

# How to deal with diabetic neuropathic foot ulcer:

## Charcot neuroarthropathy

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# CONTENT OVERVIEW

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# 1

## Clinical Presentation

Look like swelling foot without sensation in combination with ulceration

# 2

## Associate pathology

Osteomyelitis vs Charcot neuroarthropathy

# 3

## Investigation

CT MRI lab bone biopsy

# 4

## Nonoperation

Stage III with braceable

# 5

## Operation

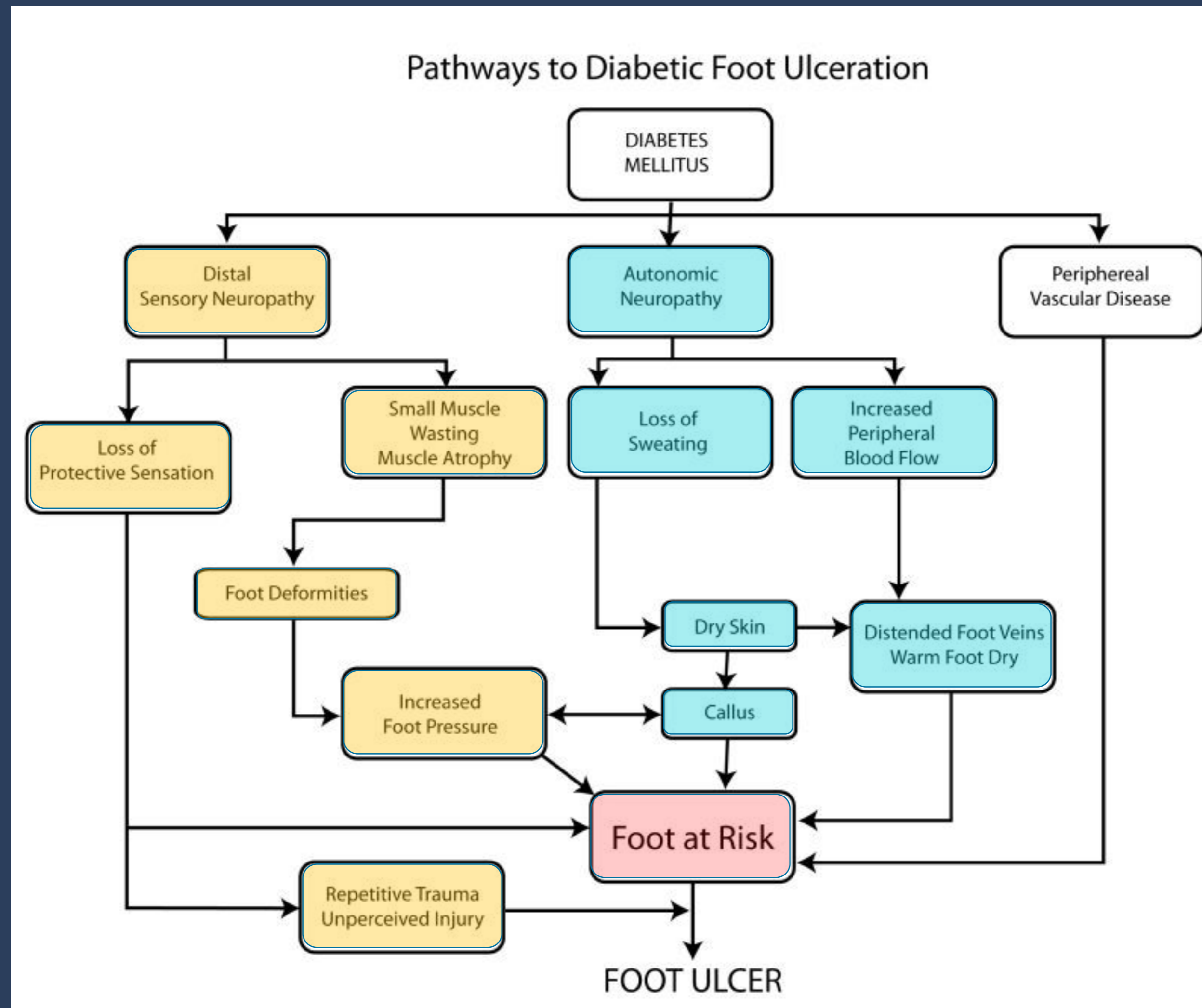
To treat and prevent further damage

# 6

## Outcomes

reasonable

# Diabetic neuropathic foot ulcer



# Clinical Presentation

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No gift of pain  
No warning symptoms



# Clinical presentation



Swelling+ history of minor trauma



No pain



STANDING

Look like fracture

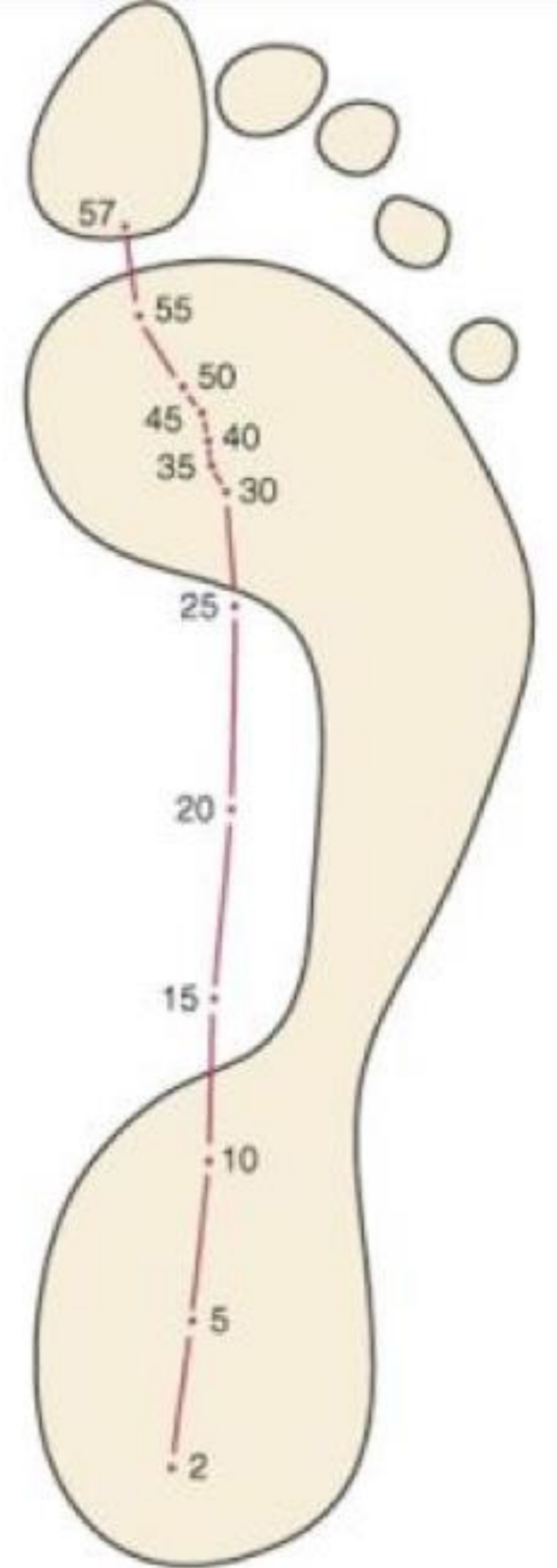


# Foot biomechanics

62% of stance phase  
50% in heel and midfoot and  
forefoot (MT head)  
50% in big toe.

