

MUSCULOSKELETAL EMERGENCIES

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Financial Disclosures

Wolters Kluwer: *UpToDate* Emergency Radiology Section
Editor Royalties

Cambridge University Press: COFFEE Editor Royalties

GE Healthcare Research Consultant

MSK Emergencies

Trauma

Fractures and Dislocations

Soft tissue Injuries

Hidden pathologies with fractures

Hidden fractures with pathologies

Infection

Necrotizing fasciitis

Osteomyelitis

Septic Arthritis

Miscellaneous

Inflammation: Tendinitis, Bursitis, Arthritis

Hardware

Neoplasm

Metabolic

LEARNING FROM ERRORS

Finger pain following trauma



Mallet Finger



Forceful flexion of distal phalanx while the extensor tendon is taut



Avulsion of extensor tendon at its insertion on the dorsal surface of the distal phalanx base

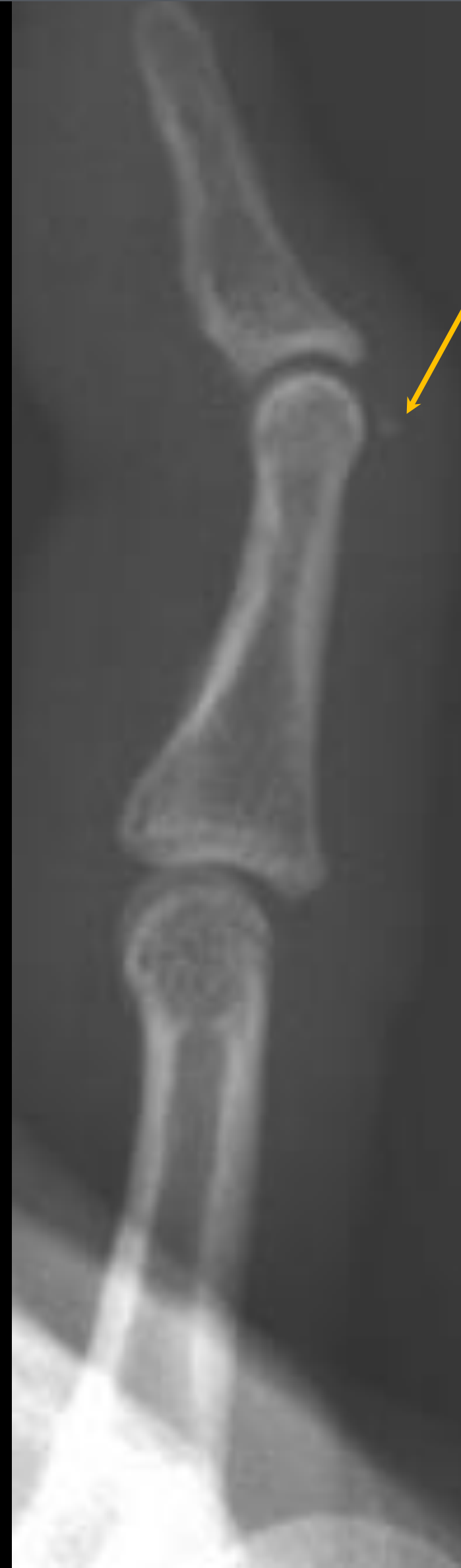
Musculoskeletal Imaging

Traumatic Finger Injuries: What the Orthopedic Surgeon Wants to Know

Ged G. Wieschhoff, Scott E. Sheehan, Jeremy R. Wortman, George S. M. Dyer, Aaron D. Sodickson, Ketan I. Patel, Bharti Khurana



