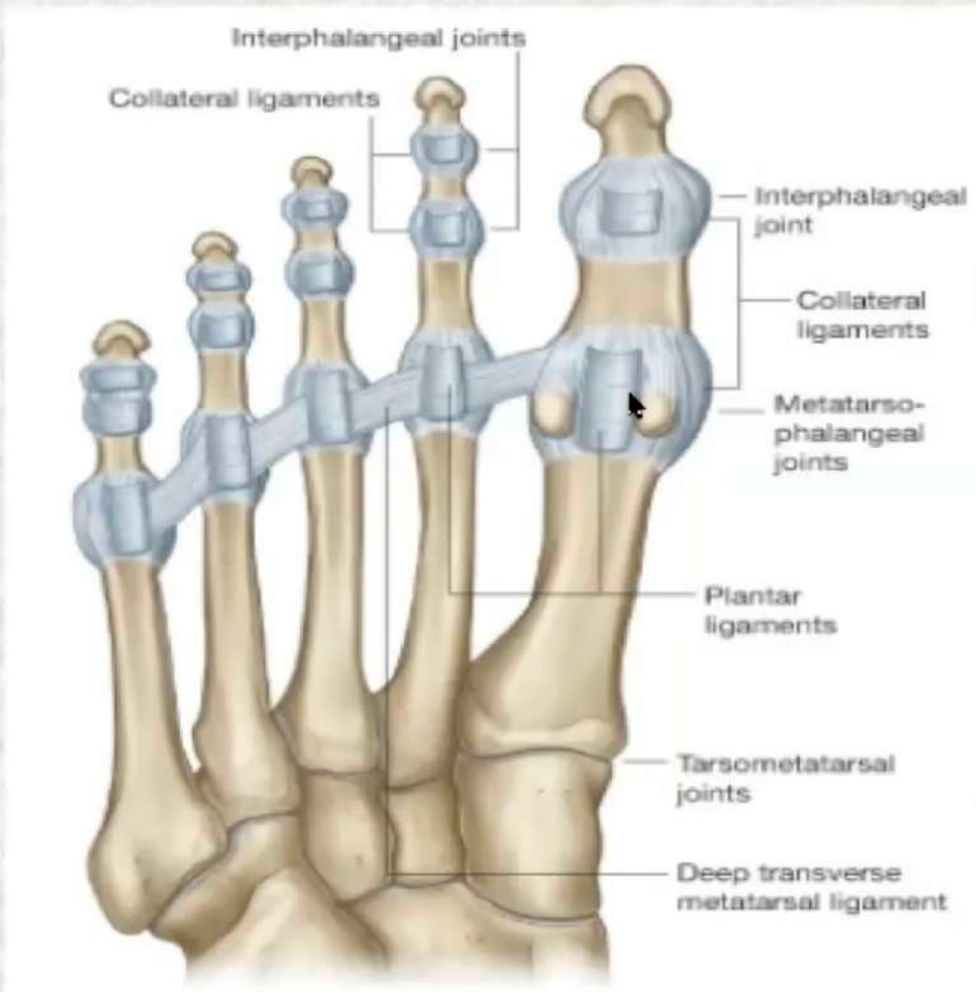
- 4 groups of tendons and muscle that move the great toe:
- **Dorsal group** : long and short extensor tendons.
- EHL anchored medially and laterally by Hood ligament.
- EHB inserts beneath hood ligament onto dorsal aspect of base of proximal phalanx.

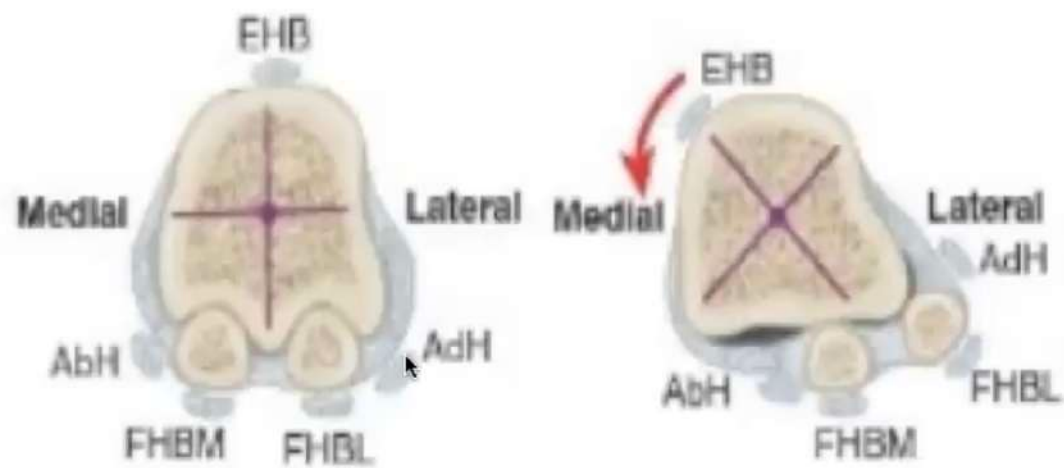


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- **Plantar group** : long and short flexor tendons.
 - FHL courses through central located sheath on plantar aspect of sesamoid complex and is firmly anchored
 - **Medial group** : abductor hallucis
 - **Lateral group**: adductor hallucis



LIGAMENTOUS ATTACHMENTS AROUND HALLUX





Normal

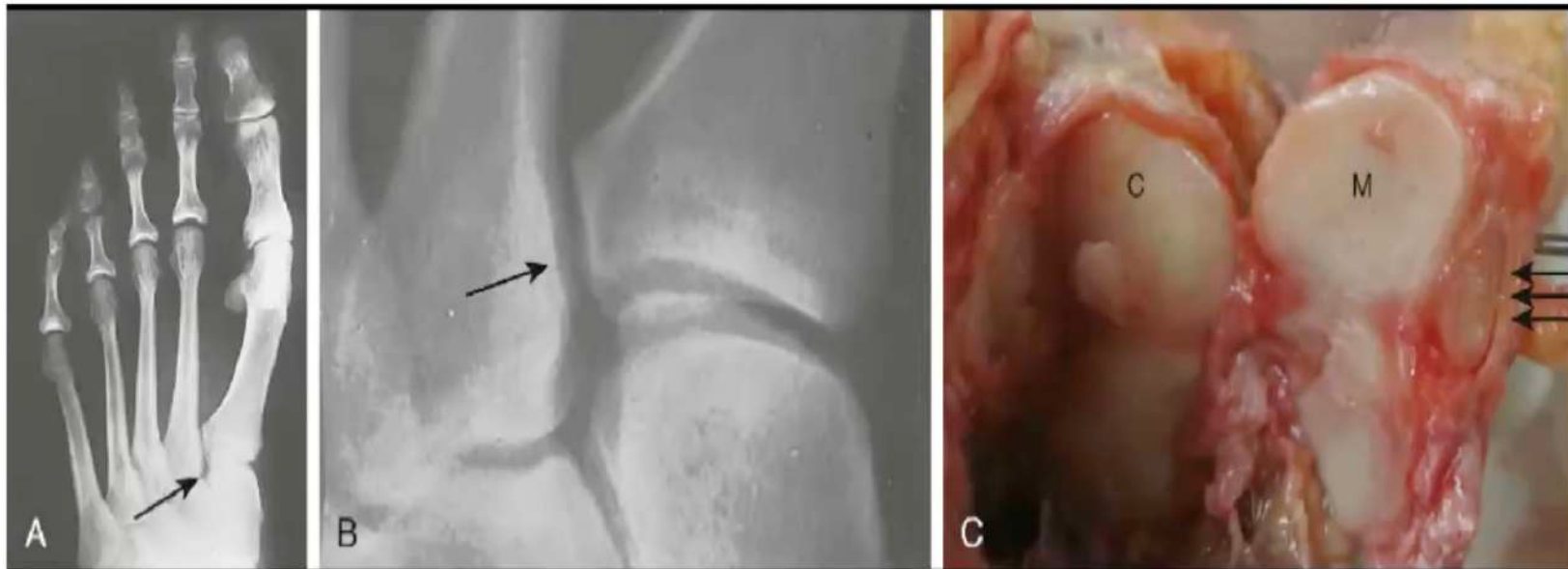
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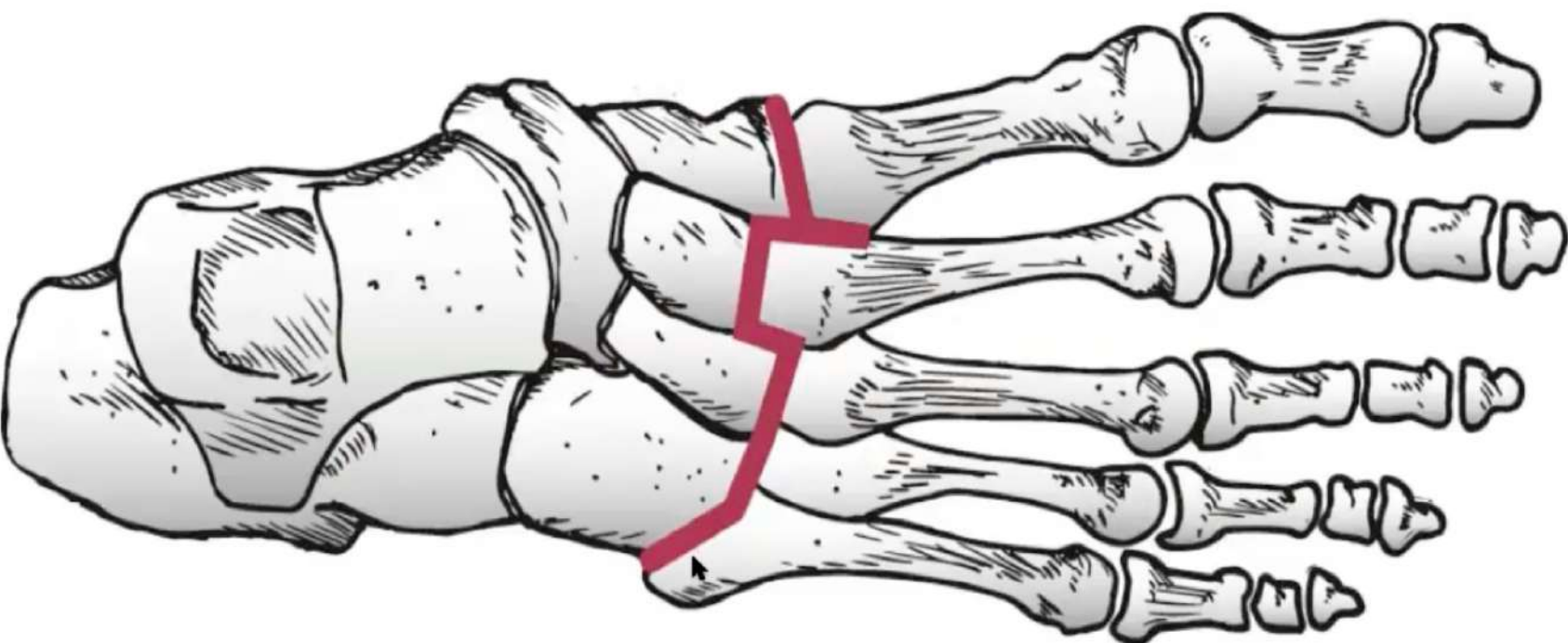
Hallux valgus