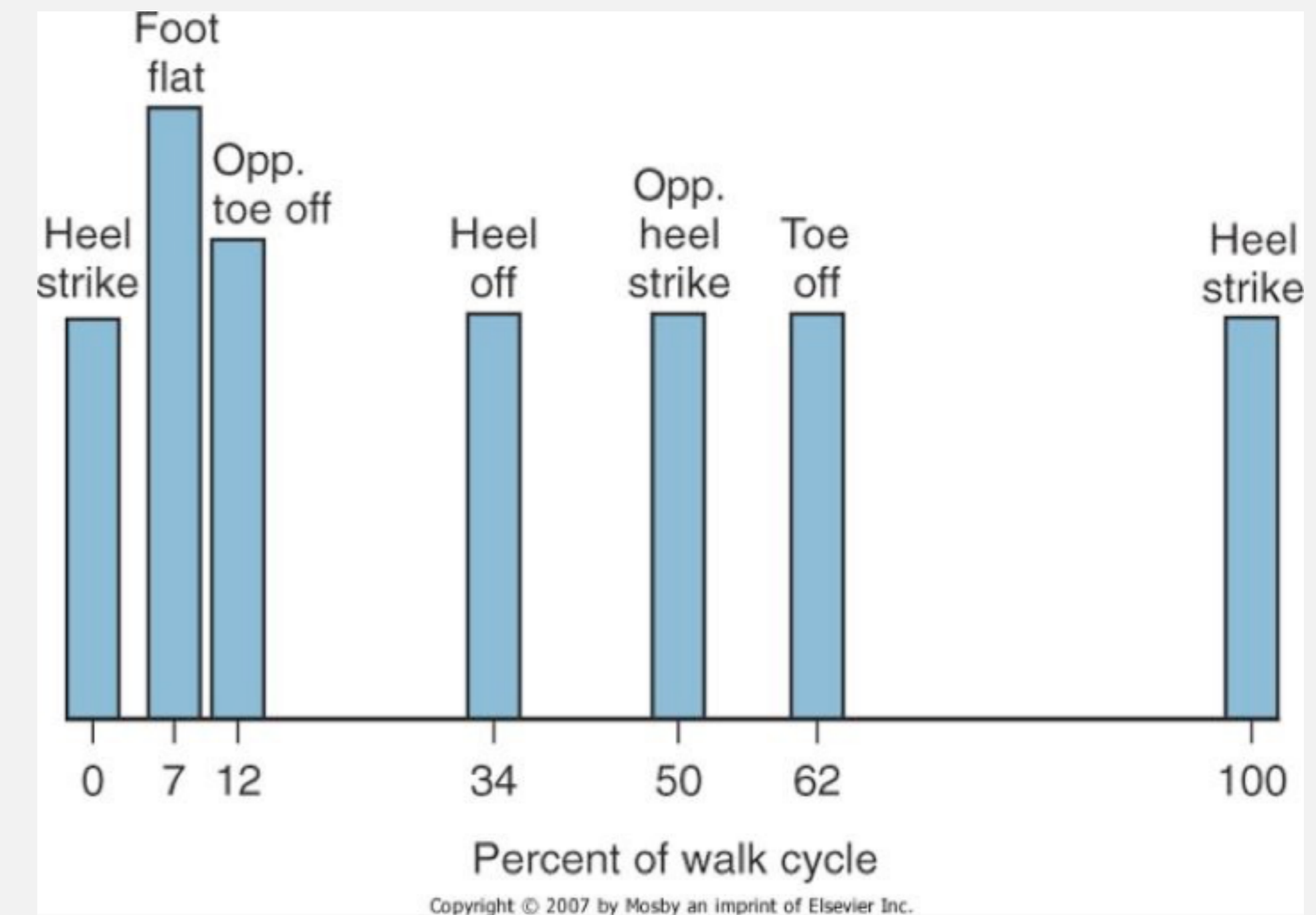
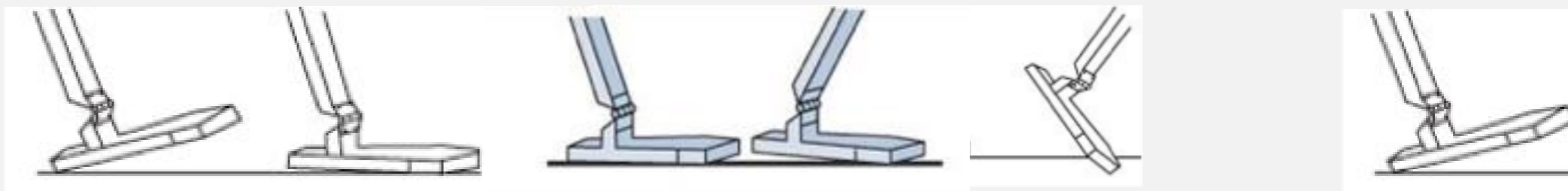
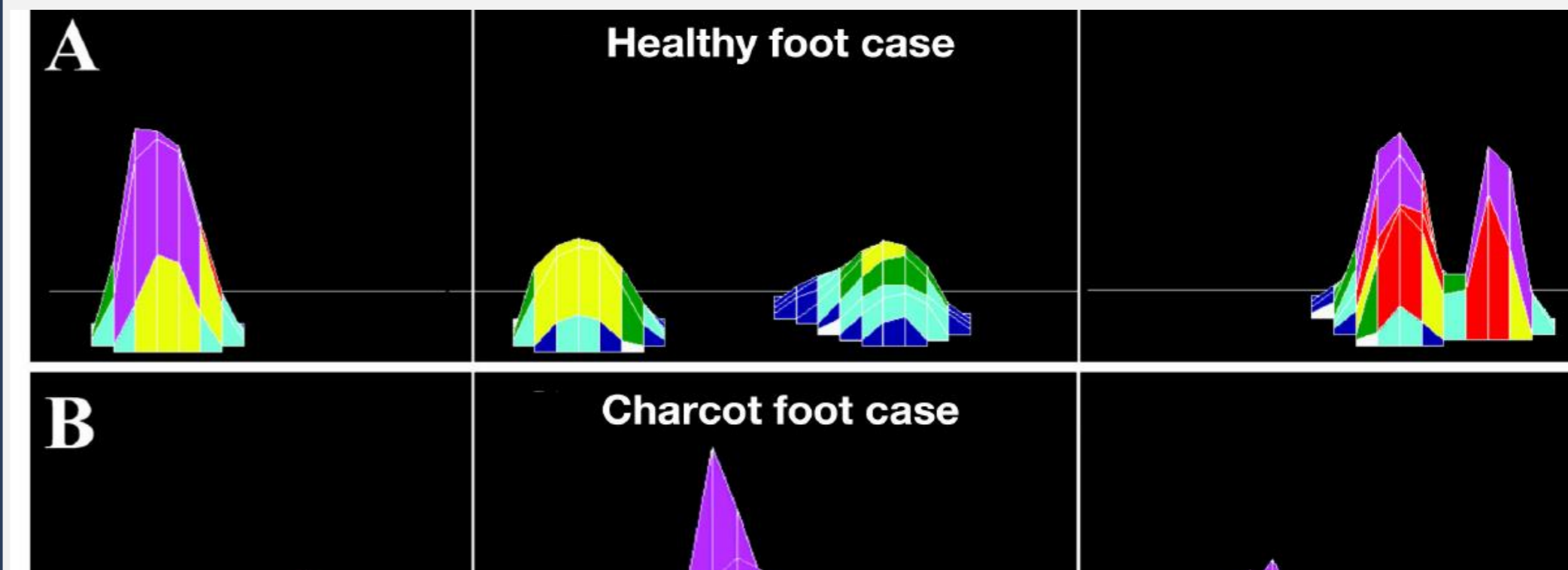
Half of stance phase