Mallet Finger



Pay attention to the alignment

Hand pain following trauma



Hand pain following trauma

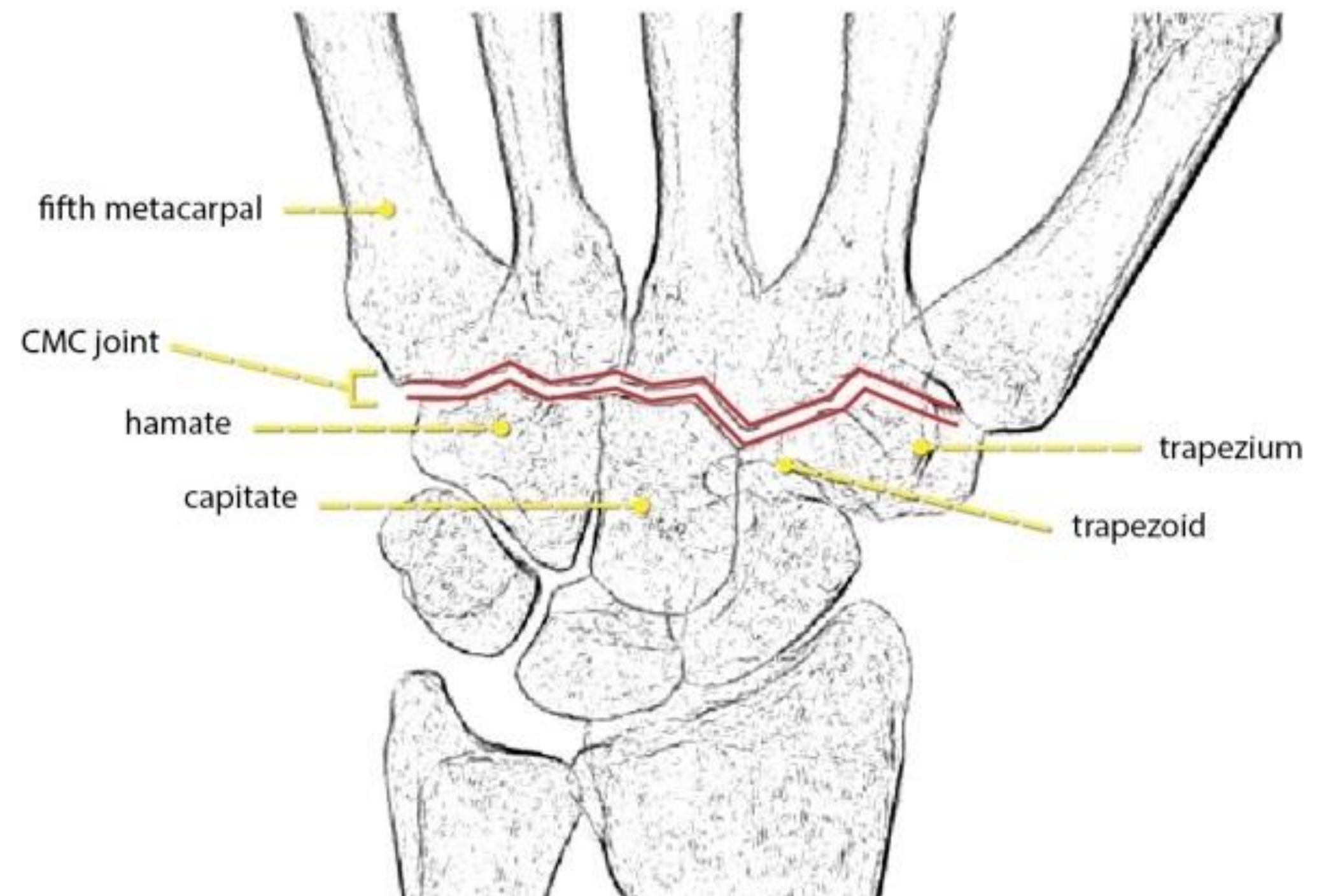




CMC alignment



Normal wrist: Parallel zigzag lines trace the CMC joints

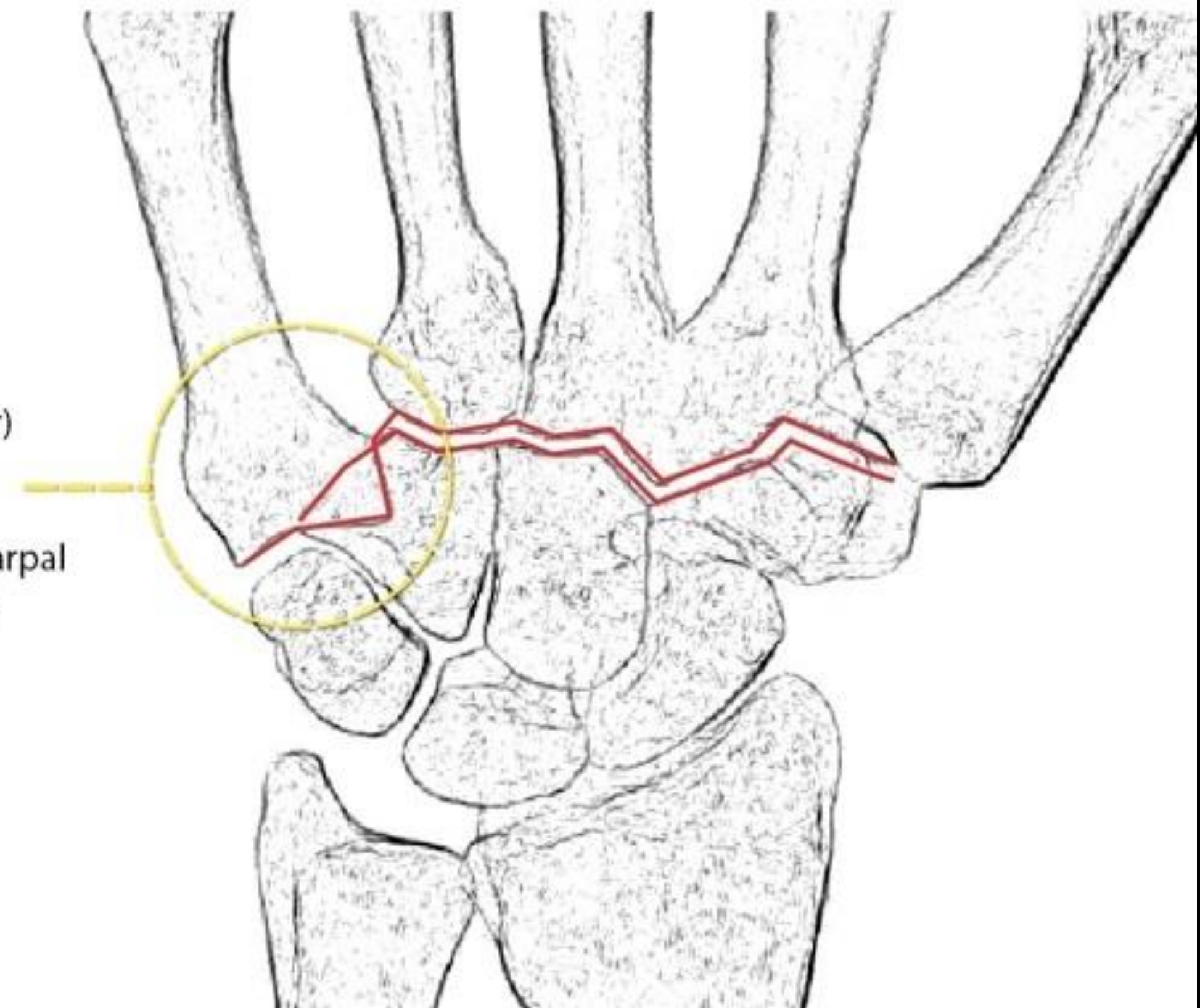


Fifth CMC dislocation



Dislocated fifth CMC: Disruption of the parallel zigzag lines

Dislocated fifth CMC with medial (ulnar) and proximal displacement of the fifth metacarpal causes disruption of the parallel zigzag lines.