B

MTC joint



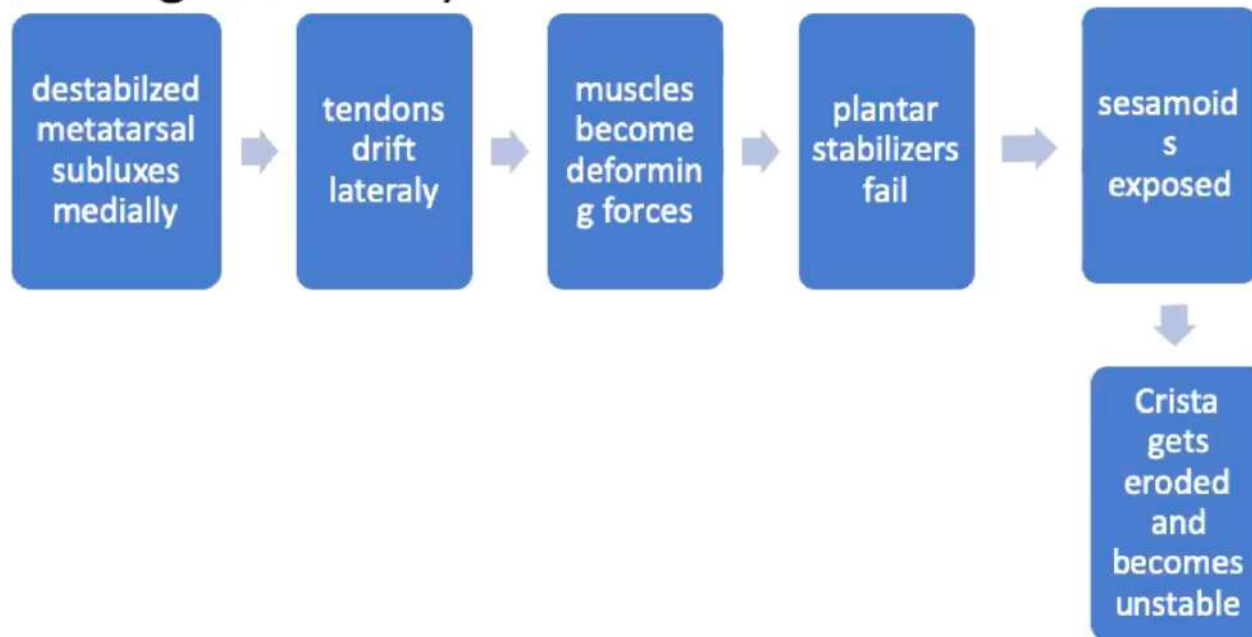
- 1st MTC joint has slight plantar inclination
- Mediolateral dimension is approx. half of dorsoplantar dimension
- Stabilized by capsular ligaments
- Laterally bordered by proximal aspect of 2nd metatarsal, gives lateral buttress.
- Orientation of MTC determines the amount of metatarsus primus varus.
- Medial inclination up-to 8 degree is normal.

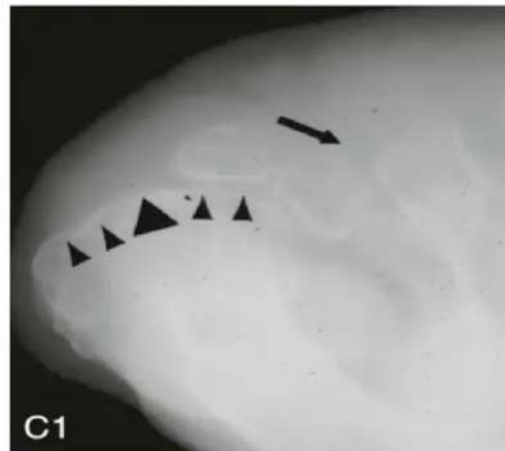
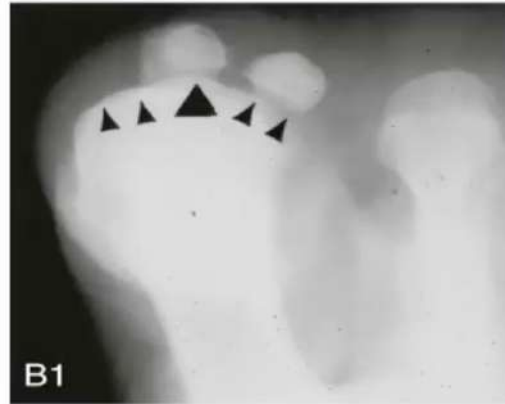




Pathoanatomy

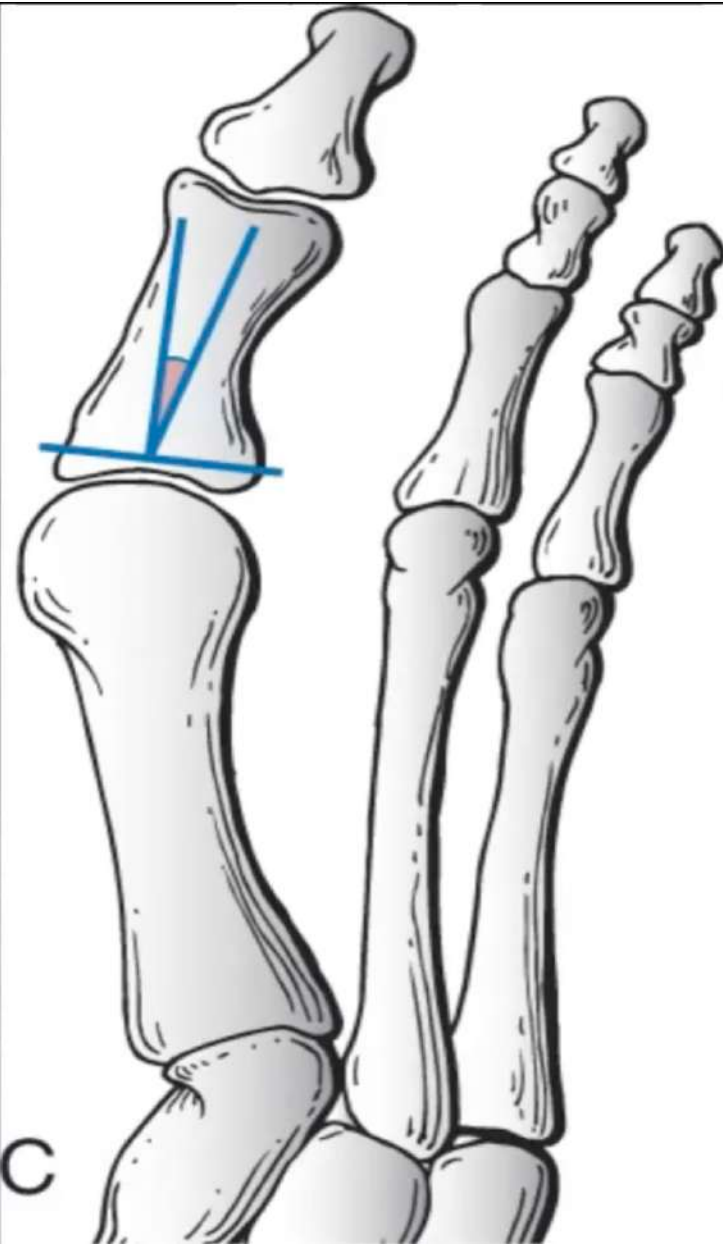
- No muscle inserts at Metatarsal head- vulnerable to extrinsic forces (constricting footwear)