Half of stance phase



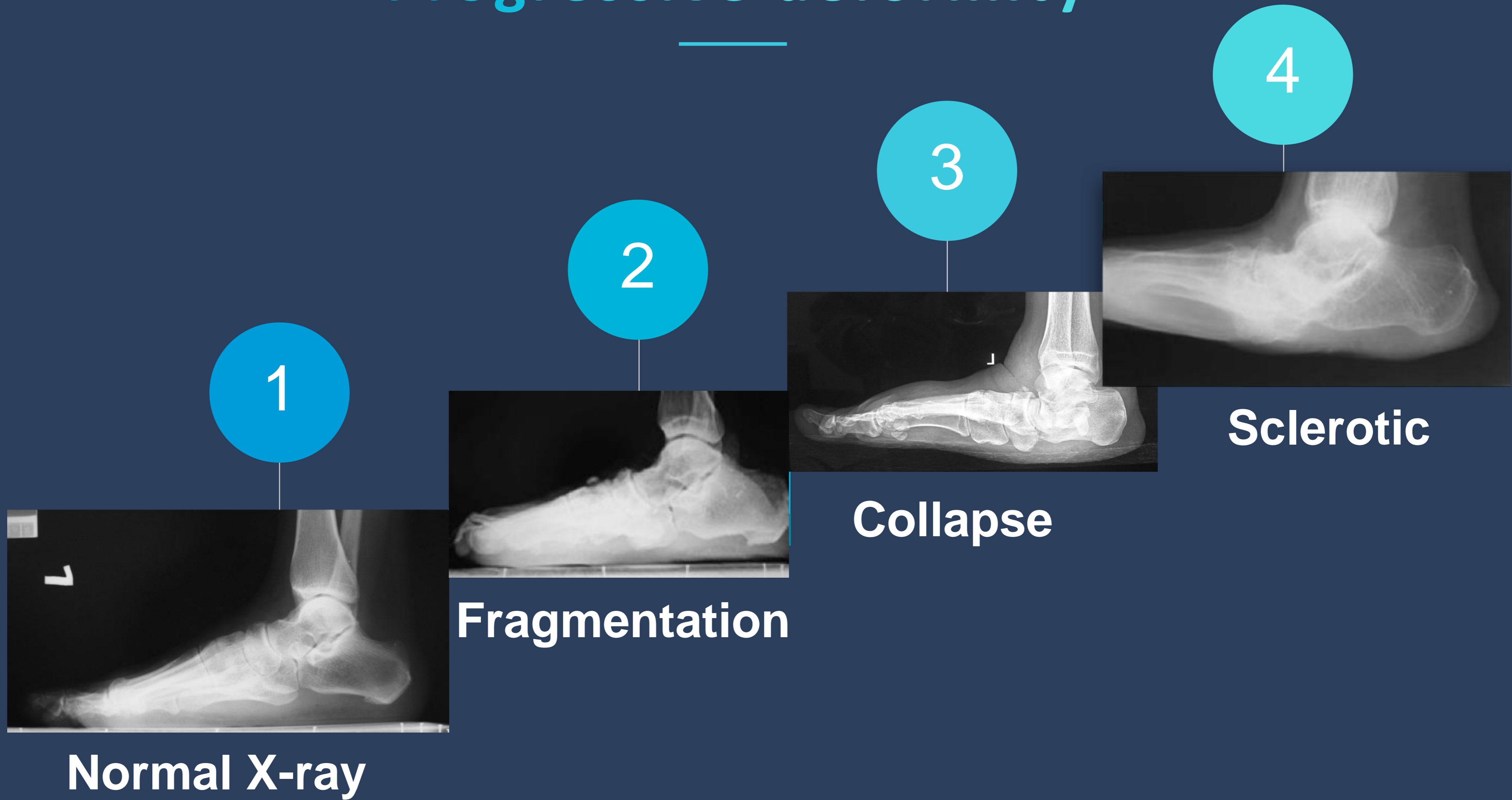
# Clinical Presentation

3 phase of gait cycle  
Normal foot shape  
Peak pressure scan



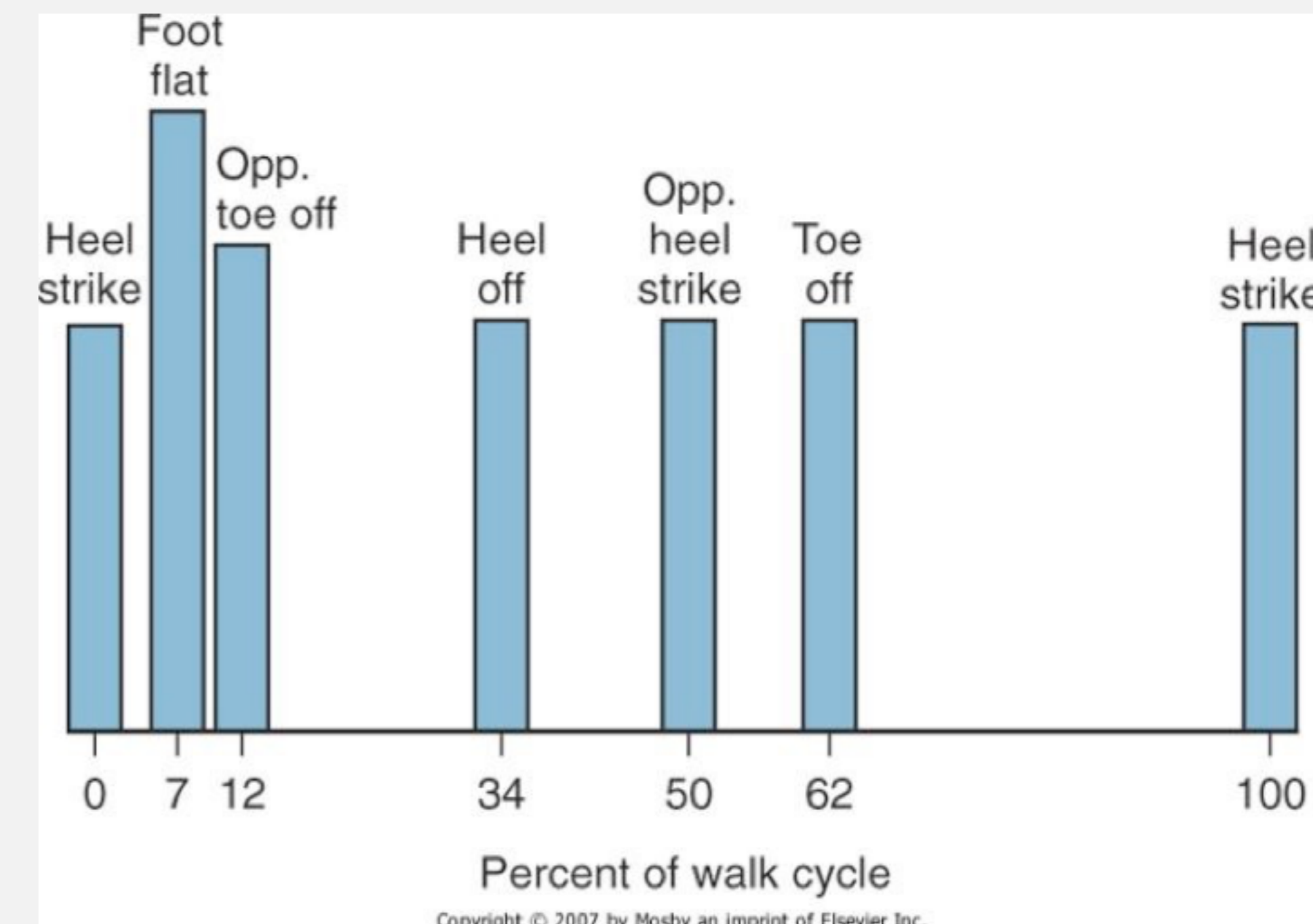
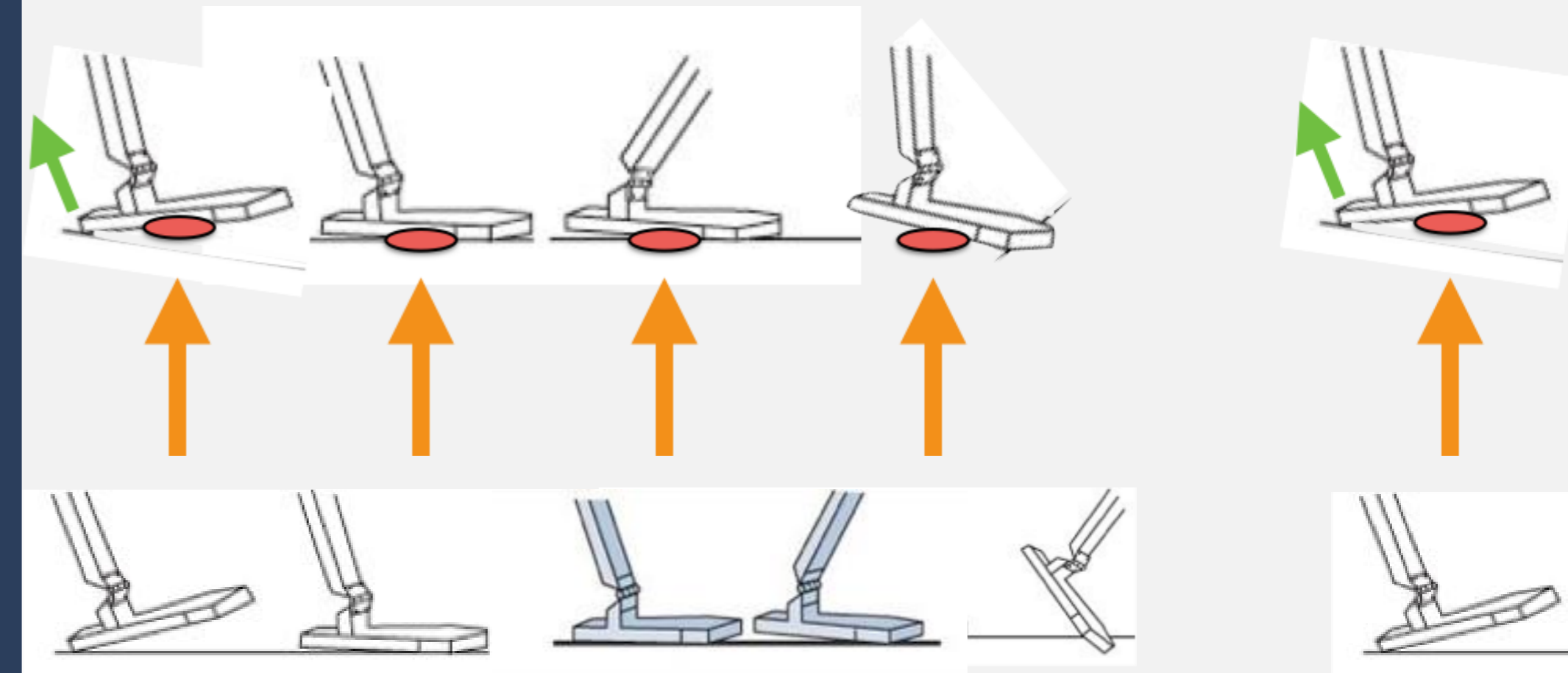


