

How useful is pre-Achilles fat pad?

Ankitkumar H. Patel M.D.

MSK Fellow

University of California San Diego

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **3,470**. (0.09 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **3,390**. (0.10 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **26,200**. (0.09 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **97,100**. (0.04 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **42,300**. (0.10 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **47,500**. (0.11 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **596**. (0.10 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **1,590**. (0.08 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **3,460**. (0.06 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **334**. (0.04 sec)

Google scholar [Advanced Scholar Search](#) [My Citations](#)
Scholar Results 1 - 10 of about **120**. (0.06 sec)

Pre-Achilles fat pad



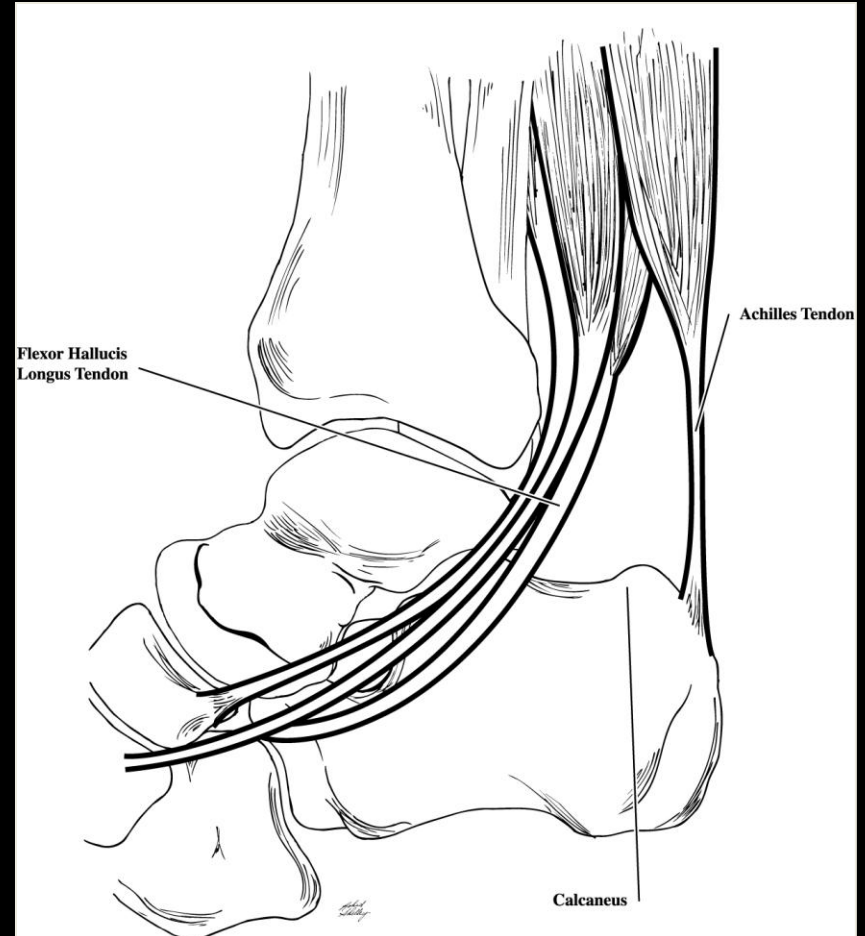
Traditional view:
Space filler

Goals

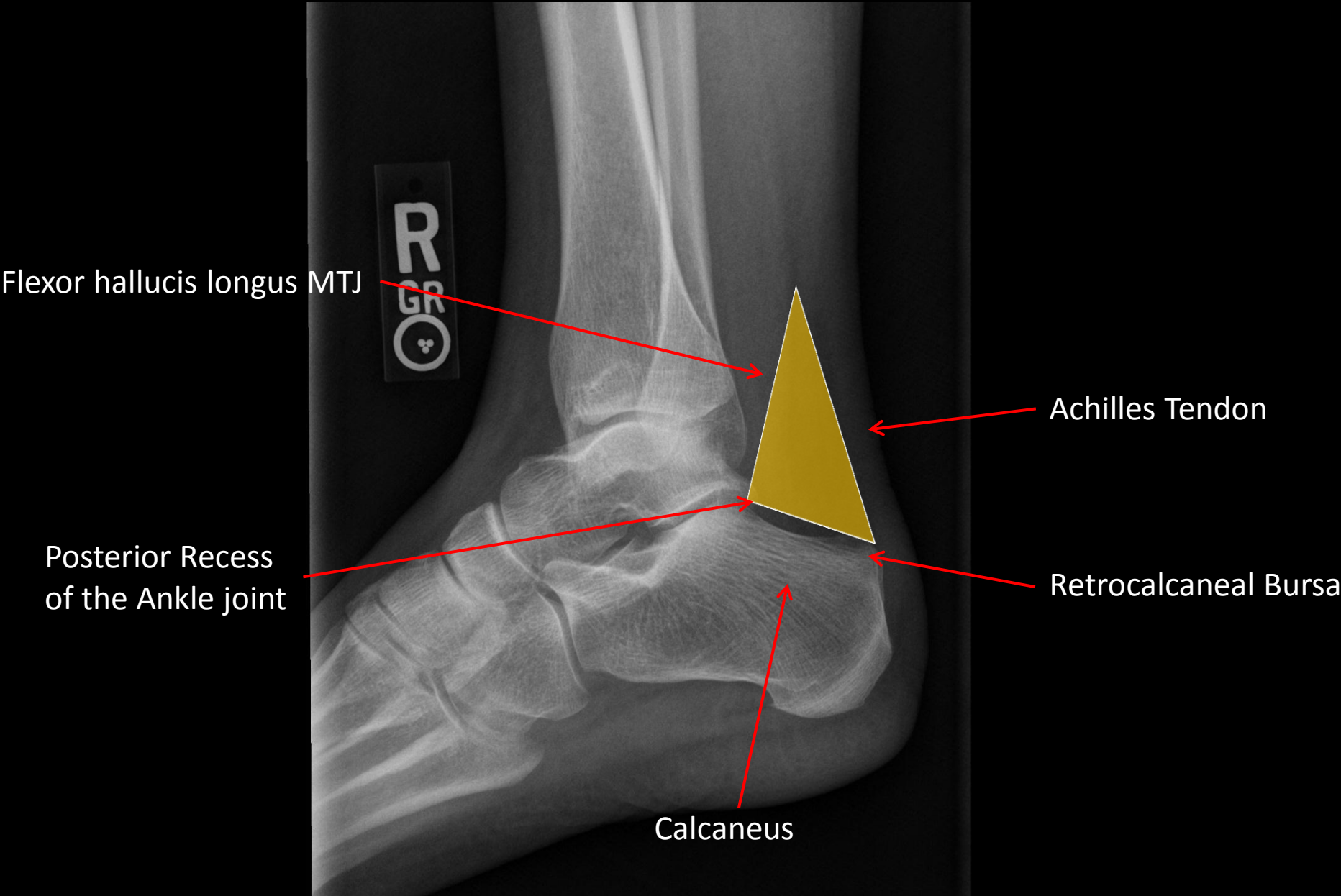
- Normal anatomy and biomechanics
- How useful is pre-Achilles fat pad?
 - Aid in detecting pathology of the posterior aspect of the ankle joint
 - Mass Effect
 - Obliteration of fat pad
 - Illustrate examples of pathology

Normal anatomy pre-Achilles fat pad

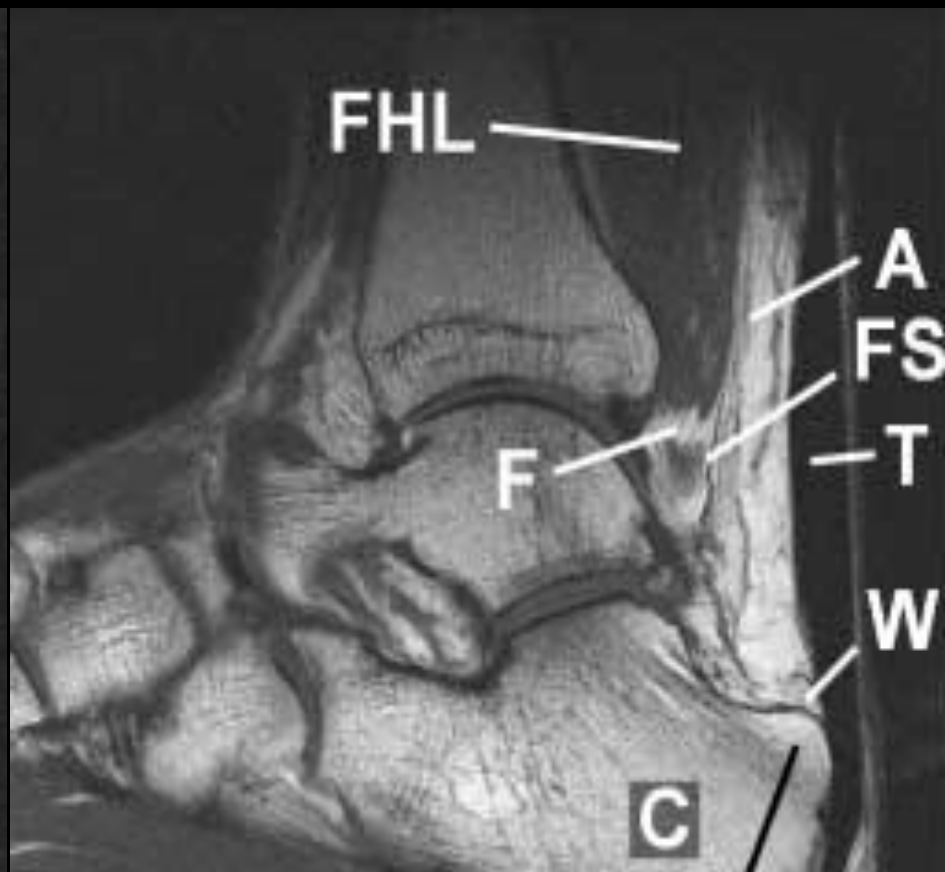
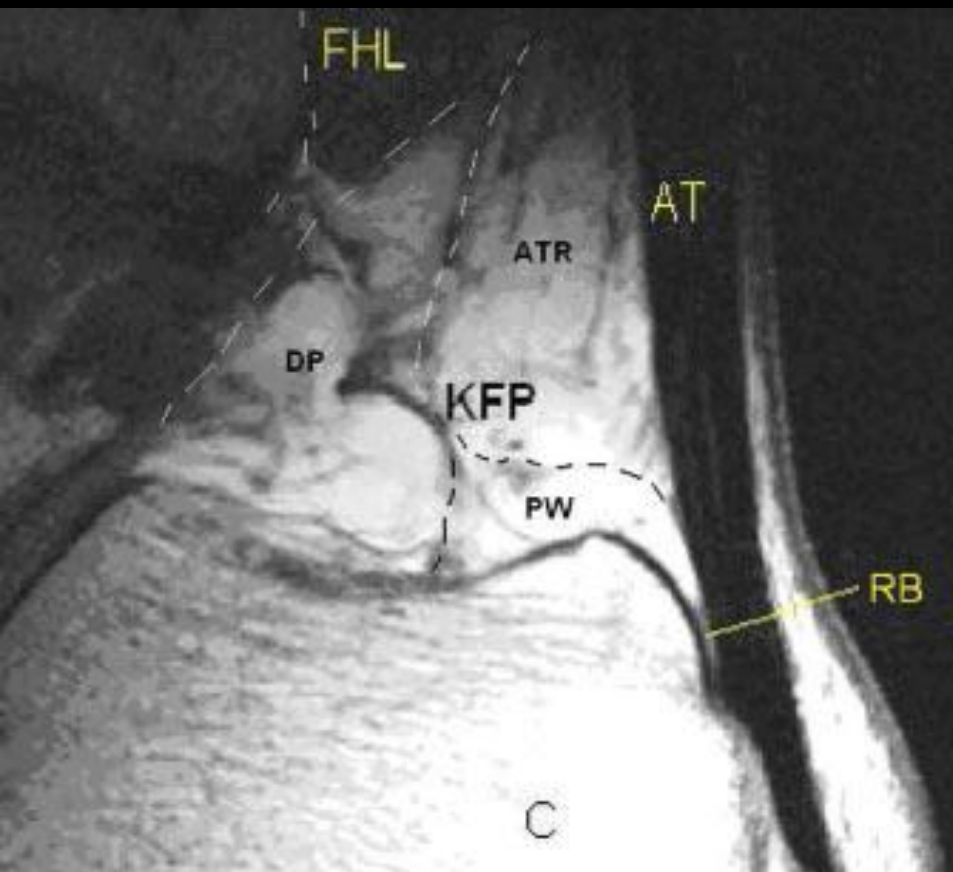
Gentle curving borders



Normal anatomy pre-Achilles fat pad

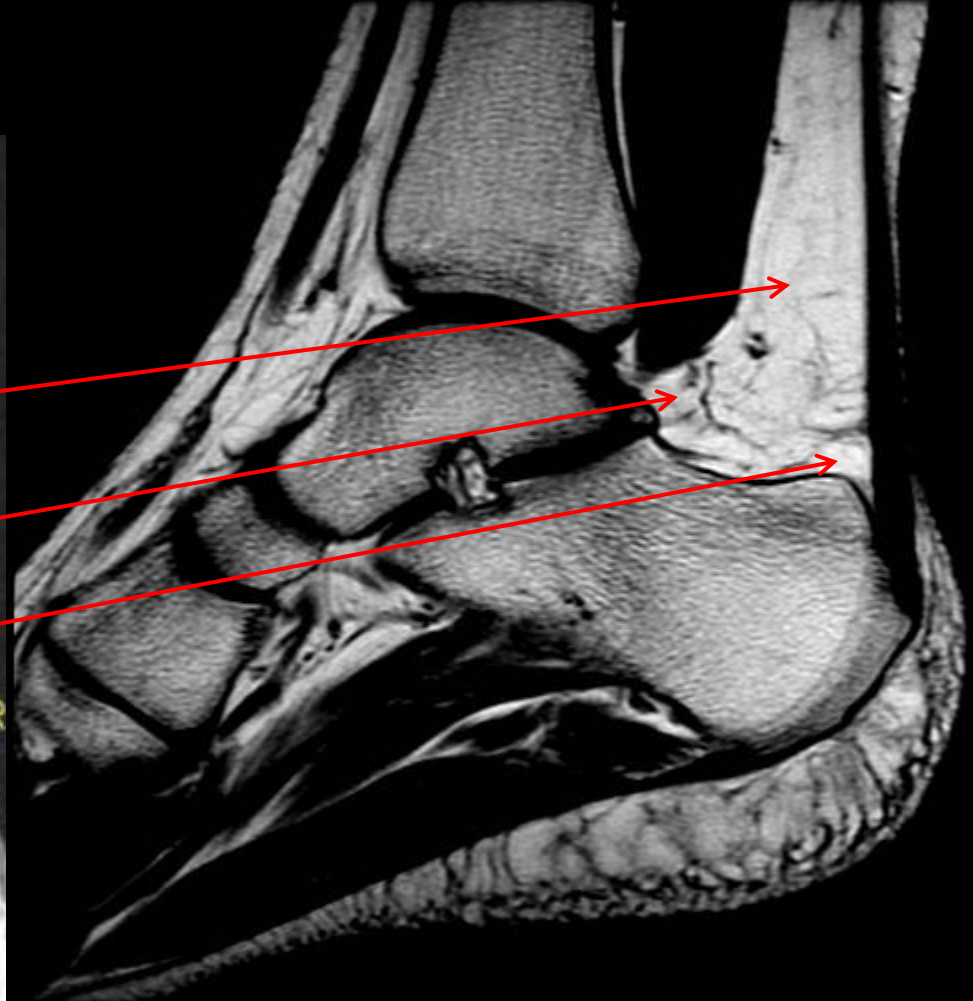
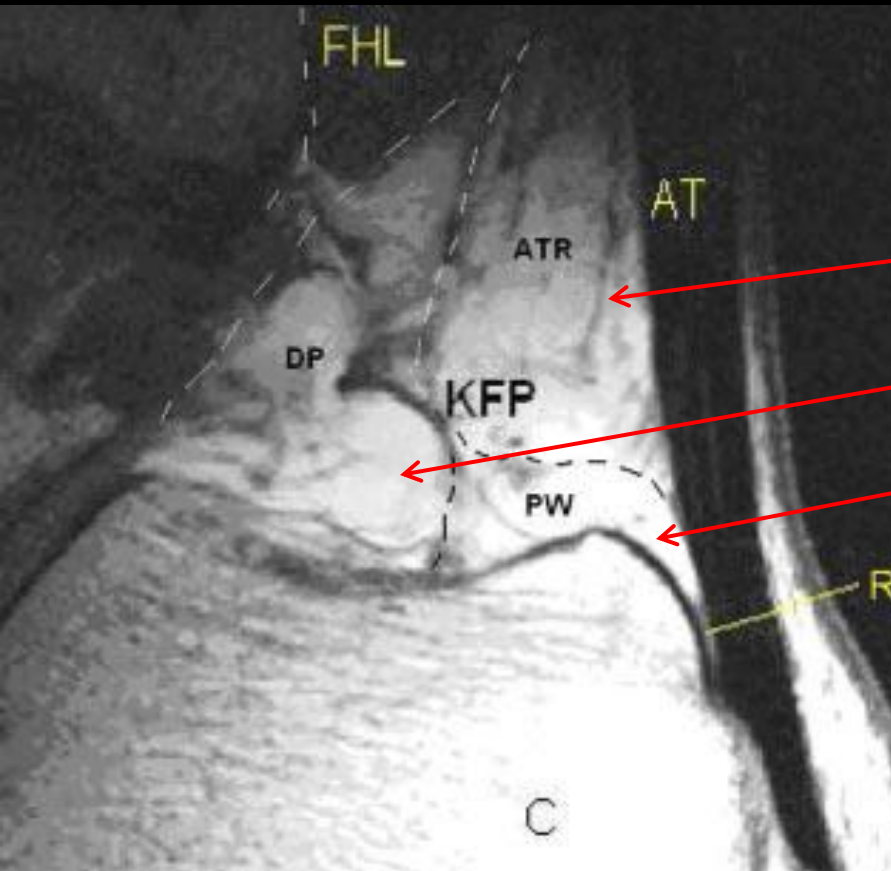


Normal anatomy pre-Achilles fat pad



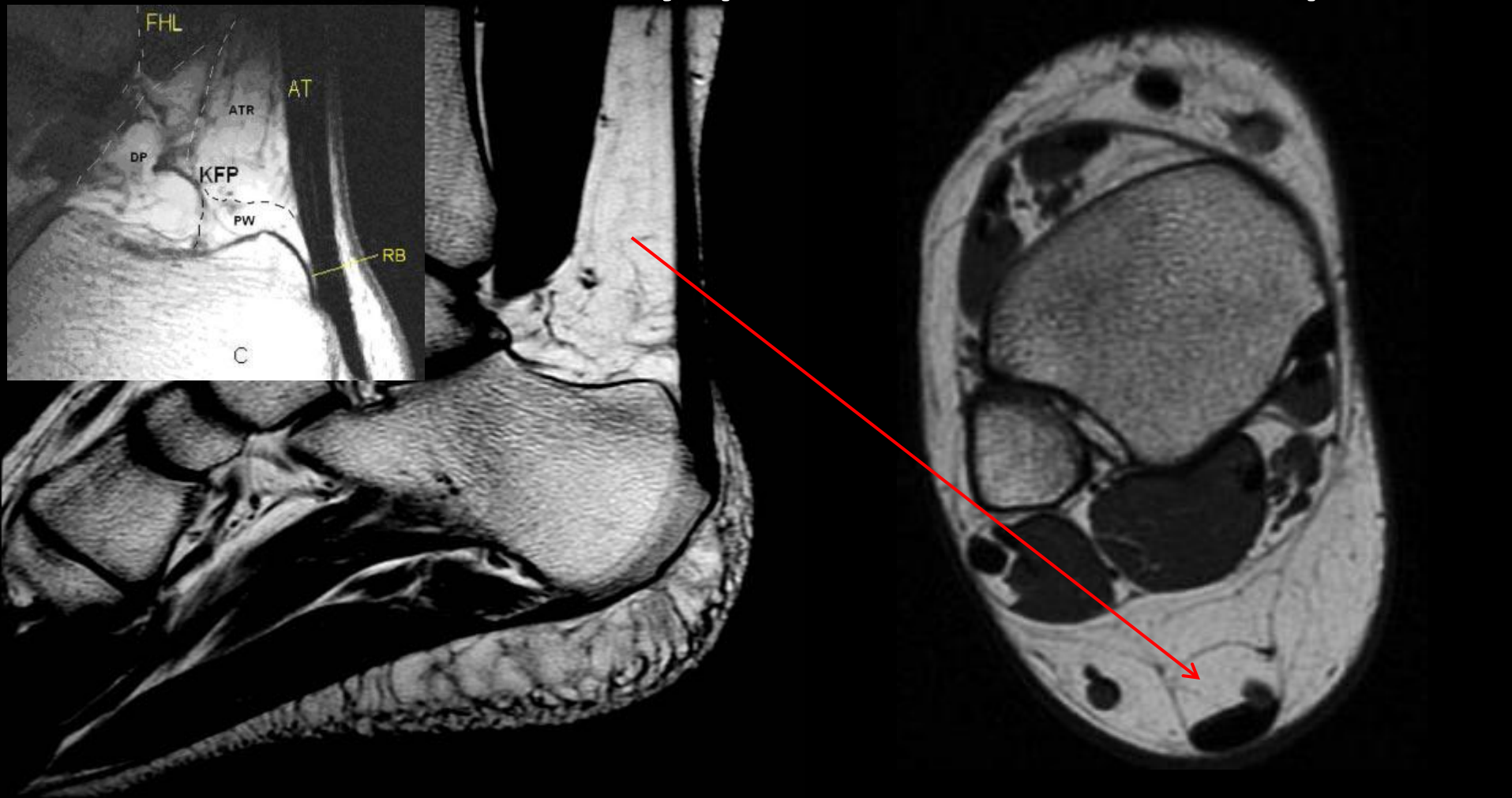
Three parts: Achilles tendon-related pad (ATR)
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad