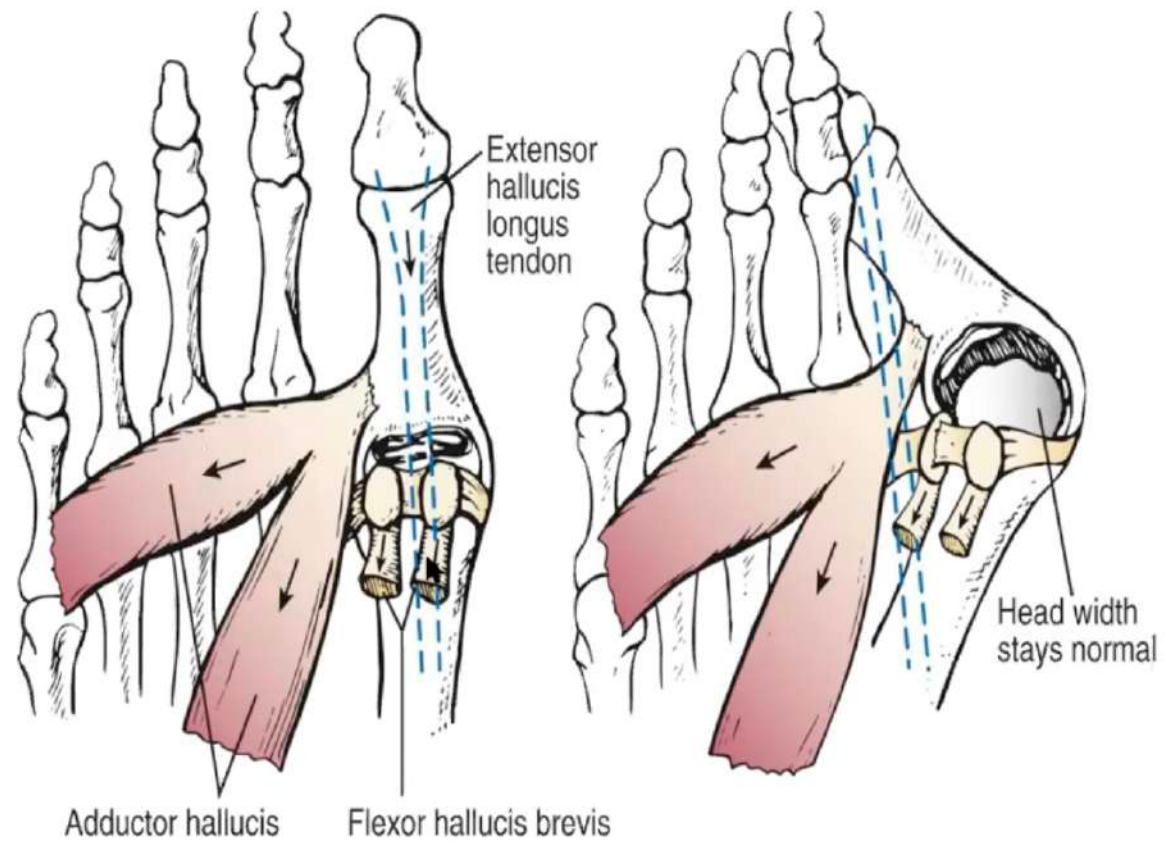


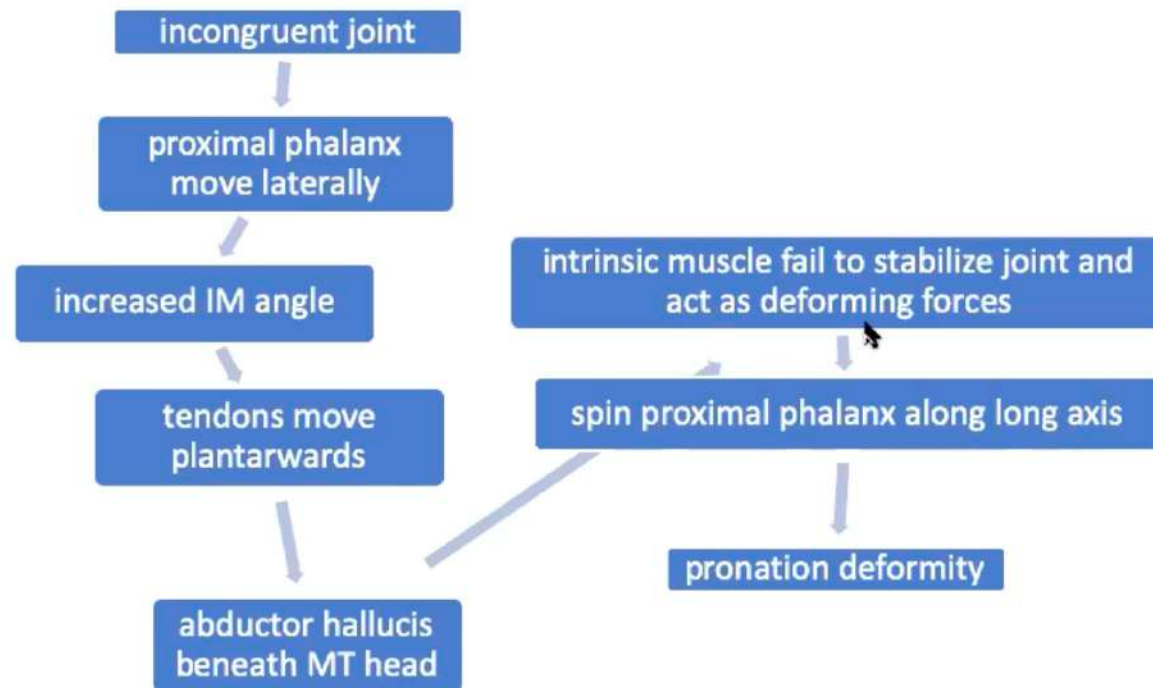


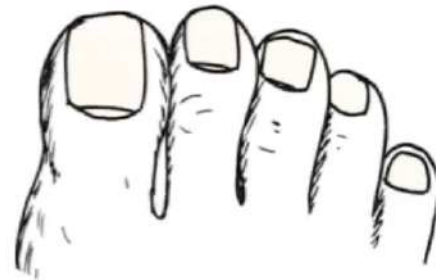
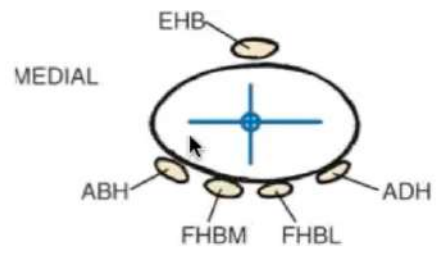
Pathophysiology

- Dynamics of articulation are important
- MTP and MTC joints and their stability.
- **Flat surface** is more stable than rounded
- **Congruent joint** is more stable
- **HVI** (hallux valgus interphalangeus)

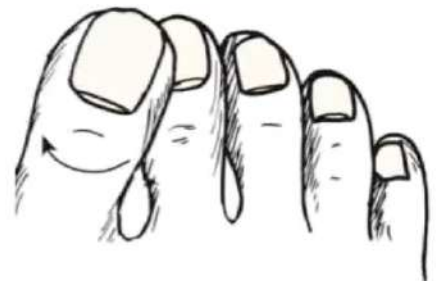
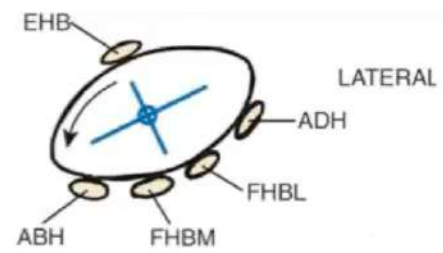






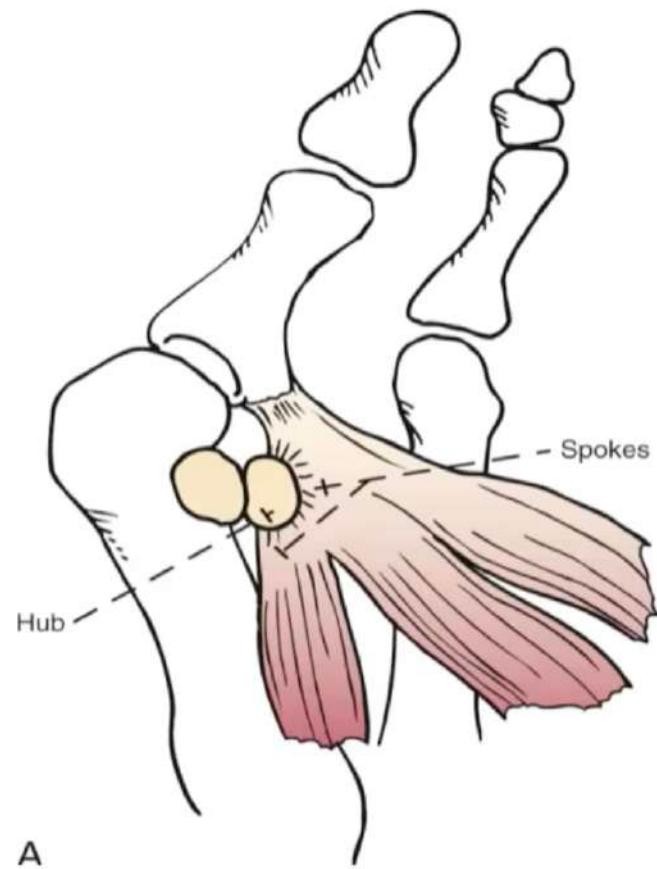


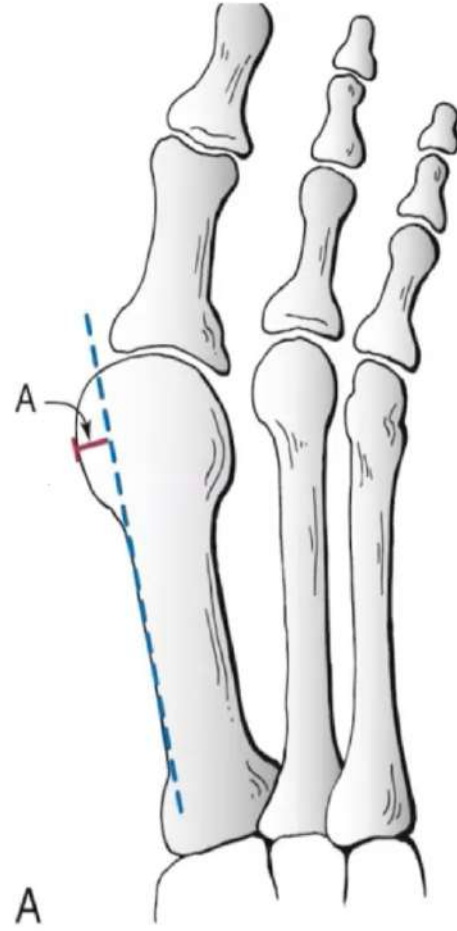
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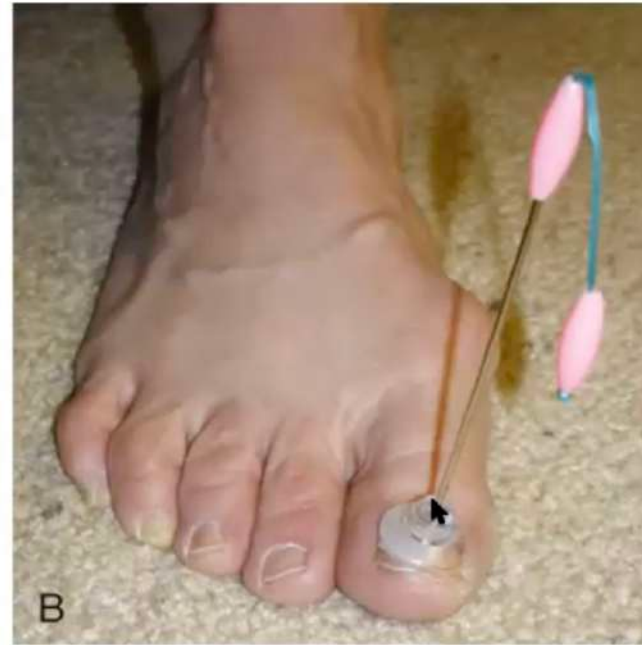


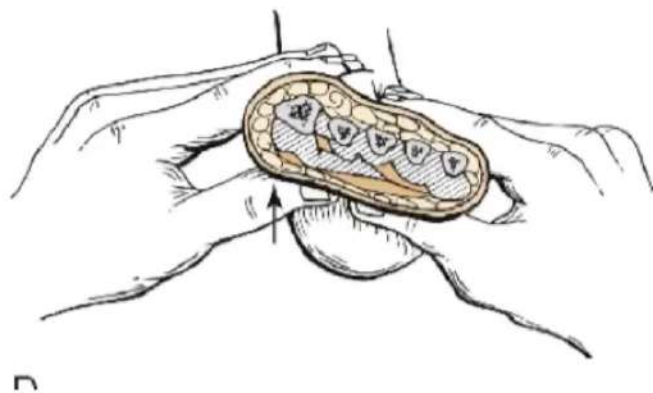
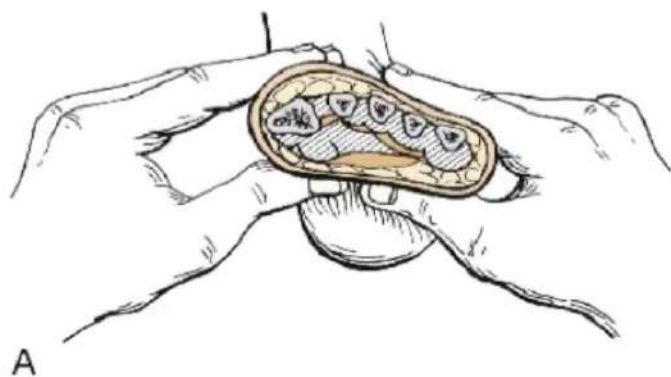
B

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- Abnormal weight distribution laterally
 - Callosities
 - Capsulitis
 - Instability
 - Deviation of 2nd toe
 - Abductor loses its function.
 - EHL contracted
 - FHL shifts laterally











- Age of onset: adolescents
- Gender: female : male- 2:1
- 90% right sided
- 2-4% of population

Angular measurements and Radiology

- Always weight bearing views
- AP, Lateral and Oblique views
- AP view: tube to film distance 1m, centered on TMT joint, 15 degree towards ankle.