Look for alignment

PLASTER CAST



FIBERGLASS



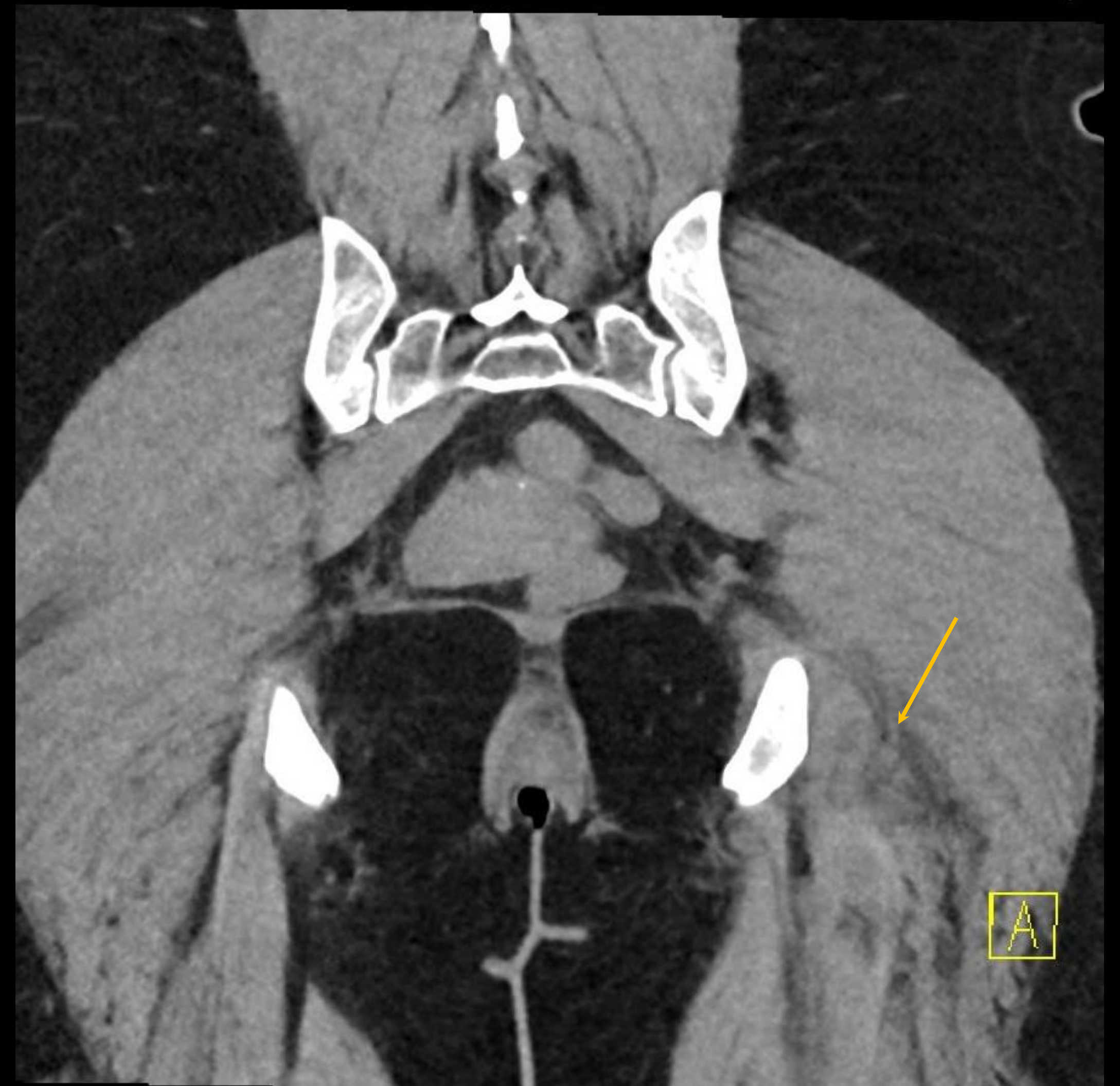
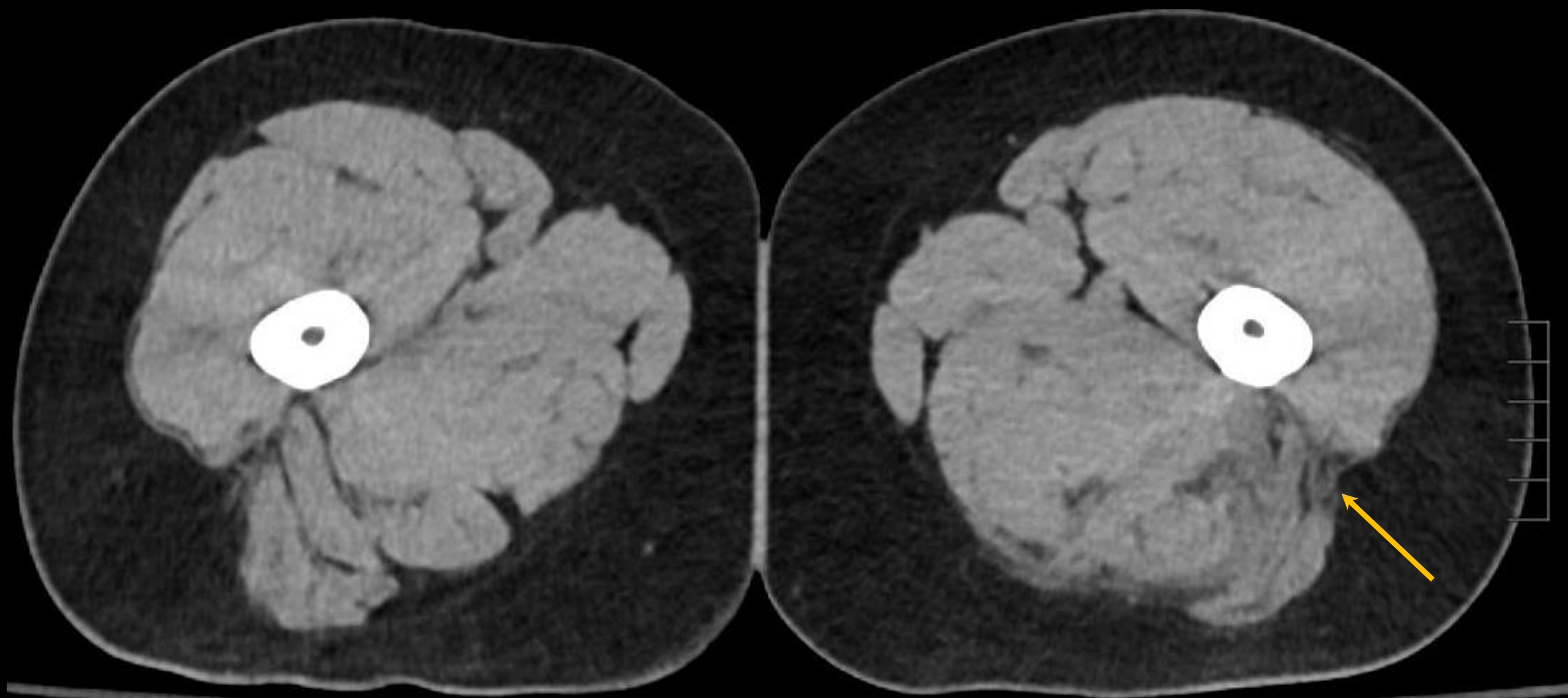
Status post fall, acute left hip pain



