



Common Forefoot Conditions

What can I do in the Primary Care Setting & when to Refer?

Mr Nadeem Mushtaq

Department of Trauma & Orthopaedics

Mr Nadeem Mushtaq

Consultant Trauma & Orthopaedic Surgeon
Imperial College Healthcare, London
Head of Foot & Ankle and Trauma

- St Mary's Hospital, Paddington
- The Lindo Wing – St. Mary's Paddington
- The Hospital of St. John & St. Elizabeth
- The Bupa Cromwell

NHS Secretary

marilyn.dominique@nhs.net

Private Secretary

tel: 02078673747

email: contact@otlclinic.co.uk

- **Today's topics**
 - Understanding the Foot
 - Hallux valgus
 - Hallux rigidus
 - Morton's Neuroma
 - Plantar Fasciitis
 - Friedberg's Disease
 - Lesser Toe Disorders

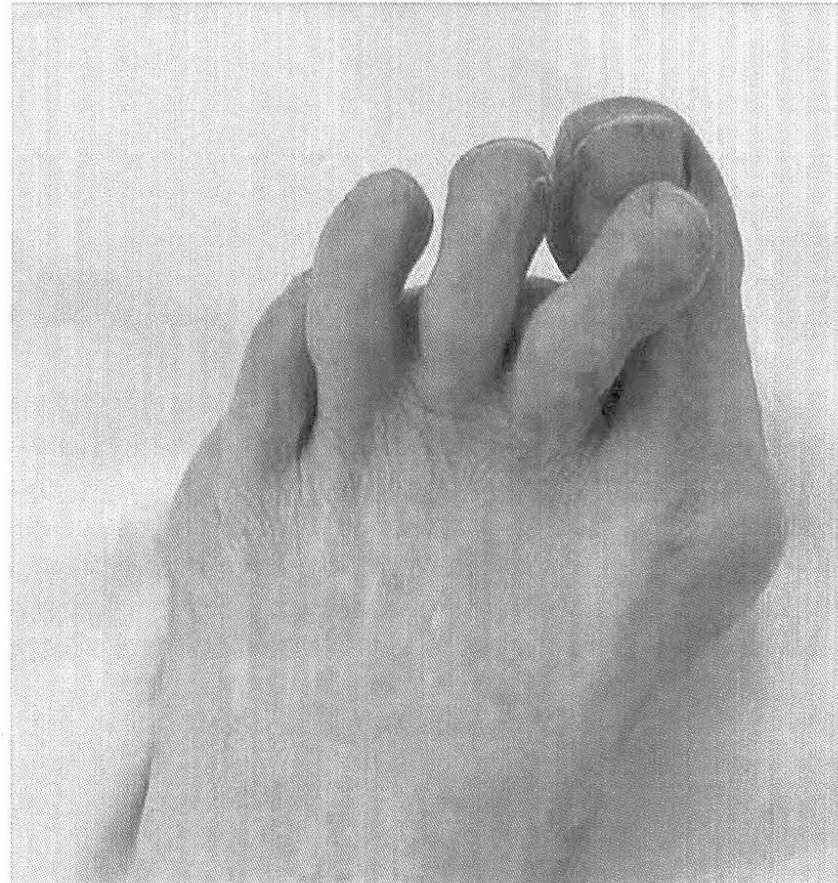


- 26 Bones (+ sesamoids & accessory)
- Joints
- Muscles
- Tendons
- Function
- Weight - standing / walking / running



Hallux valgus (not bunion)

- Hallux valgus
- is lateral deviation of the big toe at 1st MTPJ
- BUT – is that all



- 9:1 female : male
- 15:1 shoes : barefoot
- 23% in aged 18-65 years (CI: 16.3 to 29.6)
- 35.7% in aged over 65 years (CI: 29.5 to 42.0)
- Prevalence increases with age and is higher in females

- genetic predisposition with an imbalance of intrinsic and extrinsic forces on the joint.
- Instability in the MTPJ or TMT joint combined with tight footwear results in the classical deformity which over time becomes fixed and painful.
- Medical conditions may also predispose to developing the condition (Table 1).

Medical conditions predisposing

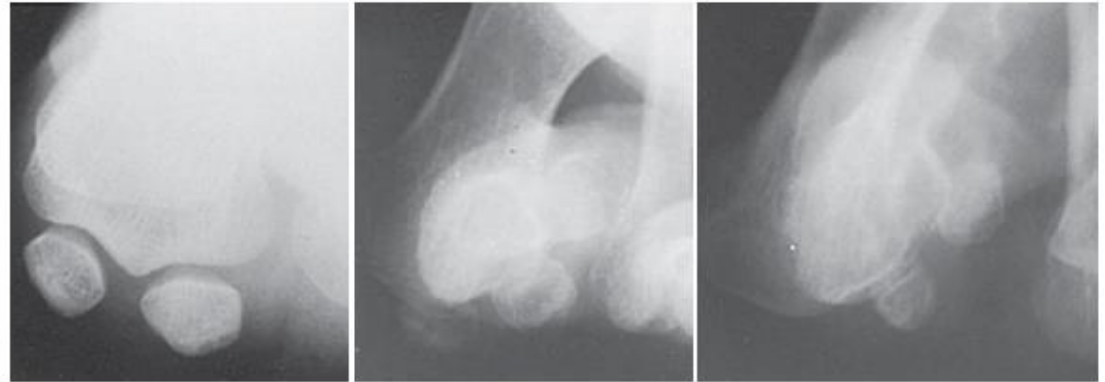
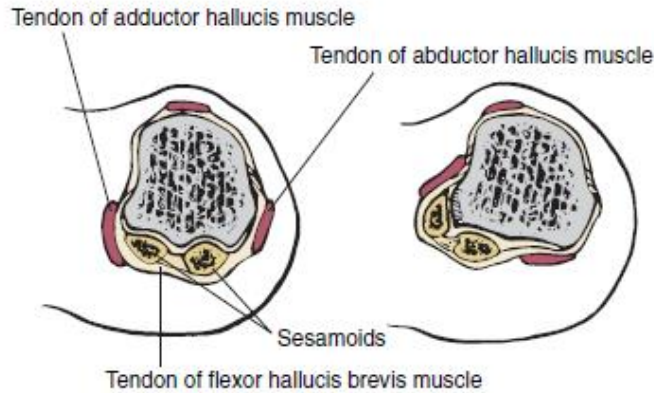
Gout	
Rheumatoid arthritis	
Psoriatic arthropathy	
Joint hypermobility	Ehlers-Danlos syndrome, Marfan's syndrome
ligamentous laxity	Down's syndrome
Multiple sclerosis	
Charcot-Marie-Tooth disease	
Cerebral palsy	



A

B

Figure 6-27 Longitudinal rotation of the first ray. **A**, Supination. **B**, Pronation. A pendulum is attached to the toenail of the great toe.