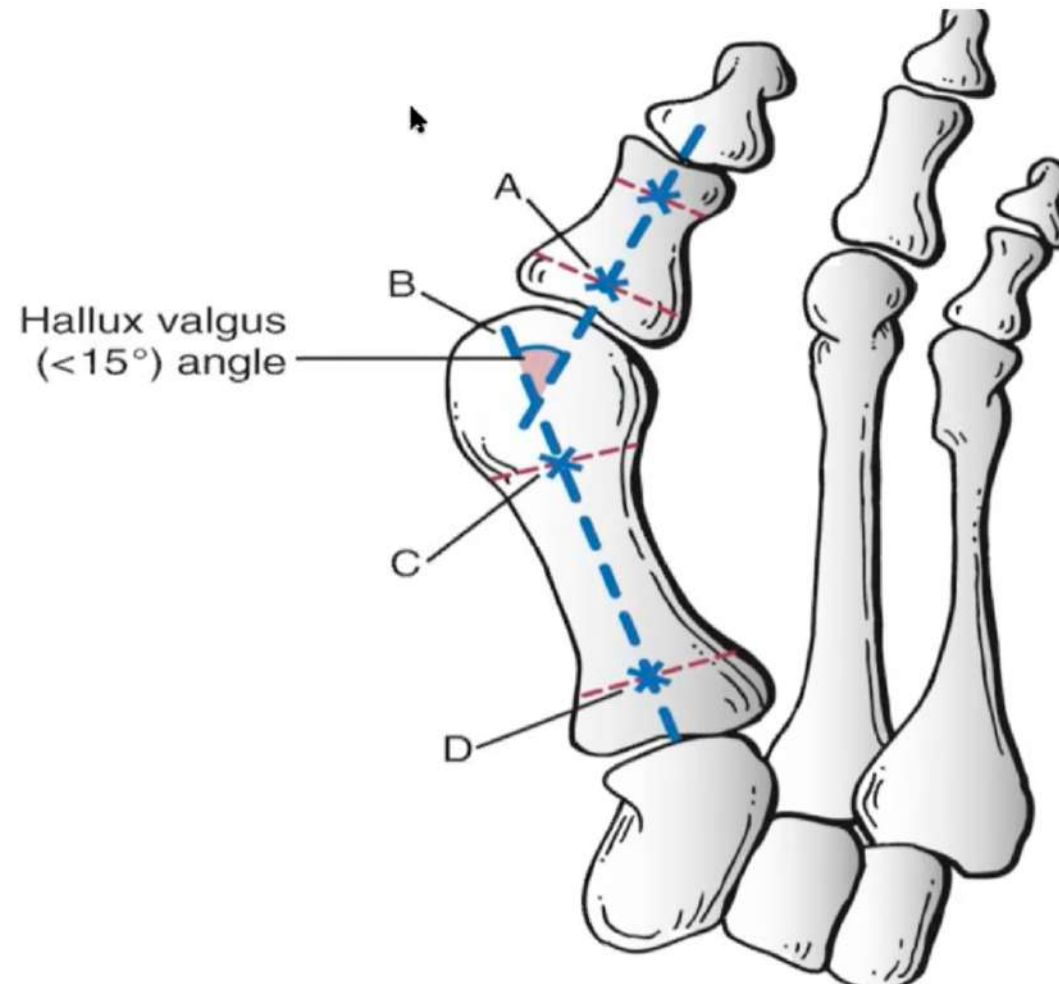
Hallux Valgus Angle (HVA)

Normal <15

Mild 15-20

Moderate 20-40

Severe > 40



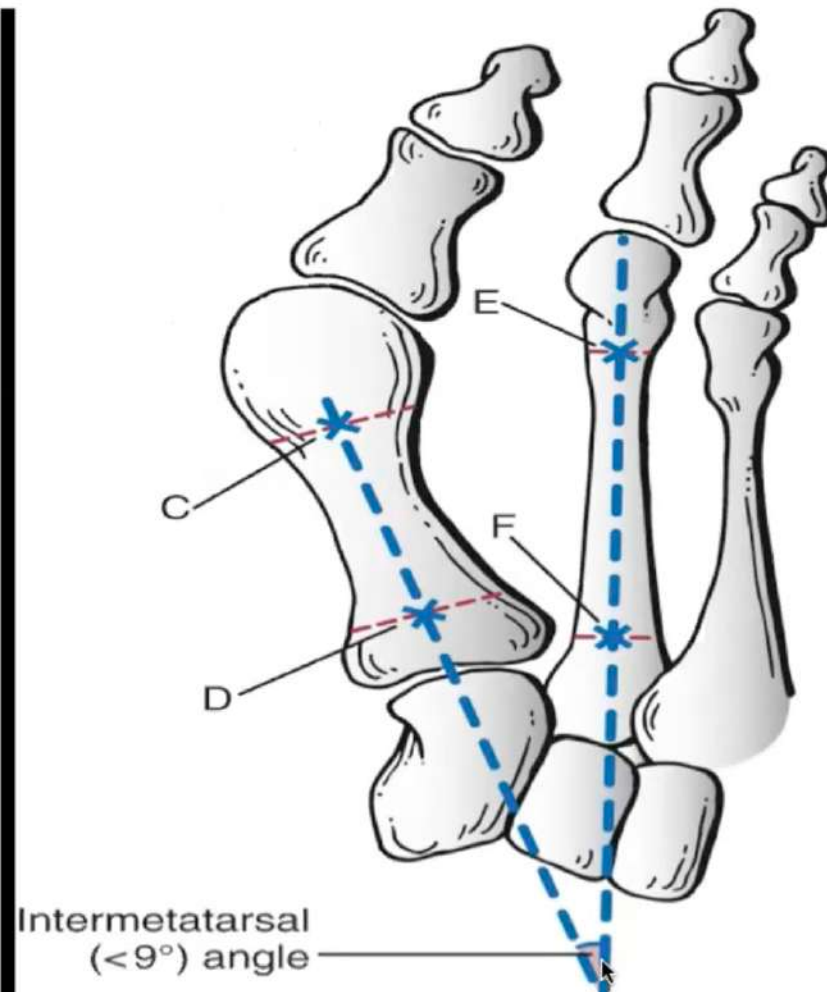
1-2 Intermetatarsal Angle (IMA)

Normal <9 degree

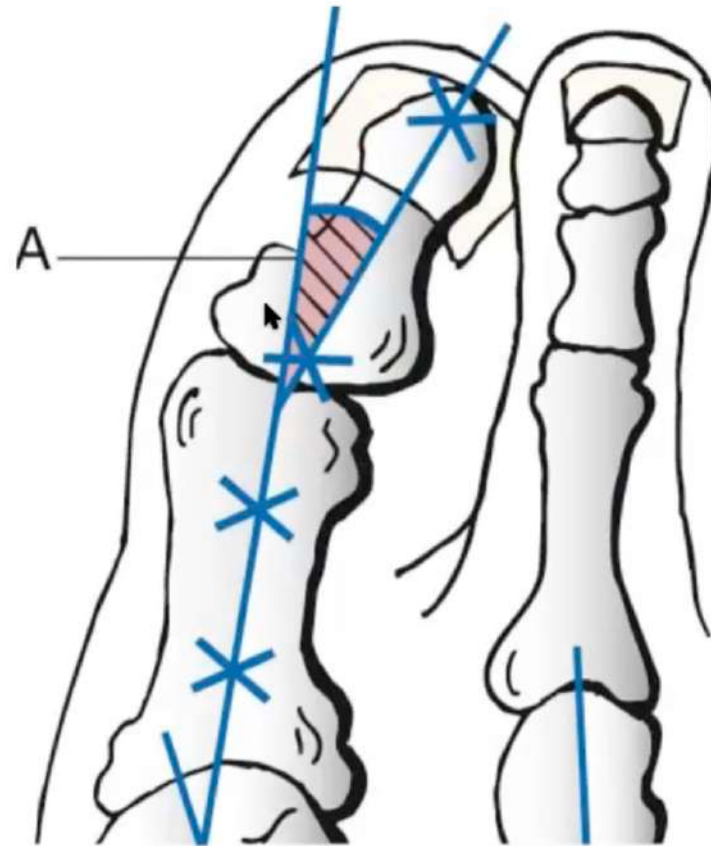
Mild 9-11 degree

Moderate 11-16

Severe > 16

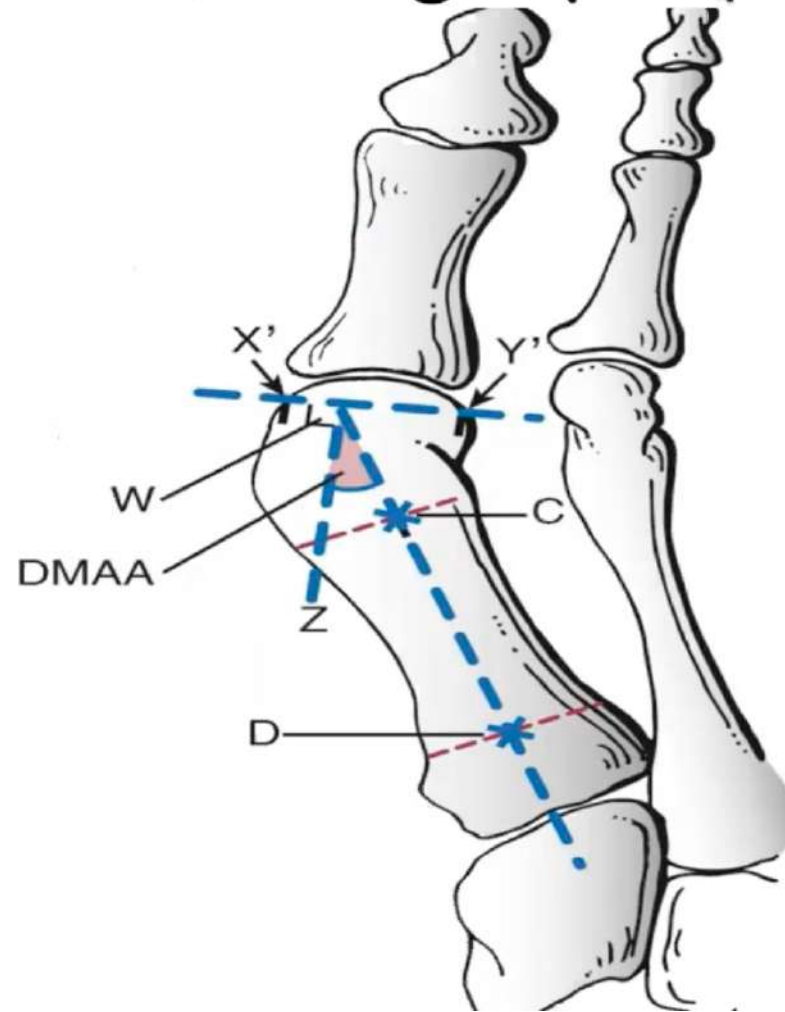


Hallux valgus interphalangeal angle (HVIA)