Three parts: Achilles tendon-related pad (ATR)
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad



Three parts: **Achilles tendon-related pad (ATR)**
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

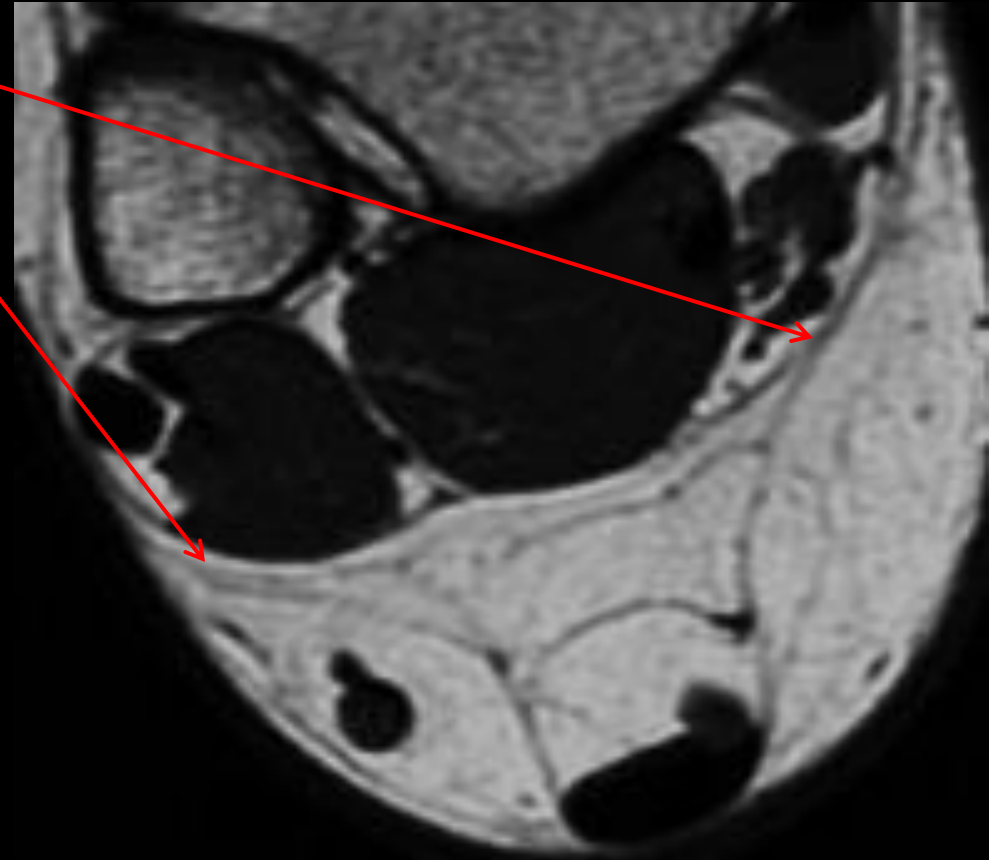
- ATR – anchored to the Achilles tendon by fascia and retinaculum “basket”
- ATR – neural and vascular supplies to Achilles tendon



Three parts: **Achilles tendon-related pad (ATR)**
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

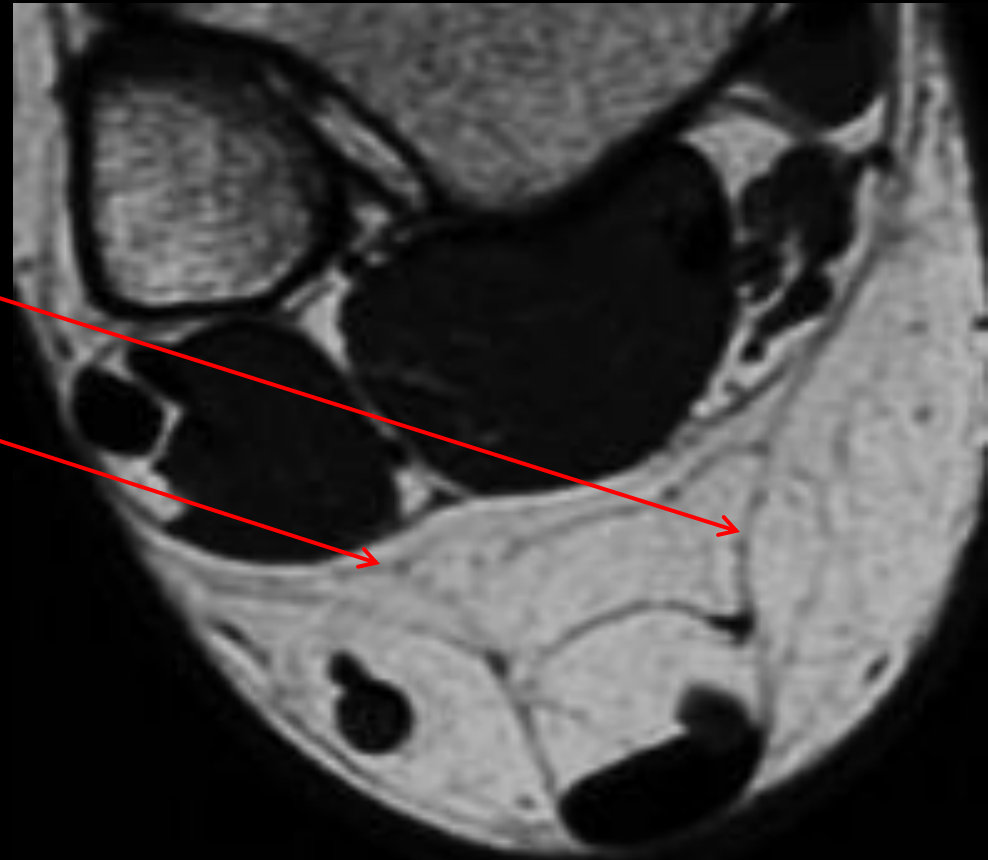
- Flexor retinaculum
- Peroneal retinaculum
- Superficial aponeurosis
- Deep aponeurosis
- Fascia
- Conjoined retinaculum and fascia



Three parts: **Achilles tendon-related pad (ATR)**
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

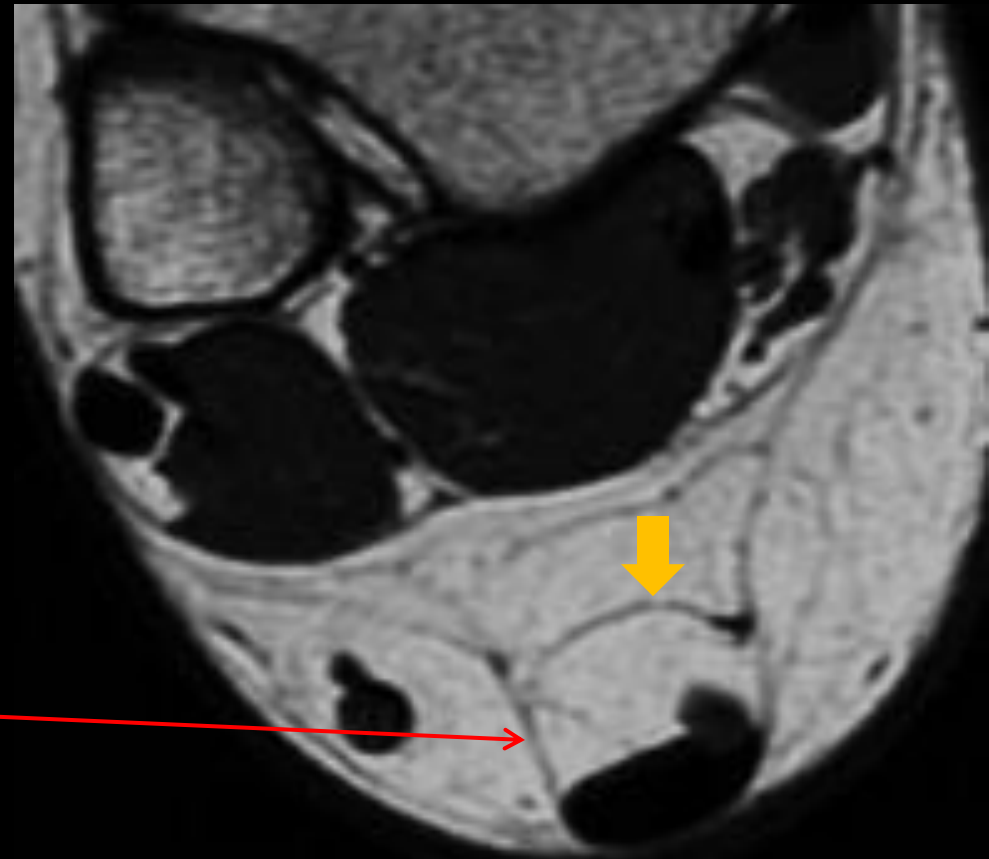
- Flexor retinaculum
- Peroneal retinaculum
- Superficial aponeurosis
- Deep aponeurosis
- Fascia
- Conjoined retinaculum and fascia



Three parts: **Achilles tendon-related pad (ATR)**
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

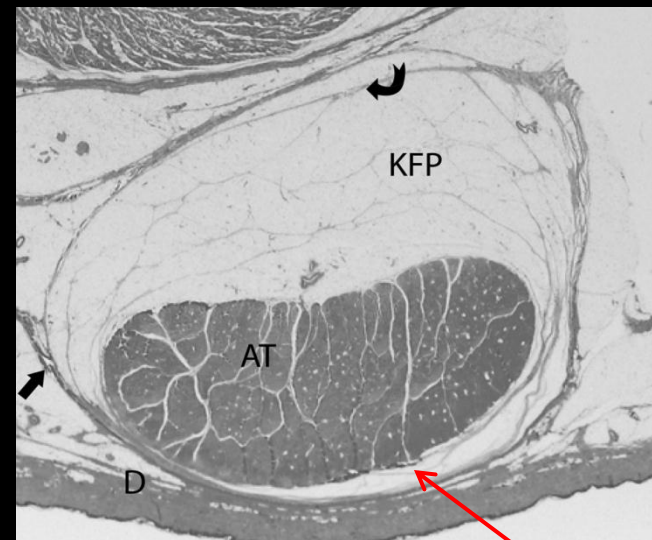
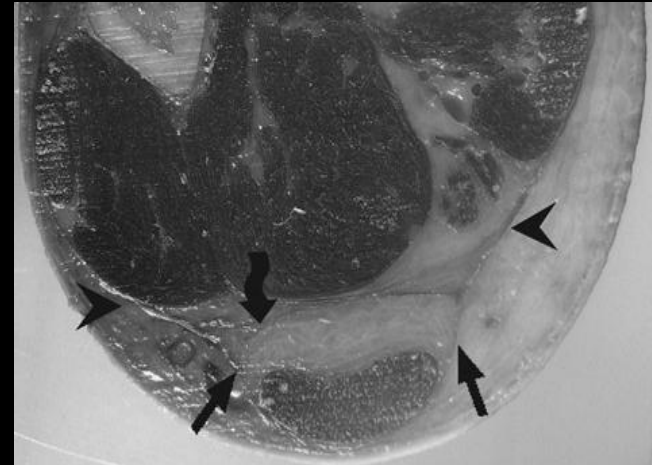
- Flexor retinaculum
- Peroneal retinaculum
- Superficial aponeurosis
- Deep aponeurosis
- Fascia
- Conjoined retinaculum and fascia “basket”



Three parts: **Achilles tendon-related pad (ATR)**
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

- ATR – anchored to the Achilles tendon by fascia and retinaculum “basket”
 - Flexor retinaculum
 - Peroneal retinaculum
 - Superficial aponeurosis
 - Deep aponeurosis
 - Fascia
 - Conjoined retinaculum and fascia “basket”

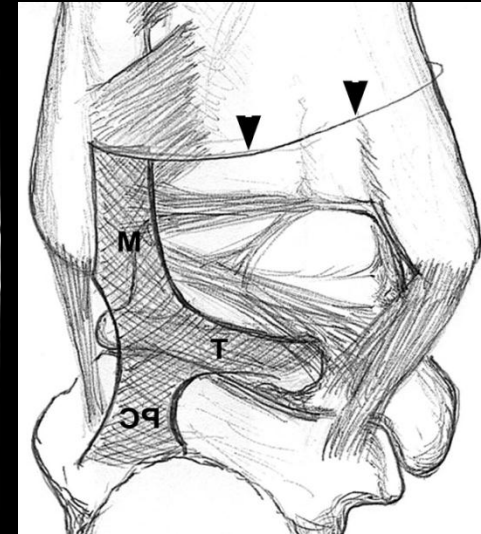
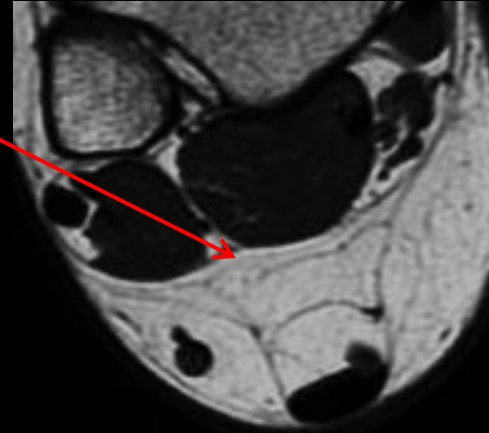


Three parts: **Achilles tendon-related pad (ATR)**
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Epitenon + Paratenon =
Peritendon

Normal anatomy pre-Achilles fat pad

- Deep aponeurosis (deep posterior crural fascia) – continuous with **fibulotalocalcaneal ligament**



FTC Ligament function:

- Unknown
- Sarrafian:
 - limit dorsiflexion
 - Contribute to fibro-osseous tunnels for Peroneal and FHL tendons

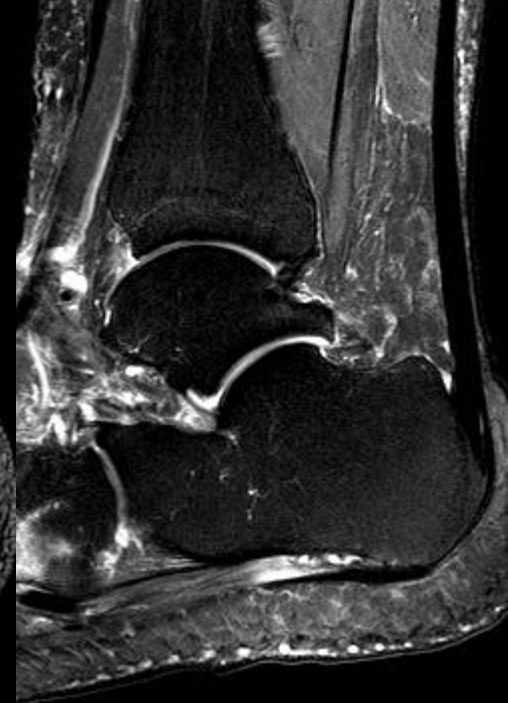


Three parts: **Achilles tendon-related pad (ATR)**
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

- ATR – anchored to the Achilles tendon by fascia and retinaculum “basket”
- ATR – neural and vascular supplies to Achilles tendon

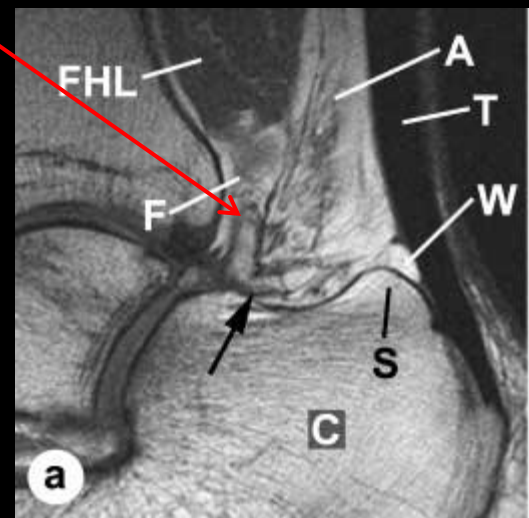
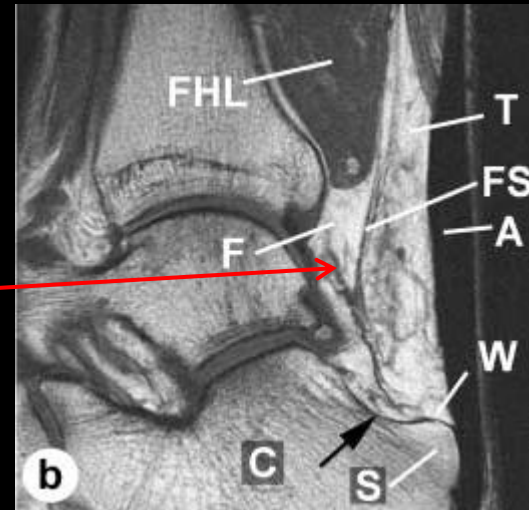
Branches of the posterior Tibial and Peroneal arteries



Three parts: **Achilles tendon-related pad (ATR)**
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

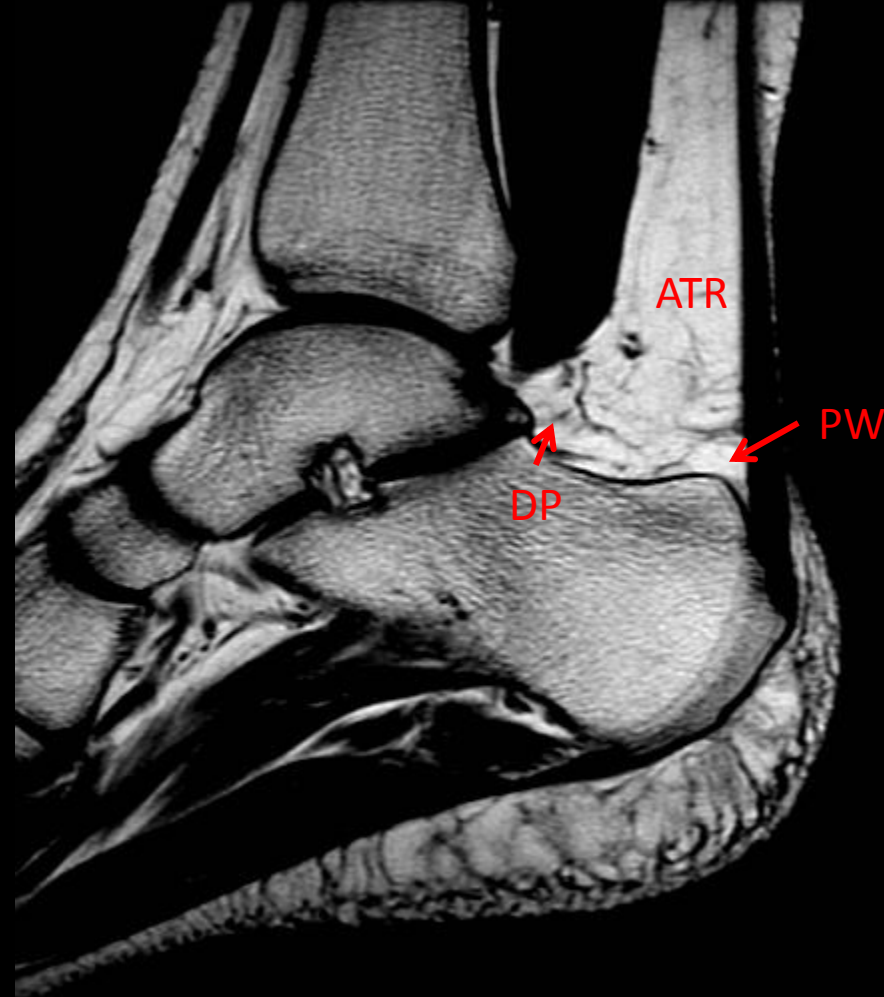
- Deep pad (FHL Part) seen extending in an inverted J-shaped (dorsiflexed foot) or L-shaped (plantarflexed foot) fashion under the ATR
- DP fuses with the ATR to form the retrocalcaneal protruding wedge (PW)



Three parts: Achilles tendon-related pad (ATR)
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

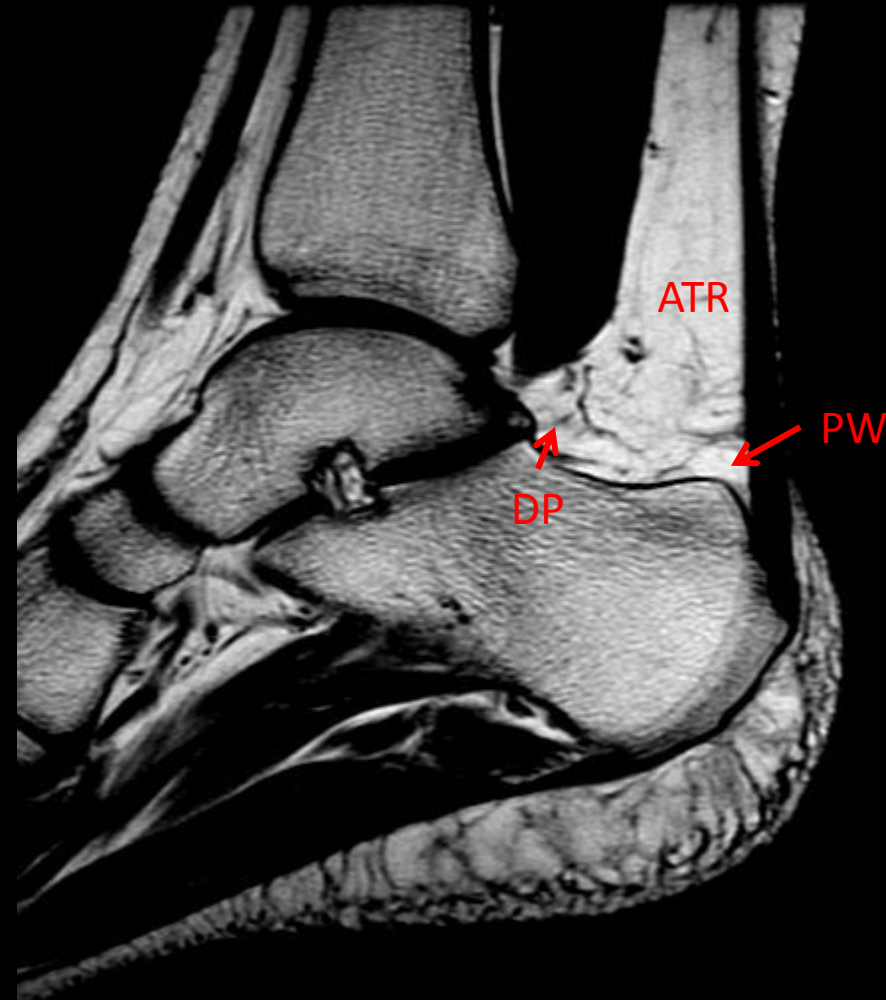
- Deep pad (FHL Part) seen extending in an inverted J-shaped (dorsiflexed foot) or L-shaped (plantarflexed foot) fashion under the ATR
- DP fuses with the ATR to form the retrocalcaneal protruding wedge (PW)