# Progressive deformity



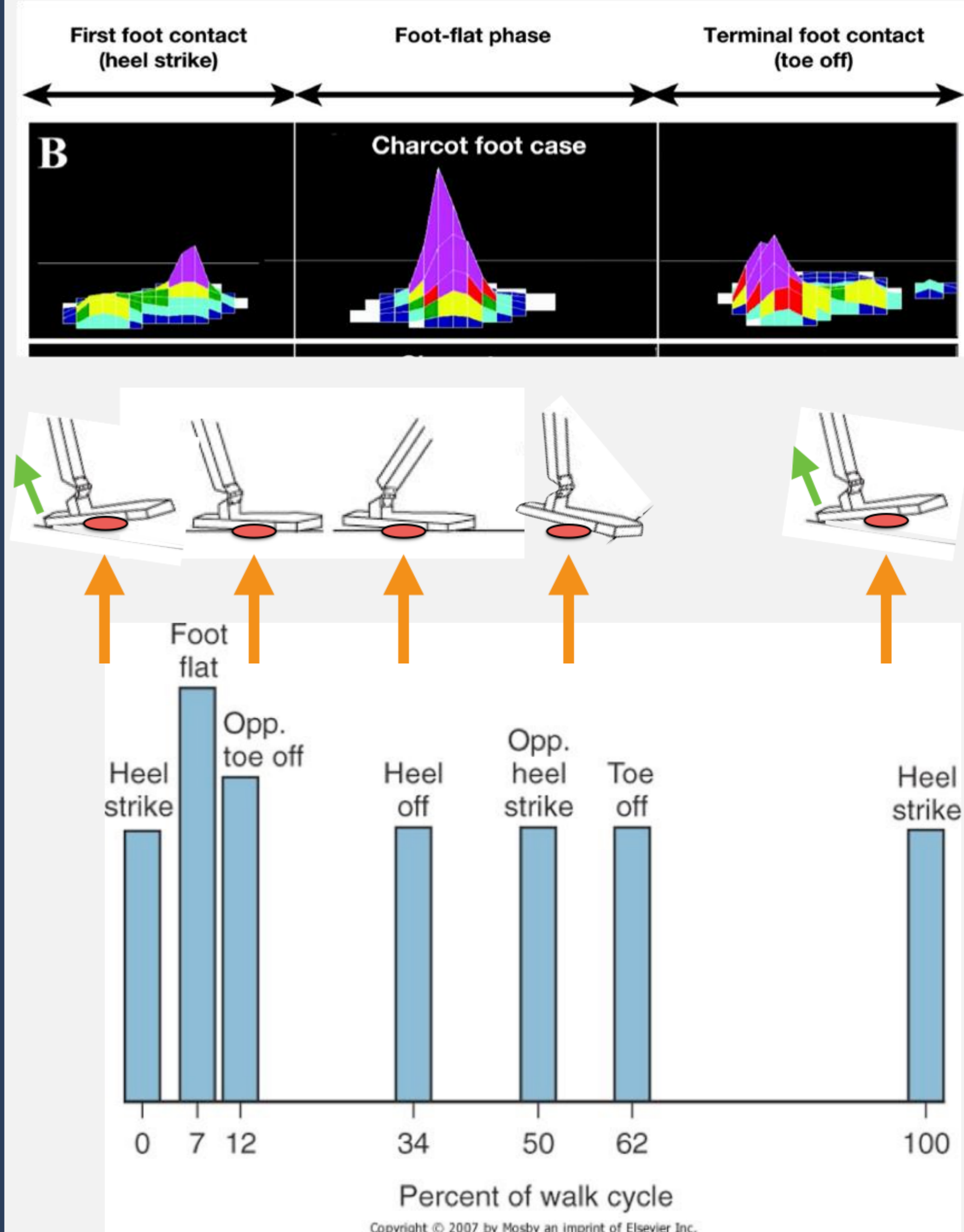
# Clinical Presentation

Midfoot collapse  
Peak pressure change  
Mechanic change



# Clinical Presentation

High peak pressure on the deformity site  
Midfoot collapse