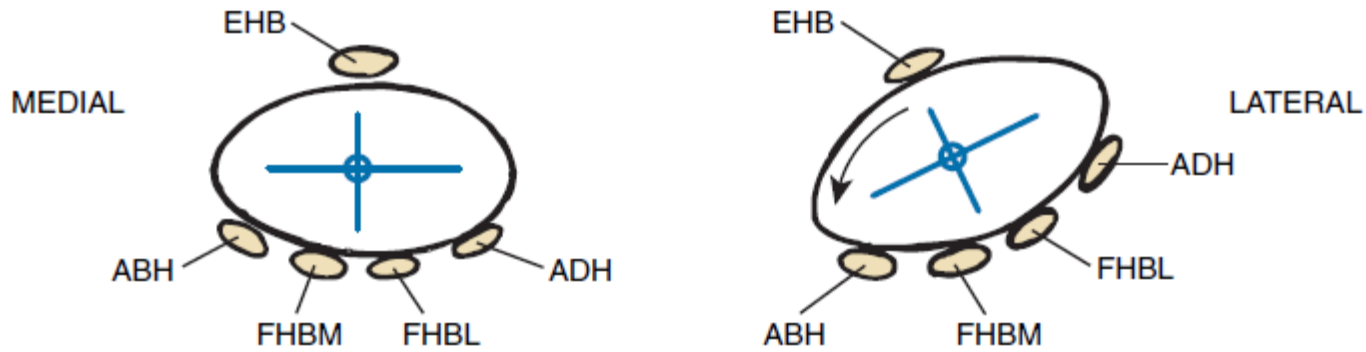
A

B

C

D

Figure 6-18 Relationship of the sesamoids to the metatarsal head. **A**, Diagram demonstrating the sesamoids stabilized by the crista, followed by atrophy of the crista as the metatarsal head deviates medially off the sesamoids. **B**, Normal relationship of the sesamoids to the crista. **C**, Moderate hallux valgus deformity. **D**, Severe hallux valgus deformity.



Presentation: usually due to pain

- pain over the bunion (bursa pain)
- joint pain (capsule stretching, joint subluxation, arthritic changes)
- lesser toe pain (transfer metatarsalgia – overloading of the lesser toes due to a malfunctioning great toe, with resultant hammer toe deformity)
- sesamoid pain (due to their subluxation out of cristae)

The examination should assess the following *bearing on the suggested treatment:*

- Degree of **Hallux Valgus whilst standing**
- **Pronation** of toe and resulting medial callus
- Passive **ROM** of 1st mtpj – restricted dorsiflexion in corrected position is unlikely to improve after surgery and in female patients may prevent wearing high heels.
- **Pain** and **stiffness** in the 1st mtpj with a palpable **dorsal osteophyte** (Hallux Rigidus)
- Associated **lesser toe** deformities, metatarsalgia, **planter callosities** over metatarsal heads
- position of the **arch** - Cavus or Plano-Valgus foot
- 1st TMTP **instability** – defined as elevation of 1st MT above level of 2nd MT with dorsal pressure
- intermetatarsal **neuroma**

- What & Why ?



plantar callosities

- Why ?
- Dysfunctional 1st ray which takes 75% of the body weight



Wt Bearing xrays



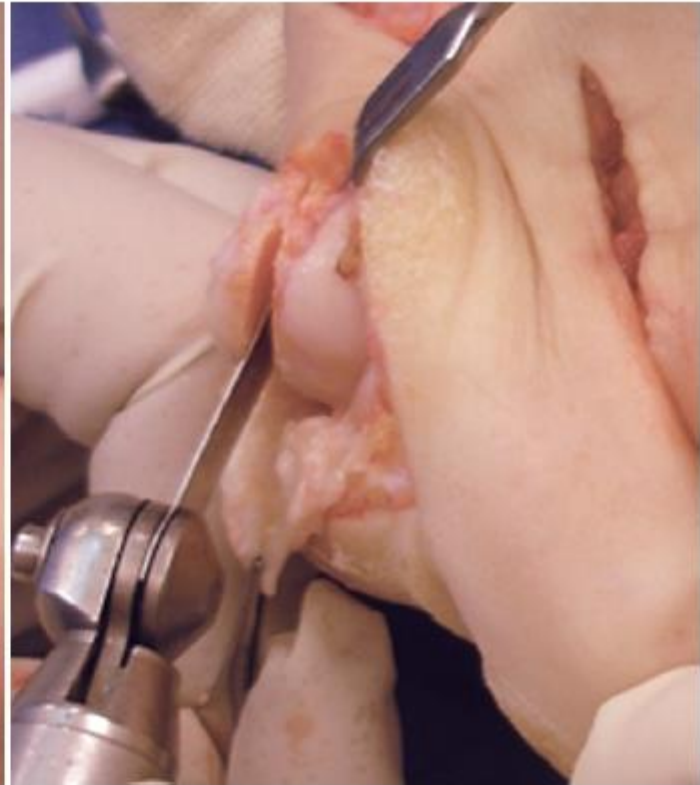
Non-surgical treatments

- wide, high boxed shoes to accommodate the 1' and 2' deformities
- Padding & spacers
- Insoles may be required if there is associated hypermobility or pes planus.



- **Surgical treatments**
 - distal soft tissue release and a metatarsal osteotomy (various types exist eg. chevron, scarf, proximal)
 - Occasionally, a 1st MTPJ arthrodesis has to be performed to address hypermobility of the joint and the hallux valgus is addressed at the same time.
 - If there is an associated hallux valgus interphalangeus then an Akin (medial closing wedge) osteotomy is also performed.