Three parts: Achilles tendon-related pad (ATR)
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

- Retrocalcaneal protruding wedge (PW) is free from all connections to the Achilles tendon
- Synovial invagination divides the PW from the Achilles tendon and calcaneus
- Fibrosis leading edge
- Meniscal fold of varying length between the Achilles tendon and calcaneus. It originated from the most proximal part of the entheses

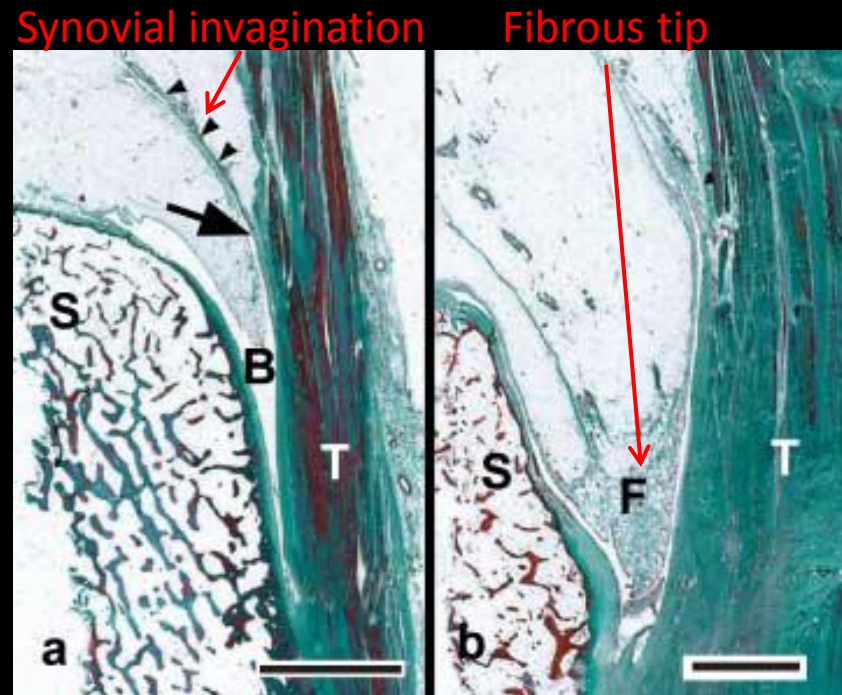
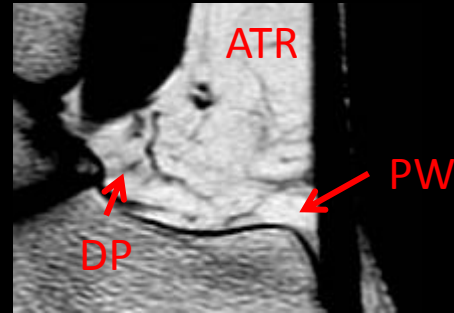


Three parts: Achilles tendon-related pad (ATR)
Deep pad (DP)

Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

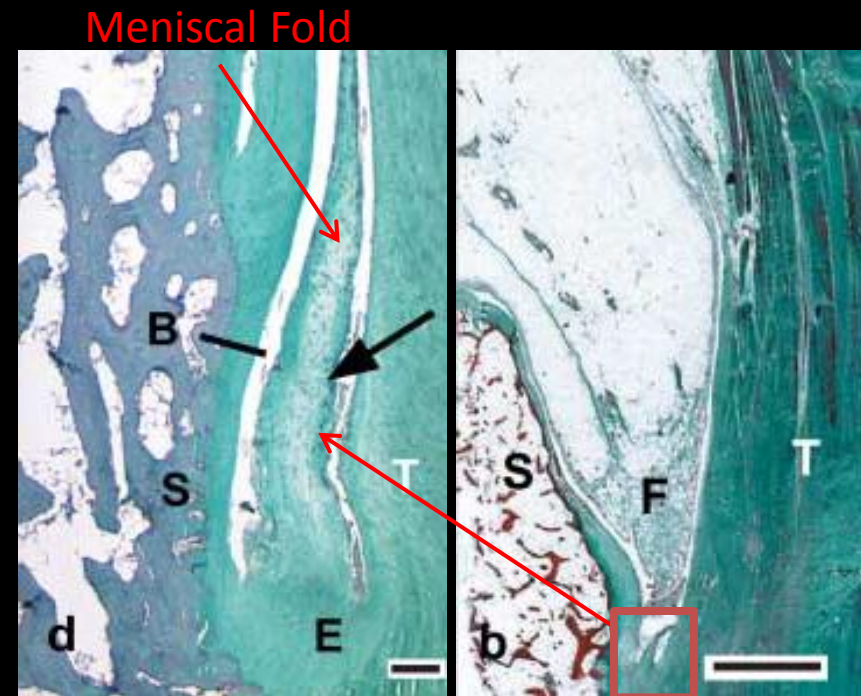
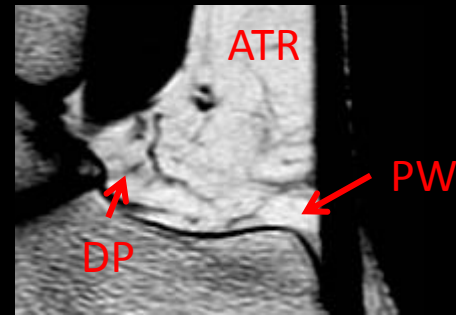
- Retrocalcaneal protruding wedge (PW) is free from all connections to the Achilles tendon
- Synovial invagination divides the PW from the Achilles tendon and calcaneus
- Fibrosis leading edge
- Meniscal fold of varying length between the Achilles tendon and calcaneus. It originated from the most proximal part of the entheses



Three parts: Achilles tendon-related pad (ATR)
Deep pad (DP)
Retrocalcaneal protruding wedge (PW)

Normal anatomy pre-Achilles fat pad

- Retrocalcaneal protruding wedge (PW) is free from all connections to the Achilles tendon
- Synovial invagination divides the PW from the Achilles tendon and calcaneus
- Fibrosis leading edge
- **Meniscal fold of varying length between the Achilles tendon and calcaneus. It originated from the most proximal part of the entheses**



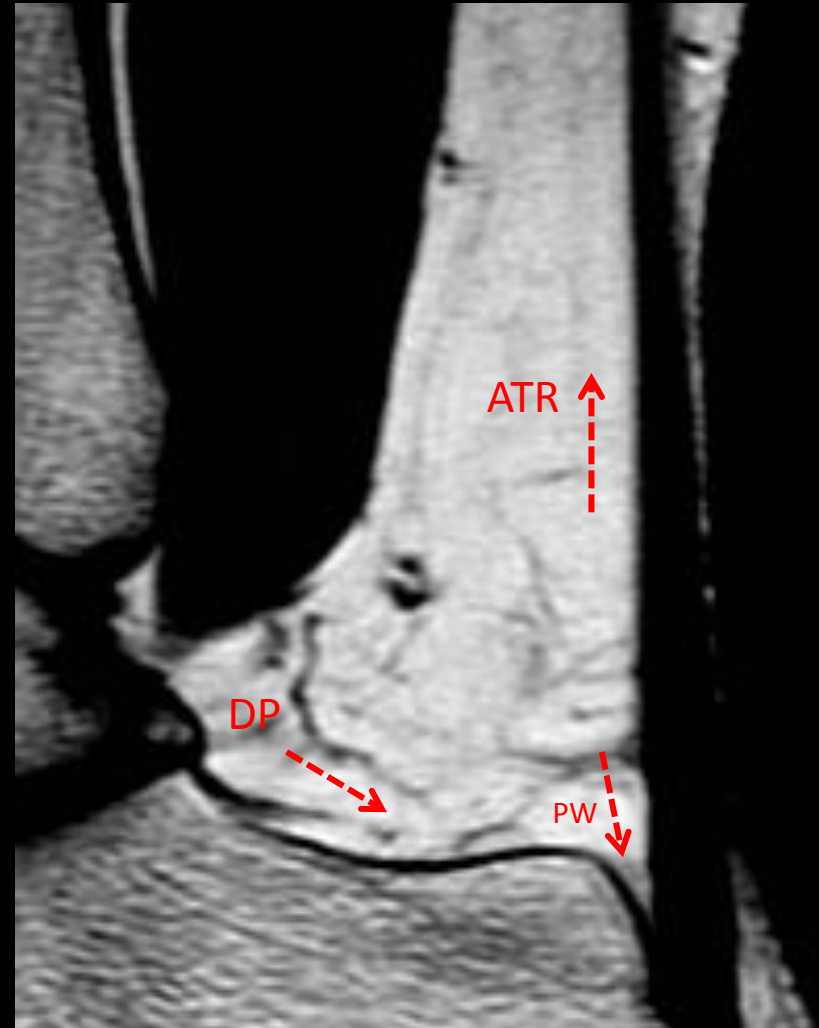
Three parts: Achilles tendon-related pad (ATR)
Deep pad (DP)

Retrocalcaneal protruding wedge (PW)

Biomechanics - pre-Achilles fat pad

Ankle plantar flexion:

1. ATR shifts upward
2. DP moves downward
3. PW slides over the calcaneus into the retrocalcaneal bursa space (synovial invagination)



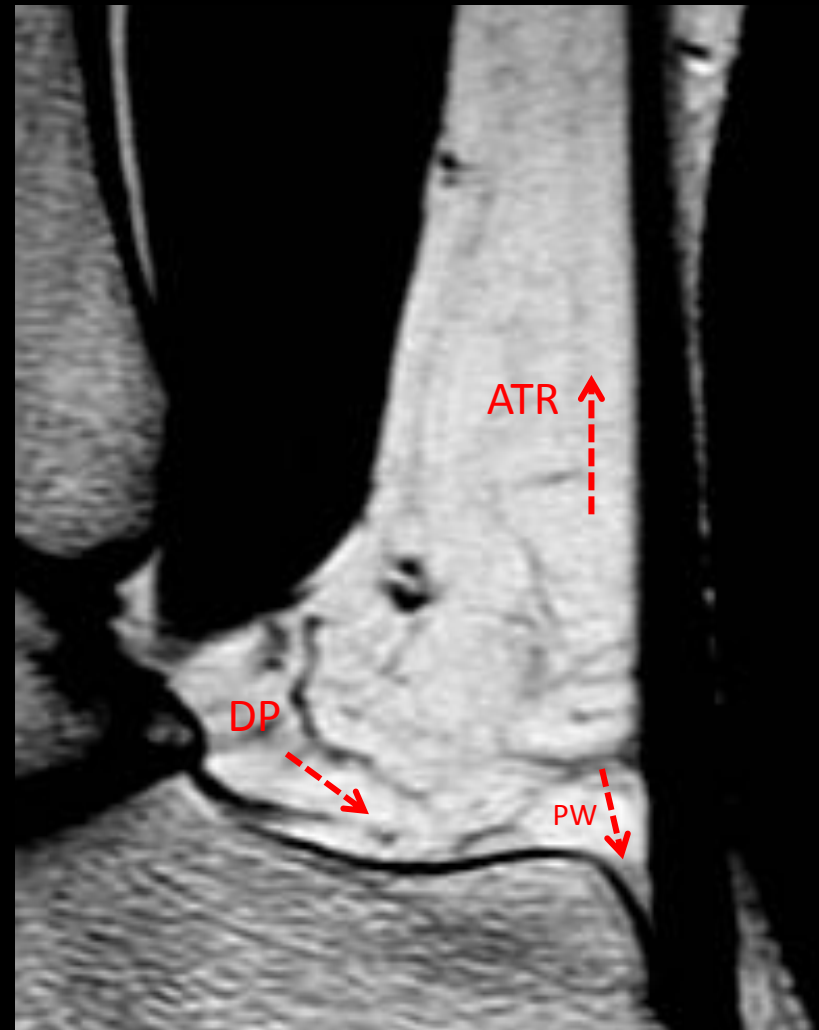
Biomechanics - pre-Achilles fat pad

Ankle plantar flexion:

PW slides over the calcaneus into the retrocalcaneal bursa space (synovial invagination)

Mechanism:

- movement is a passive consequence of an upward displacement of the calcaneus
- PW is 'sucked' (i.e. pulled) into the bursa to minimize pressure changes
- fat is pushed into the bursa by muscle contraction, i.e. the muscle belly of FHL



Biomechanics - pre-Achilles fat pad

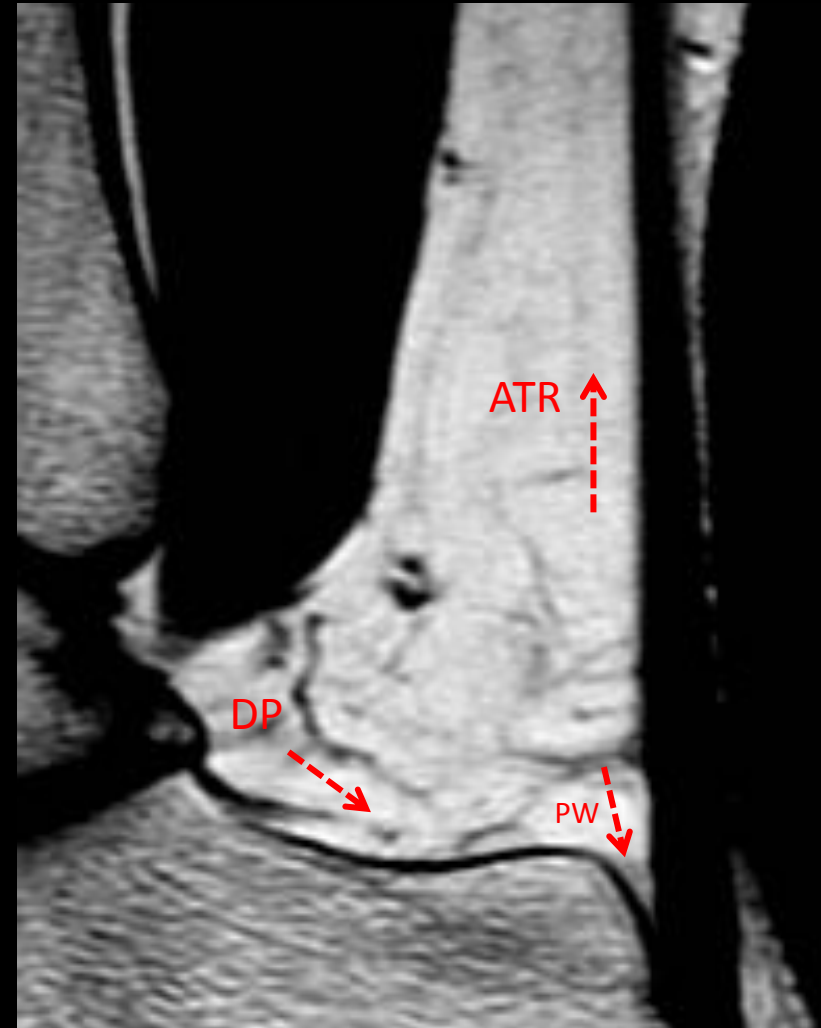
Ankle plantar flexion:

PW slides over the calcaneus into the retrocalcaneal bursa space (synovial invagination)

Mechanism:

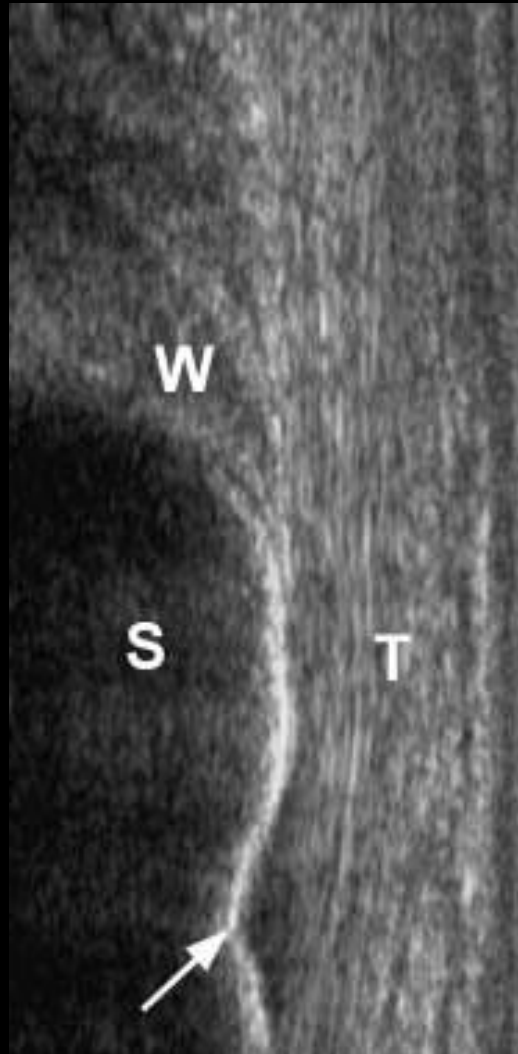
- movement is a passive consequence of an upward displacement of the calcaneus
- PW is 'sucked' (i.e. pulled) into the bursa to minimize pressure changes
- ~~fat is pushed into the bursa by muscle contraction, i.e. the muscle belly of FHL~~

(no wedge motion was recorded during the FHL muscle contraction per Ghazzawi A, et al. J of Orthop Res 2009)