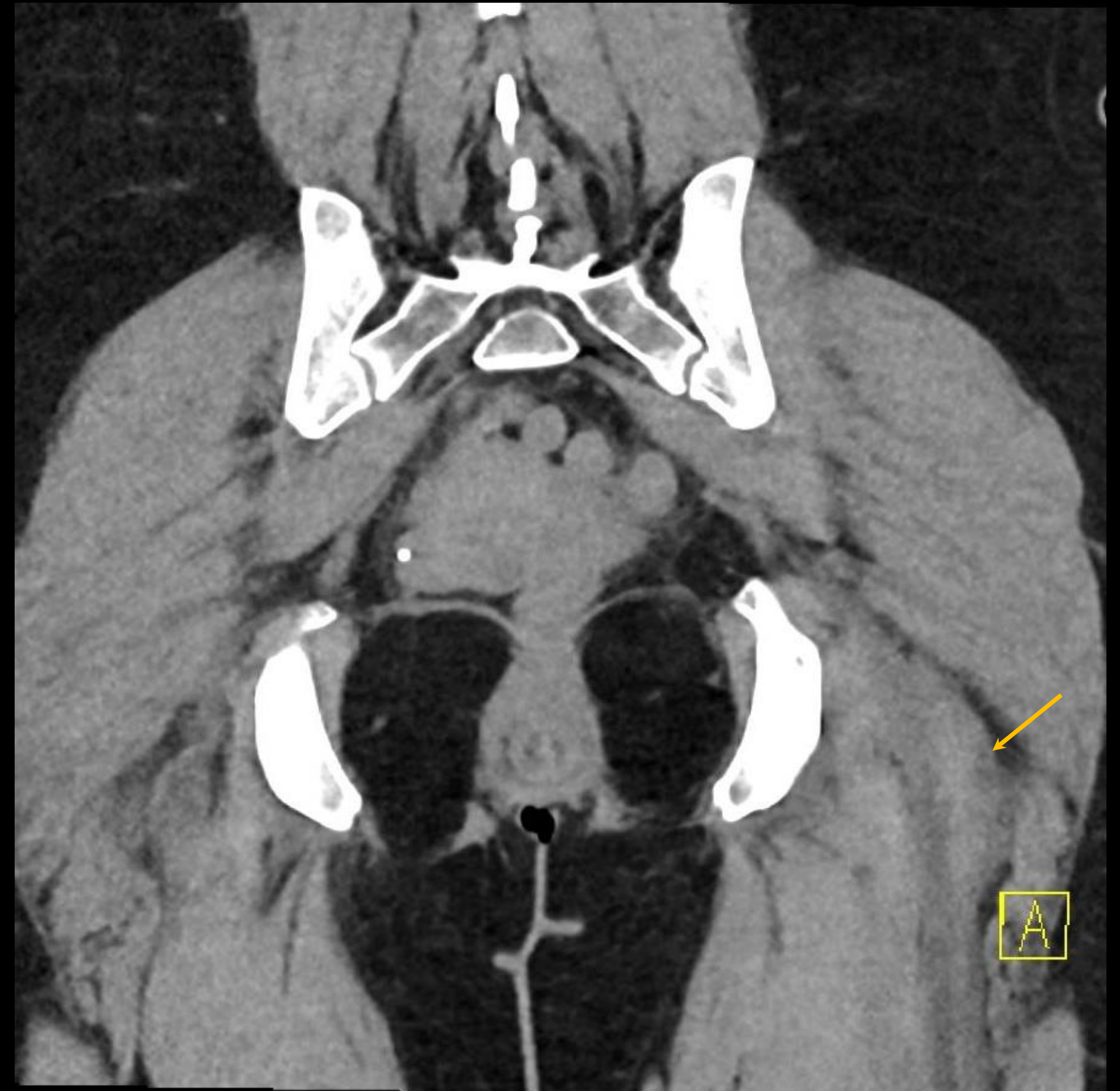
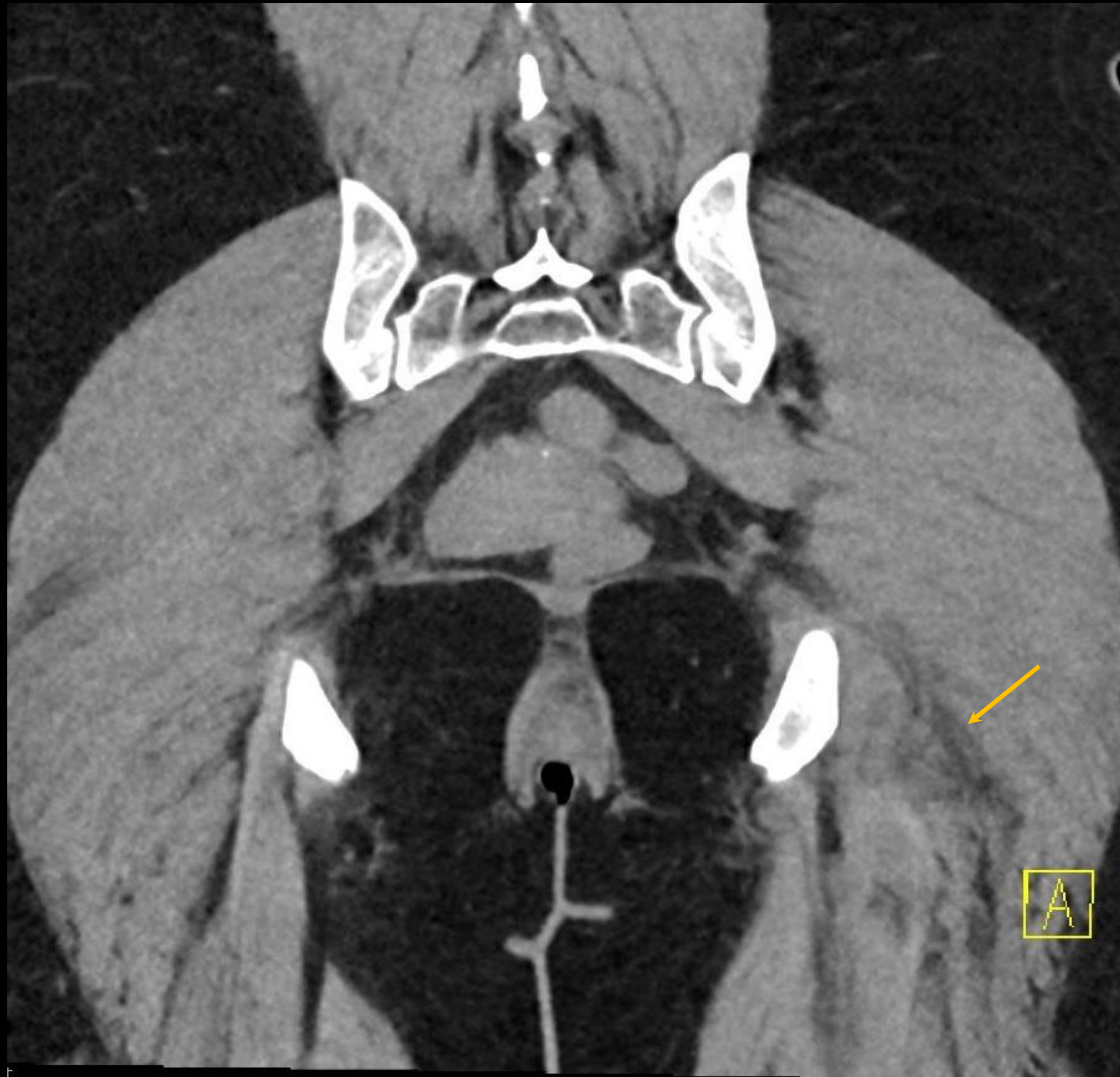
Status post fall, acute left hip pain