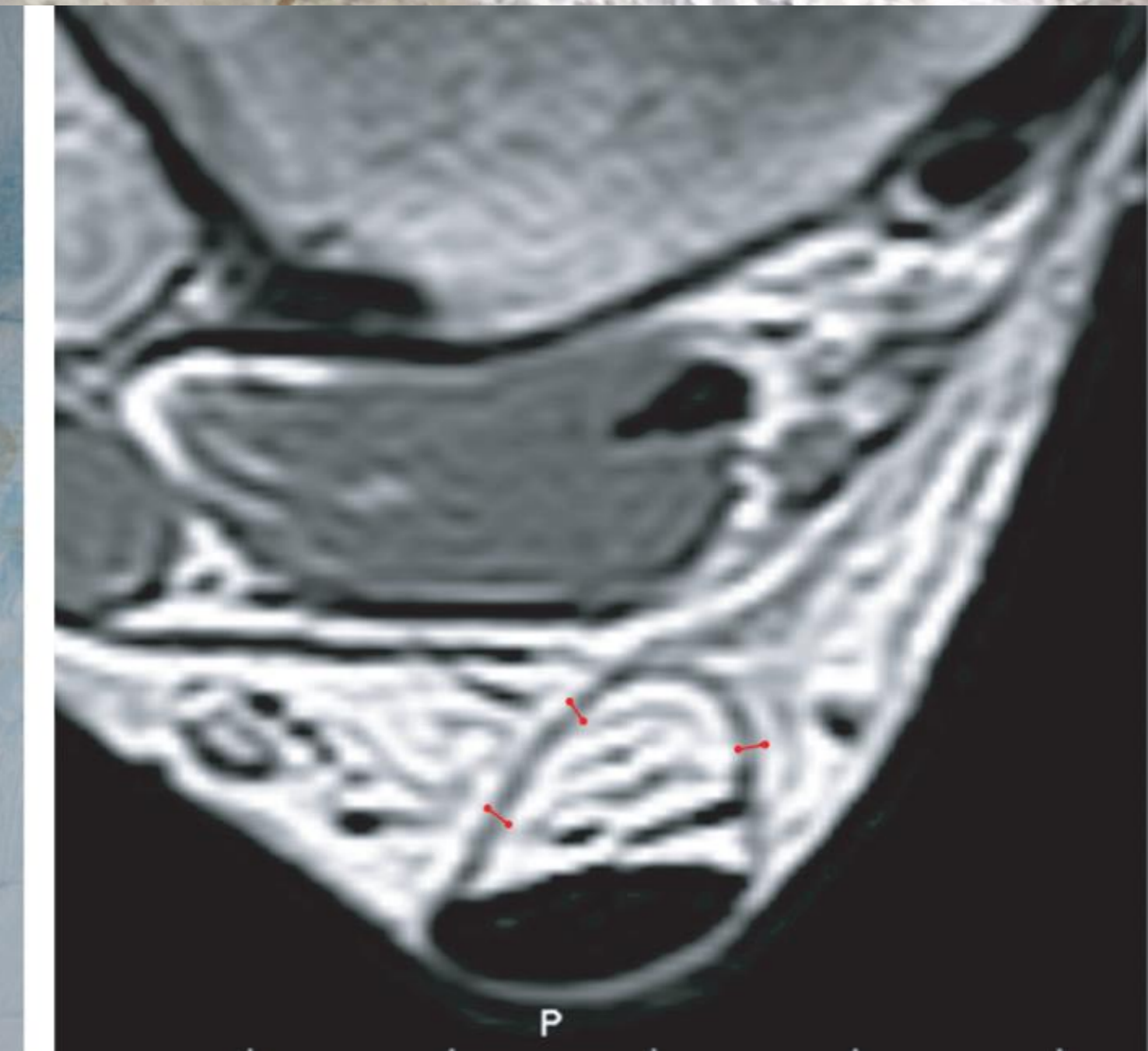
## Associate pathology

Achilles tendon tightness = true offender

Risk: DM foot ulcer, callosity, recurrence ulcer

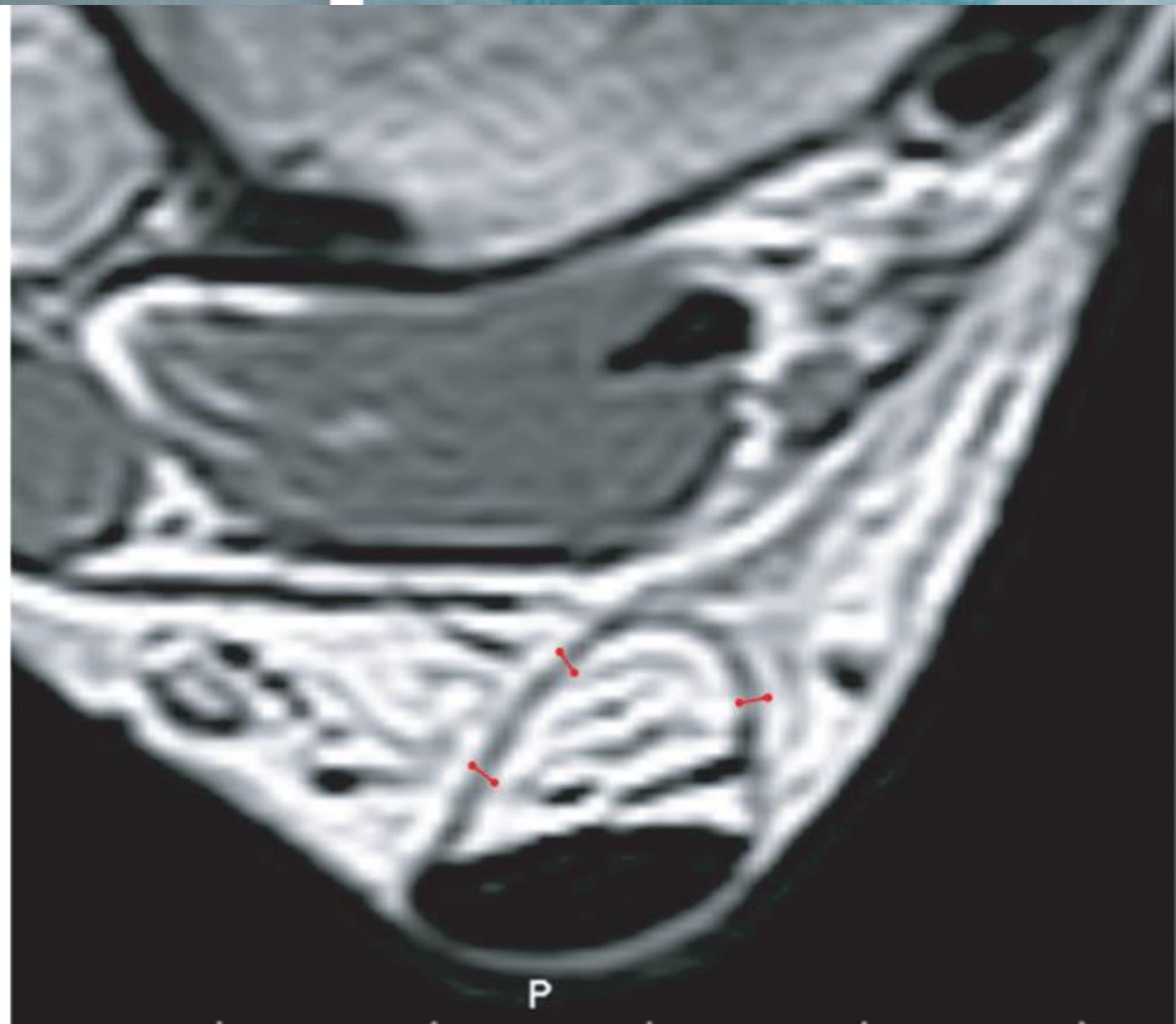
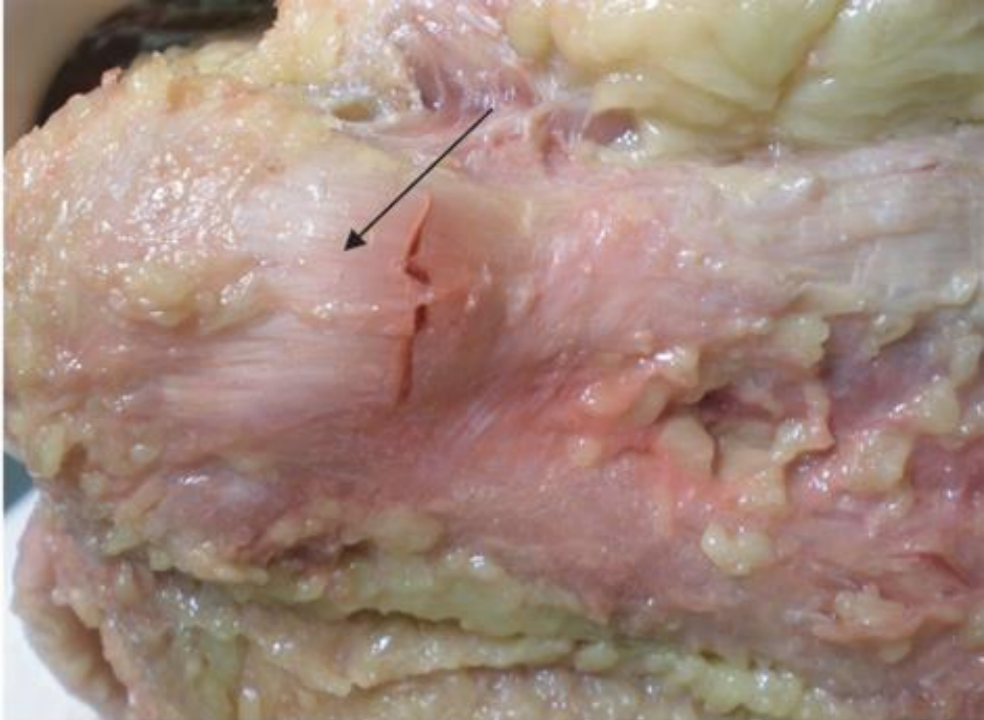
Pain