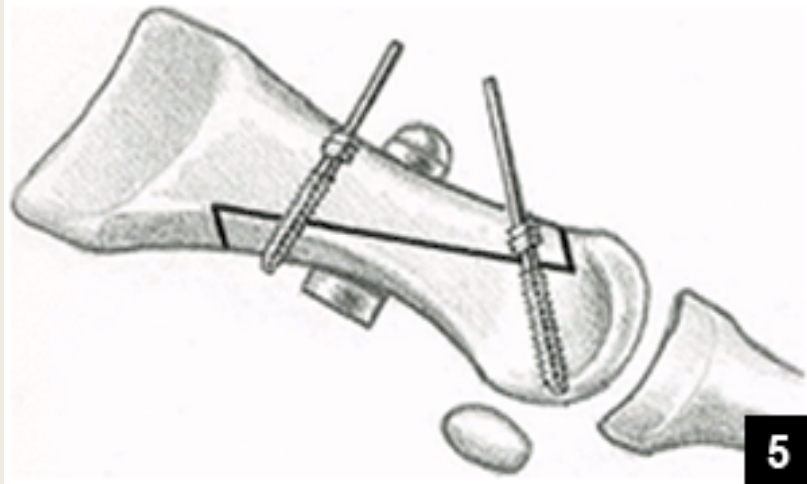
1st – Excise bunion



2nd - Choose your osteotomy



Scarf



Modified chevron





Minimally invasive



New but unproven

Use a Burr – not a saw



Minimally invasive



Post-op – multiple small cuts, not a large single cut

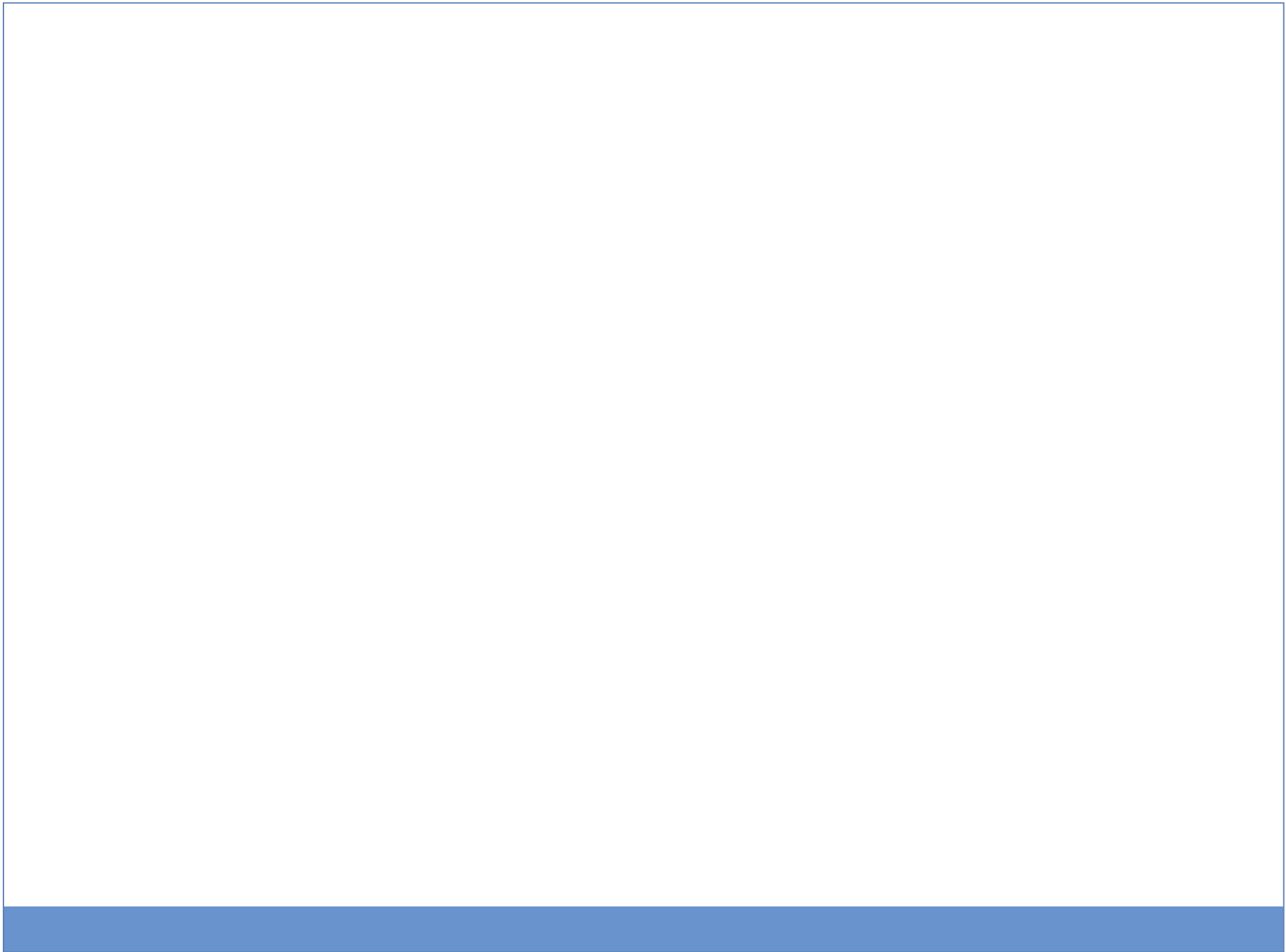


- 1.1 Current **evidence** on the efficacy of surgical correction of hallux valgus using minimal access techniques is **limited and inconsistent**. In addition, the evidence relates to a range of different surgical techniques. The evidence on **safety is inadequate**. Therefore, this procedure **should only be used with special arrangements** for clinical governance, consent and audit or research.

- 1.2 Clinicians wishing to undertake surgical correction of hallux valgus using minimal access techniques should take the following actions.
 - Inform the clinical governance leads in their Trusts.
 - Ensure that patients and their carers understand the uncertainty about the procedure's safety and efficacy and provide them with clear written information.
 - Audit and review clinical outcomes of all patients having surgical correction of hallux valgus using minimal access techniques (see section 3.1).

Post-op shoes





H. Rigidus





- Analgesia
- Stiff soled shoes
- Morton's Extension Insole
 - (not insole for Morton's Neuroma)
 - Rigid bar to prevent movement at MTPJ
- Steroid injection +/- MUA



Can we retain the movement ?

- Lots of different metal implants tried
- None so far have a good survival ??
- Difficult to revise as too much bone taken away during insertion



Synthetic cartilage implants ?