Status post fall, acute left hip pain



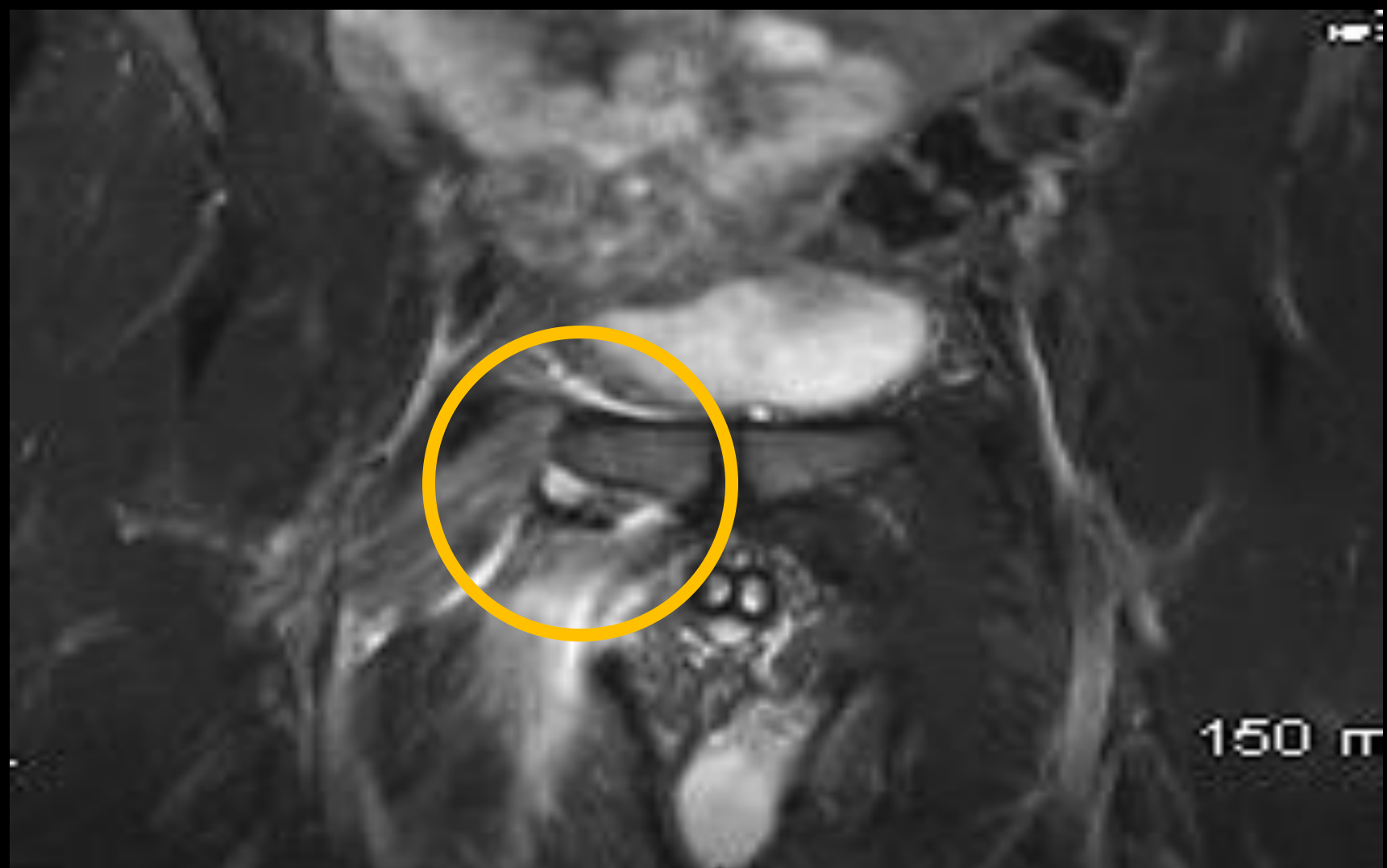
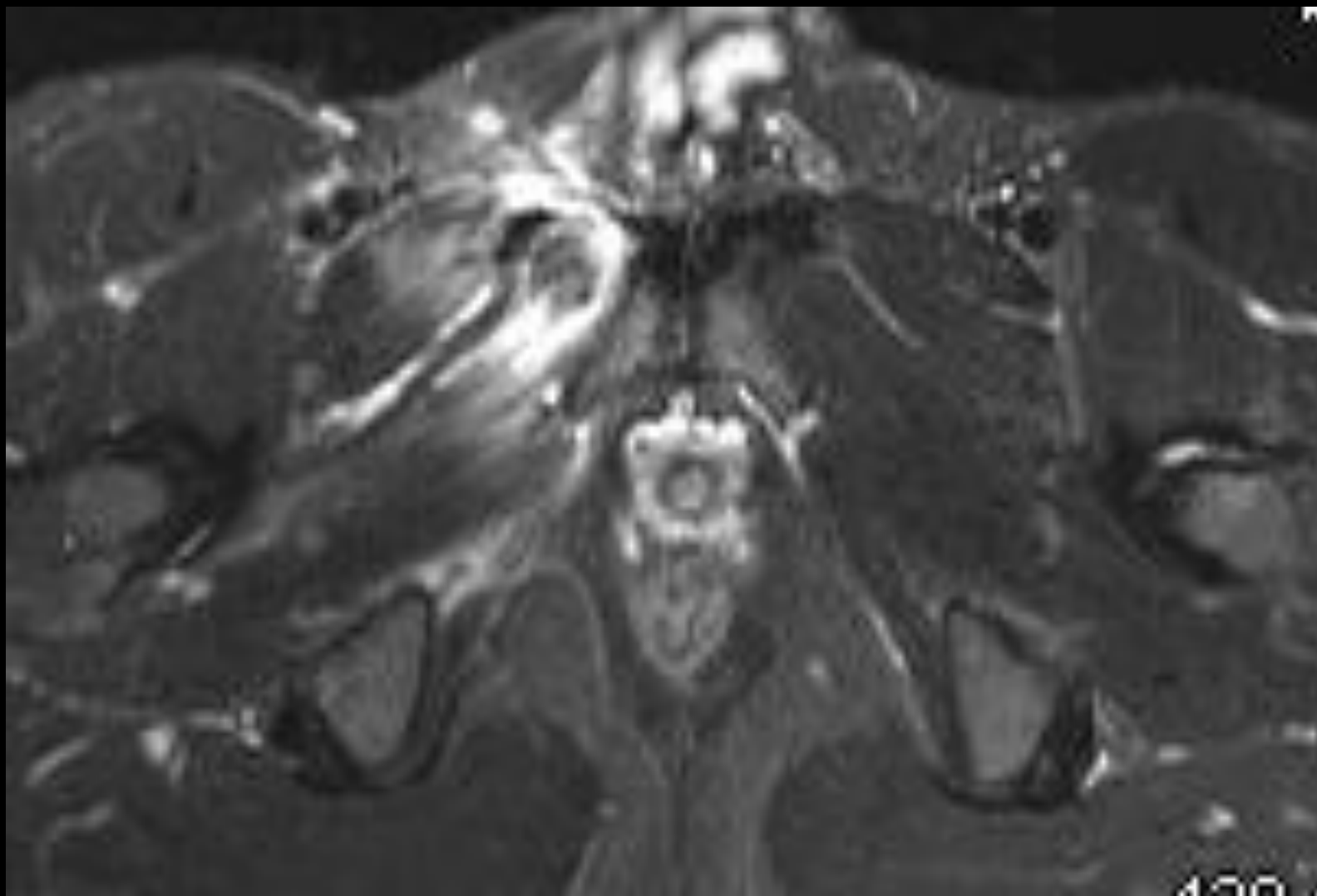