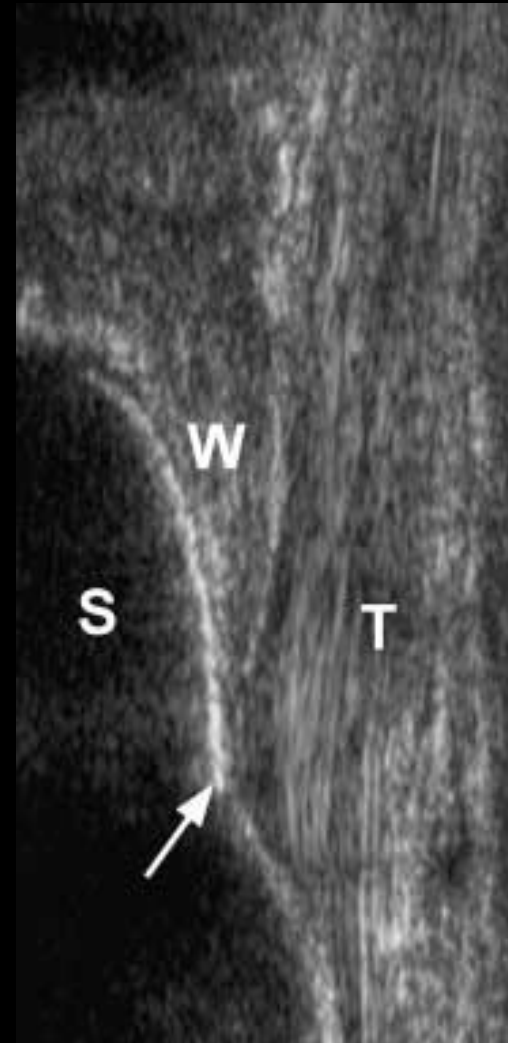


Biomechanics - pre-Achilles fat pad

PW slides over the calcaneus into the retrocalcaneal bursa space



Neutral



Plantar flexion

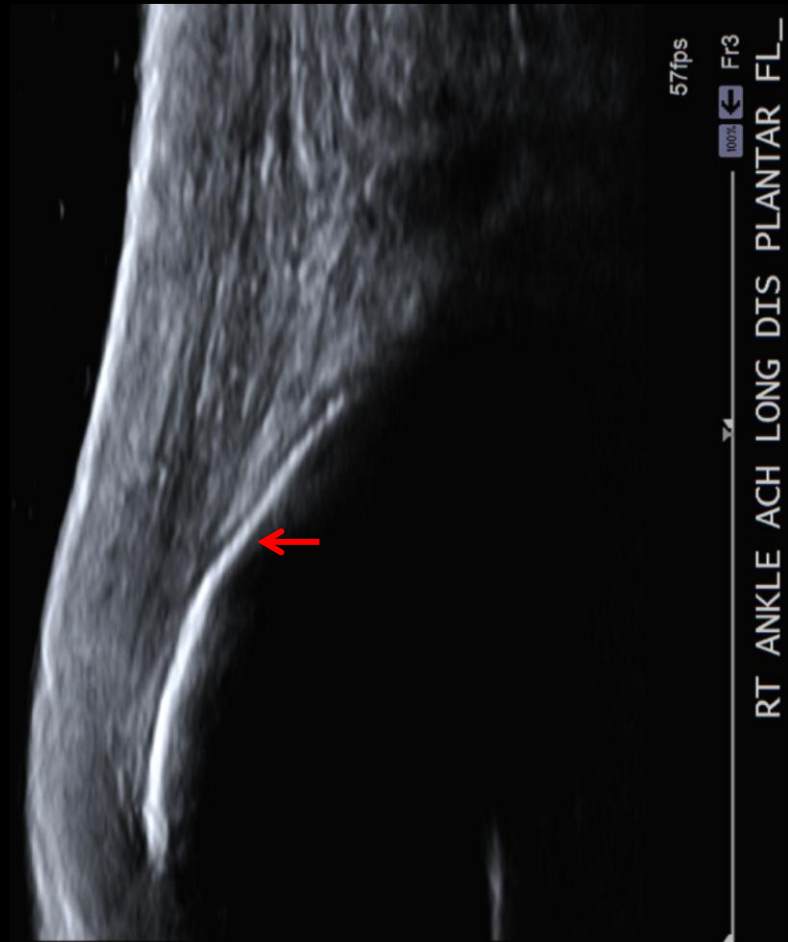
Biomechanics - pre-Achilles fat pad

PW slides over the calcaneus into the retrocalcaneal bursa space

Non-weight bearing plantar flexion in prone position



Neutral



Plantar flexion

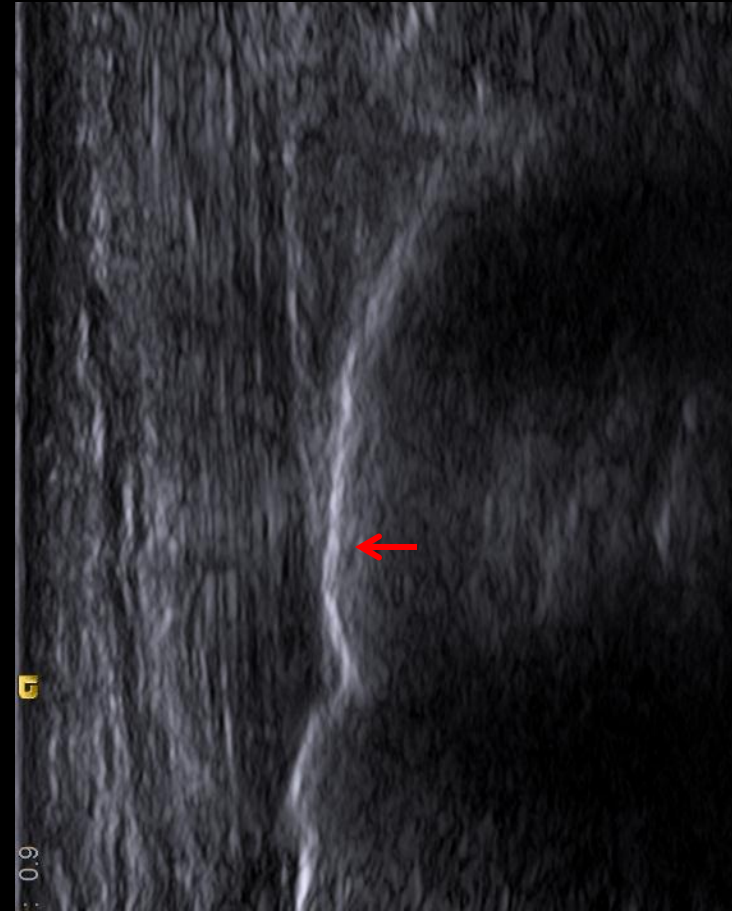
Biomechanics - pre-Achilles fat pad

PW slides over the calcaneus into the retrocalcaneal bursa space

Weight bearing plantar flexion in standing position



Neutral



Plantar flexion

60fps 2

100% Fr332

LEFT ACHILLES LONG PLANTAR_

Biomechanics - pre-Achilles fat pad

PW slides over the calcaneus into the retrocalcaneal bursa space

Weight bearing plantar flexion in standing position

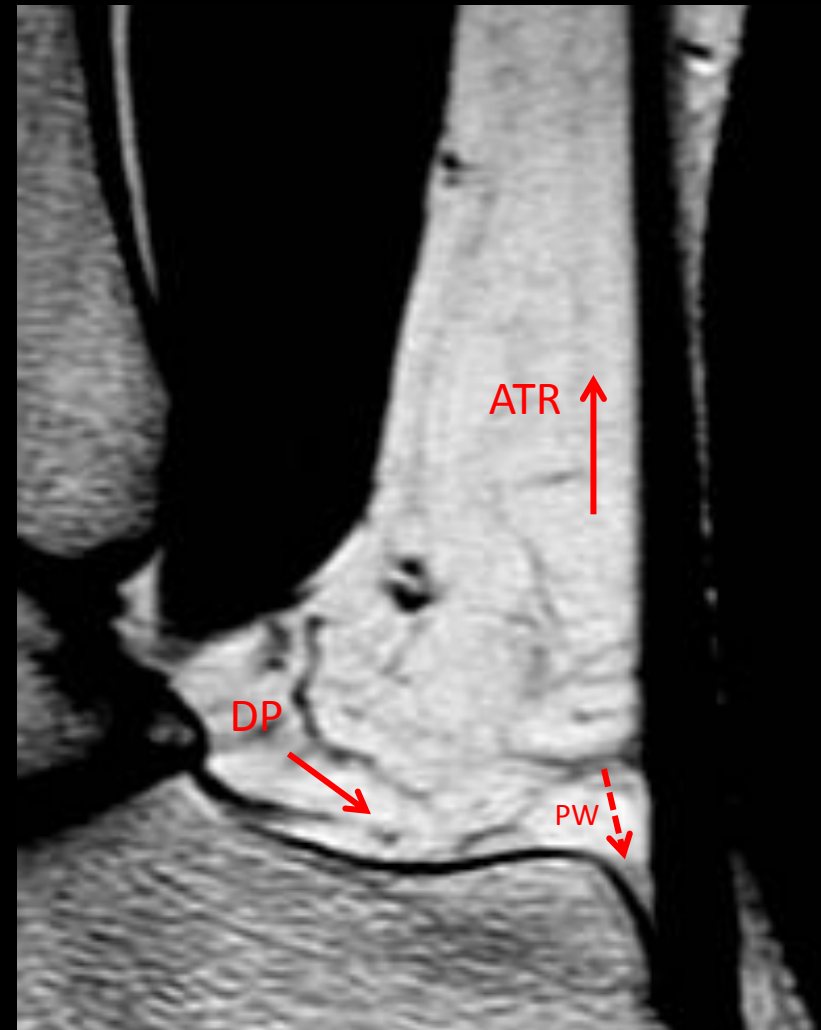


Biomechanics - pre-Achilles fat pad

Ankle plantar flexion
PW slides over the
calcaneus into the
retrocalcaneal bursa space

Advantages

1. Increases lever arm of the Achilles tendon
2. Minimizes pressure changes in the retrocalcaneal bursa
3. Protection to the Achilles tendon – lubrication and decrease wear



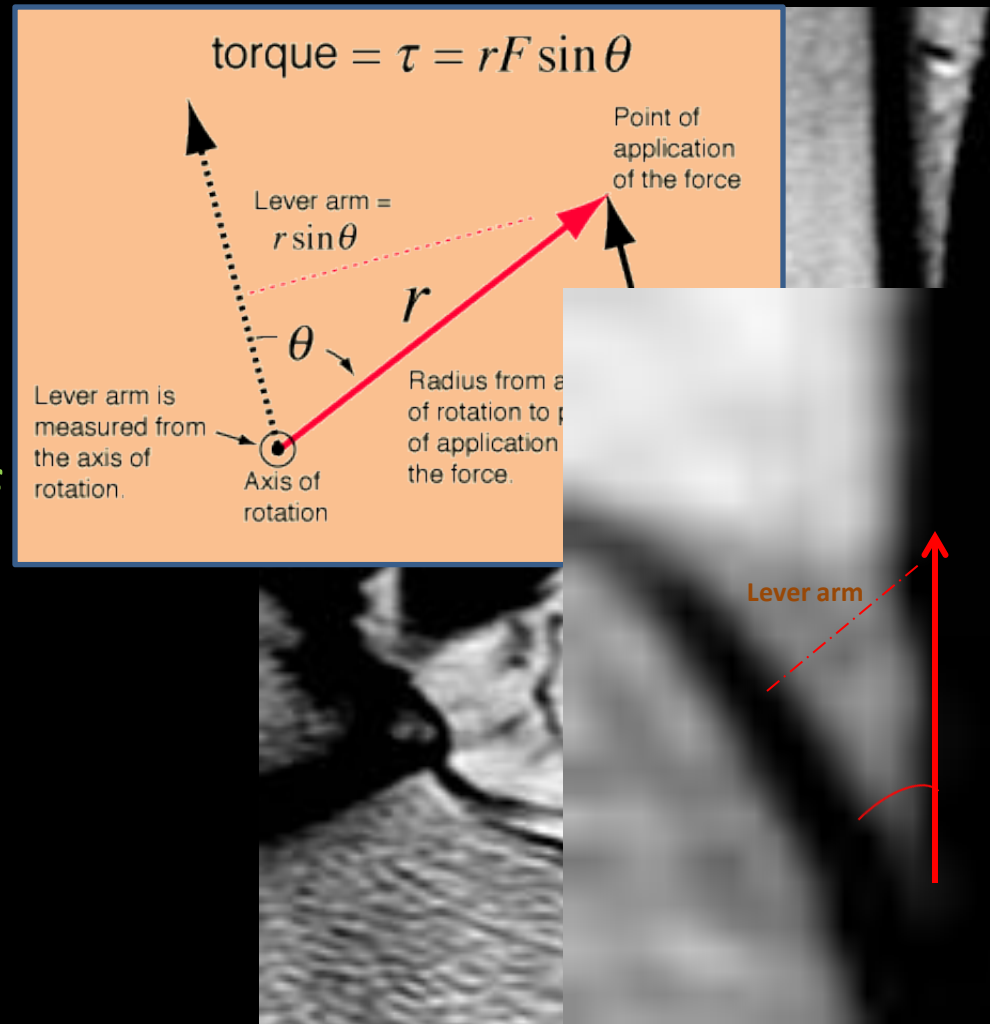
Biomechanics - pre-Achilles fat pad

Ankle plantar flexion:

PW slides over the calcaneus into the retrocalcaneal bursa space

Advantages

1. Increases lever arm of the Achilles tendon
2. Minimizes pressure changes in the retrocalcaneal bursa
3. Protection to the Achilles tendon – lubrication and decrease wear

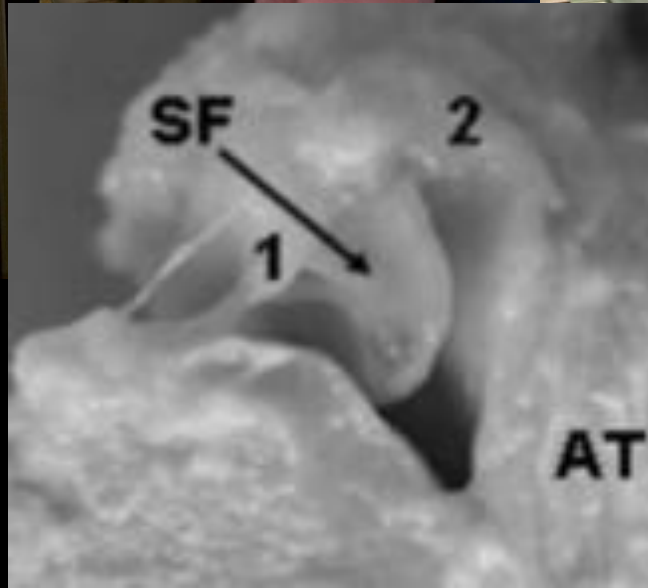


Biomechanics - pre-Achilles fat pad

Ankle plantar flexion:
PW slides over the
calcaneus into the
retrocalcaneal bursa space

Advantages

1. Increases lever arm of the Achilles tendon
2. Minimizes pressure changes in the retrocalcaneal bursa
3. Protection to the Achilles tendon – lubrication and decrease wear



Biomechanics - pre-Achilles fat pad

Ankle plantar flexion:

PW slides over the calcaneus into the retrocalcaneal bursa space

Advantages

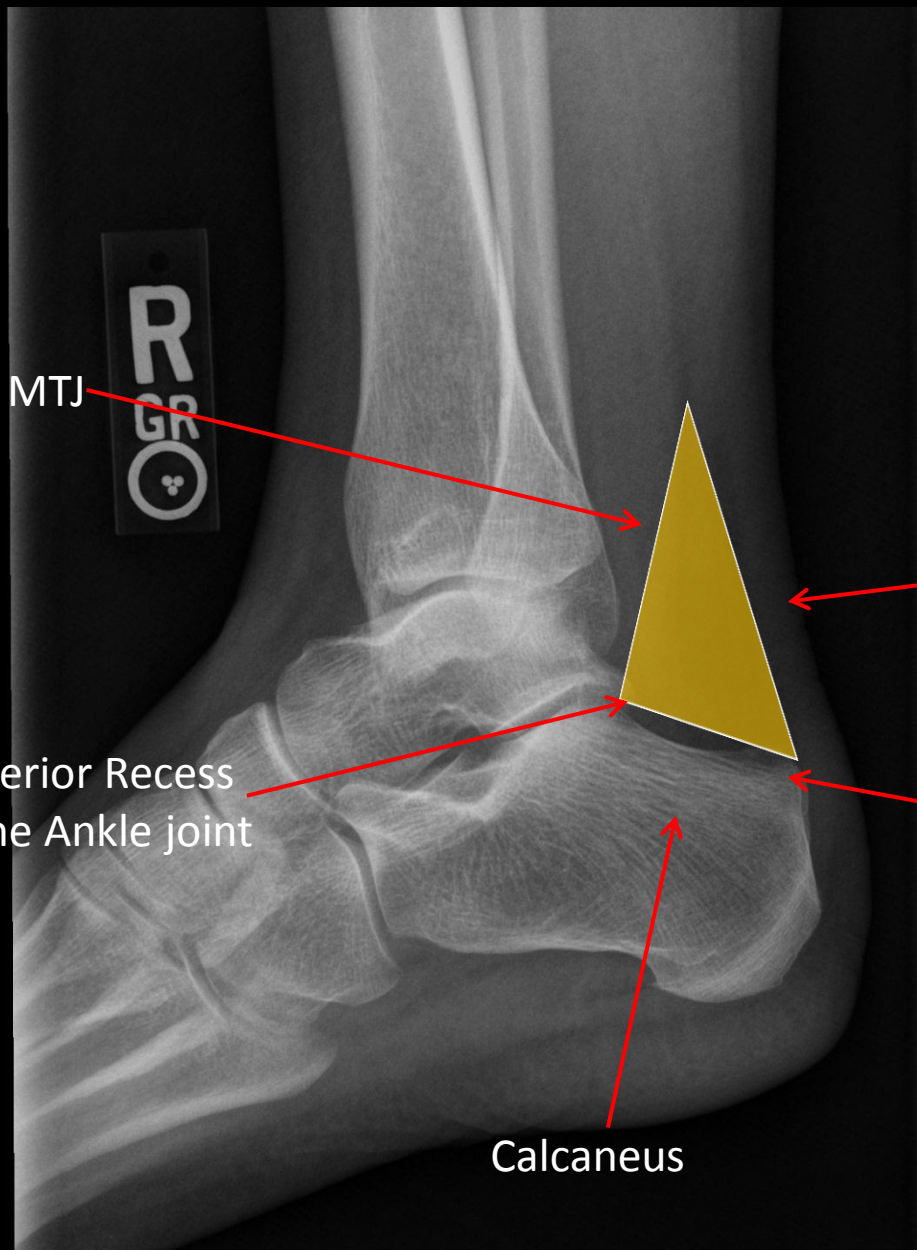
1. Increases lever arm of the Achilles tendon
2. Minimizes pressure changes in the retrocalcaneal bursa
3. Protection to the Achilles tendon – lubrication and decrease wear



Goals

- ✓ Normal anatomy and biomechanics
- How useful is pre-Achilles fat pad?
 - Aid in detecting pathology of the posterior aspect of the ankle joint
 - Mass Effect
 - Obliteration of fat pad (edema, hemorrhage, inflection, inflammation)
 - Illustrate examples of pathology

Pathology - pre-Achilles fat pad



Flexor hallucis longus MTJ



Achilles Tendon

Posterior Recess of the Ankle joint

Retrocalcaneal Bursa

Calcaneus

How useful is pre-Achilles fat pad?

Achilles Tendon



- Tear, Tendonosis
- Peritendinitis
- Hagland Syndrome
- Xanthomatosis

How useful is pre-Achilles fat pad?

Achilles Tendon

□ Tear – radiography signs

- Thicken Achilles tendon
 - > 8mm
 - 78%
- Obliteration of pre-Achilles fat
 - 100%
- Positive Arner's sign
 - 48%
- Diminished Toygar's sign
 - 12%
- Avulsion
- Ossified Achilles tendon fracture



How useful is pre-Achilles fat pad?

Achilles Tendon

□ Tear – radiography signs

- **Thicken Achilles tendon**
 - > 8mm
 - 78%
- **Obliteration of pre-Achilles fat**
 - 100%
- Positive Arner's sign
 - 48%
- Diminished Toygar's sign
 - 12%
- Avulsion
- Ossified Achilles tendon fracture

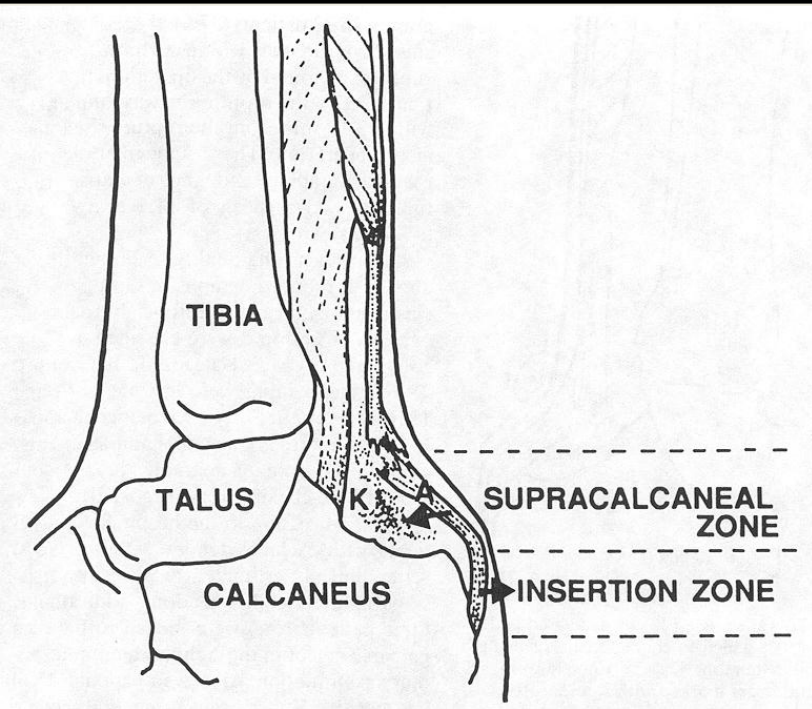


How useful is pre-Achilles fat pad?

Achilles Tendon

□ Tear – radiography signs

- Thicken Achilles tendon
 - > 8mm
 - 78%
- Obliteration of pre-Achilles fat
 - 100%
- **Positive Arner's sign**
 - **48%**
- Diminished Toygar's sign
 - 12%
- Avulsion
- Ossified Achilles tendon fracture



Supracalcaneal Zone:
Contour moves forward

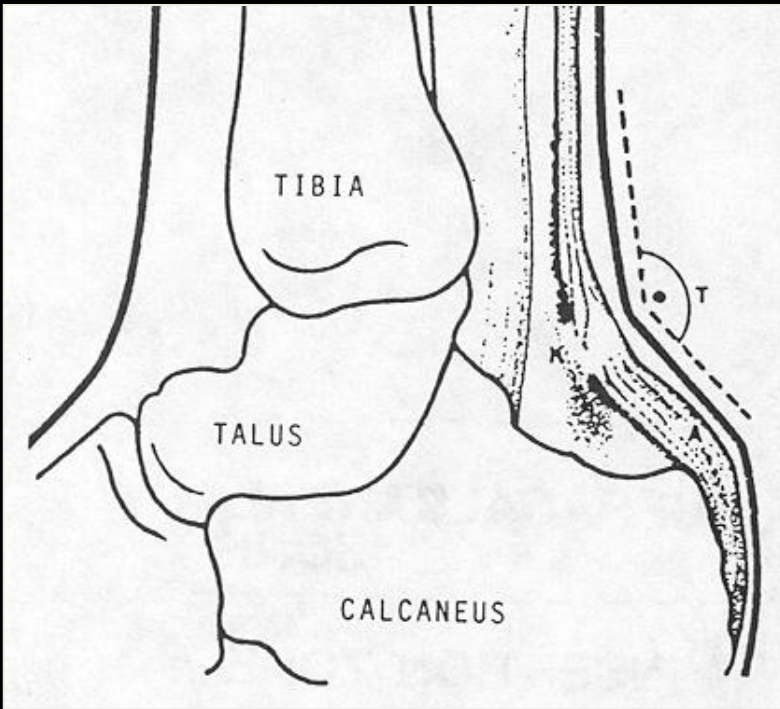
Insertion Zone:
Contour curves away???

How useful is pre-Achilles fat pad?

Achilles Tendon

□ Tear – radiography signs

- Thicken Achilles tendon
 - > 8mm
 - 78%
- Obliteration of pre-Achilles fat
 - 100%
- Positive Arner's sign
 - 48%
- **Diminished Toygar's sign**
 - **12%**
- Avulsion
- Ossified Achilles tendon fracture



Angle of posterior skin surface curve

Pathologic < 150 degrees

How useful is pre-Achilles fat pad?