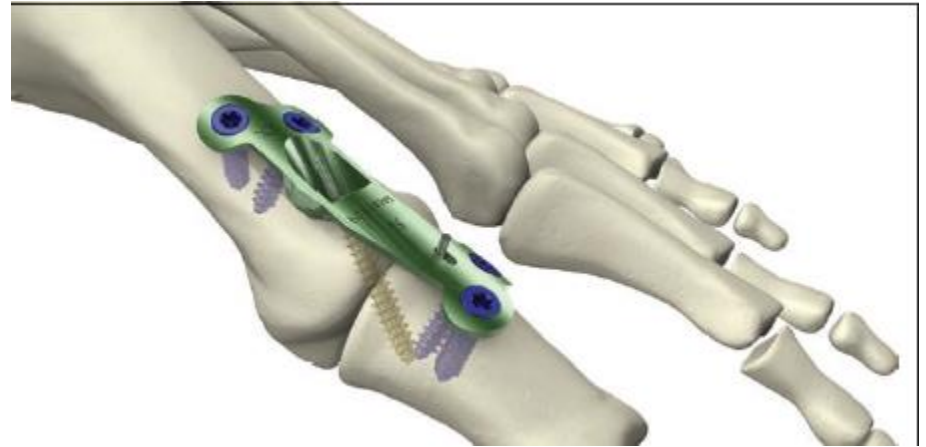


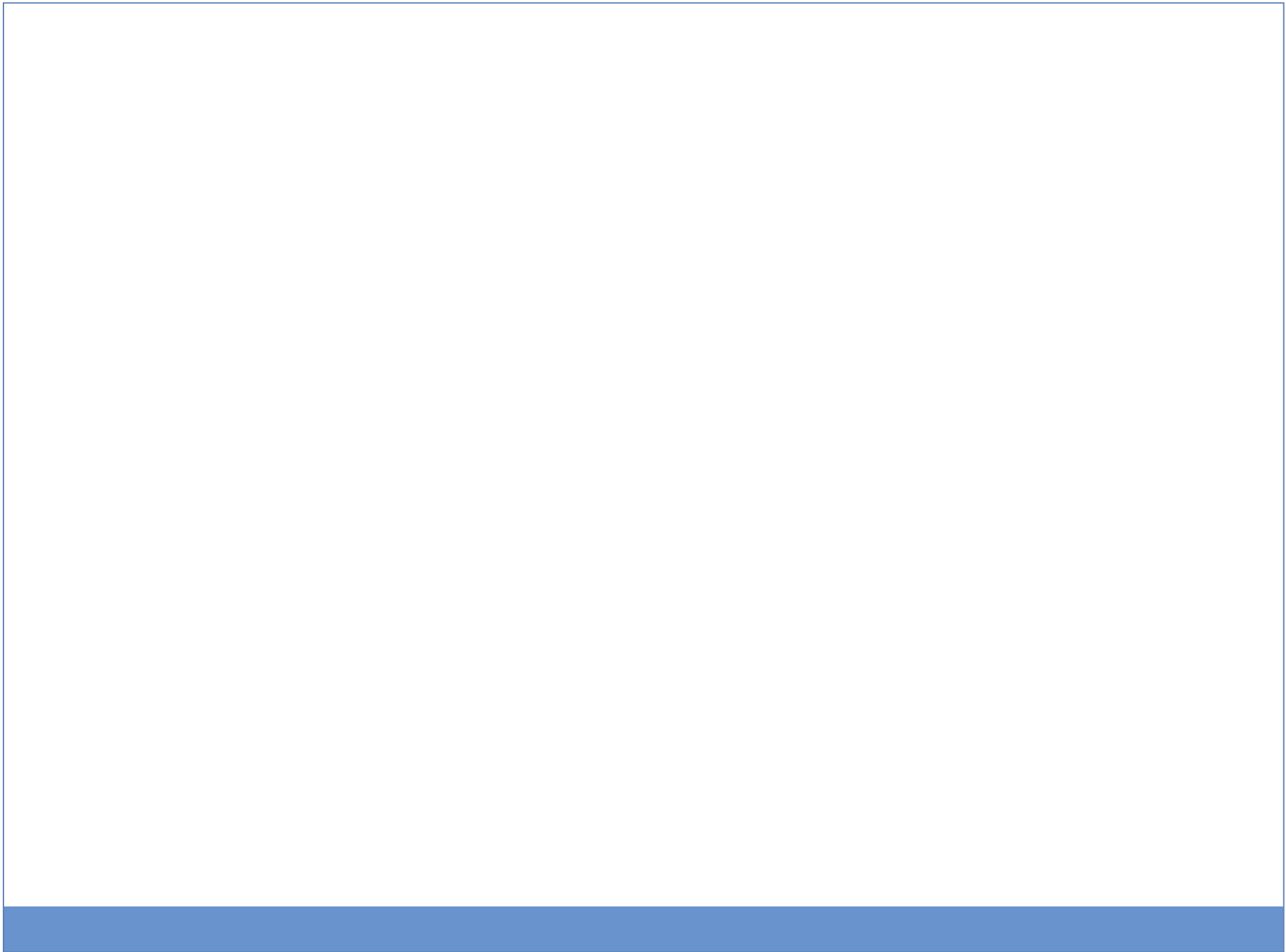
Before Cartiva Implant



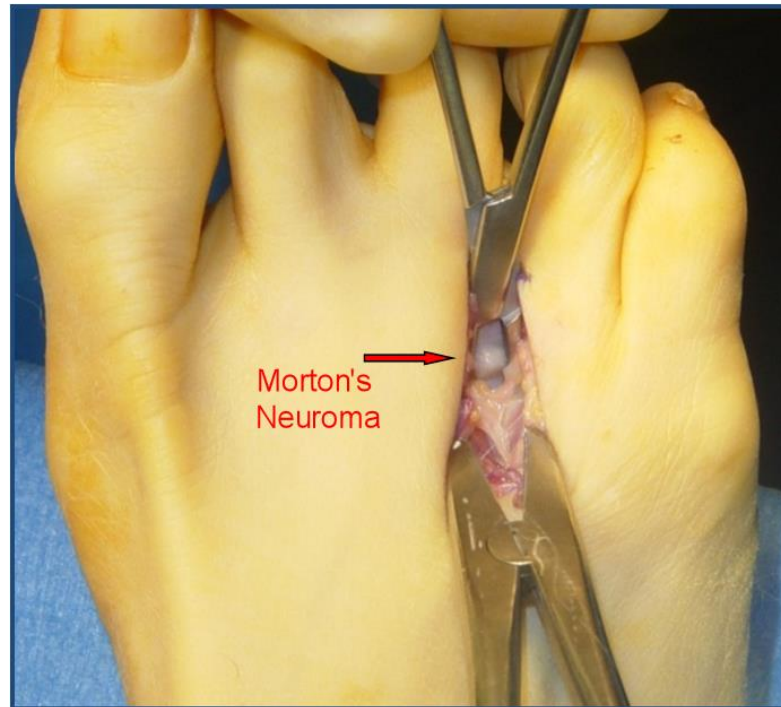
With Cartiva Implant

Lots of ways to fuse the joint





Morton's Neuroma



- compression neuropathy of the plantar digital nerve
- distal edge of the transverse intermetatarsal ligament
- Any process that diminishes space
 - metatarsophalangeal synovitis
 - ganglion cysts
 - Trauma with swelling
 - poorly fitted shoe wear
 - repetitive hyperextension at the MTPJ
- Location (3,2,4,1)
- third intermetatarsal space, which may be due to dual contribution

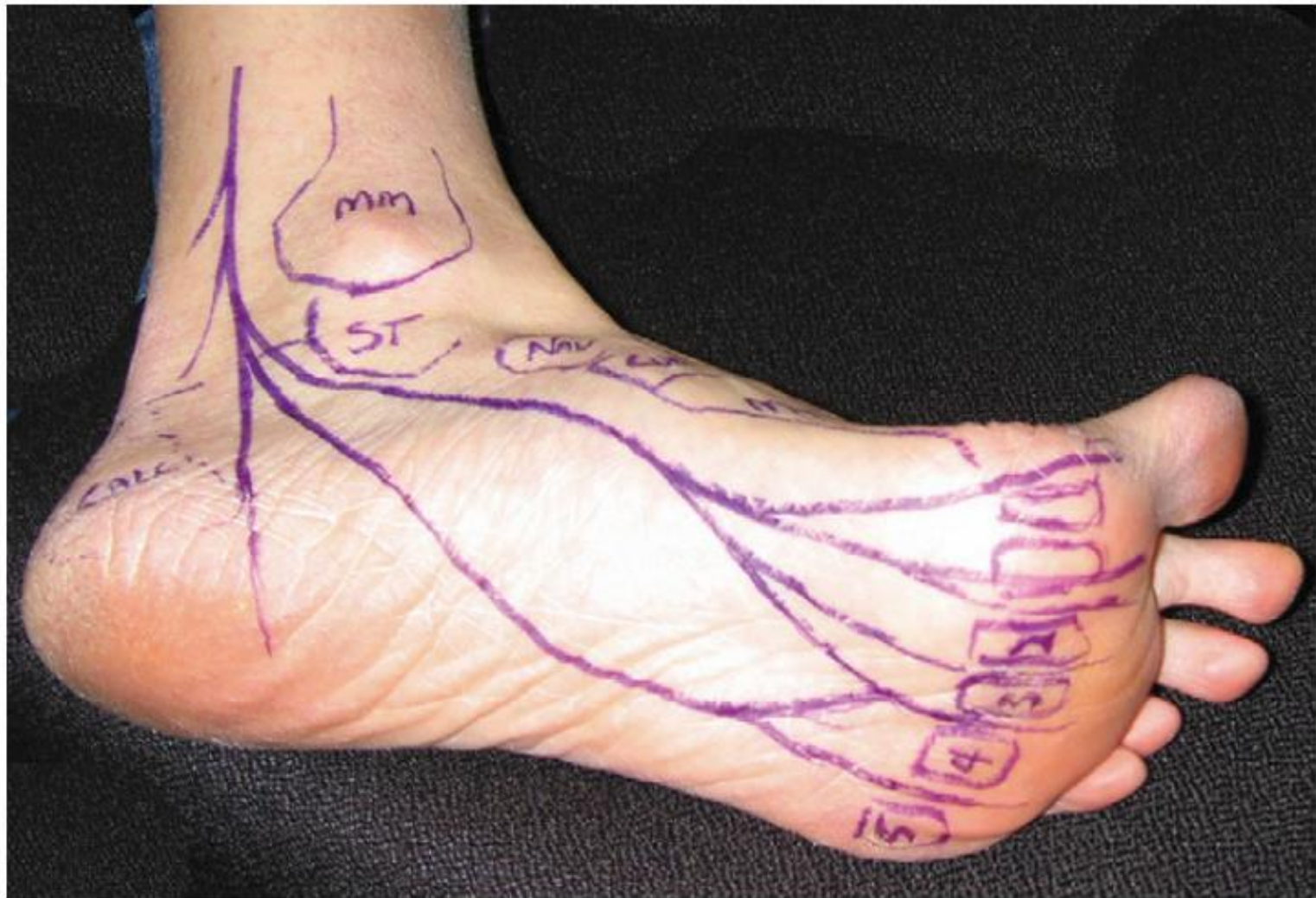
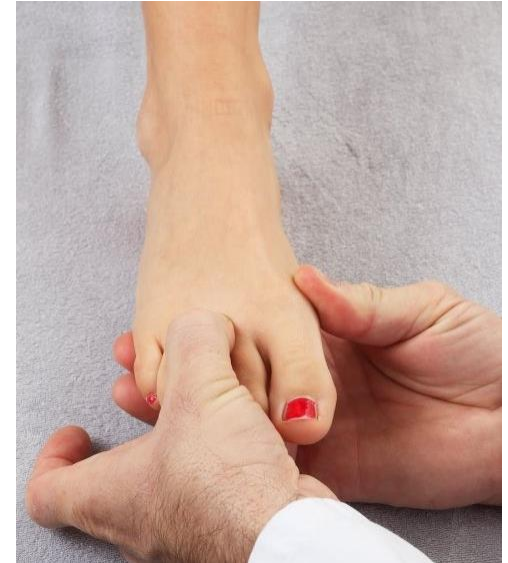