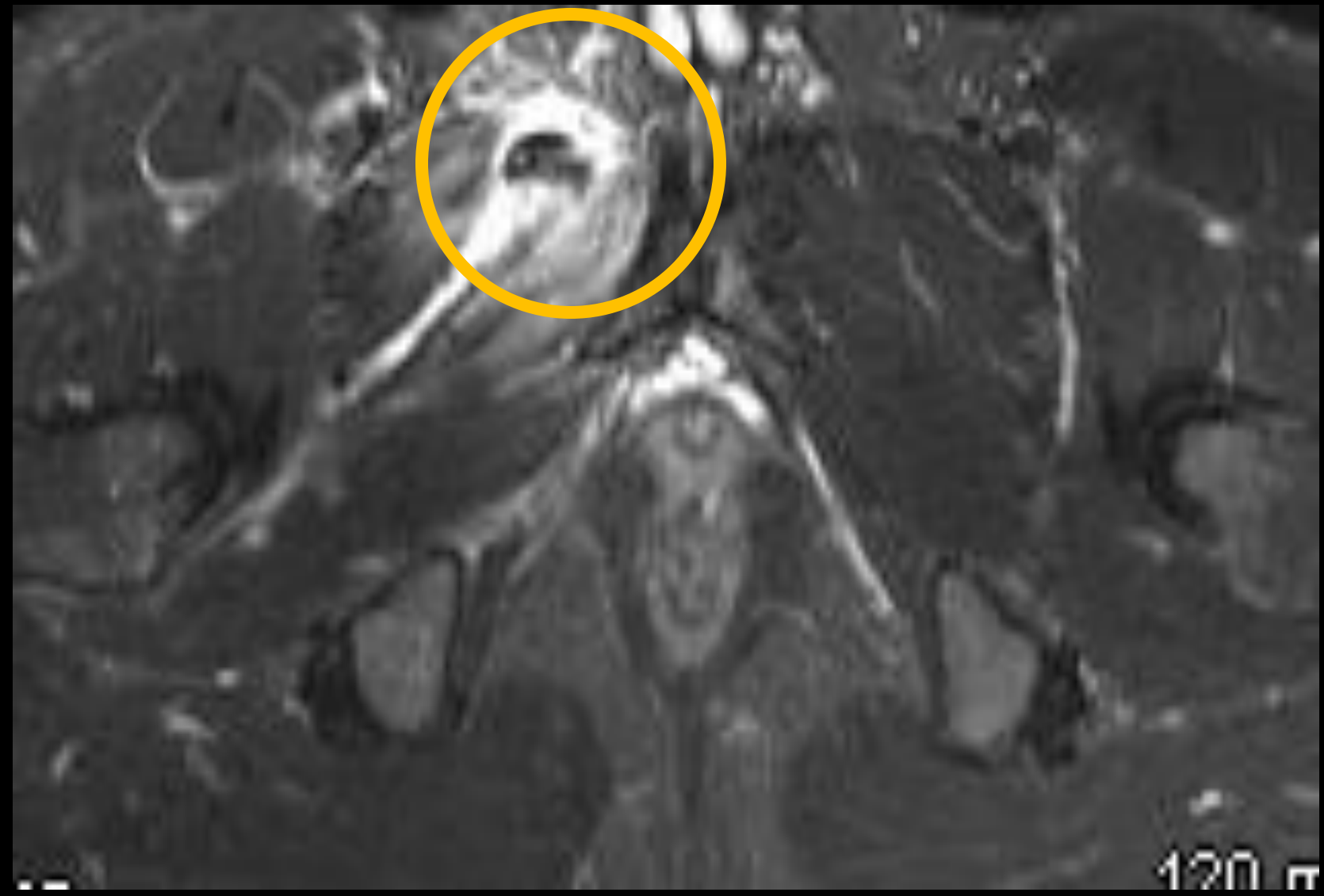
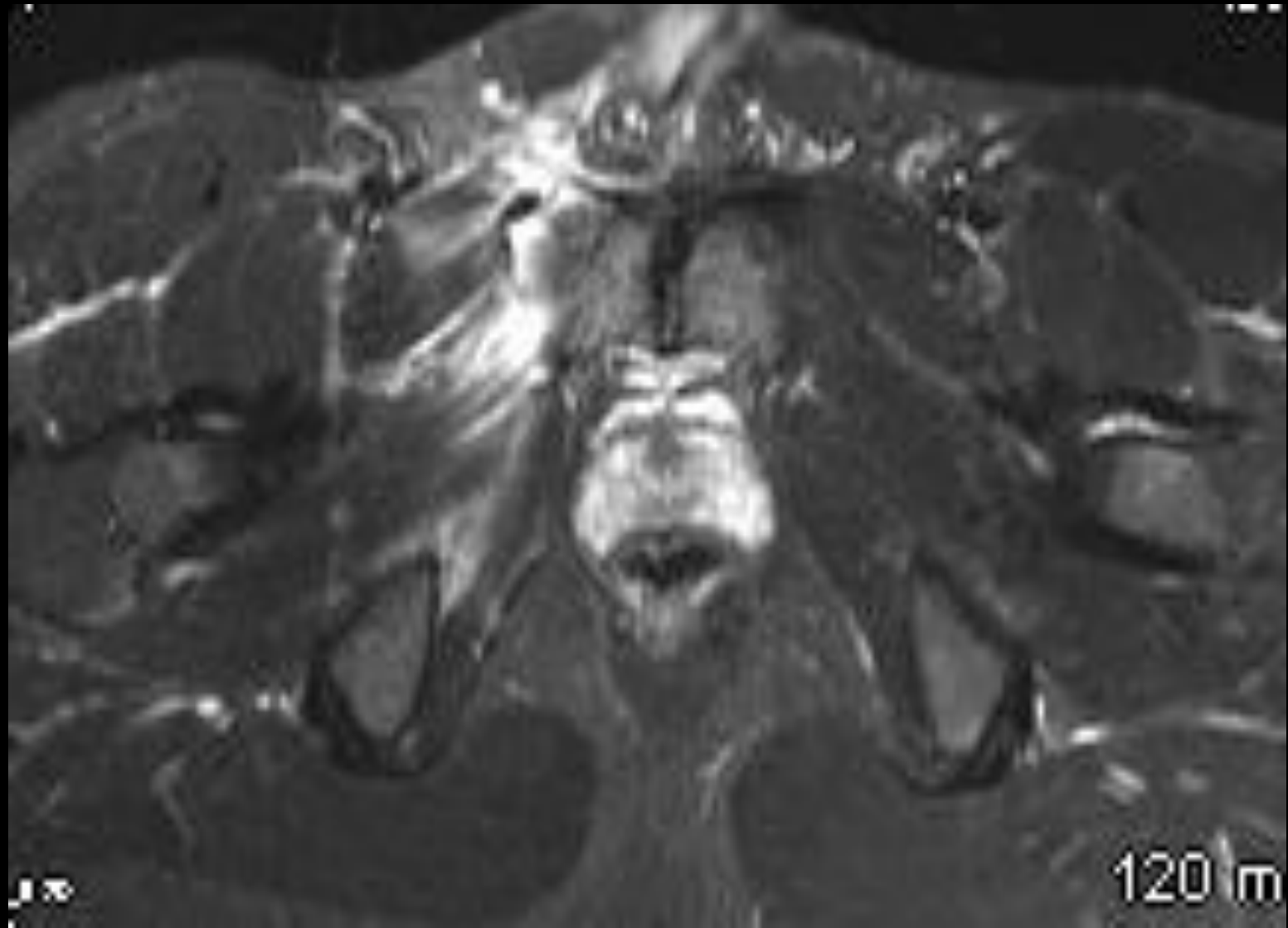
Hamstring Injury