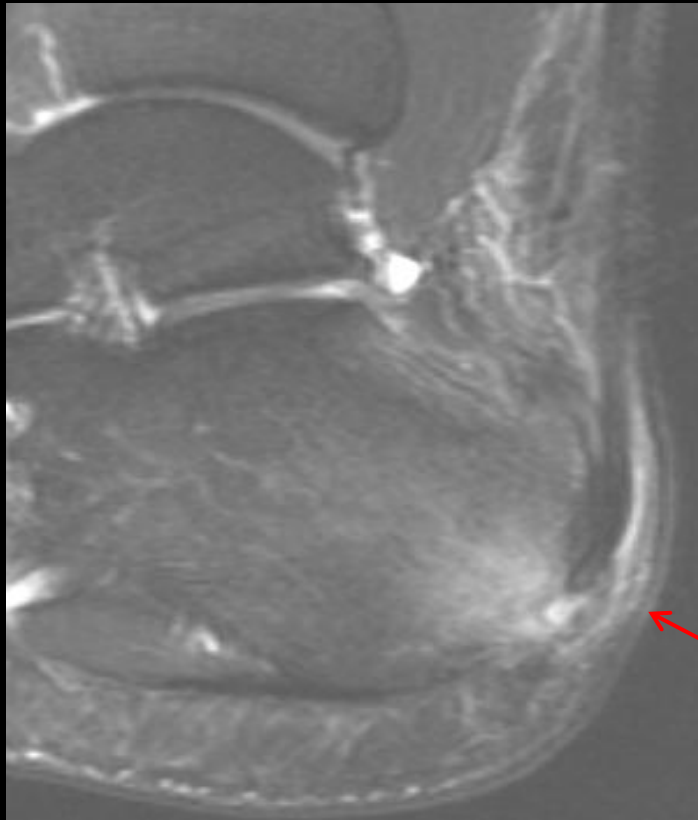


Achilles Tendon

☐ Tear – radiography signs

- Thicken Achilles tendon
 - > 8mm
 - 78%
- Obliteration of pre-Achilles fat
 - 100%
- Positive Arner's sign
 - 48%
- Diminished Toygar's sign
 - 12%
- **Avulsion**
- Ossified Achilles tendon fracture

How useful is pre-Achilles fat pad?



Avulsion at
Calcaneal
tubercle

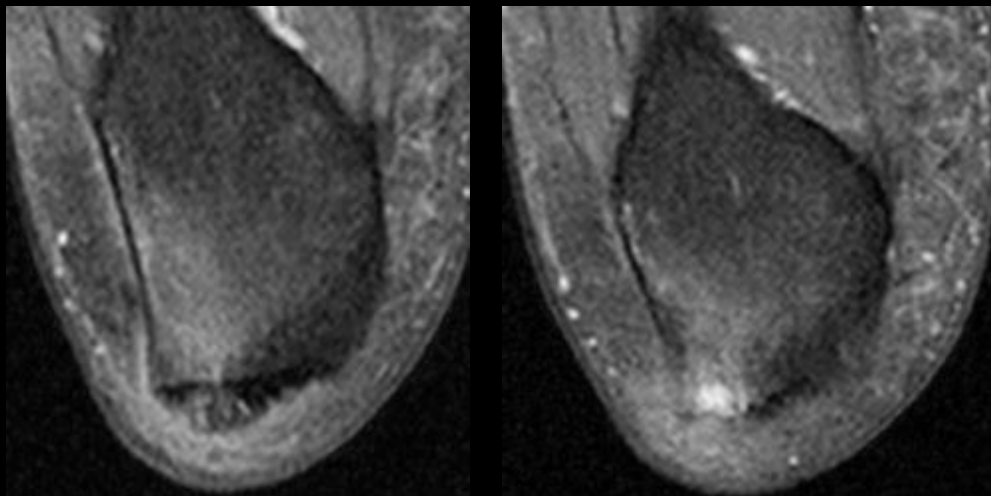
Achilles Tendon

□ Tear – radiography signs

- Thicken Achilles tendon
 - > 8mm
 - 78%
- Obliteration of pre-Achilles fat
 - 100%
- Positive Arner's sign
 - 48%
- Diminished Toygar's sign
 - 12%

– Avulsion

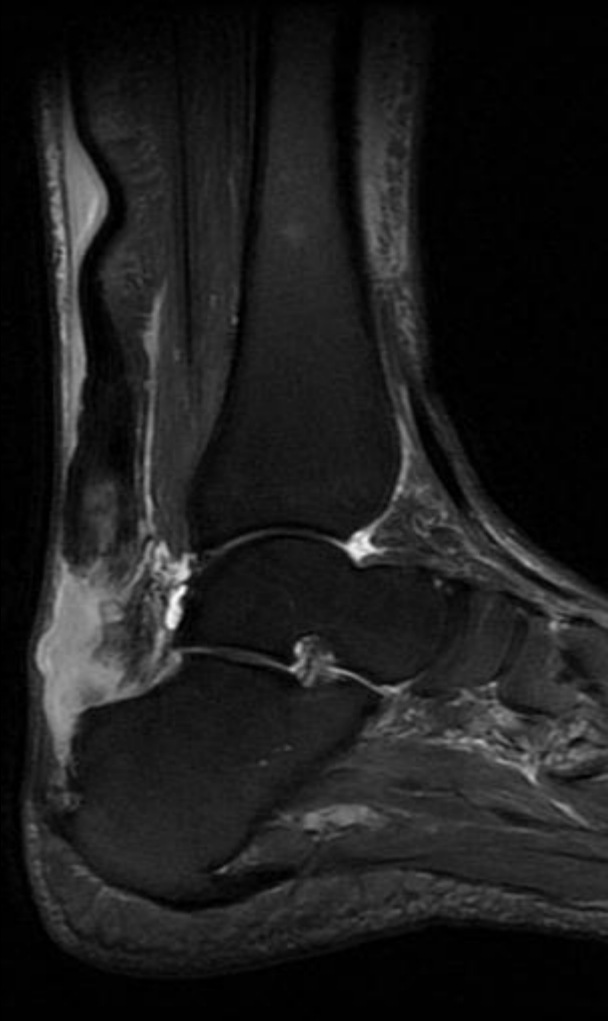
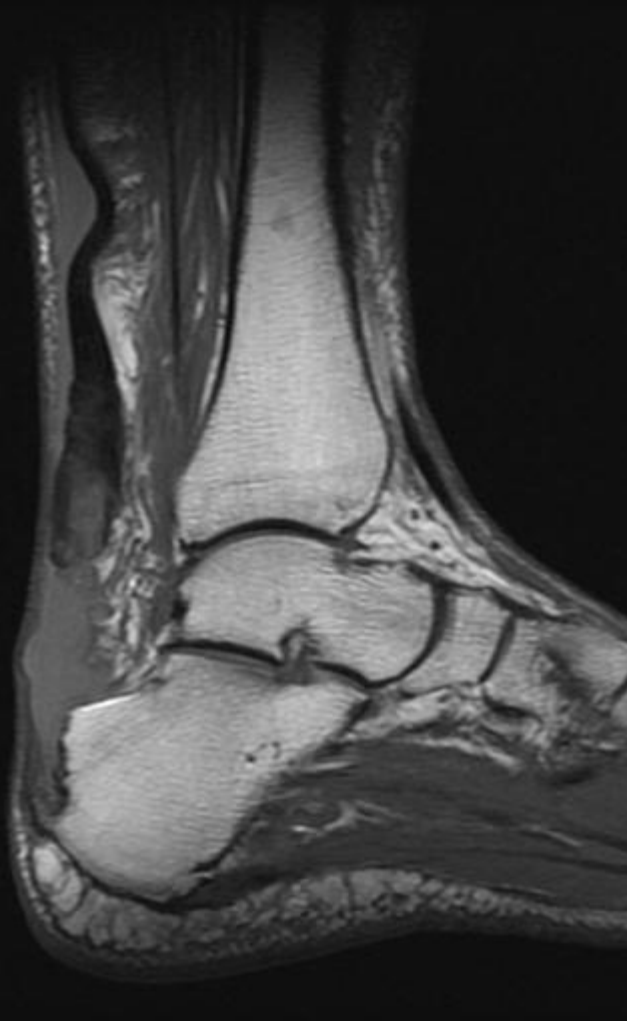
- Ossified Achilles tendon fracture



How useful is pre-Achilles fat pad?

Achilles Tendon

Complete Tear



Obliteration of pre-Achilles fat - Hemorrhage

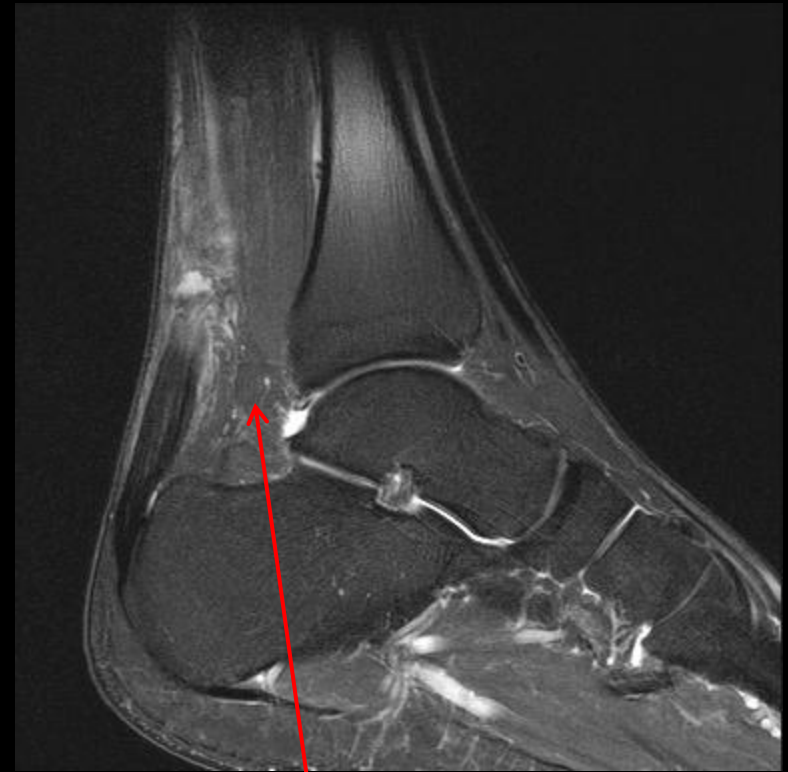
How useful is pre-Achilles fat pad?

Achilles Tendon

Near-complete Tear



Abnormal SI in the ATR –
pre-Achilles fat pad



No abnormal SI in the
deep pad

Obliteration of pre-Achilles fat - Hemorrhage

How useful is pre-Achilles fat pad?

Achilles Tendon

□ Tear – radiography signs

- Thicken Achilles tendon
 - > 8mm
 - 78%
- Obliteration of pre-Achilles fat
 - 100%
- Positive Arner's sign
 - 48%
- Diminished Toygar's sign
 - 12%
- Avulsion
- **Ossified Achilles tendon fracture**



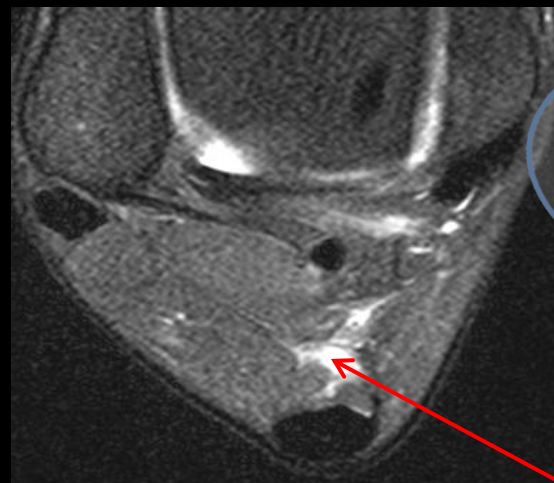
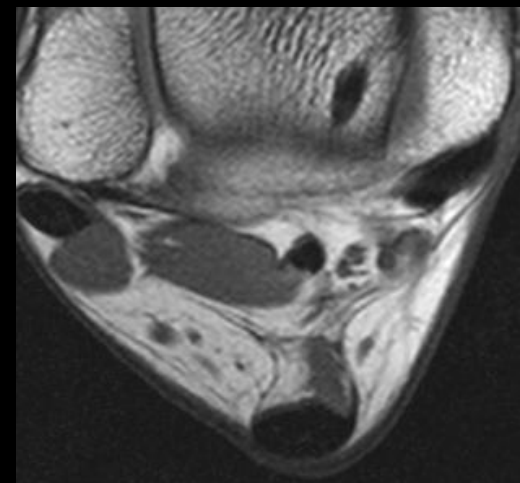
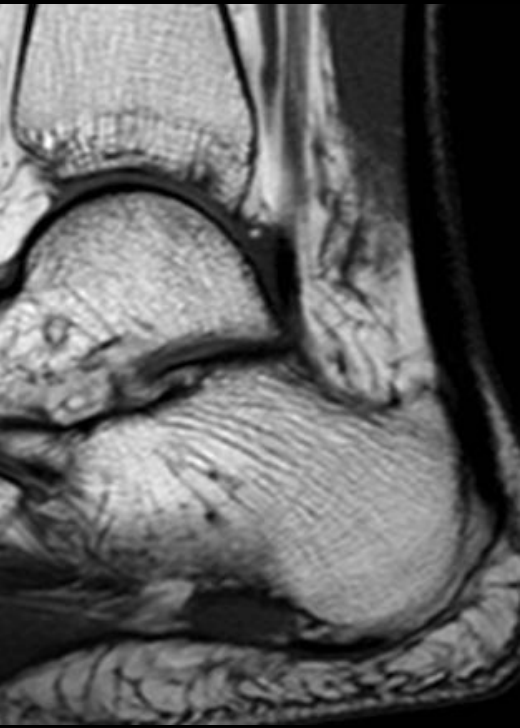
Ossified Achilles tendons without fracture

How useful is pre-Achilles fat pad?

Achilles Tendon

□ Peritendinitis

- Inflammation about the Achilles tendon
- Altered signal intensity most pronounced in the ATR – pre-Achilles fat pad
- Patients can be symptomatic or asymptomatic



“make sure to spell out peritendinitis, you don’t realize how much time I spend making corrections ”

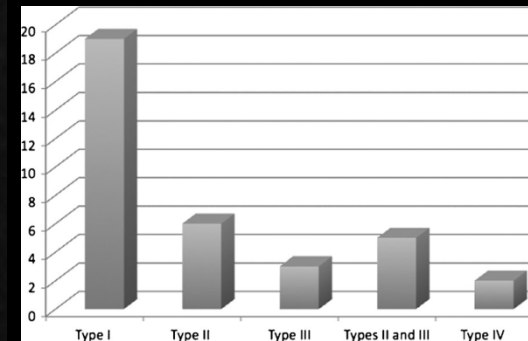
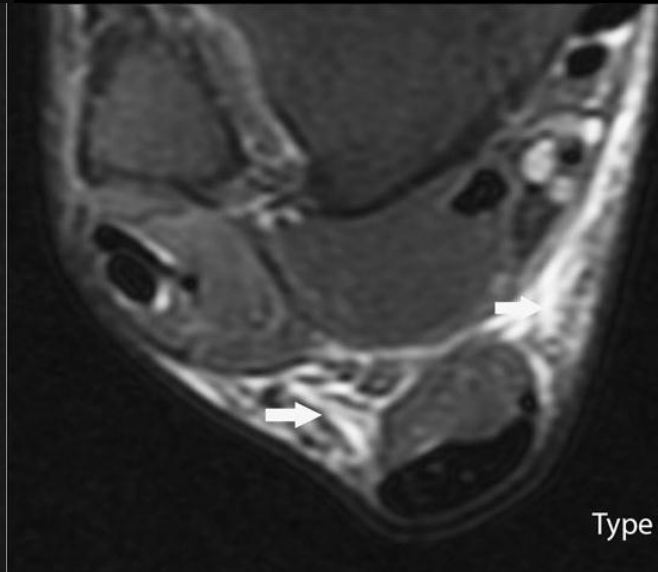
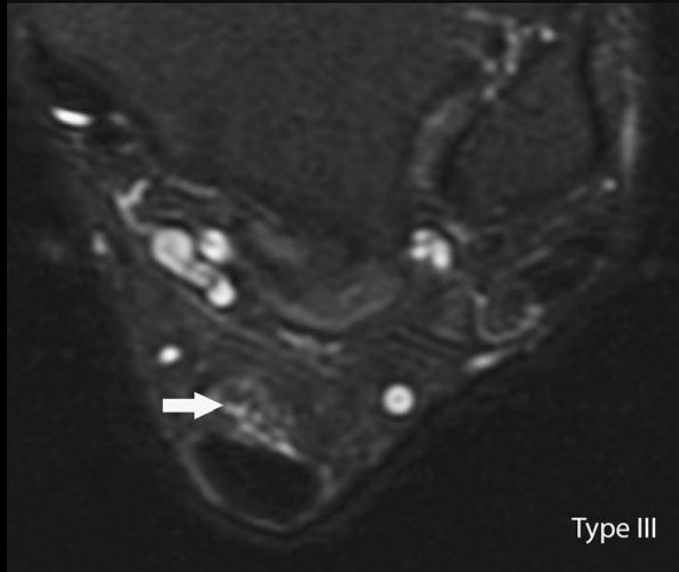
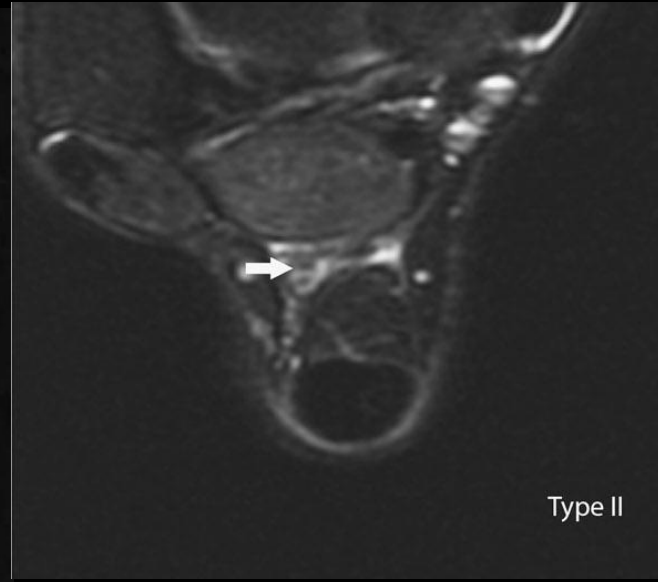
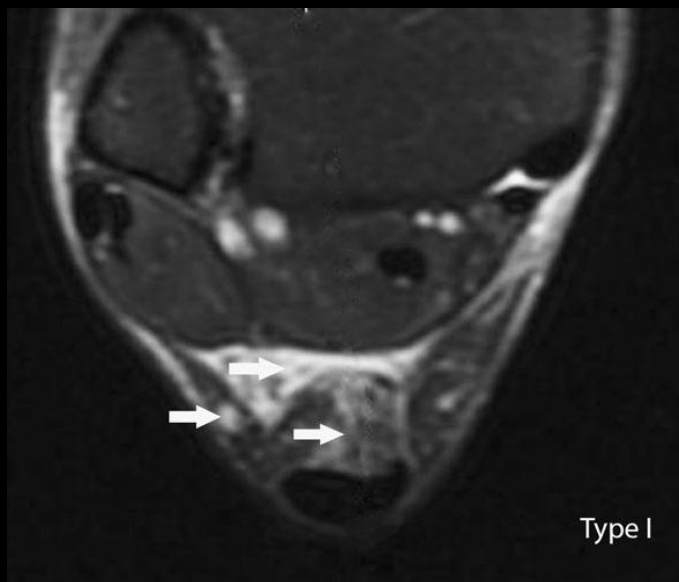
Altered SI in the ATR – pre-Achilles fat pad



How useful is pre-Achilles fat pad?

Pre-Achilles fat pad edema

- Different patterns of confined edema can reflect the origin of the inflammatory process
- Fascia and retinaculum act as barrier protects the posterior ankle from disseminated inflammation

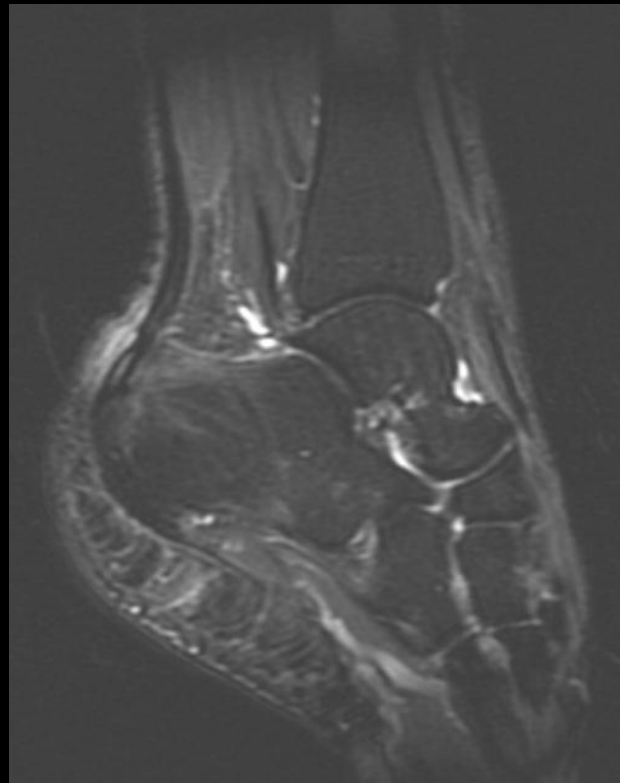
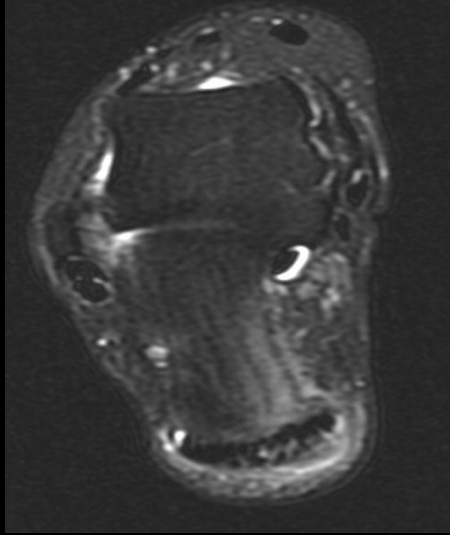


How useful is pre-Achilles fat pad?