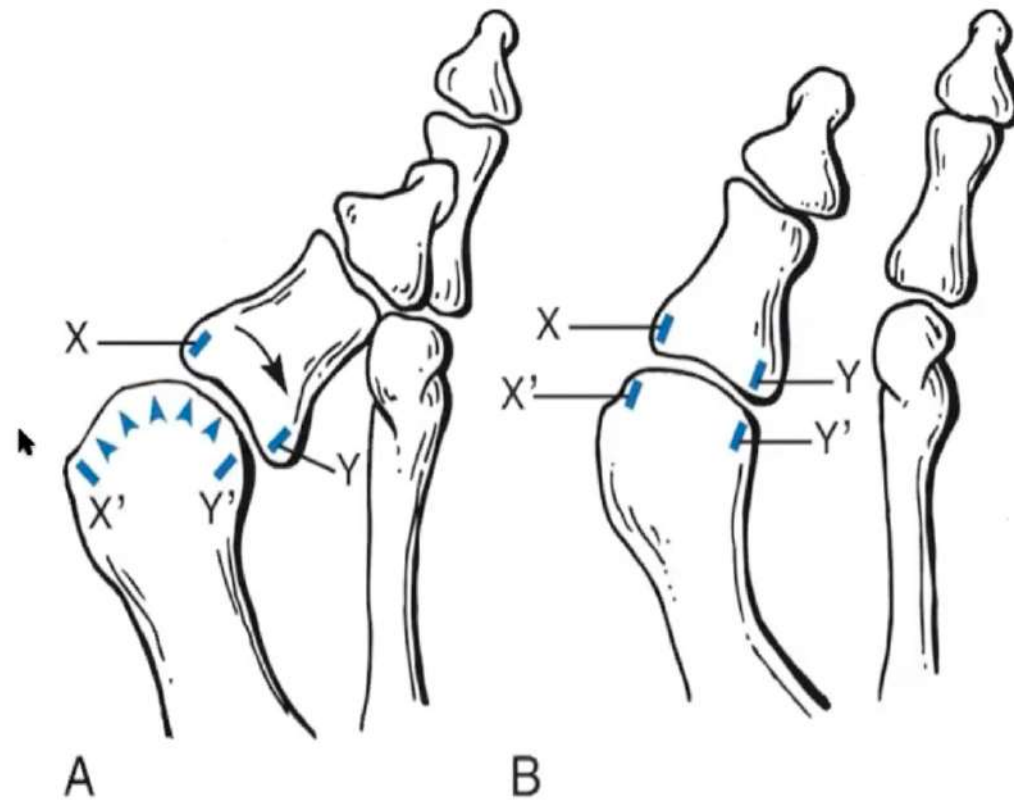


Distal Metatarsal Articular Angle (DMAA)

Normal <6 degrees deviation



MTP joint congruency



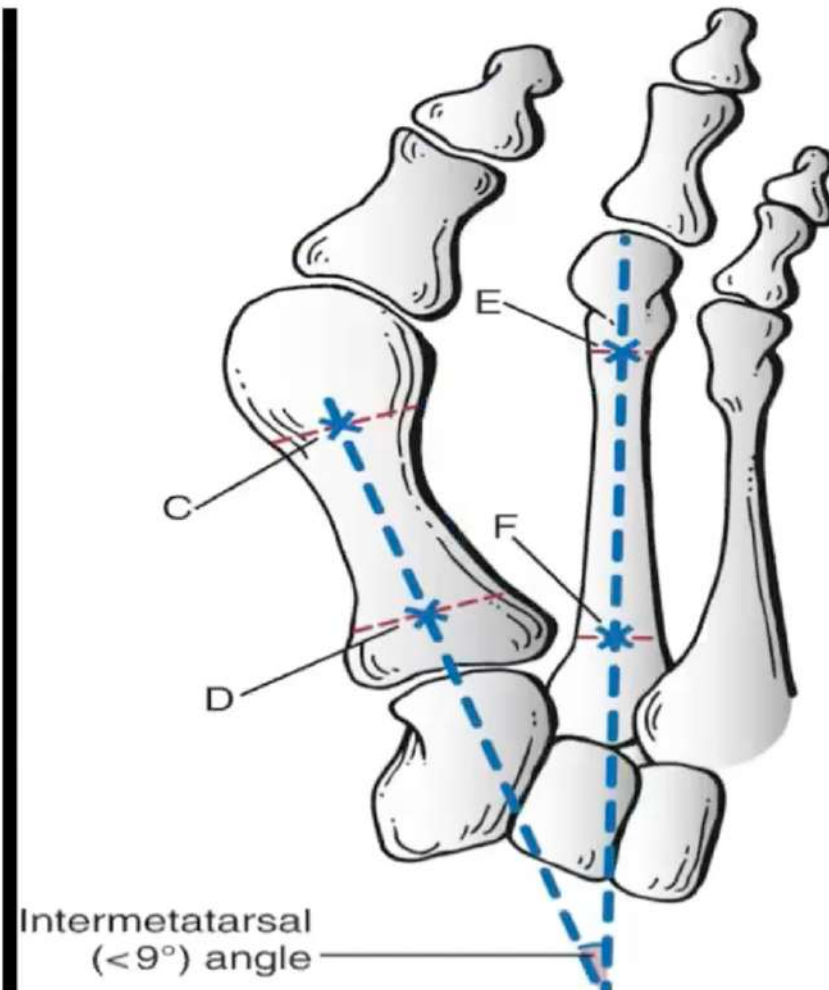
1-2 Intermetatarsal Angle (IMA)

Normal <9 degree

Mild 9-11 degree

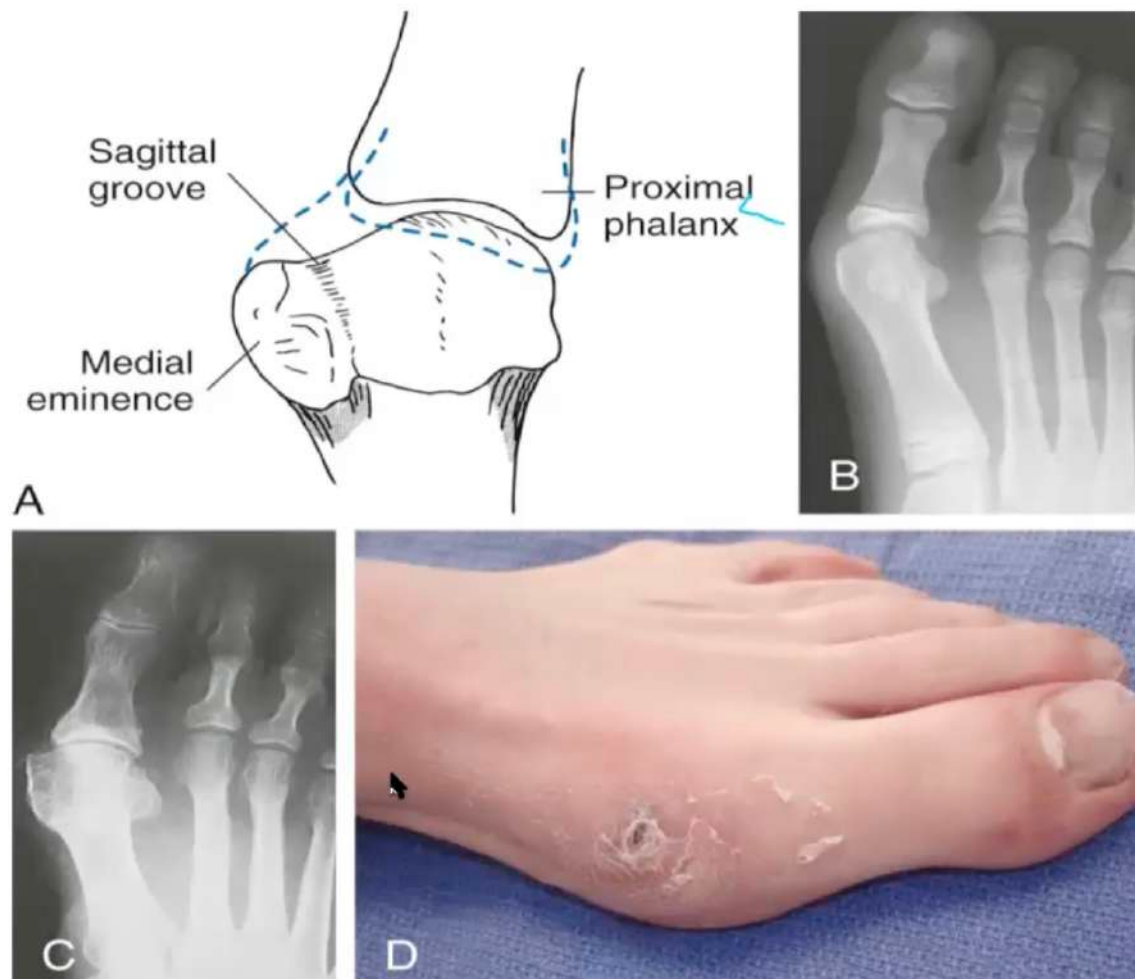
Moderate 11-16

Severe > 16



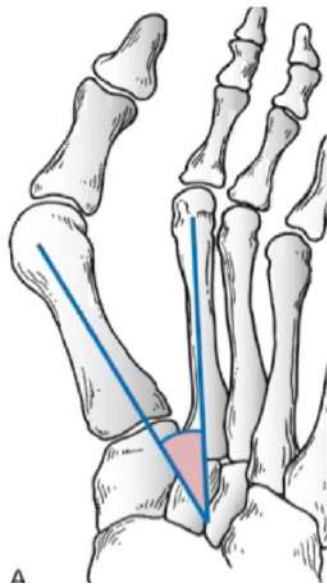


Medial eminence

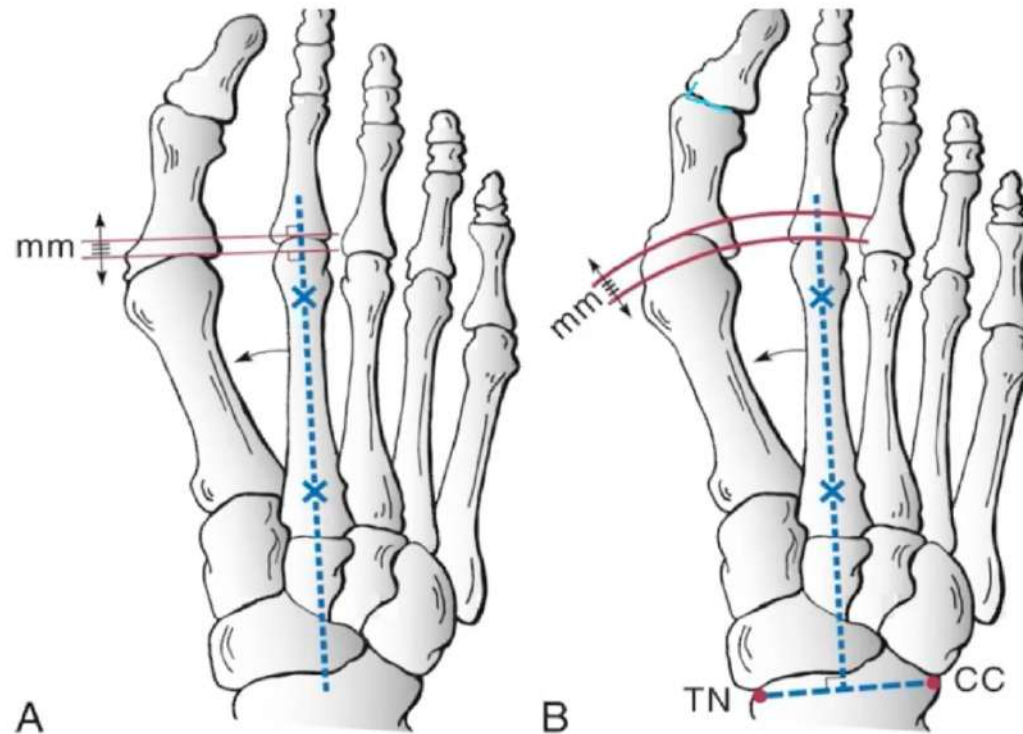


Metatarsus Primus Varus

- Truslow: “Metatarsus primus varus” congenital anomaly, if present “inevitably results in Hallux Valgus” when the person is forced to wear a shoe.
- More common with juvenile hallux valgus