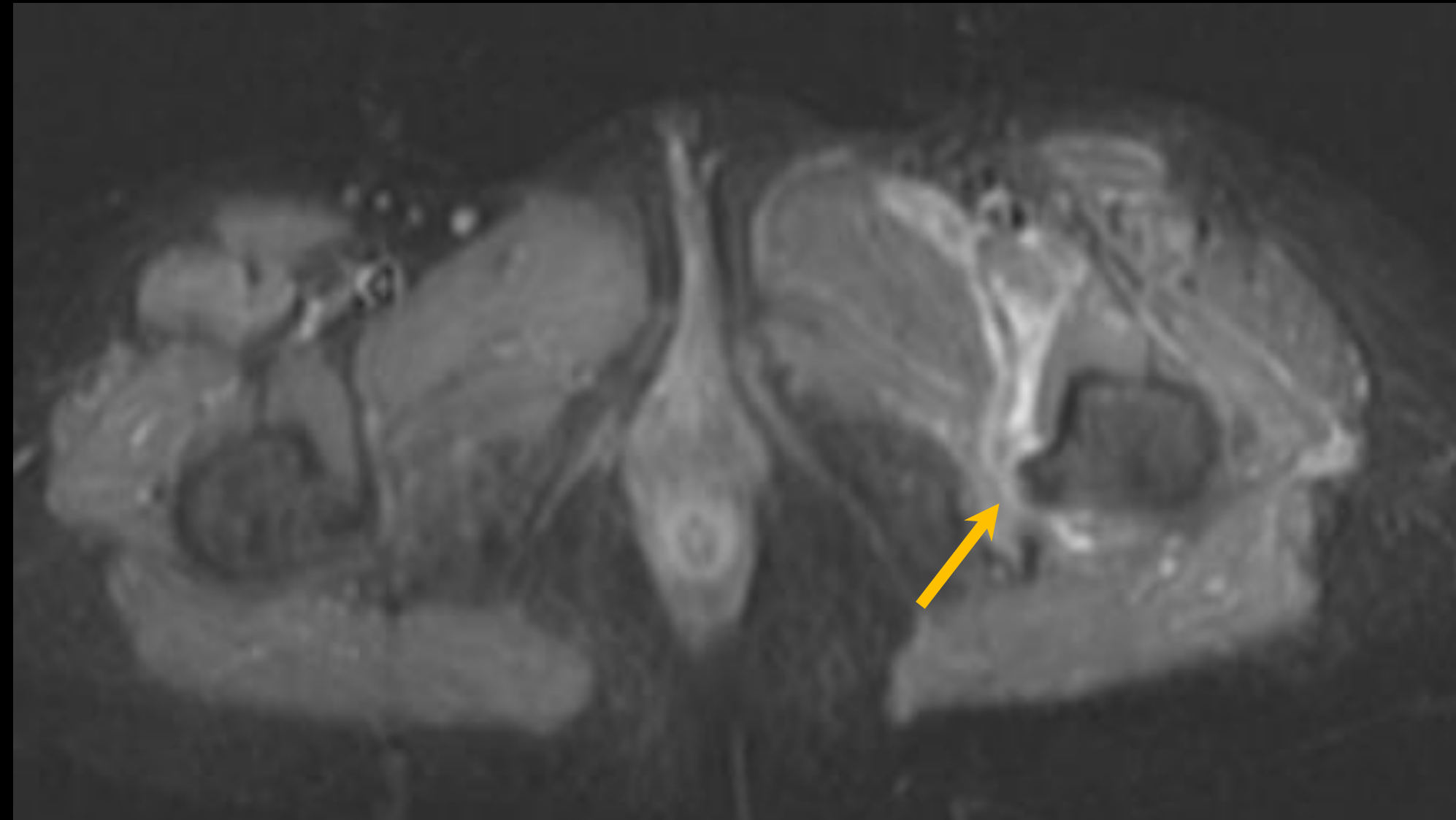
Hamstring Injury



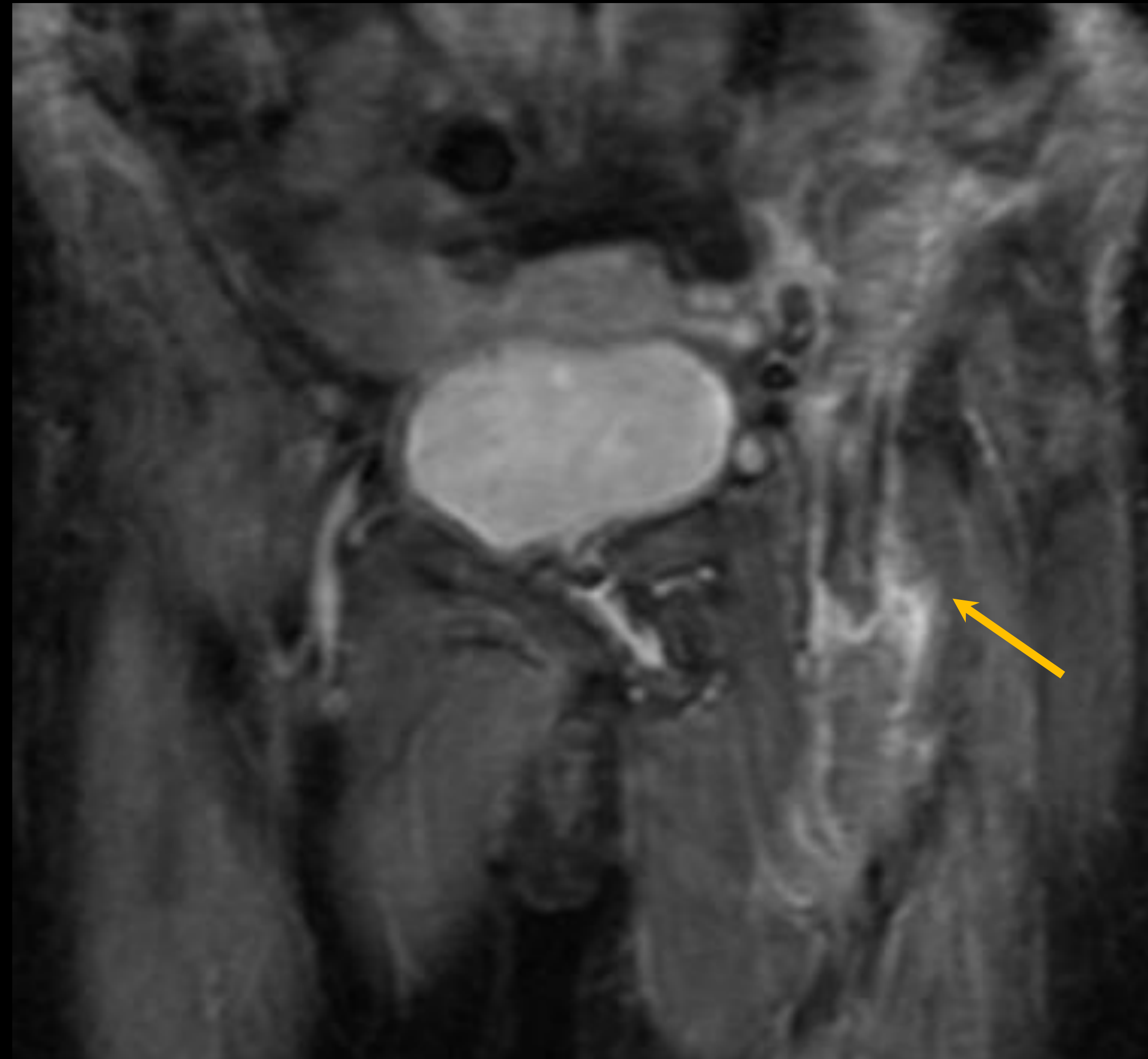
Adductor Longus Injury