Achilles Tendon

□ Haglund Syndrome

- Thickening of Achilles tendon
- Retrocalcaneal bursitis
- Retro-Achilles bursitis
- Pump's bump



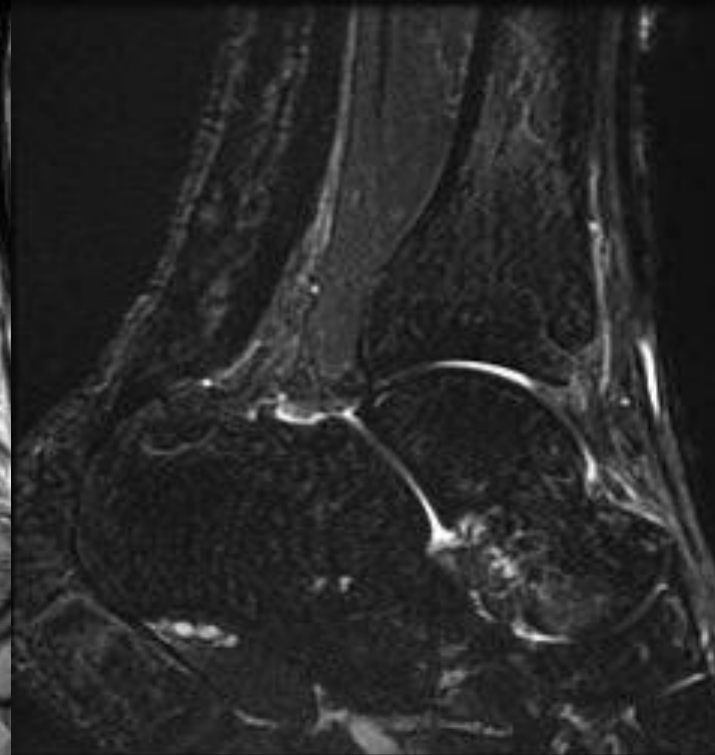
How useful is pre-Achilles fat pad?

Achilles Tendon

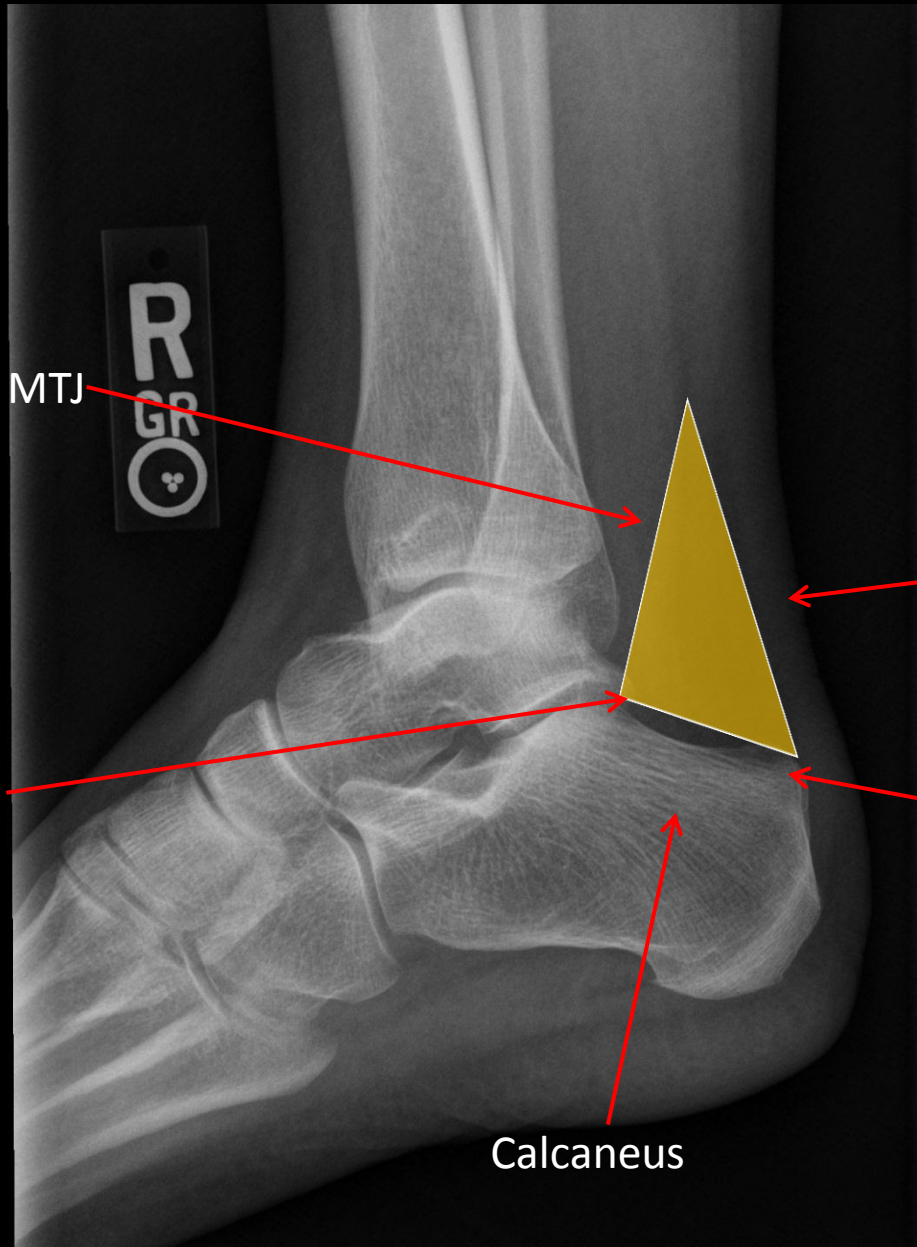
□ Xanthomatosis

- Familial Hypercholesterolemia
- Cerebrotendinous Xanthomatosis
 - Bilateral cataracts and diarrhea
 - Neurologic abnormalities
- Low SI collagen with high SI foamy histiocytes and inflammation

Mass effect on ATR
pre-Achilles fat pad



Pathology - pre-Achilles fat pad



Flexor hallucis longus MTJ



✓ Achilles Tendon

Posterior Recess of the Ankle joint

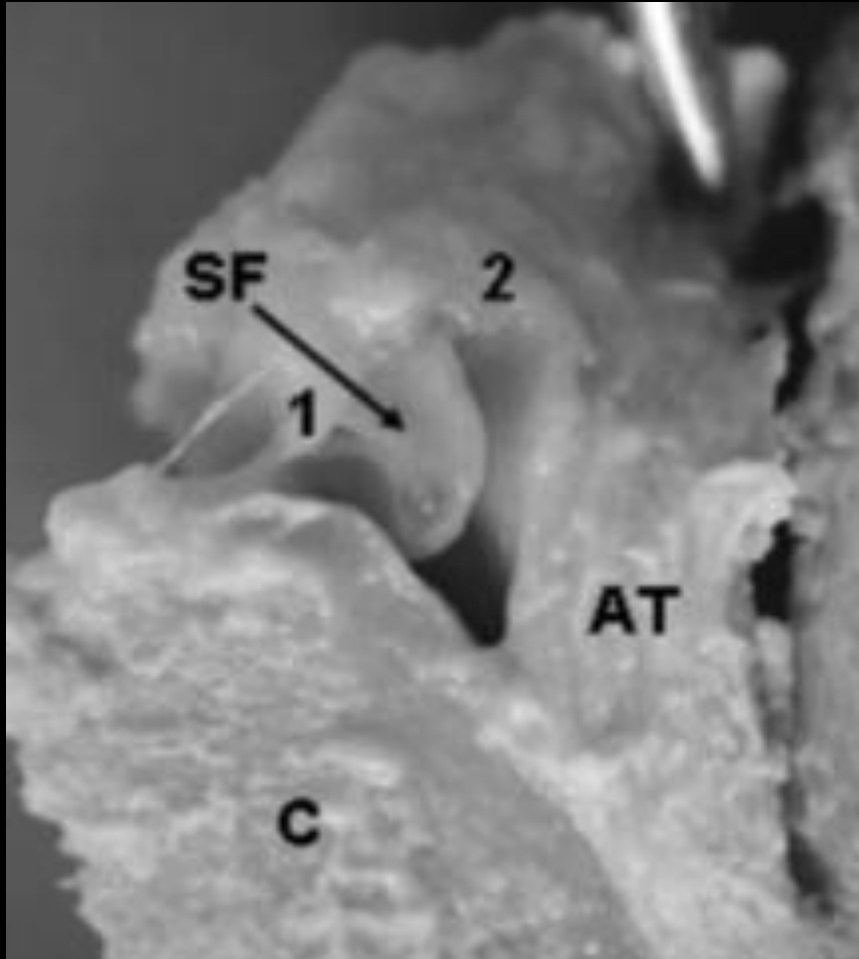
Retrocalcaneal Bursa

Calcaneus

How useful is pre-Achilles fat pad?

Retrocalcaneal Bursa

- ❑ Retrocalcaneal bursitis
- ❑ Inflammatory arthritis
 - Gout
 - Rheumatoid arthritis
 - Reactive arthritis
 - Psoriatic arthritis



How useful is pre-Achilles fat pad?

Retrocalcaneal Bursa

□ Retrocalcaneal bursitis

Retrocalcaneal protruding wedge:

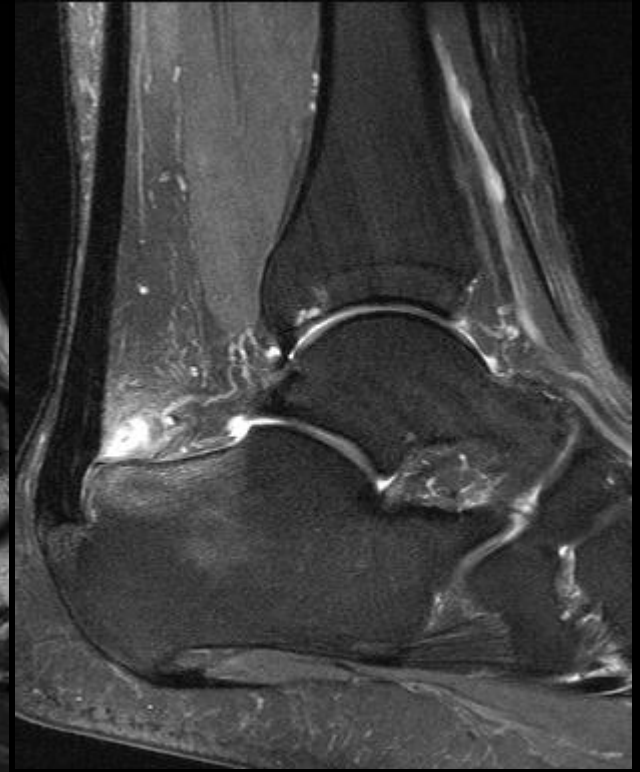
- Increase lever arm
- Minimizes pressure changes
- Achilles tendon lubrication decrease wear

Corticosteroids:

- Side effect is fat atrophy
- Can be debated against the use of local steroids for retrocalcaneal pain

Abnormal if greater than:

- 11 mm in medial-lateral
- 7 mm in superior-inferior
- 1 mm in anterior-posterior



How useful is pre-Achilles fat pad?

Retrocalcaneal Bursa

- Inflammatory arthritis
 - Rheumatoid arthritis

Retrocalcaneal bursitis with erosion



“bare area” erosions



Ulnar styloid erosion



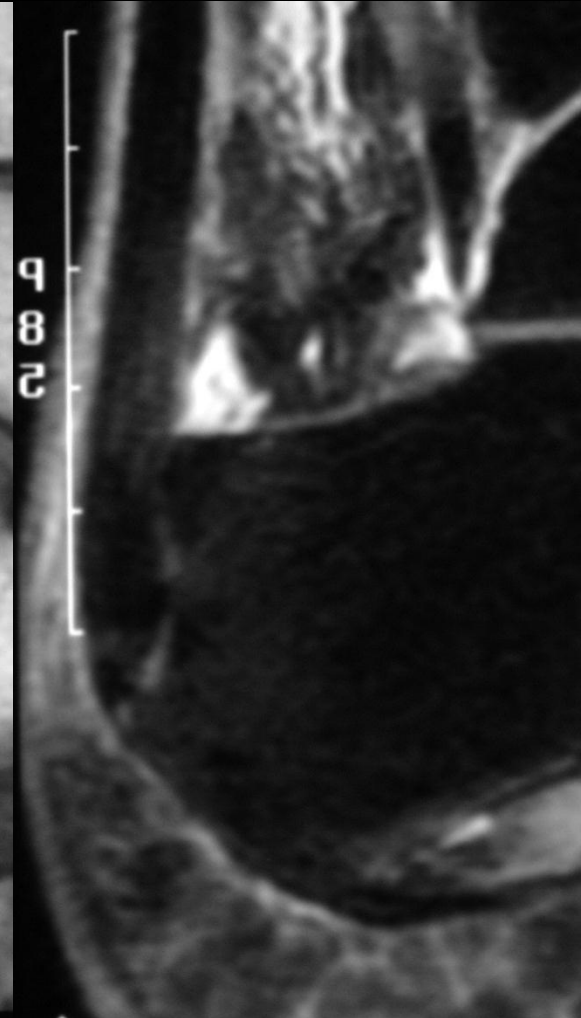
How useful is pre-Achilles fat pad?

Retrocalcaneal Bursa

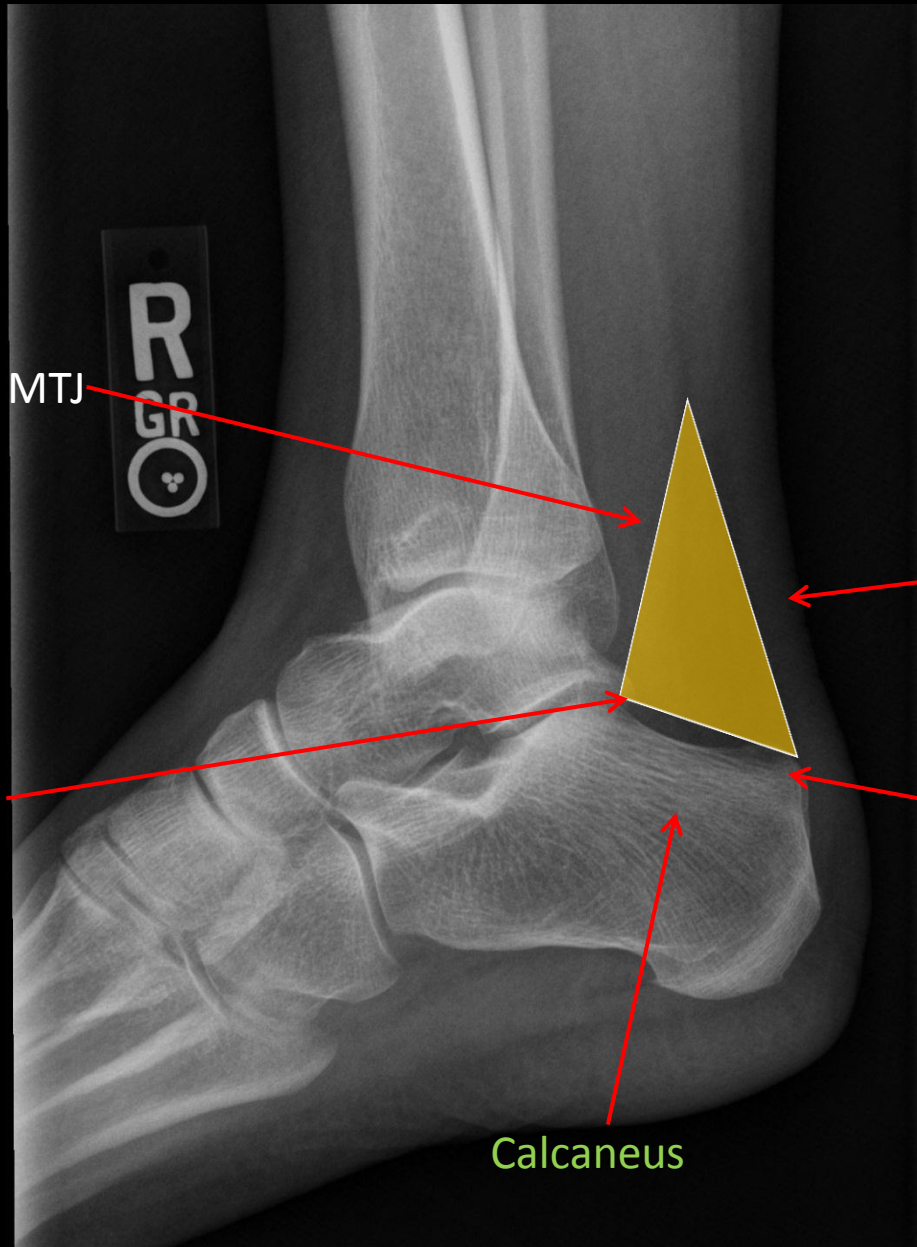
□ Inflammatory arthritis

- Reactive arthritis

Retrocalcaneal bursitis with erosion



Pathology - pre-Achilles fat pad



Flexor hallucis longus MTJ



Posterior Recess of the Ankle joint

Calcaneus

✓ Achilles Tendon

✓ Retrocalcaneal Bursa

How useful is pre-Achilles fat pad?

Calcaneus Fracture

- Traumatic
- Stress
- Insufficiency fracture



How useful is pre-Achilles fat pad?

Calcaneus Fracture

□ Traumatic

- Fall, MVA
- **Obliteration of pre-Achilles fat pad**
- Decreased Bohler's angle
- Association - Spine fracture

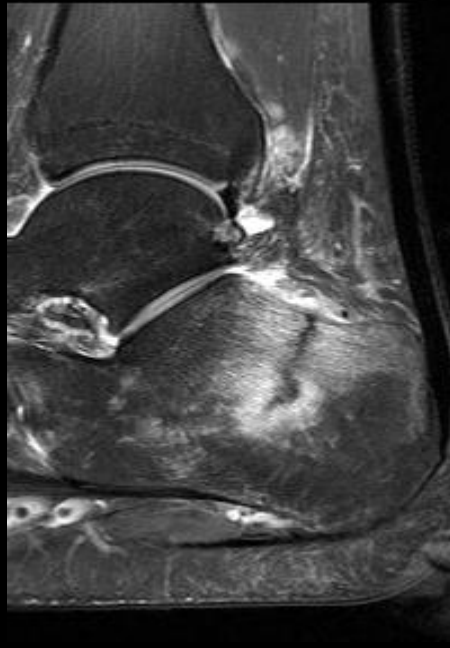
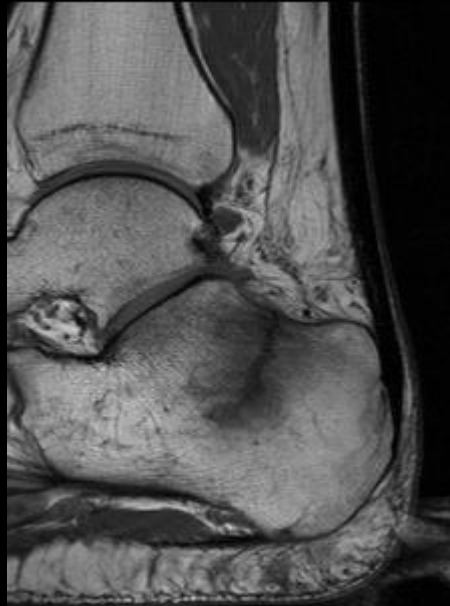


How useful is pre-Achilles fat pad?

Calcaneus Fracture

□ Stress

- Overall, 2nd most common site after metatarsal
- Curvilinear sclerosis
- **Obliteration of pre-Achilles fat pad**



How useful is pre-Achilles fat pad?

Calcaneus Fracture

❑ Insufficiency

- Avulsion fracture
- Diabetes with peripheral neuropathy (20 yrs)
- 1-3 cm of displacement

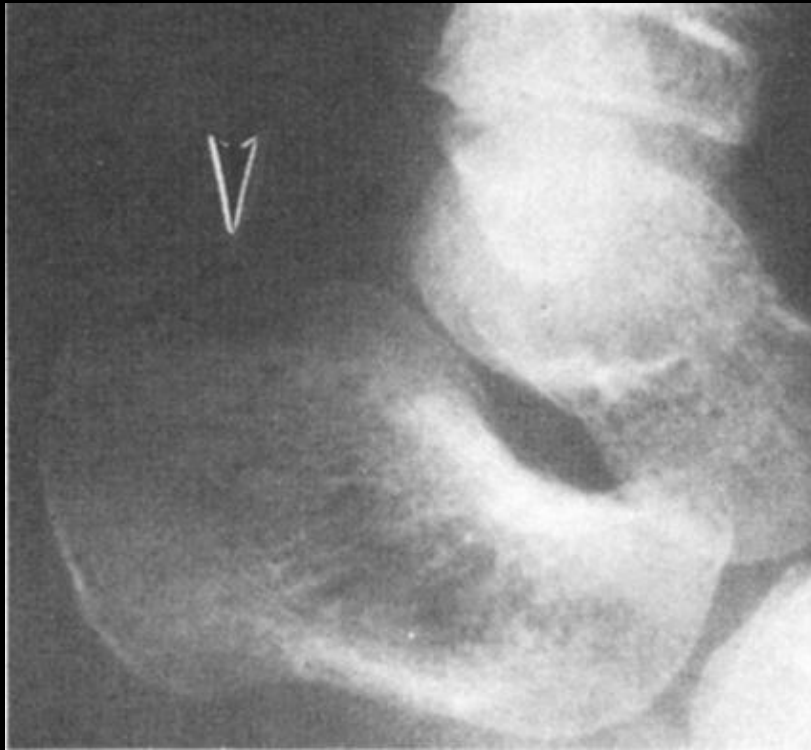


How useful is pre-Achilles fat pad?