First metatarsal length: no correlation



Joint congruity

- Defines stability of the MTPJ and deformity



First MTC joint

Development of IMA & HVA

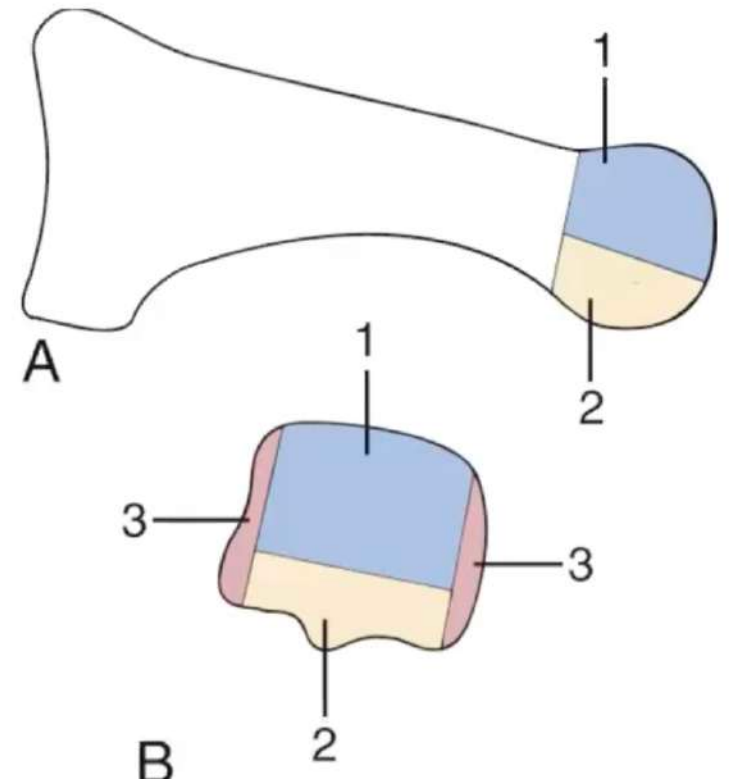
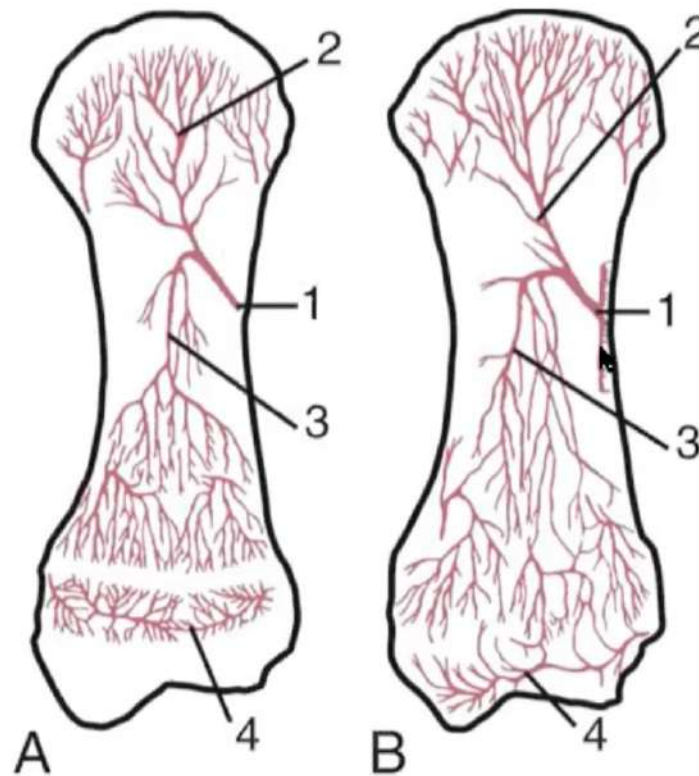
Orientation and flexibility of MTC joint plays important role in deformity at MTP joint





Other surgical consideration

- Blood supply to MT
- Open epiphysis



Juvenile hallux valgus

- Onset of deformity- preteen or teenage
- MTPJ arthritis is rare
- Bursal thickening is not common
- Open epiphysis
- IMA is higher
- HVA is lower
- Pronation of hallux is less common
- Hypermobile MTC joint

Classification

Mild

- HVA <20
- Congruent joint
- IMA ≤ 11
- Fibular sesamoid anatomic or may have up to 50% displacement
- Painful medial eminence

moderate

- HVA 20-40
- Hallux pronated
- IMA 11-16
- Fibular sesamoid displaced 75-100%

severe

- HVA >40
- IMA 16-18 degrees
- Crossover toes
- Moderate to severe pronation
- Painful callosity beneath 2nd MT
- 100% lateral displacement of sesamoid



Patient evaluation

- History
- Pain- bunion, 2nd toe plantar keratosis, metatarsalgia
- Instability of lesser MTPJs
- Interdigital neuromas
- Lesser toe deformities
- Corns , calluses.
- Patient's Level of activity
- Occupation

Physical examination

- Gait
- Foot assessment in standing and sitting
- Note magnitude of deformity, longitudinal arch and hindfoot
- Pronation
- Range of motion at ankle, subtalar, transverse tarsal and MTPJs.
- Silverskiolds test
- Forefoot- varus, valgus, neutral
- Exact site of pain
- 1st MTC joint mobility
- Neurovascular assessment