metatarsalgia



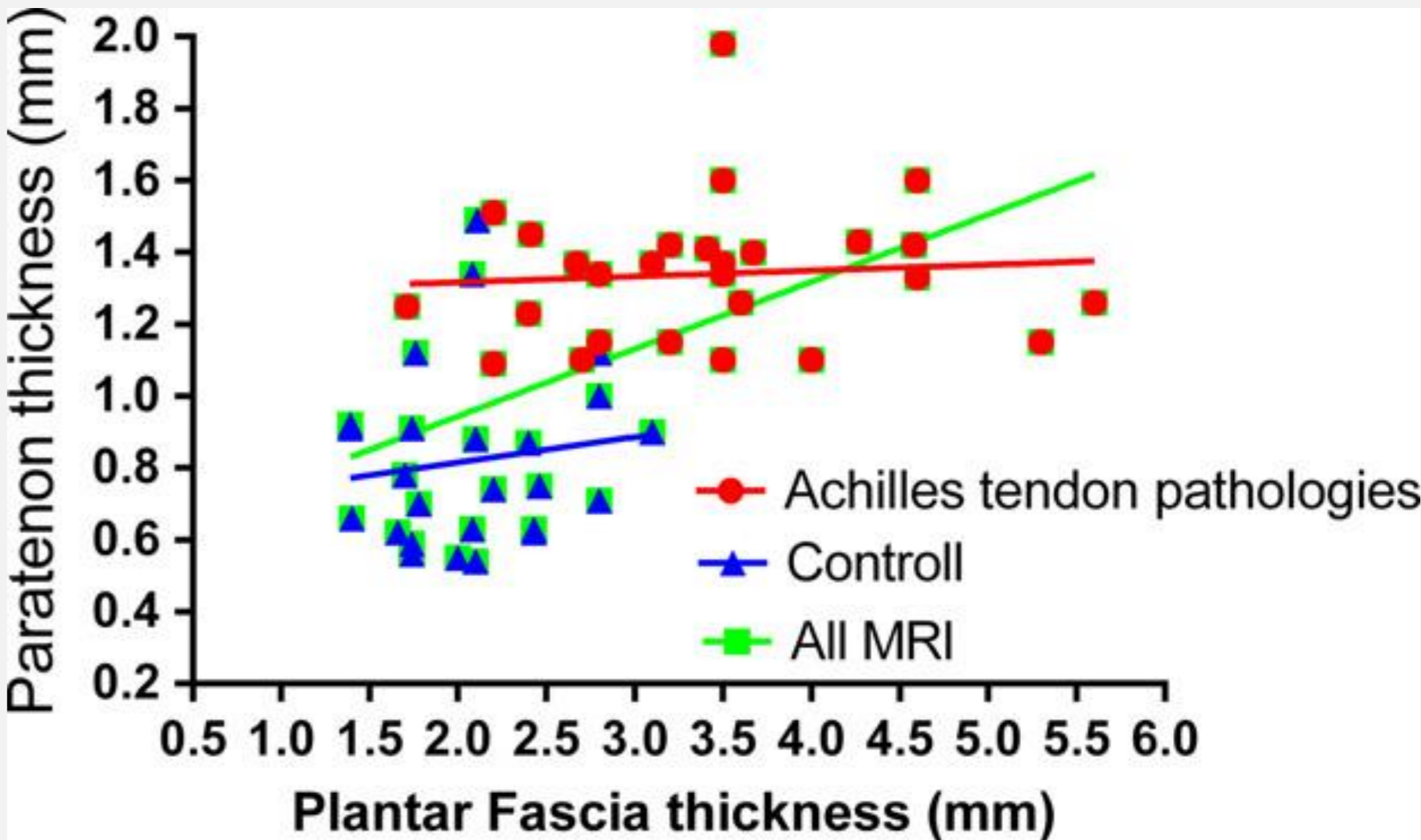
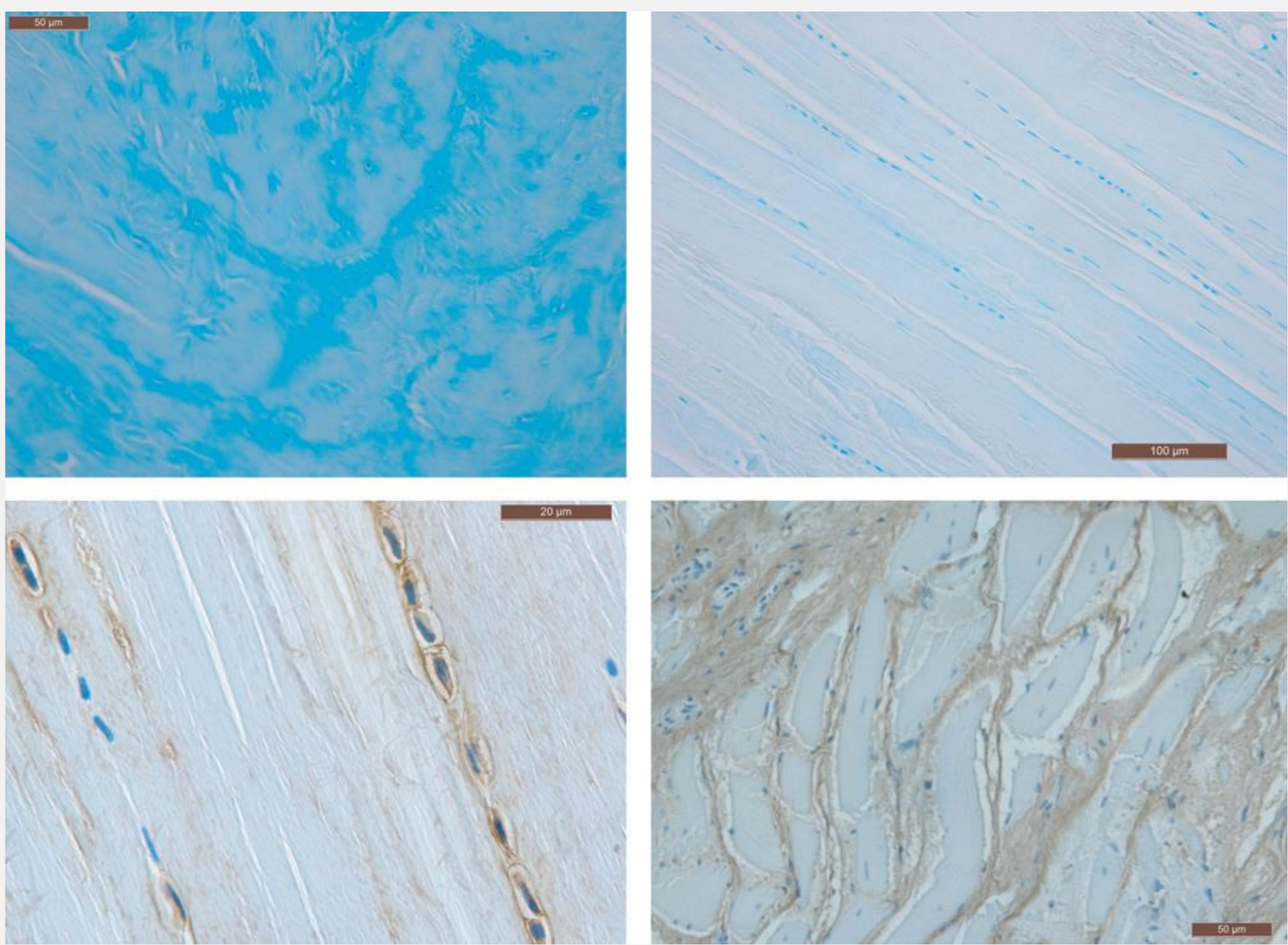
# Associate pathology