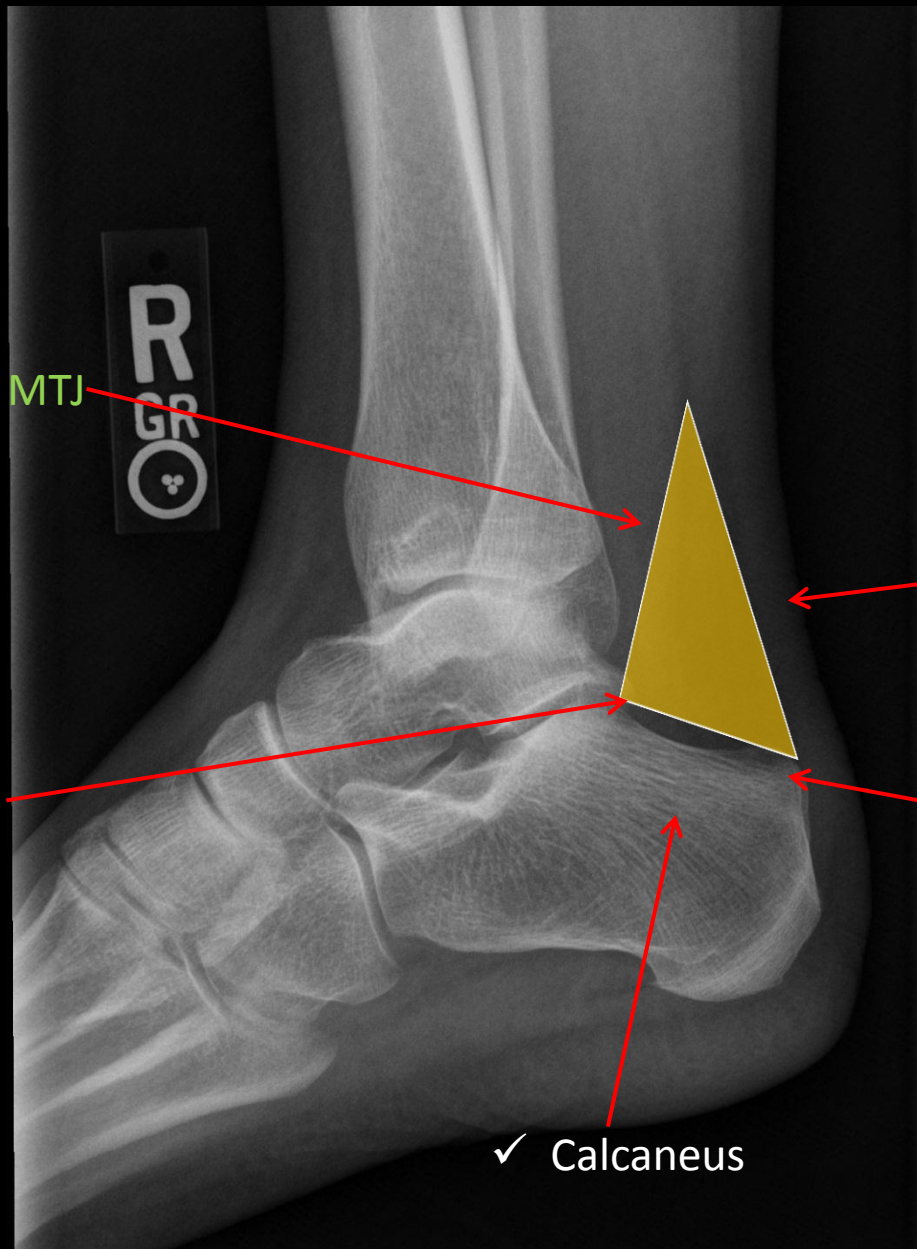
Calcaneus

☐ Sickle Cell Anemia

- Erosive changes in the superior aspect of the calcaneus
- Possible inflammatory synovium and extension of the posterior recess
- 14/100 patients with sickle cell disease



Pathology - pre-Achilles fat pad



Flexor hallucis longus MTJ



Posterior Recess of the Ankle joint

✓ Calcaneus

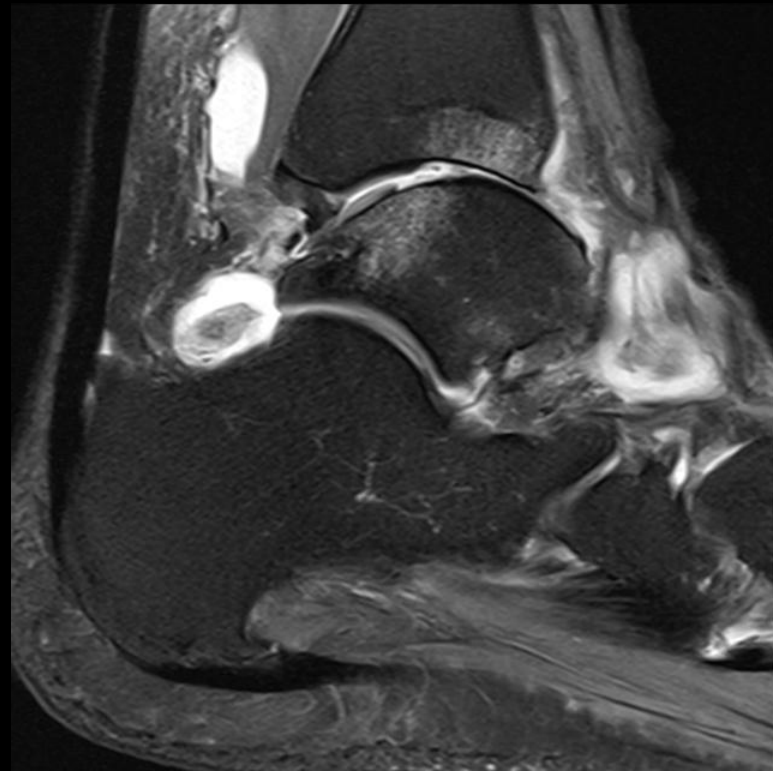
✓ Achilles Tendon

✓ Retrocalcaneal Bursa

How useful is pre-Achilles fat pad?

Ankle joint / FHL

- Ankle Joint Effusion
 - Trauma
 - Infection
- Joint abnormality
 - Synovial disease

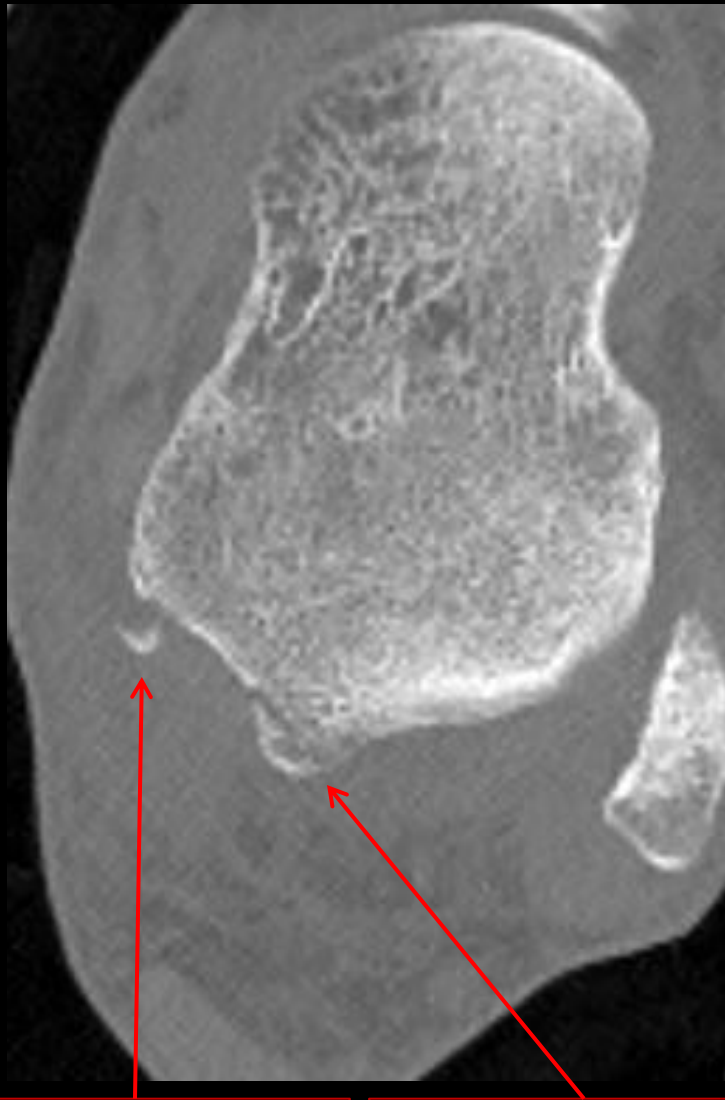


How useful is pre-Achilles fat pad?

Ankle joint / FHL

☐ Ankle Joint Effusion

- Greater than 13 mm in anterior + posterior capsular distension
- Underlying fracture following acute trauma
 - 91% Specificity
 - 82% Sensitivity
 - 82% PPV



Cedell fracture:
medial tubercle of the
talus posterior
process

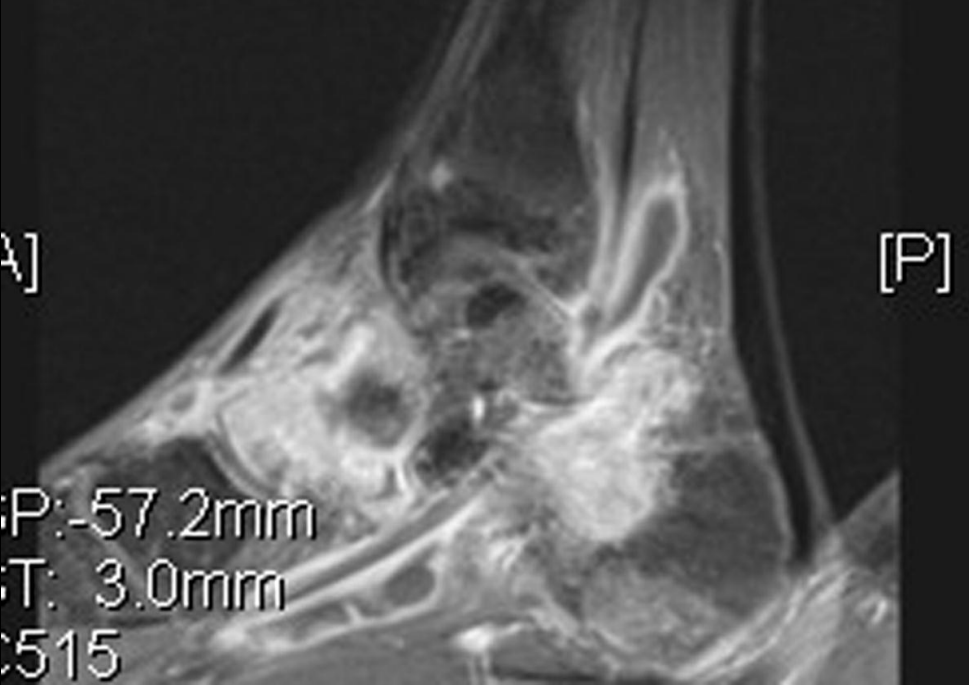
Shepherd fracture:
lateral tubercle of the
talus posterior
process

How useful is pre-Achilles fat pad?

Ankle joint / FHL

- ☐ Ankle Joint Effusion
 - Infection

Disseminated Coccidioidomycosis



How useful is pre-Achilles fat pad?

Ankle joint / FHL

- ☐ Ankle Joint Effusion
 - Infection



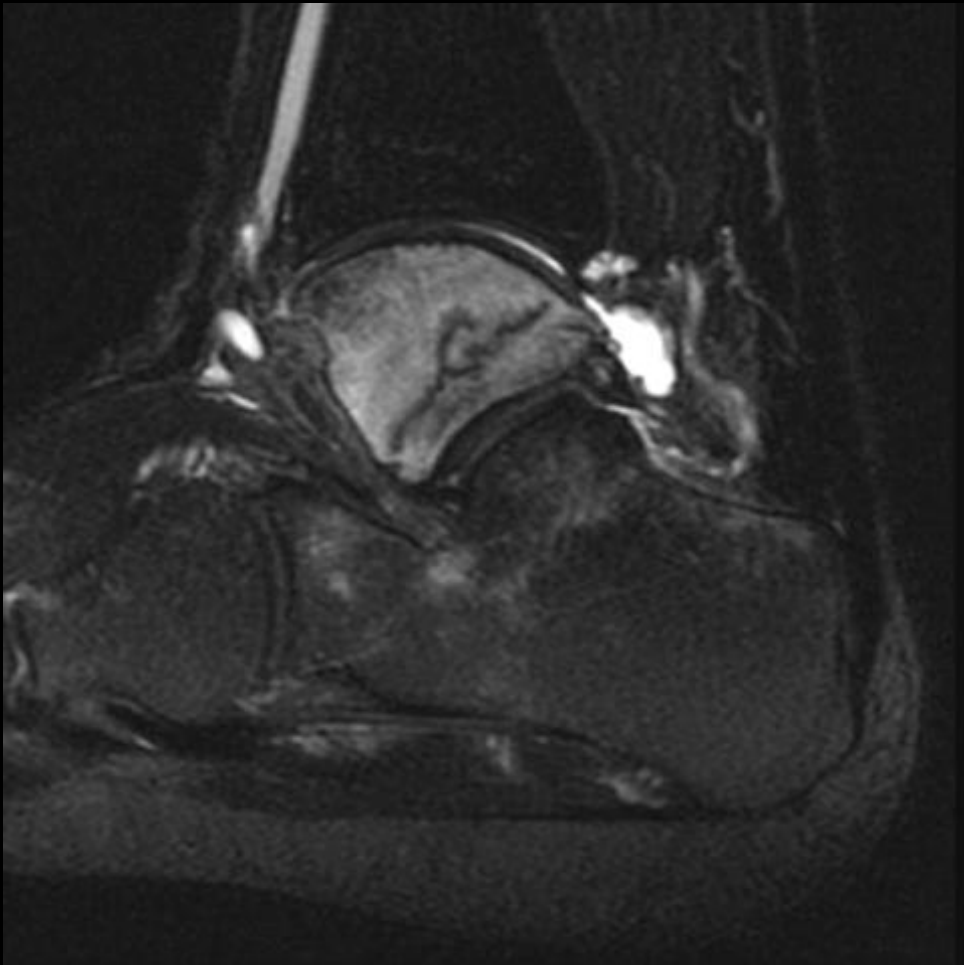
Diabetic foot with air from infection

How useful is pre-Achilles fat pad?

Ankle joint / FHL

☐ Ankle Joint Effusion

Talus stress fracture



How useful is pre-Achilles fat pad?

Ankle joint / FHL

Ankle Joint Effusion

Osteochondritis Dissecans



"osteochondral defect in the medial aspect of the talar dome falling into the general spectrum of osteochondritis dissecans"



How useful is pre-Achilles fat pad?

Ankle joint / FHL

☐ Joint abnormality

Inflammatory arthritis

Gout



How useful is pre-Achilles fat pad?

Ankle joint / FHL

☐ Joint abnormality

Inflammatory arthritis

Gout

Abnormality of the deep pad of the pre-Achilles fat

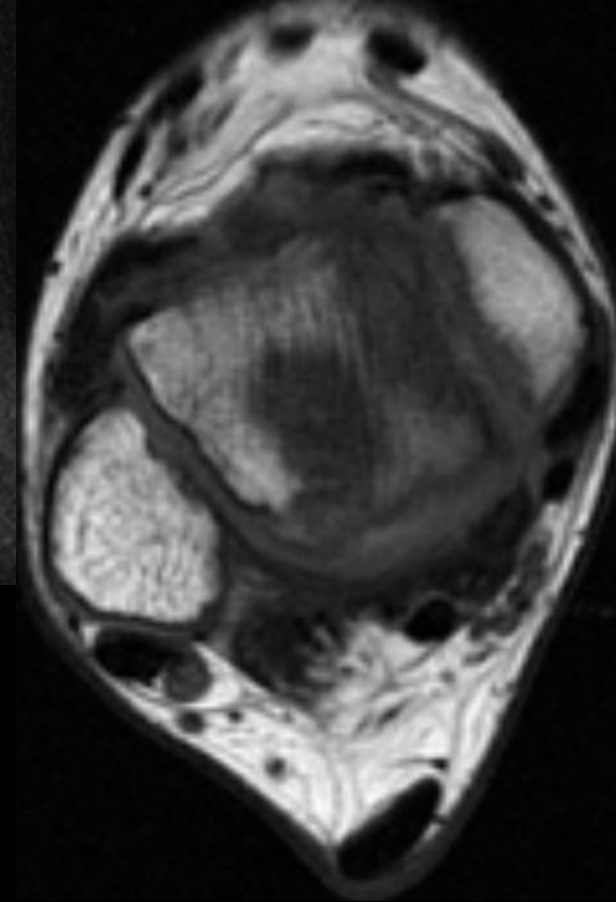
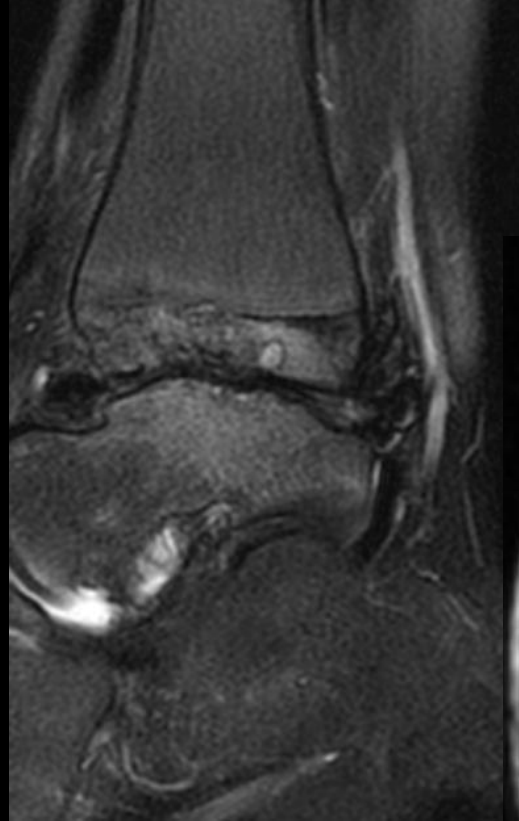


How useful is pre-Achilles fat pad?

Ankle joint / FHL

☐ Joint abnormality

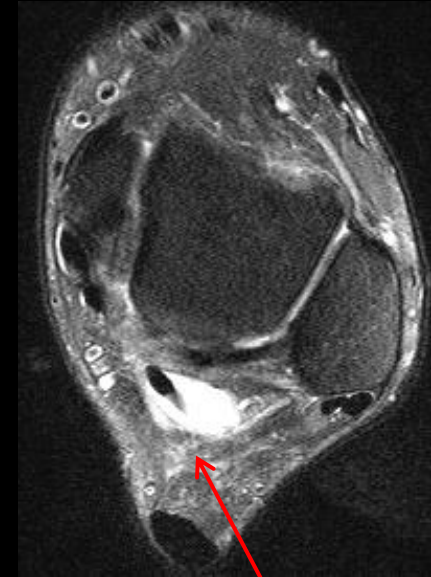
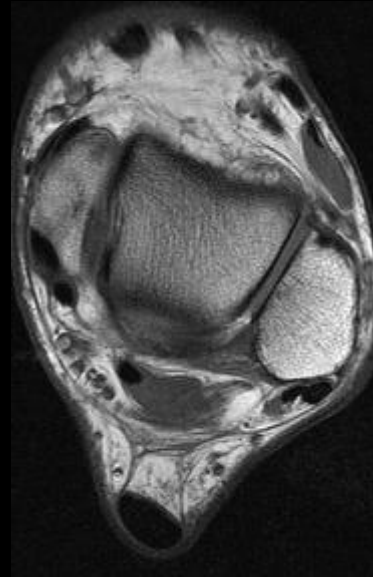
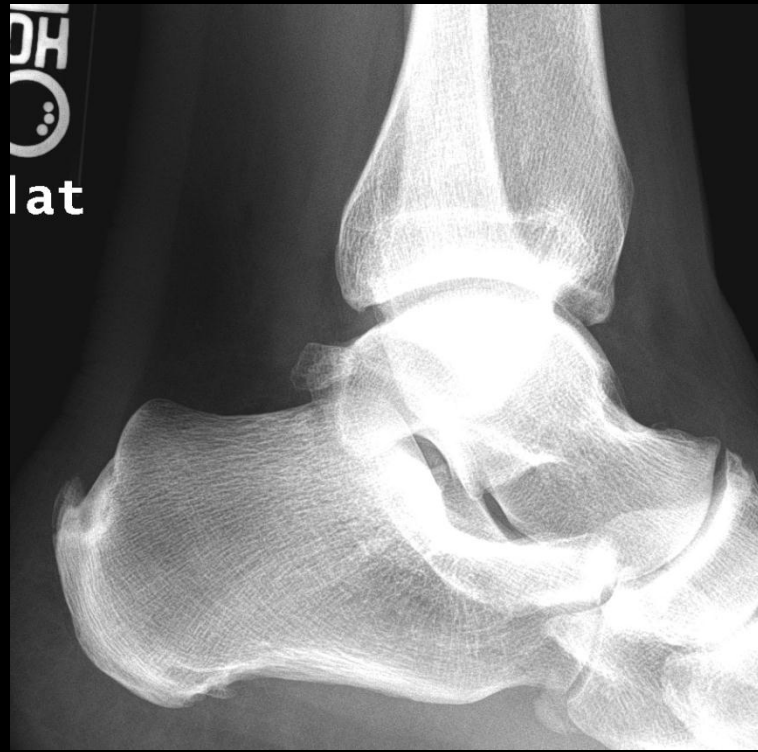
Hemophilic Arthropathy



How useful is pre-Achilles fat pad?