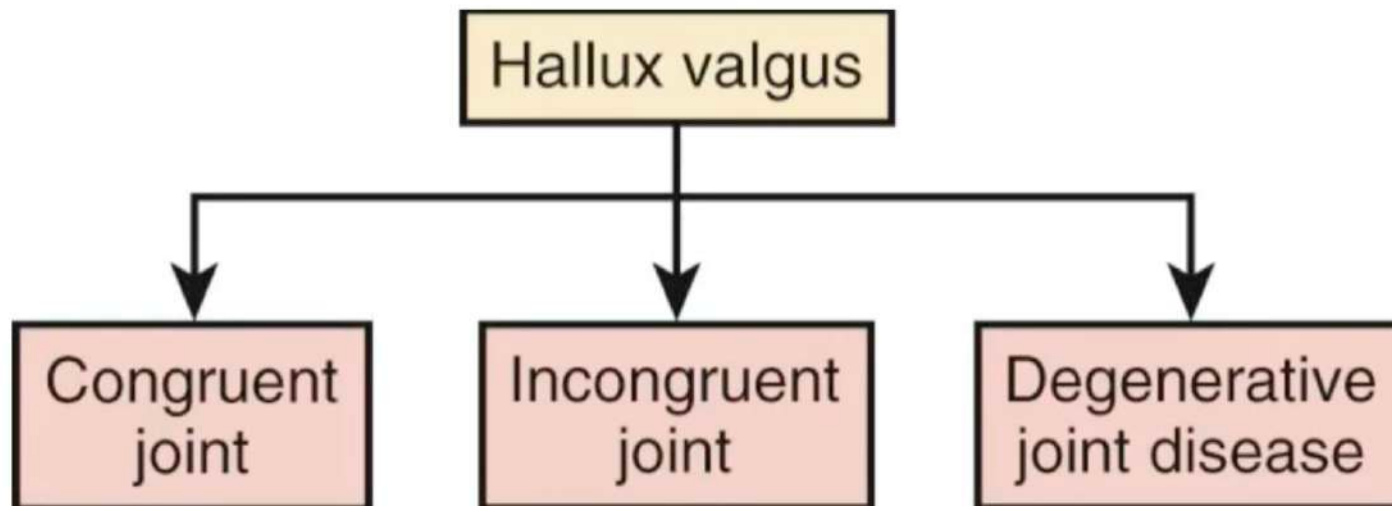
Conservative treatment

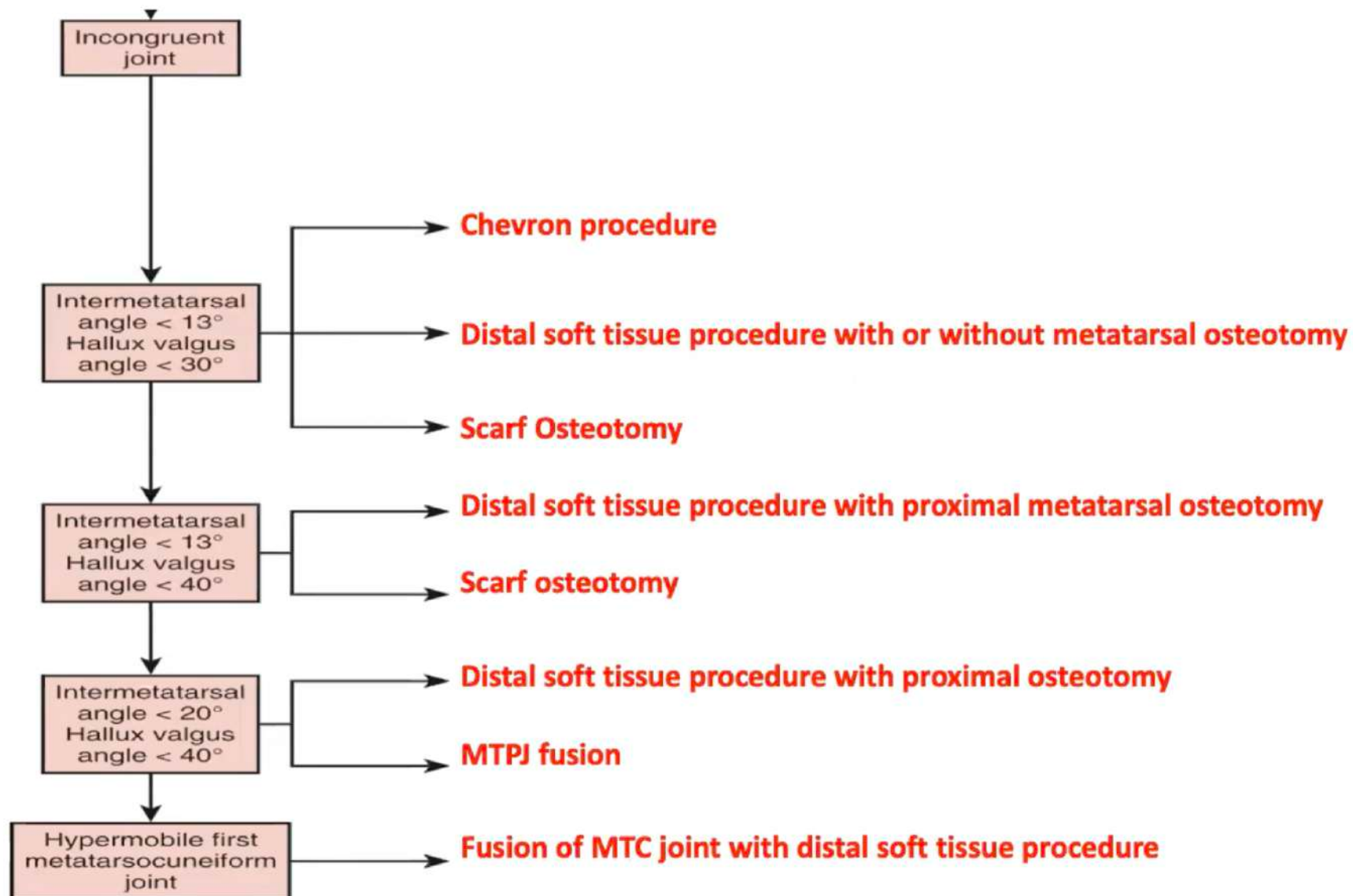


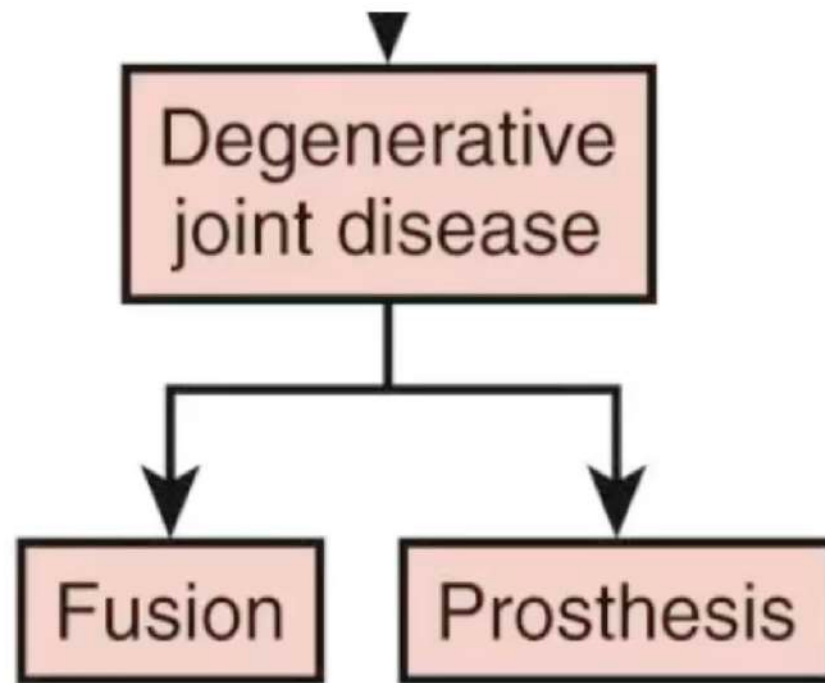
Surgical decision making

- The patient's chief complaint, occupation, and athletic interests
- Physical findings
- Radiographic evaluation, which should include the magnitude of the hallux valgus, intermetatarsal, and interphalangeal angles; the magnitude of the DMAA; the presence of a congruent or incongruent joint; the extent of MTP and MTC joint arthrosis; and the degree of pronation of the hallux
- The patient's age
- Neurovascular status of the foot
- The patient's expectations

Surgical algorithm



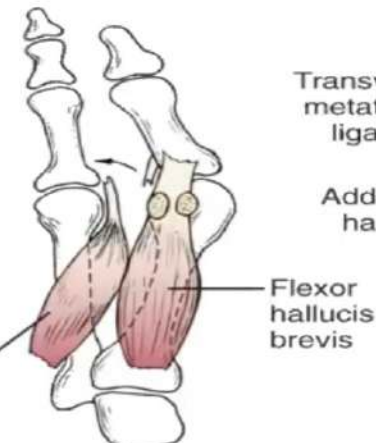
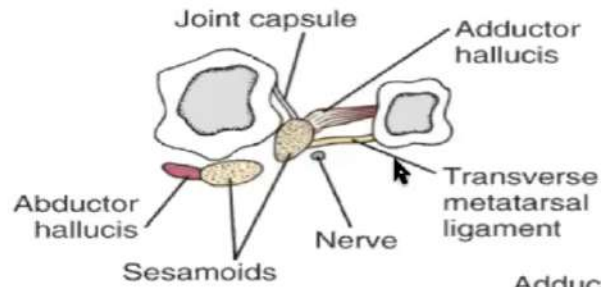




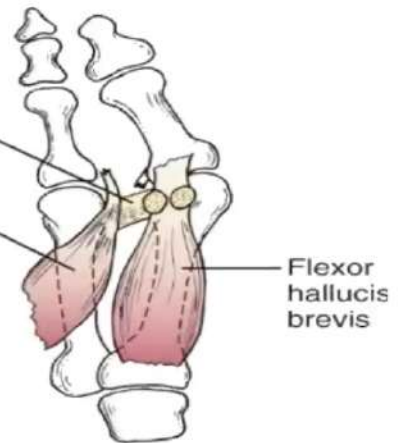




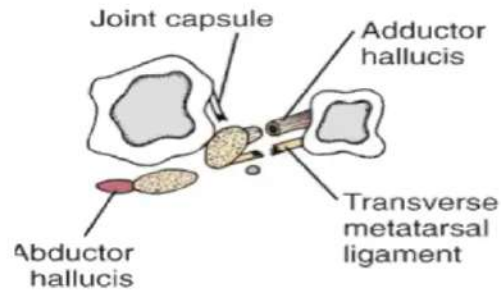
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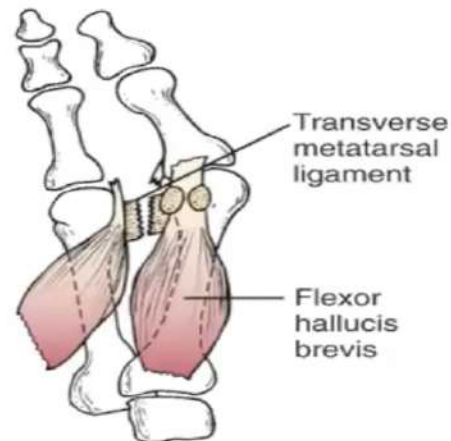
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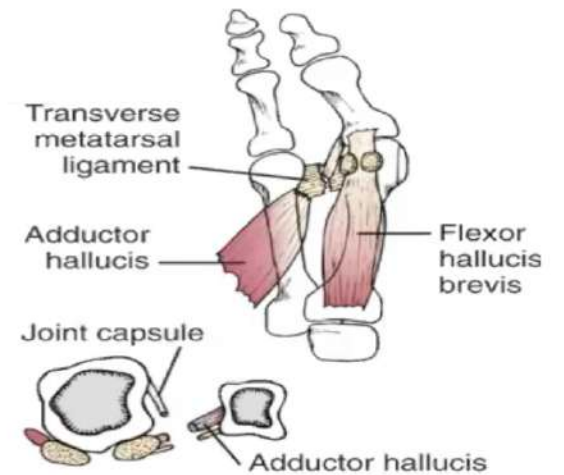
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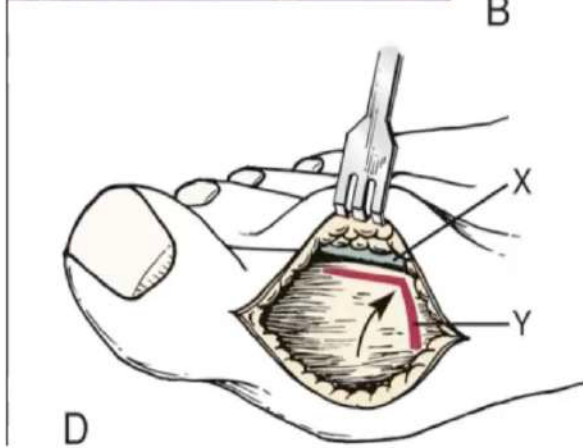
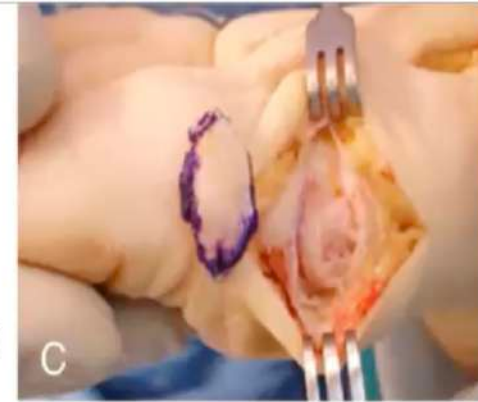
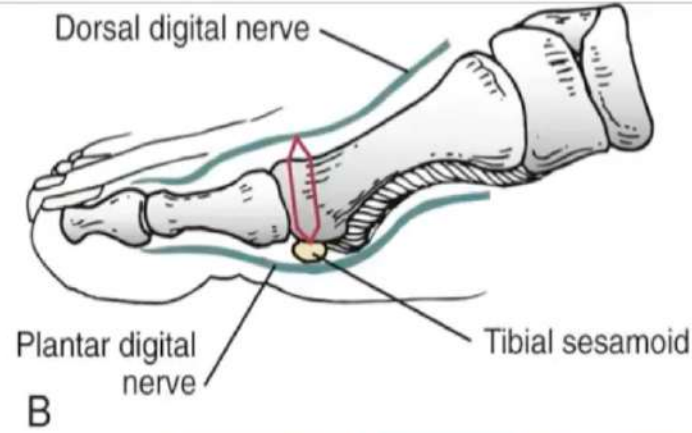
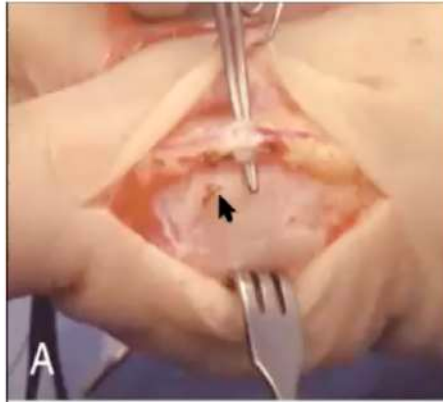
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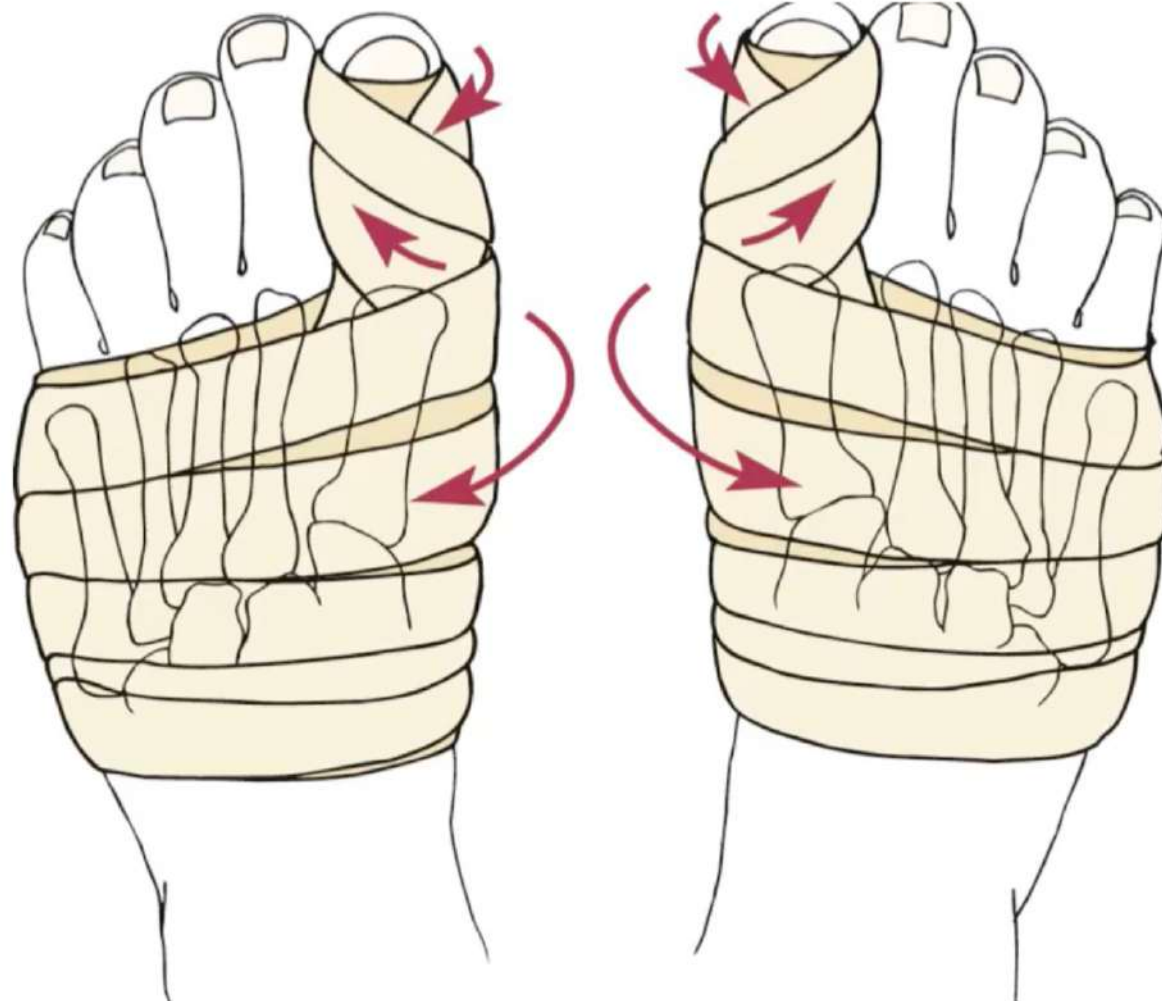