Figure 11-1 Illustration of nerves on the plantar aspect of the foot. Note the third toe has mixed innervation from the medial and lateral plantar nerves.

TABLE 11-1**Preoperative Symptoms of Interdigital Neuroma**

Symptom	Patients Affected (%)
Plantar pain increased by walking	91
Relief of pain by resting	89
Plantar pain	77
Relief of pain by removing shoes	70
Pain radiating into toes	62
Burning pain	54
Aching or sharp pain	40
Numbness in toes or foot	40
Pain radiating up foot or leg	34
Cramping sensation	34

- plantar **tenderness** with palpation just distal to metatarsal heads
- check **sensation** in affected region as it may be altered in some patients
- a bursal click (**Mulder's** click) may be elicited by squeezing metatarsals together
- metatarsalgia and MTP synovitis or **instability** must be ruled out (use drawer test at MTPJ)

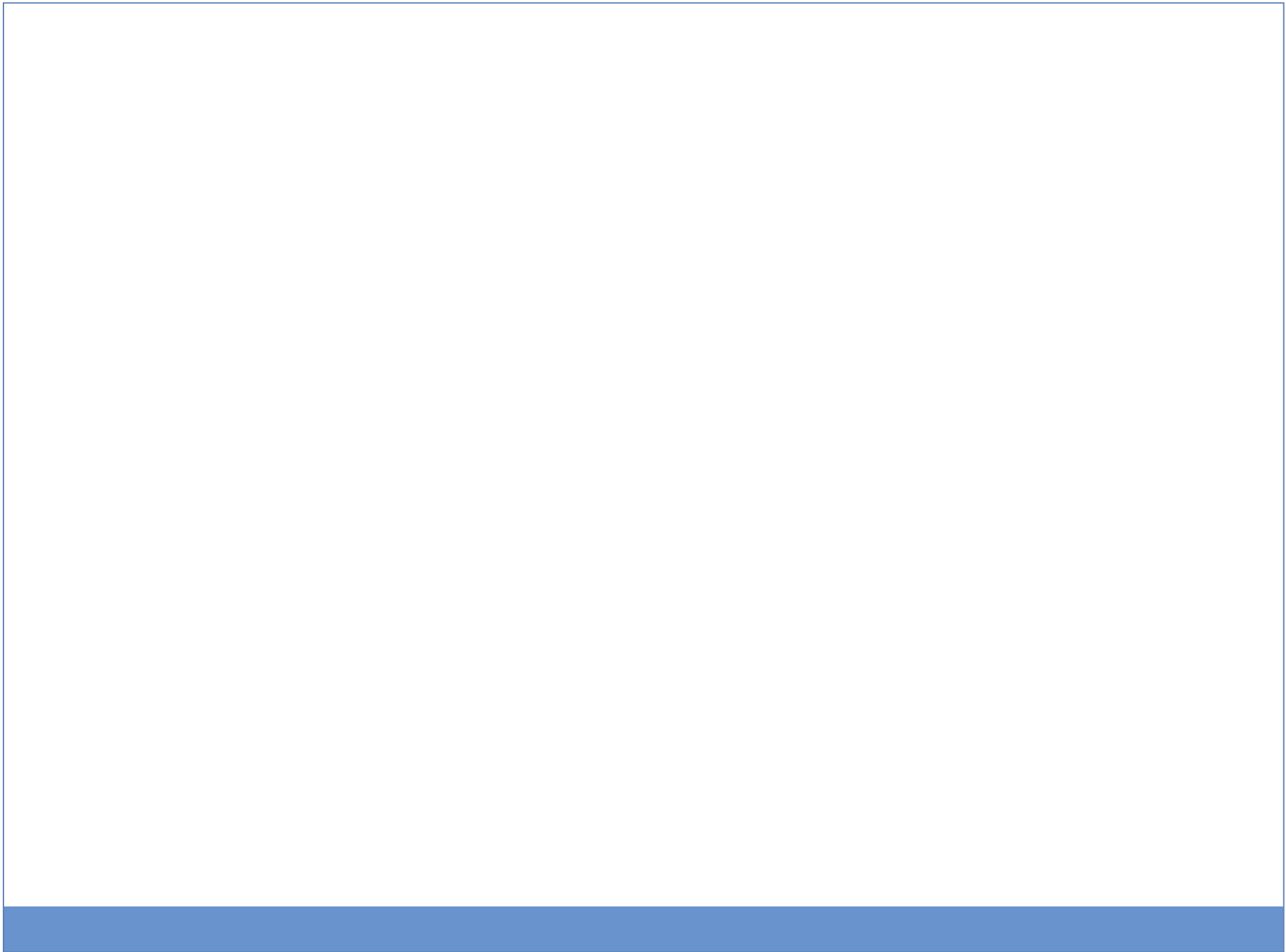


- Shoes
 - High heels
 - Constricting toebox
 - Thin sole
- Metatarsal pad
- MT Dome orthotic
- USS & Steroid inj.



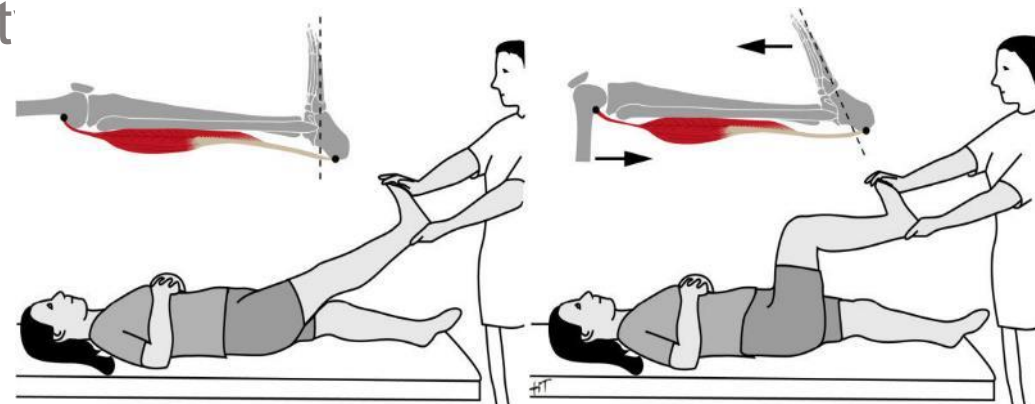
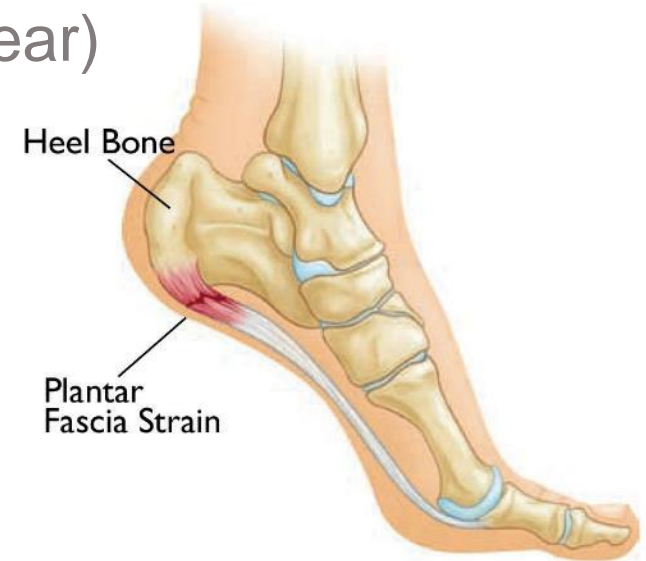