Link  
Plantar fascia to Achilles tendon



# Associate pathology

Same collagen type  
thickness  
Plantar fascia to Achilles tendon



# Investigation

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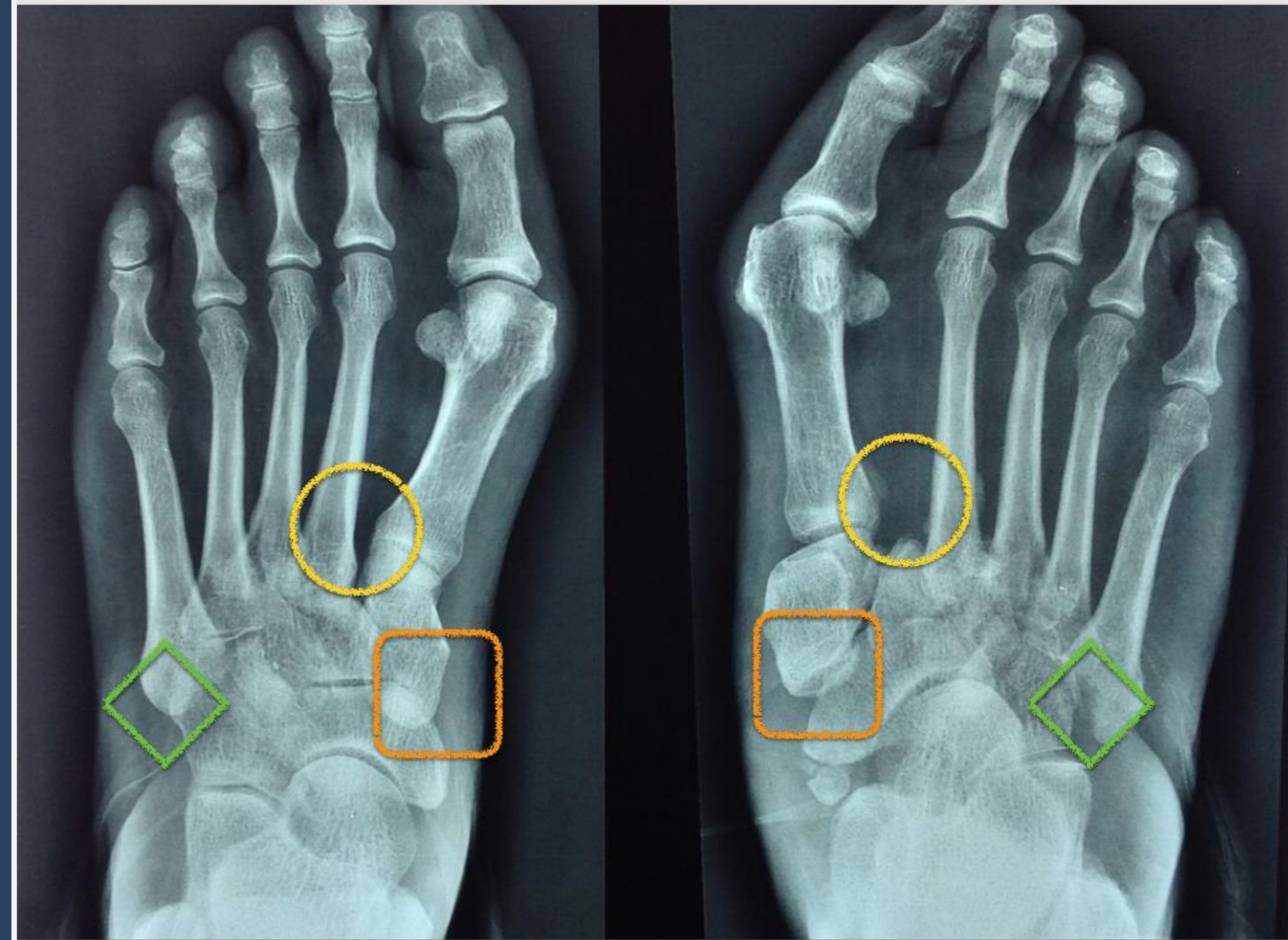
Plain film  
Weight bearing film  
Fragmentation



# Investigation

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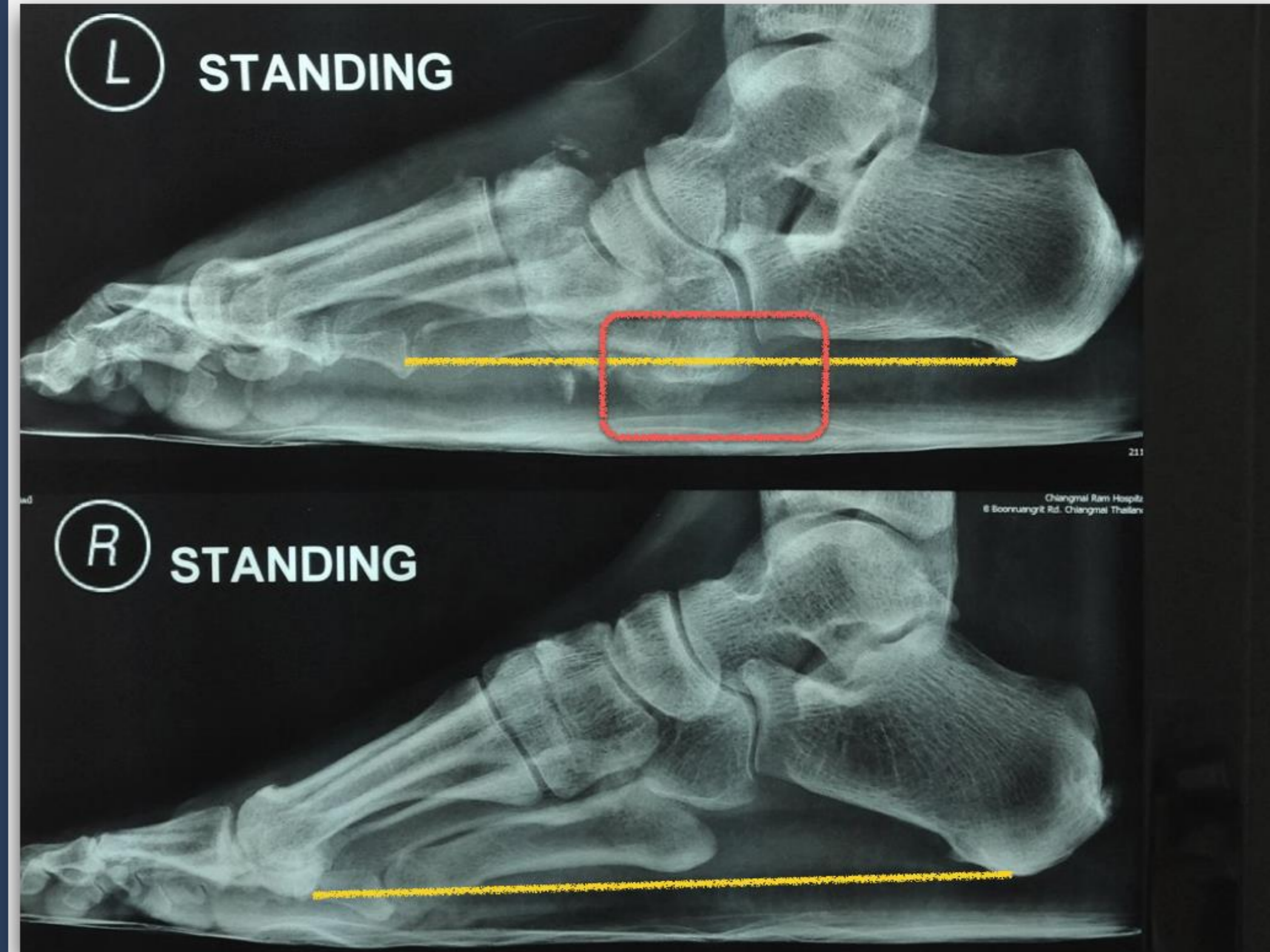
Lisfranc joint resorptions and separation  
Weight bearing film





# Investigation

Cuboid height  
Midfoot collapse



# Investigation

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Infection:  
2 week intervals  
History of DM and location of  
ulceration  
Focal loss of bone density (hallmark)  
Periosteal reaction at metaphysis



## Nonoperation

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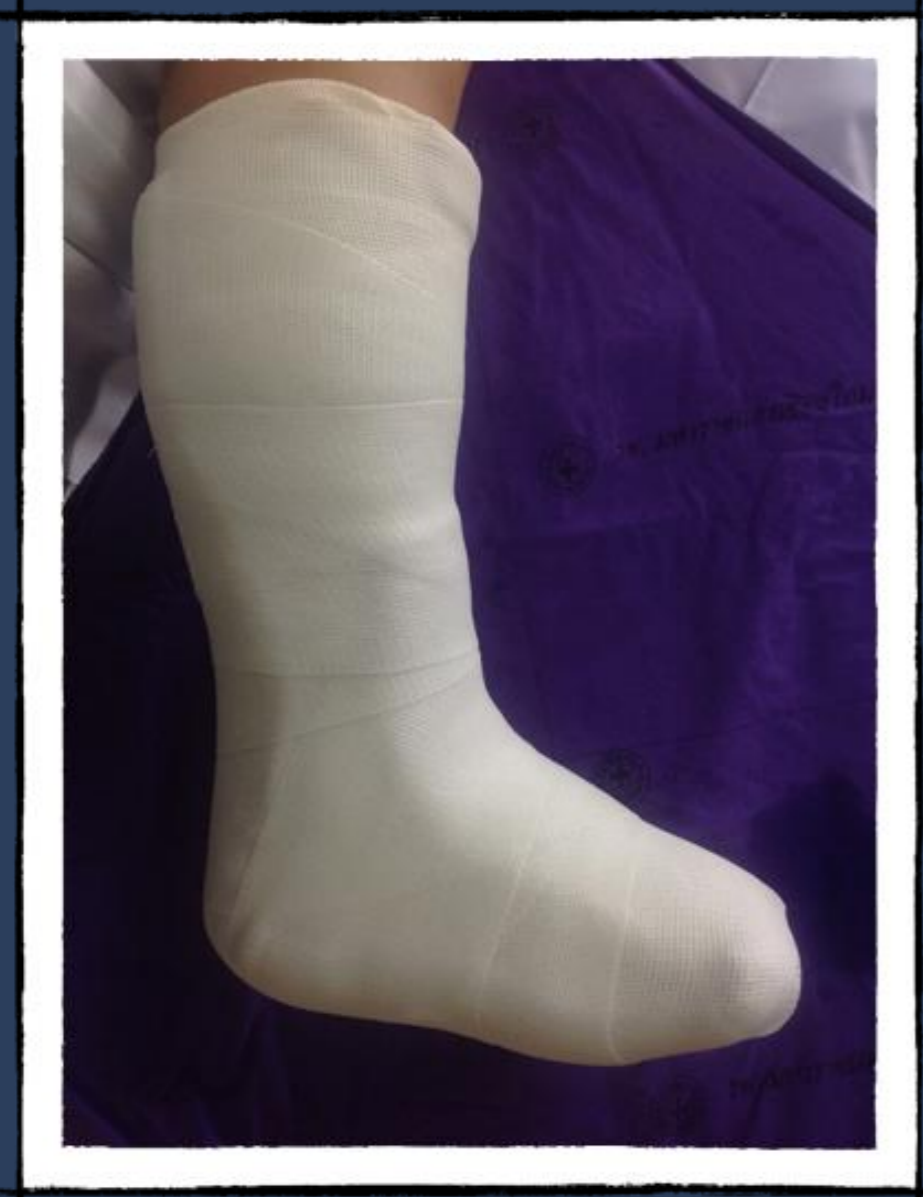
“what can one put on the wound to heal it?”