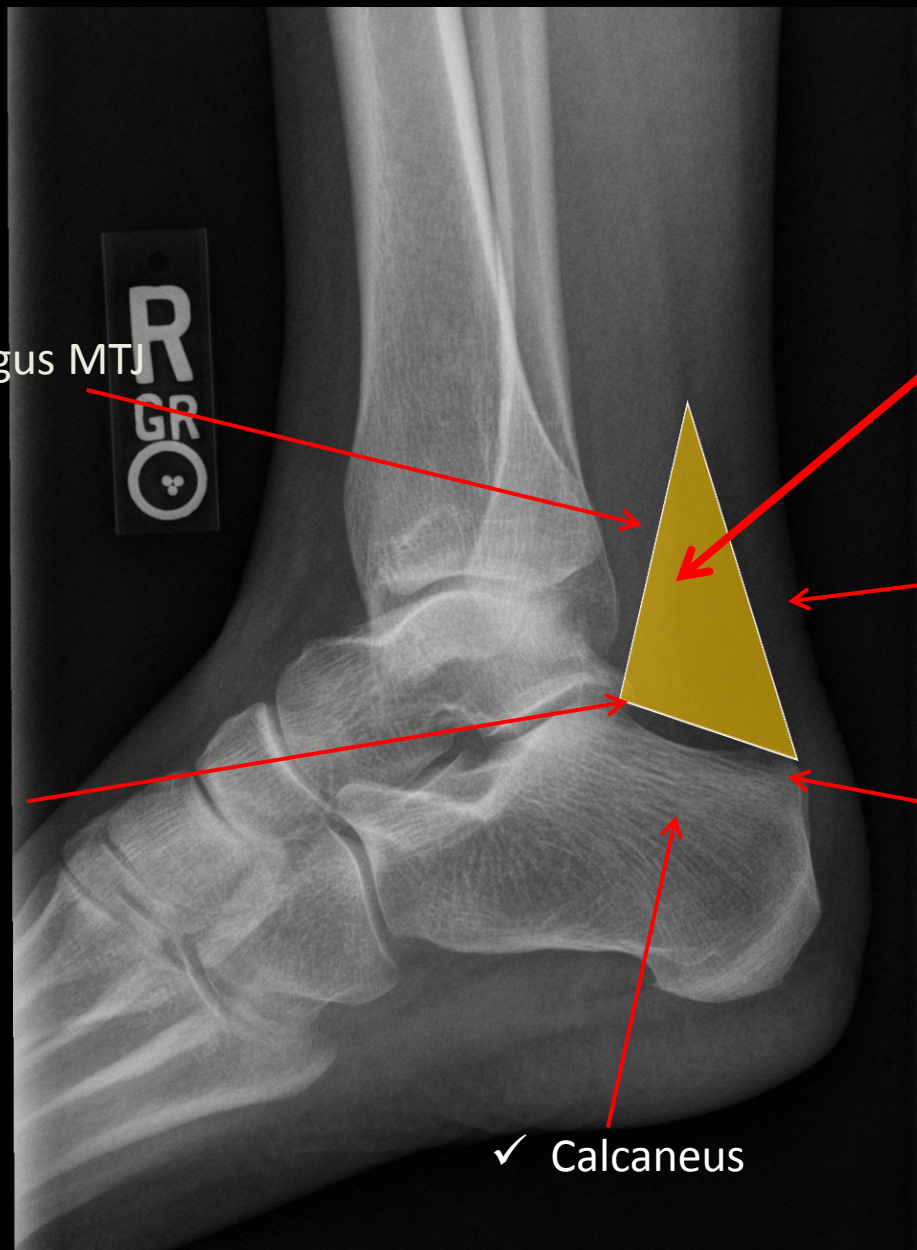
Ankle joint / FHL

❑ Posterior Ankle Impingement



Altered SI in the deep pad of the pre-Achilles fat

Pathology - pre-Achilles fat pad



Kager's Fat Pad

- Accessory Muscle
- Tumors

✓ Flexor hallucis longus MTJ

✓ Achilles Tendon

✓ Posterior Recess of the Ankle joint

✓ Retrocalcaneal Bursa

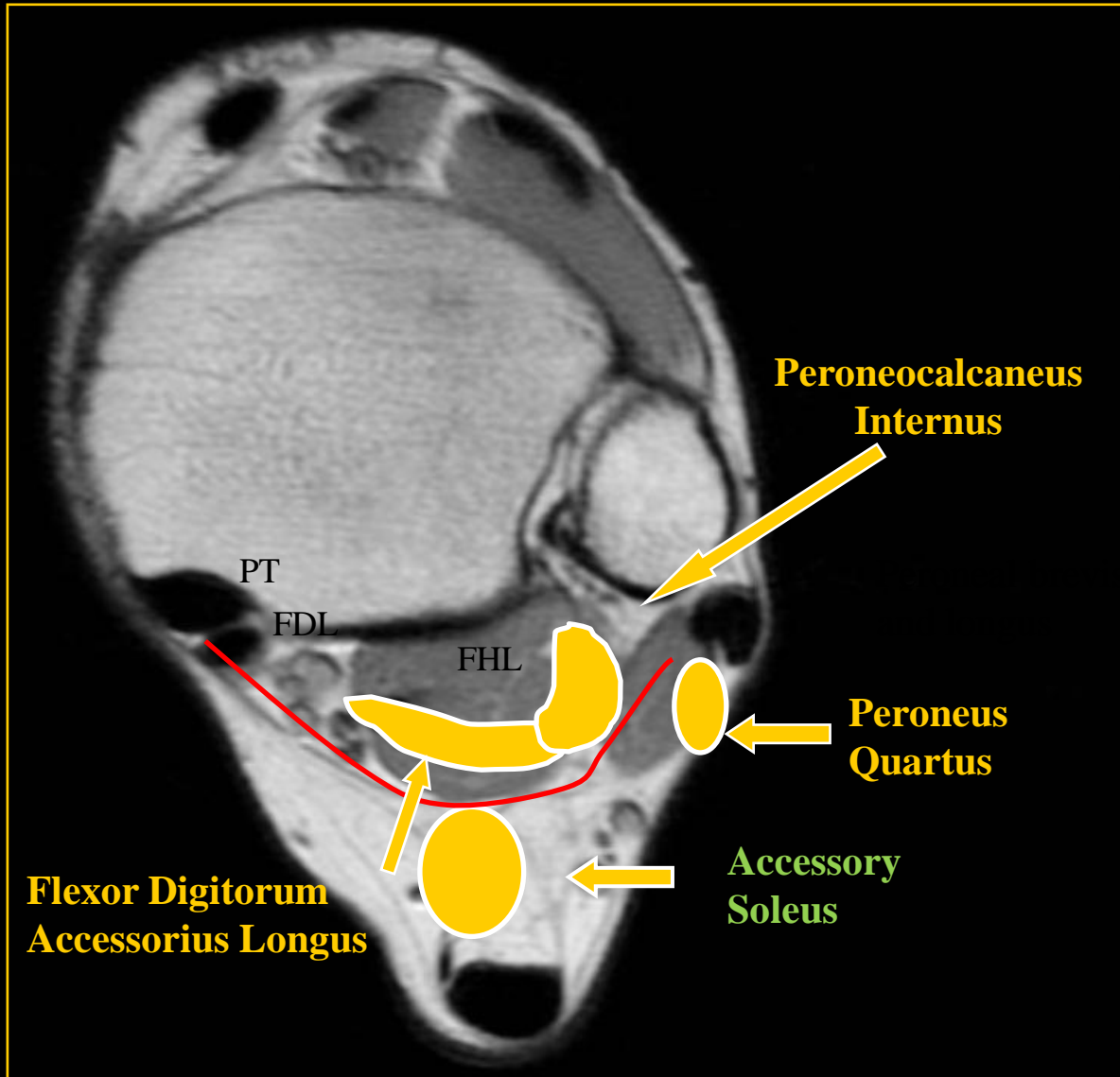
✓ Calcaneus

How useful is pre-Achilles fat pad?

Kager's Fat Pad

□ Accessory muscle (most common – **Accessory Solues**)

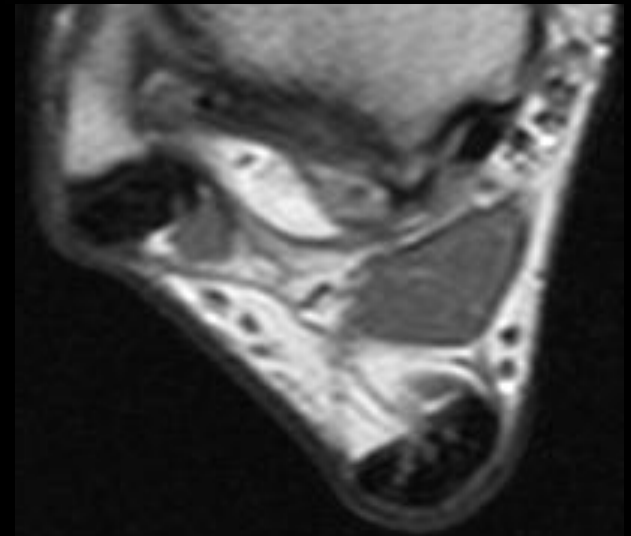
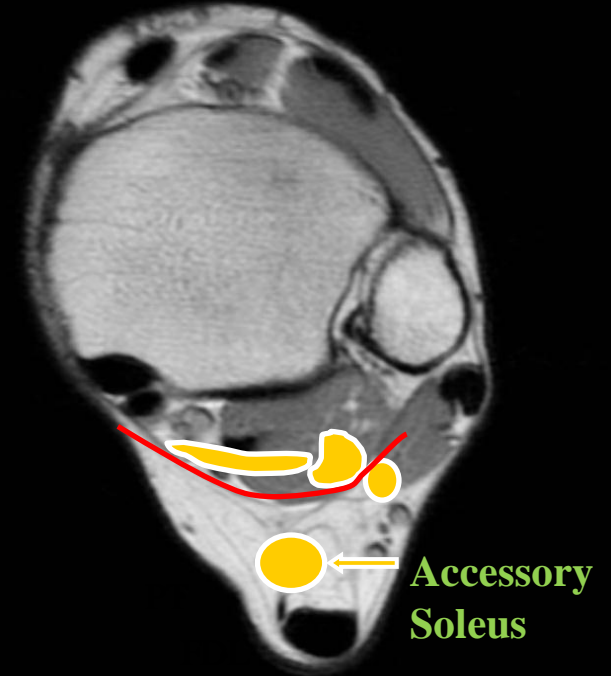
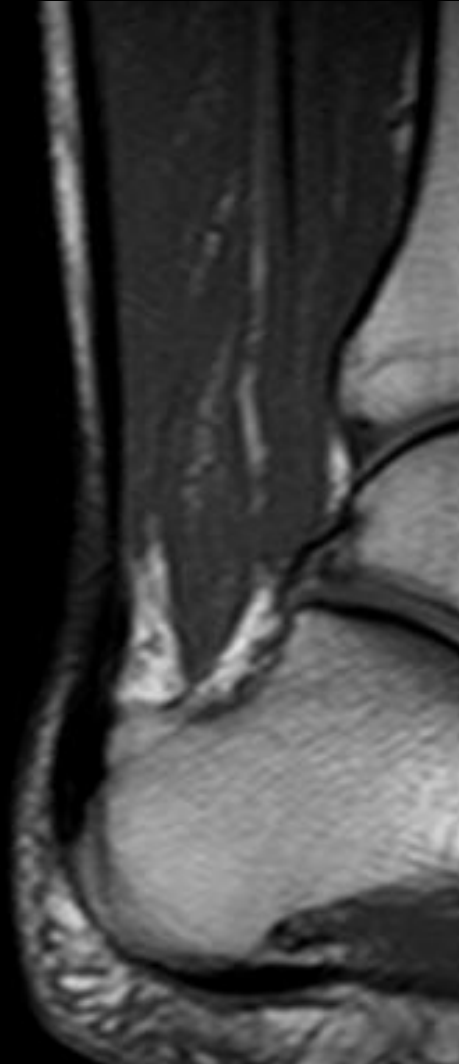
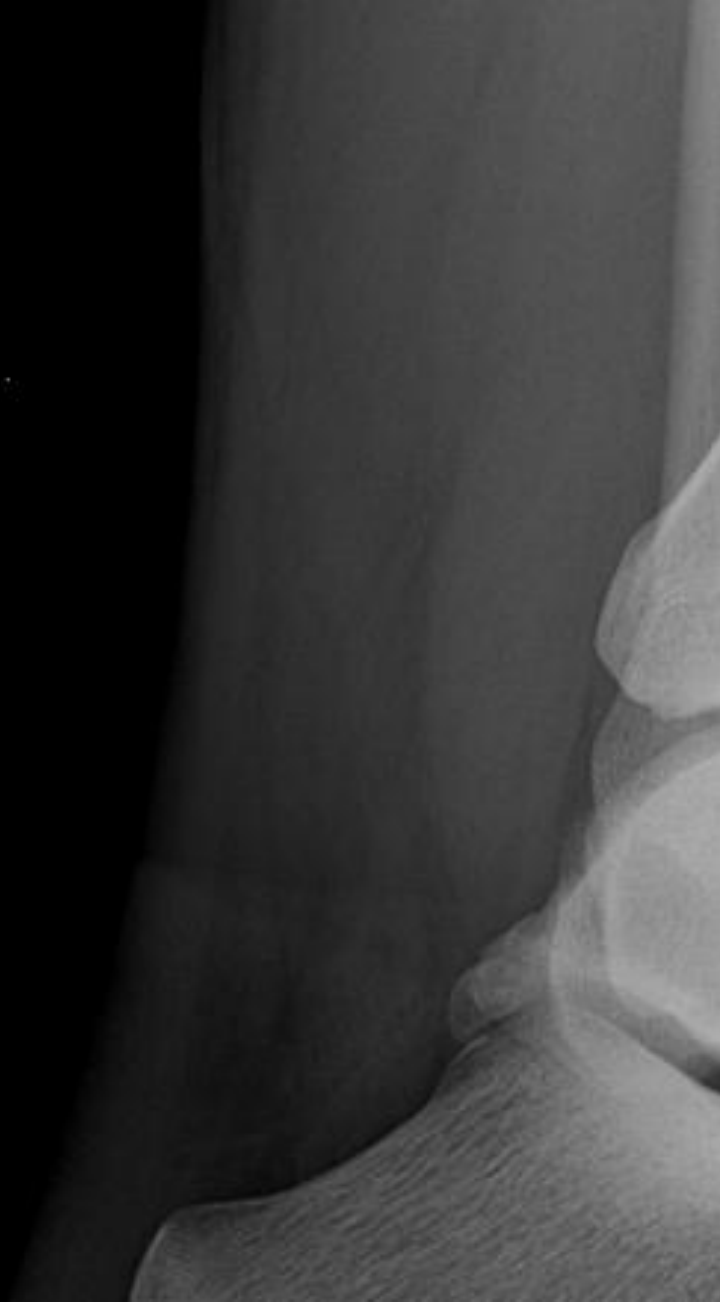
- Patient may present with pain or mass in the posteromedial ankle
- May cause compression neuropathy of the posterior tibial nerve
- Tx – fasciotomy or excision



How useful is pre-Achilles fat pad?

Kager's Fat Pad

☐ Accessory Soleus muscle

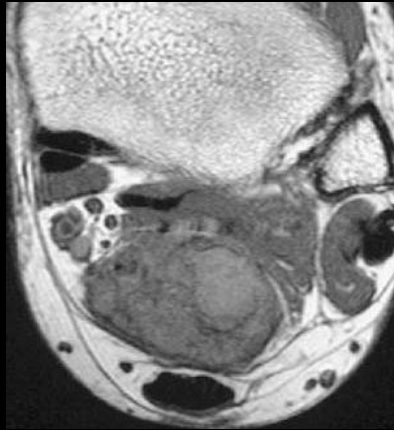


How useful is pre-Achilles fat pad?

68-year-old man presented with a history of a lump at the lower end of the left calf for 4 years. No pain.

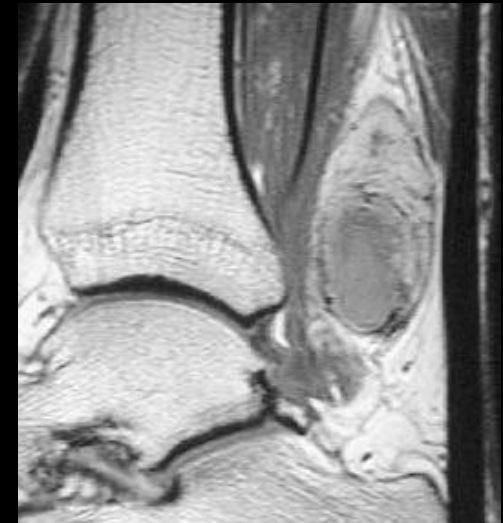
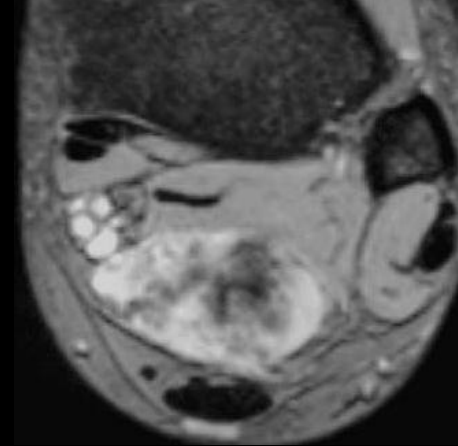


Myopericytoma – continuum of between myofibromatosis and hemangiopericytoma



Kager's Fat Pad

- ☐ Tumors – **rare**
 - Hemangiopericytoma
 - Extraskelatal myxoid chondrosarcoma



How useful is pre-Achilles fat pad?

Kager's Fat Pad

☐ Tumors – **rare**

- **Hemangiopericytoma**

- Rare vascular tumors
- 40s – 50s age
- More common in axial skeleton or proximal long bones
- No specific imaging features
- Spoke wheel appearance from vascularity



How useful is pre-Achilles fat pad?

Kager's Fat Pad

☐ Tumors – **rare**

- Extraskelatal Mesenchymal chondrosarcoma
- Extraskelatal chondrosarcoma
 - Classification:
 - » Myxoid
 - » Mesenchymal
 - » Well-differentiated



Review

- ✓ Normal anatomy and biomechanics:
 - Pre-Achilles fat pad is more than just space filler
 - Important anatomic structure of the ankle
 - 3 major parts of the fat pad
 - Fat pad protects the Achilles tendon and retrocalcaneal bursa
- ✓ How useful is pre-Achilles fat pad?
 - Aid in detecting pathology of the posterior aspect of the ankle joint
 - Mass Effect
 - Obliteration of fat pad
 - ✓ Best used in conjunction with other abnormalities and clinical history
 - Illustrated examples of pathology



Our dream car!!!



"I would give up my Porsche for this beauty"

THANK YOU

"GOT IT, LICKED – It's mine now!!!!"



References

- Goodman LR, Shanser JD. 1977. The pre-Achilles fat pad: An aid to early diagnosis of local or systemic disease. *Skeletal Radiol* 2:81–86.
- Ly JQ, Bui-Mansfield LT. 2004. Anatomy of and abnormalities associated with Kager's fat Pad. *AJR Am J Roentgenol* 182:147–154.
- Theobald P, Bydder G, Dent C, et al. 2006. The functional anatomy of Kager's fat pad in relation to retrocalcaneal problems and other hindfoot disorders. *J Anat* 208:91–97.
- Ghazzawi A, et al. 2009. Quantifying the Motion of Kager's Fat Pad. *J of Orthop Res* 27:1457 – 1460.
- Rheno R, Nico M, Buck F, Trudell D, Haghighi P, Resnick D. 2010. *J Comput Assit Tomogr* 34:621-625.
- Cetti R, Andersen I. Roentgenographic diagnoses of ruptured Achilles tendons. *Clin Orthop*. 1993 Jan;(286):215-21.
- Bottger BA, Schwietzer M, El-Noueam, Desai M. *AJR* 1998;170:1239-41
- Clark TW et al. Detection of radiographically occult ankle fractures following acute trauma PPV of an ankle effusion. *AJR* 1995;164:1185-9.
- Barkhof F et al. Cerebrotendinous xanthomatosis: The spectrum of imaging findings and the Correlation with Neuropathologic finding. *Radiology*. 2000; 217: 869-76.
- Kachlik et al. Clinical anatomy of the retrocalcaneal bursa. *Surg Radiol Anat* 2008.
- Kathol MH, el-Khoury GY, Moore TE, Marsh JL. Calcaneal insufficiency avulsion fractures in patients with diabetes mellitus. *Radiology*. 1991 Sep;180(3):725-9.
- Peduto A, Numkarunarunrote N, Trudell D, Resnick D. 2009. Fibulotalocalcaneal Ligament: MRI finding with cadver correlation. *J Comput Assit Tomogr* 33:444-448.
- Rothschild B, Sebes J. 1981. Calcaneal abnormalities and erosive bone disease associated with sickle cell anemia. *The American Journal of Medicine* 71: 427-430.
- Harish S, O'Donnell P, Briggs T, Saifuddin A, Flanagan, A. 2007. Myopericytoma in Kager's fat pad. *Skeletal Radiology* 36: 165 – 169.
- Shapeero LG et al. Extraskelatal mesenchymal chondrosarcoma. *Radiology*. 1993; 186: 819-26