Figure 21-8 **A**, The neuroma is identified in a standard manner with a laminar spreader in the web space and a retractor distally pulling on the soft tissues between the toes. **B**, The bifurcation of the nerve into the two digital branches is identified, and the nerve is clamped. **C** and **D**, The nerve is then elevated distally, and each branch is cut separately. **E**, The nerve is retracted proximally, ensuring that all plantar cutaneous branches are dissected off the main nerve, and then is cut proximally between the interosseous muscles.



Plantar fasciitis

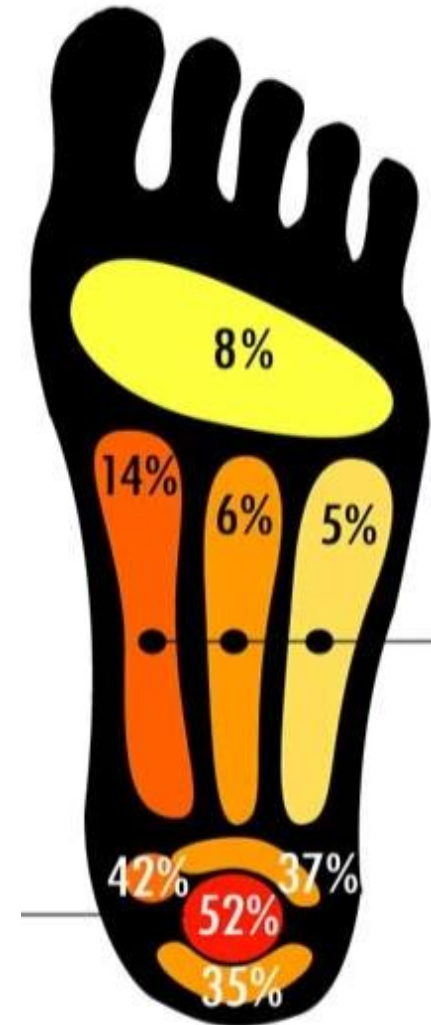
- Micro-Trauma (Vs acute trauma = Tear)
- Tight Gastrocnemius
 - silfverskiold test
- Obesity
- Cavus Foot
- Repetitive impact activity
 - Running/sports
- New/Increased activity



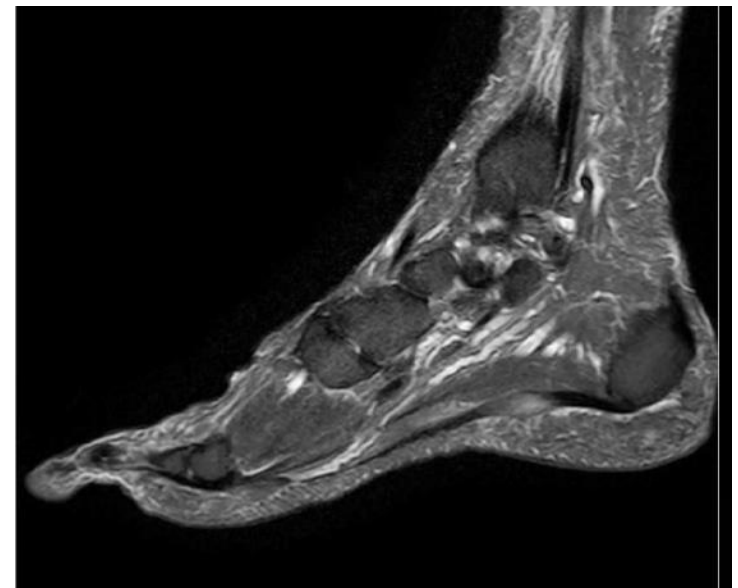
- Pain around heel

- Start-up pain
 - Getting out of bed
 - After a period of rest
 - Long car ride
 - Subsides after a few mins walking

- Pain after exercise
 - (NOT during)



- Xray exclude other pathology
- Bone spur is not cause of pain
- USS – my preferred choice
 - Can inject at same time
- MRI



Non-surgical Rx

- 90% improve in 1 year
- Activity modification
- Ice Bottle exercise - **video**
- NSAIDS
- Calf Stretches - **video**
- Plantar Fascia Stretch
- Insole
- Night splint
- Injection/shockwave



Frozen water bottle treatment
to help reduce the swelling and
alleviate the pain of plantar fasciitis

Guidelines:
5-10 min a day

You can choose to increase or decrease the
time depending on your condition

*****Do not exceed ice treatment for
more than 10min on each foot
in one series**

Alfredson calf stretches



Stretch Gastrocs *in STJ neutral*

If tight, stretch of gastrocnemius muscle in STJ neutral



Good technique

- Subtalar joint in neutral position
- No abduction of foot



Poor technique



Good technique

- Keep heel pressed into the ground
- Keep bottom tucked in (body in a straight line)