“what should one take off the foot to help heal the ulcer?”

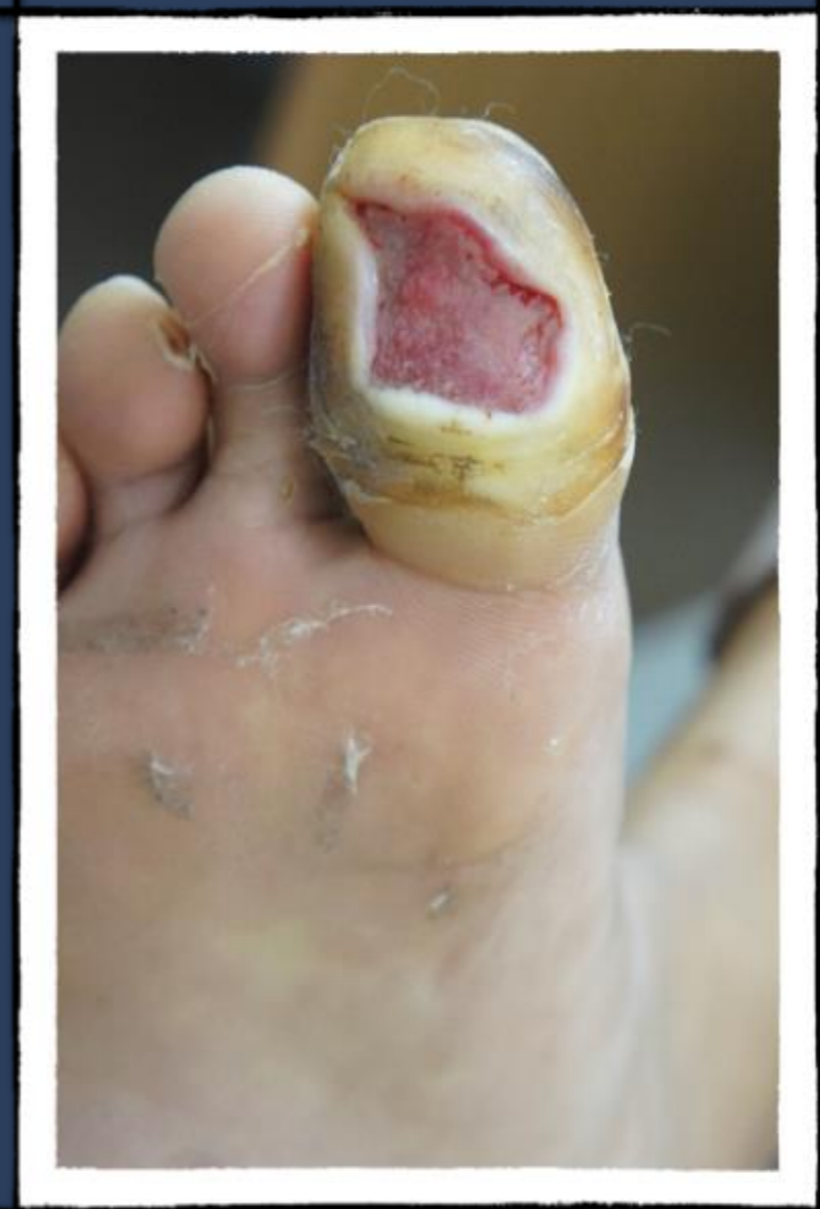


# Total contact cast

Forefoot and midfoot ulceration  
Off-loading technique (irremovable).



Total contact cast



Ulcer on big toe



4 week post casting

90%  
in 4 wk

outcome

Heel lift and toe-off phases

# Total contact cast

Ulcer under 1 MT head  
For 2 week.



Callus trimming



measuring wound



almost



healed

# Nonoperation

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Midfoot collapse.



# Operation

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From minor to major.



# Exostectomy

Consolidate phase  
Sclerotic phase



ulceration



Founded



Power

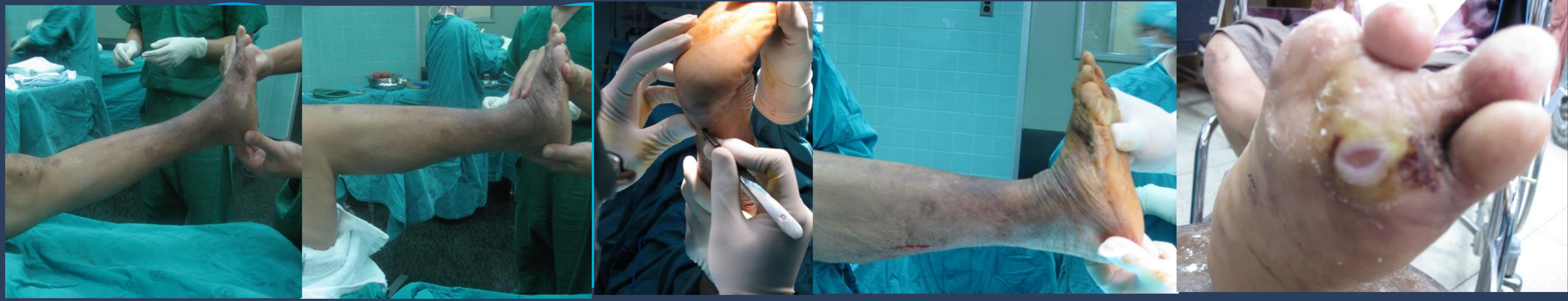


Revenue



# Achilles lengthening

Percutaneous technique  
Forefoot and midfoot ulceration .



OR alert

Percutaneous technique Motion checked

indication

# Ilizarov fixation

Stability, fusion using ilizarov external fixation.



Large ulceration



Debridement + C/S



Ambulation with crutches



outcomes

# Internal fixation

Maintain arch  
Prevent further collapse



Plate screw fixation



Good outcomes



Annual checked with X-ray

# Ilizarov fixation

High rate of fusion  
Good score  
High complication (pin tract infection)



**Midfoot ulcer**



**Bony collapse**



**Ambulation promote**

# Surgical management of Charcot

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Midfoot (with or without ulcer) 29%



**Midfoot collapse, column fixation**

# Surgical management of Charcot

Midfoot (with or without ulcer) 29%  
Hindfoot (ankle and subtalar) 40%



Ankle and subtalar involvement

Secure fixation

# Surgical management of Charcot

Midfoot (with or without ulcer) 29%  
Hindfoot (ankle and subtalar) 40%  
Ankle (minor trauma) 40%



**Ankle fracture, no pain**



**Bony collapse**



**Secure fixation**

## Outcomes

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Younger age  
Longer hospital stay  
Greater risk of amputation and infection  
Revascularization rate similar to non-Charcot





## Outcomes

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Charcot with vs without ulceration  
Charcot with ulcer: 6 times higher  
rate of amputaion  
Risk: active infection, nonunion,  
instability, postop wound problem



## Outcomes

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Amputation rate in Charcot  
8.9%  
Systematic review



# Take home messages

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No pharmacological management or prevention  
Self-foot care management

Foot care education  
Self-foot temperature monitoring