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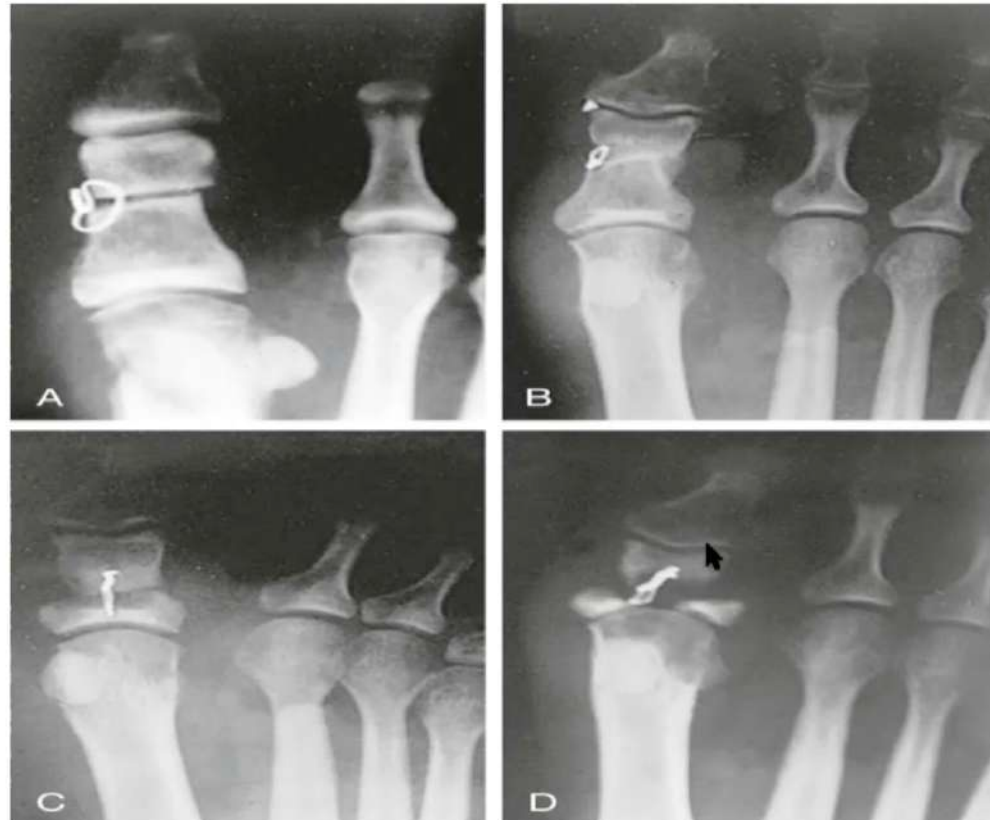
Defamdy - Hallux + Interphalangeus

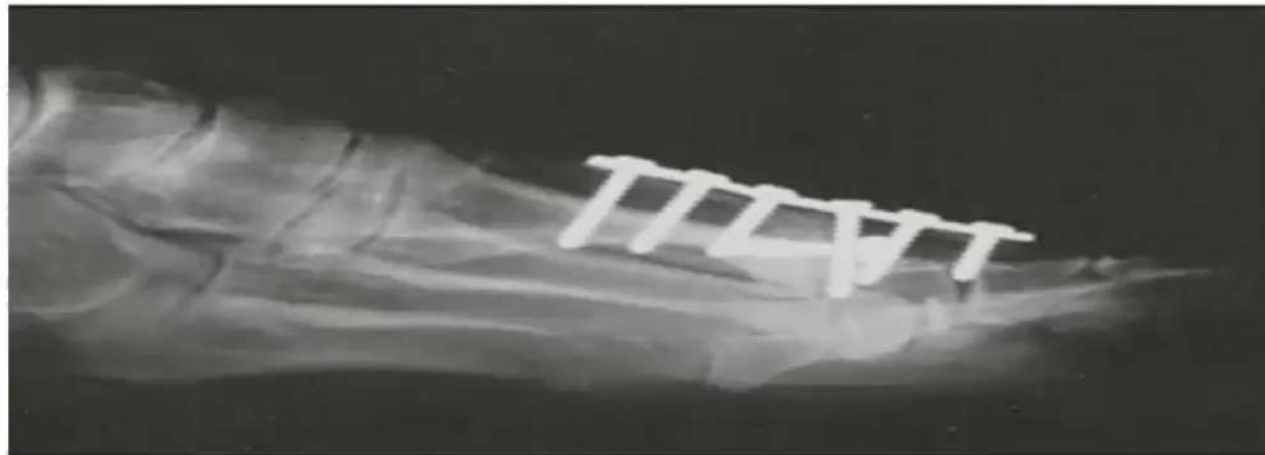
Scarf + Aris

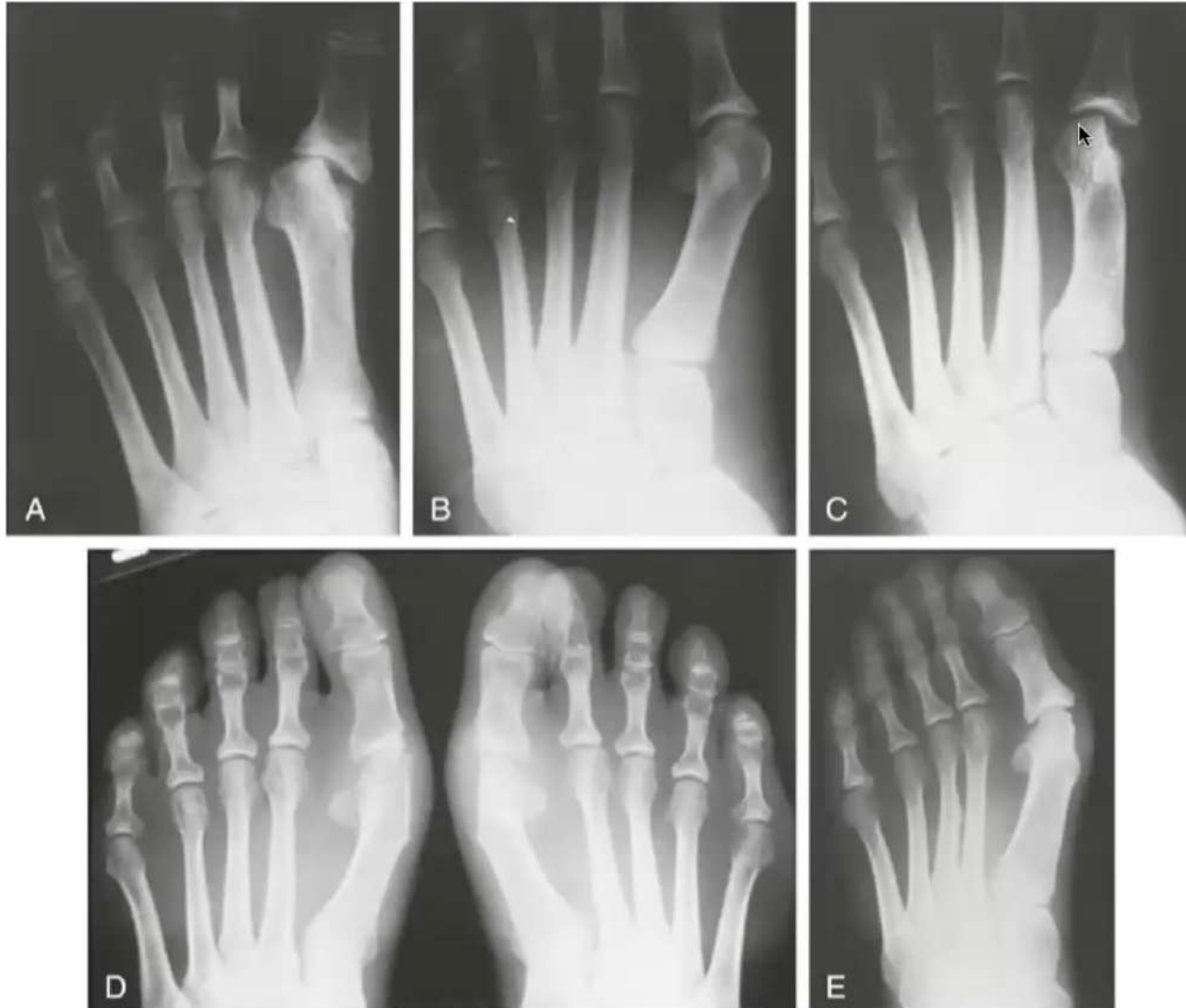
Interphalangeus - Aris

Complications

- Infections
- Delayed wound healing
- Skin sloughing
- Adherent scar
- Parasthesia
- Shortening of metatarsal shaft
- AVN
- Limited ROM
- Non union
- Hallux varus











Hallux Varus

- Medial deviation of great Toe
- Congenital – uncommon
- Neuromuscular – uncommon
- M.C- complication of hallux valgus surgery

-
- Over plication of medial capsule
 - Medial displacement of tibial sesamoid
 - Overpull of abductor hallucis
 - Overcorrection with post op dressing
 - Excessive resection of medial eminence