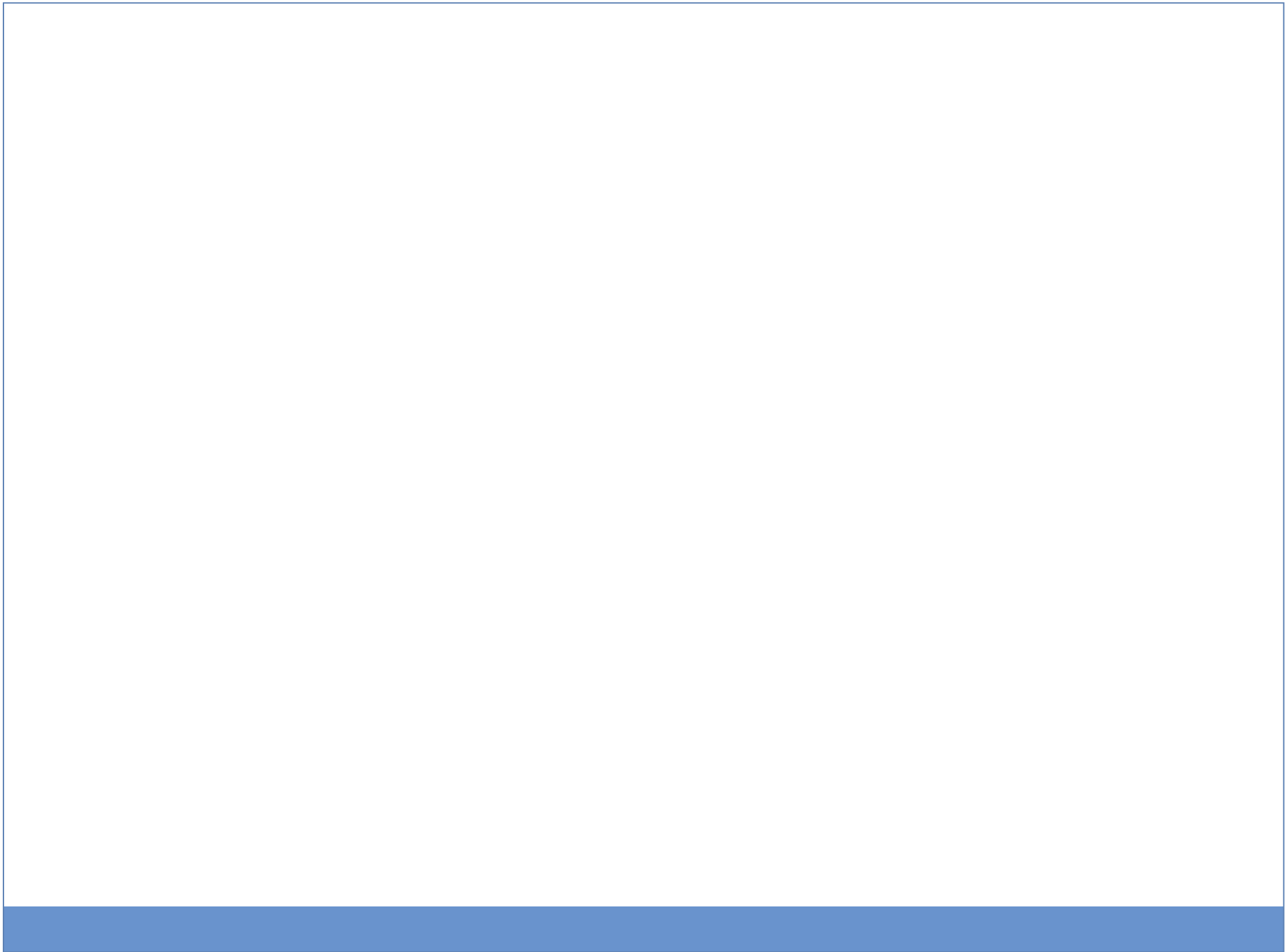
Poor technique

To help hold neutral -
wedge under back foot
(under ball of big toe)



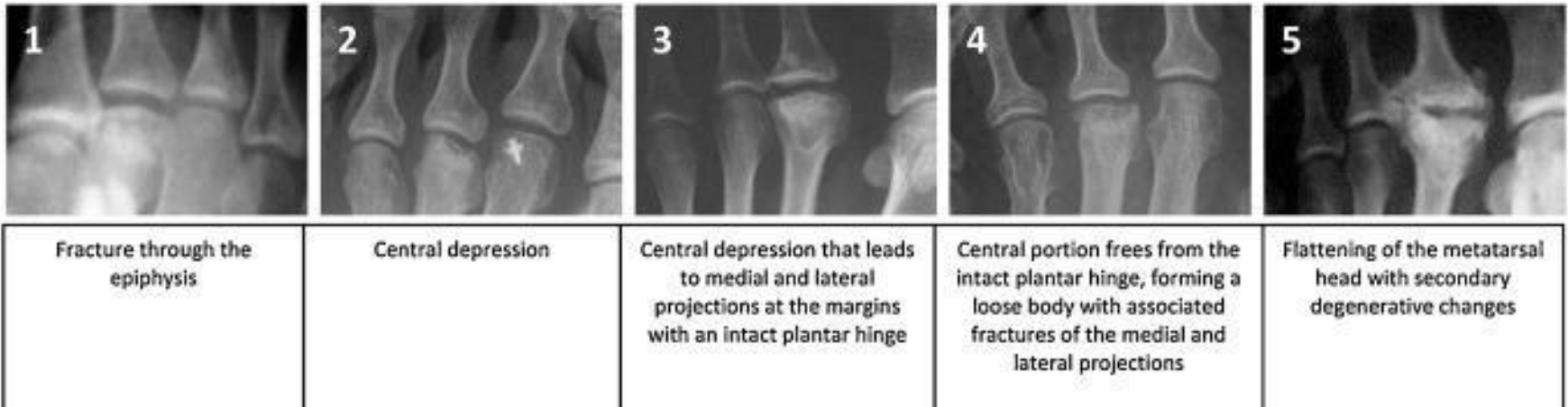
- Gastrocnemius
Recession
- Plantar Fascia Release



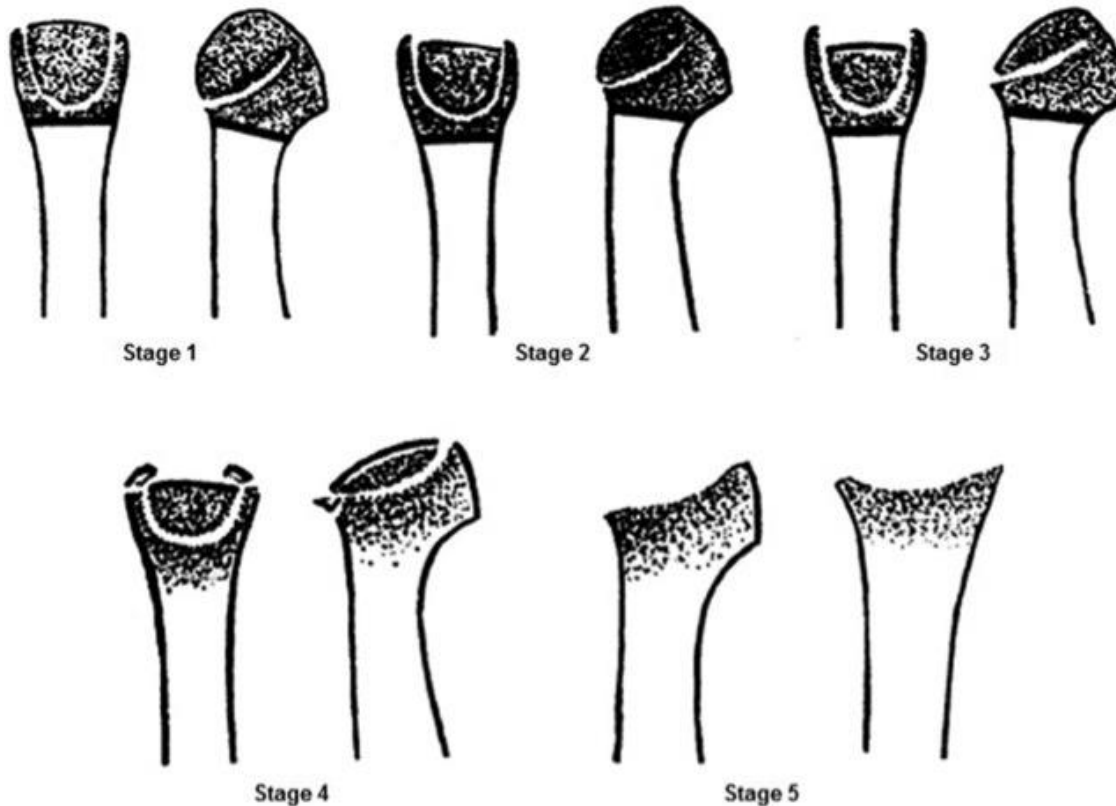


Freiberg's Disease

- infarction and fracture of the metatarsal head
- F>M
- Adolescent Athletes
- Repetitive microtrauma / overloading / AVN
- Long 2nd toe



Freiberg's Disease



Stage 1: Fissure in epiphysis with sclerosis between cancellous surfaces.

Stage 2: Absorption of cancellous tissue on the proximal side with sinking of the articular cartilage dorsally.

Stage 3: Further absorption and sinking of the articular surface with bony projections medially and laterally.

Stage 4: Articular surface has sunk so far that restoration of normal anatomy has passed.

Stage 5: Arthrosis with flattening and deformity of the metatarsal head.

Smillie's classification

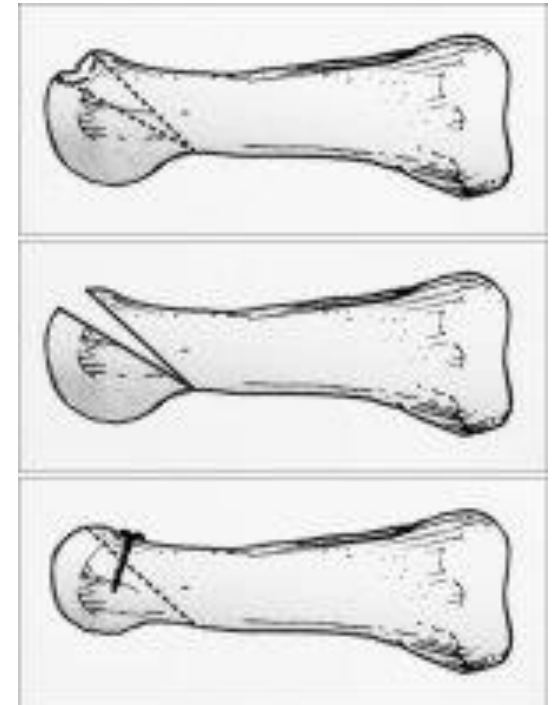
Freiberg's Disease

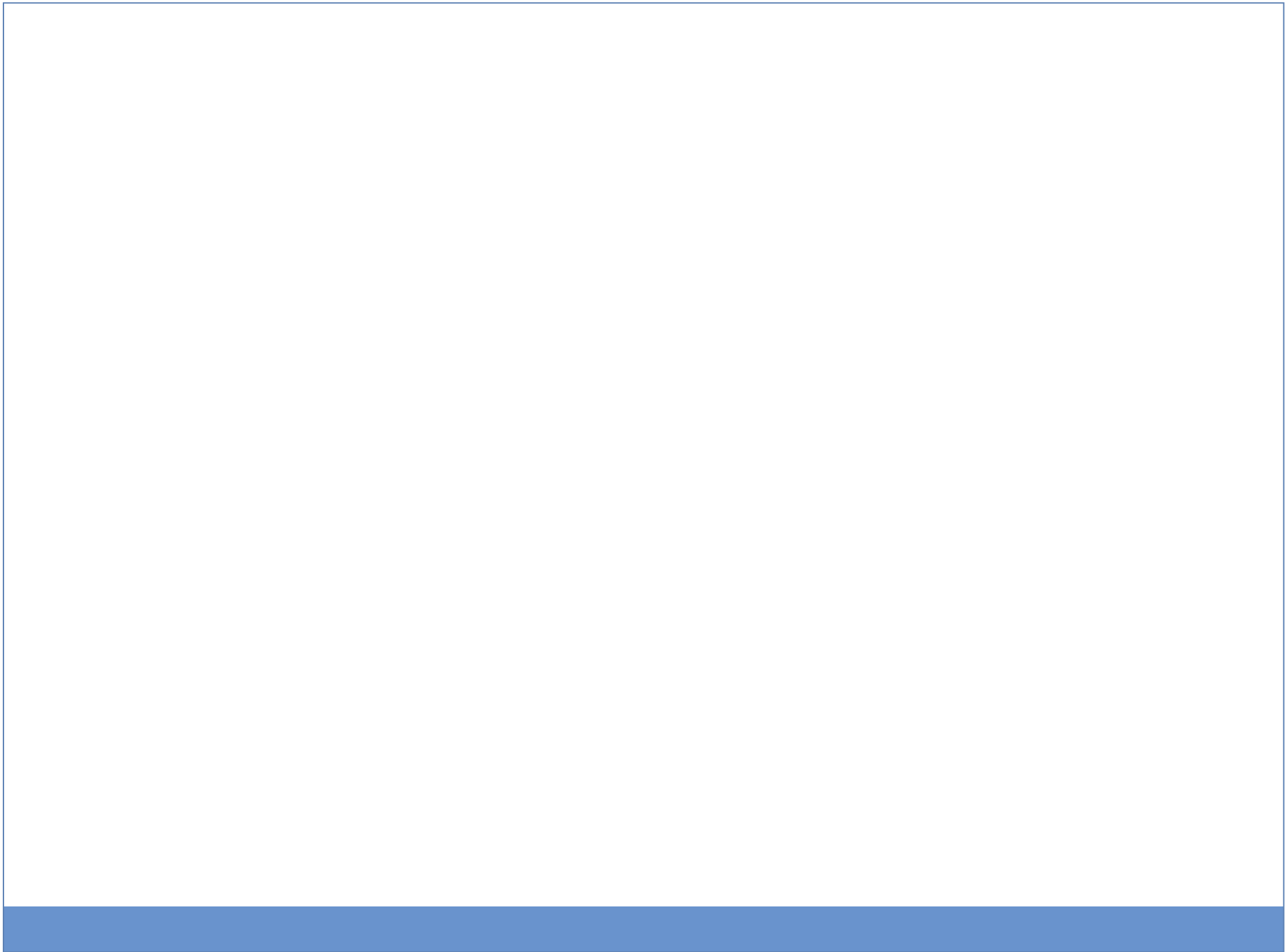
■ NON-OP

- Treat Underlying cause – forefoot overload
- Rest / Immobilisation
- Pain Meds
- Orthotics / Offload
- Shoe modification & Padding

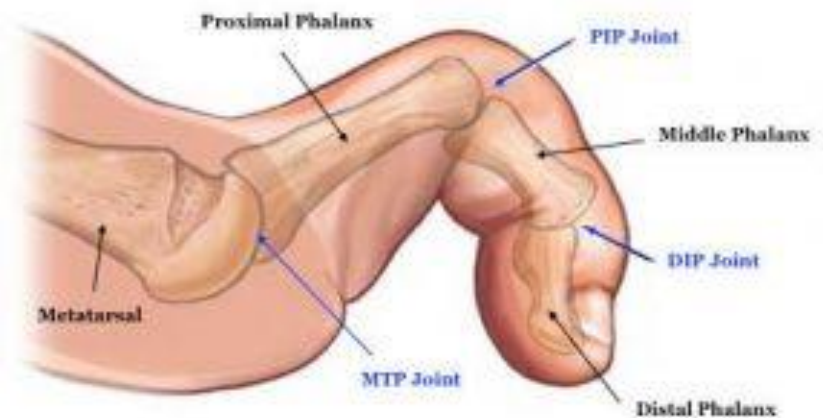


Freiberg's Disease





- alterations in normal anatomy
- imbalance between the intrinsic and extrinsic muscles
- Causes
 - improper shoe wear
 - Trauma
 - Genetics
 - inflammatory arthritis
 - Neuromuscular
 - metabolic diseases



Lesser Toe Disorders

	Claw Toe	Hammer Toe	Mallet Toe
DIP	flexion	extension	flexion
PIP	flexion	flexion	normal
MTP	hyperextension	normal (slight extension)	normal



Lesser Toe Disorders



•Taping and shoe modification

- provide adequate plantar padding using metatarsal and/or crest pads
- orthotics to offload metatarsal heads
- shoe with a high toe box
- sling to hold the proximal phalanx parallel to the ground



■ Surgery

- Tenotomy
- Tendon lengthening
- Weils MT shortening
- PIPj Fusion
- DIPj Fusion



Questions