Iliopsoas Injury

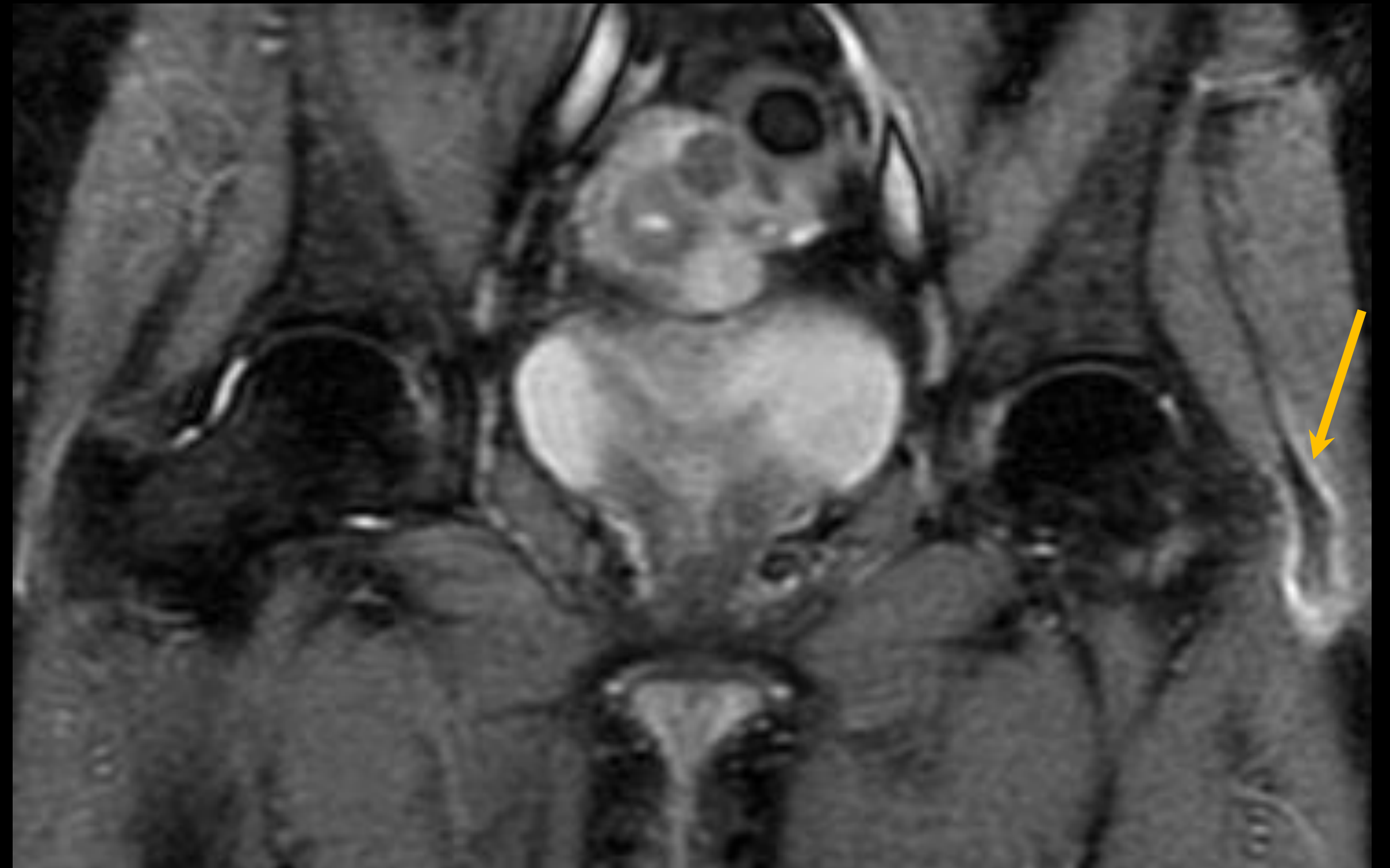
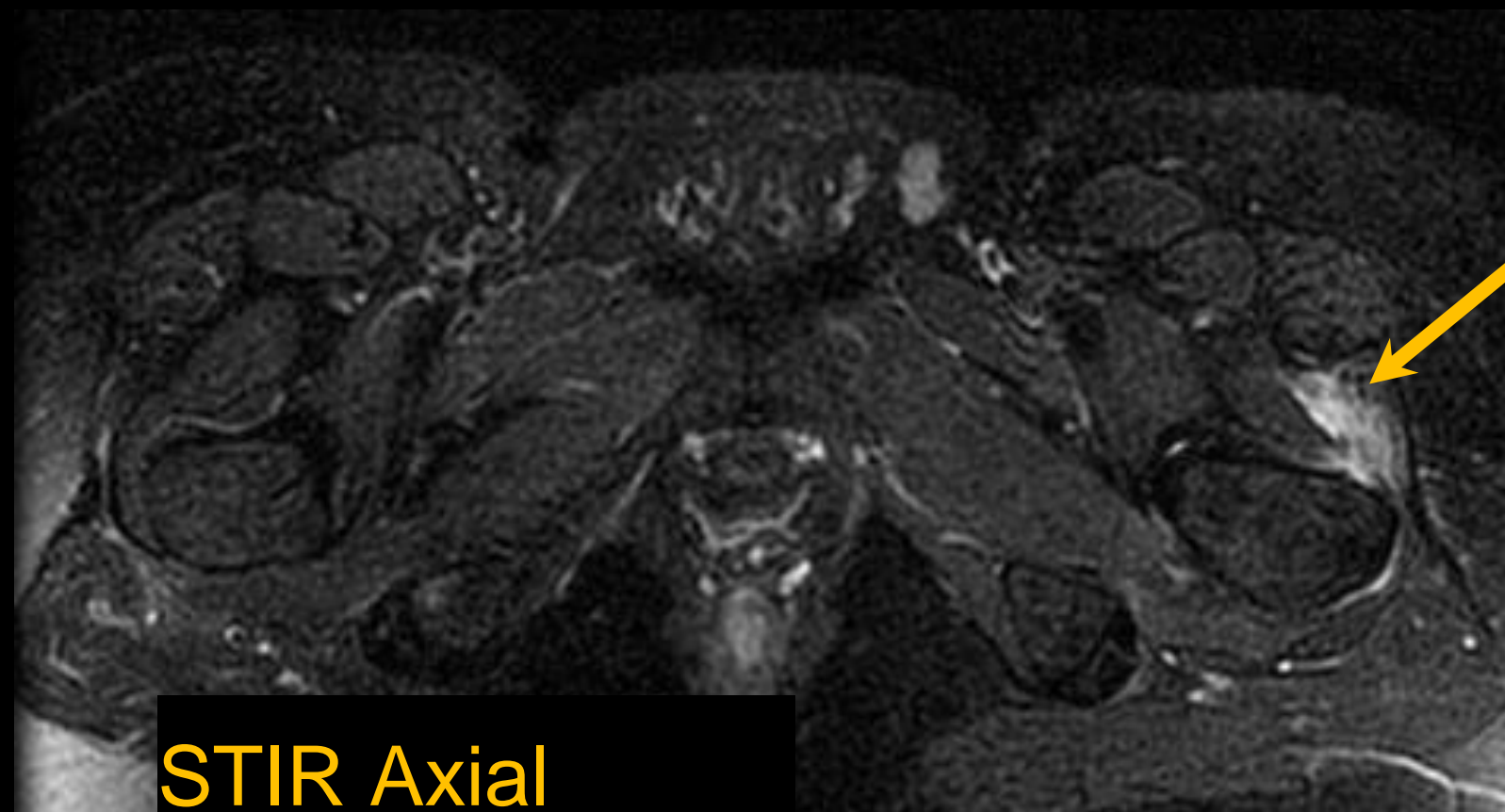


STIR Axial



STIR Cor

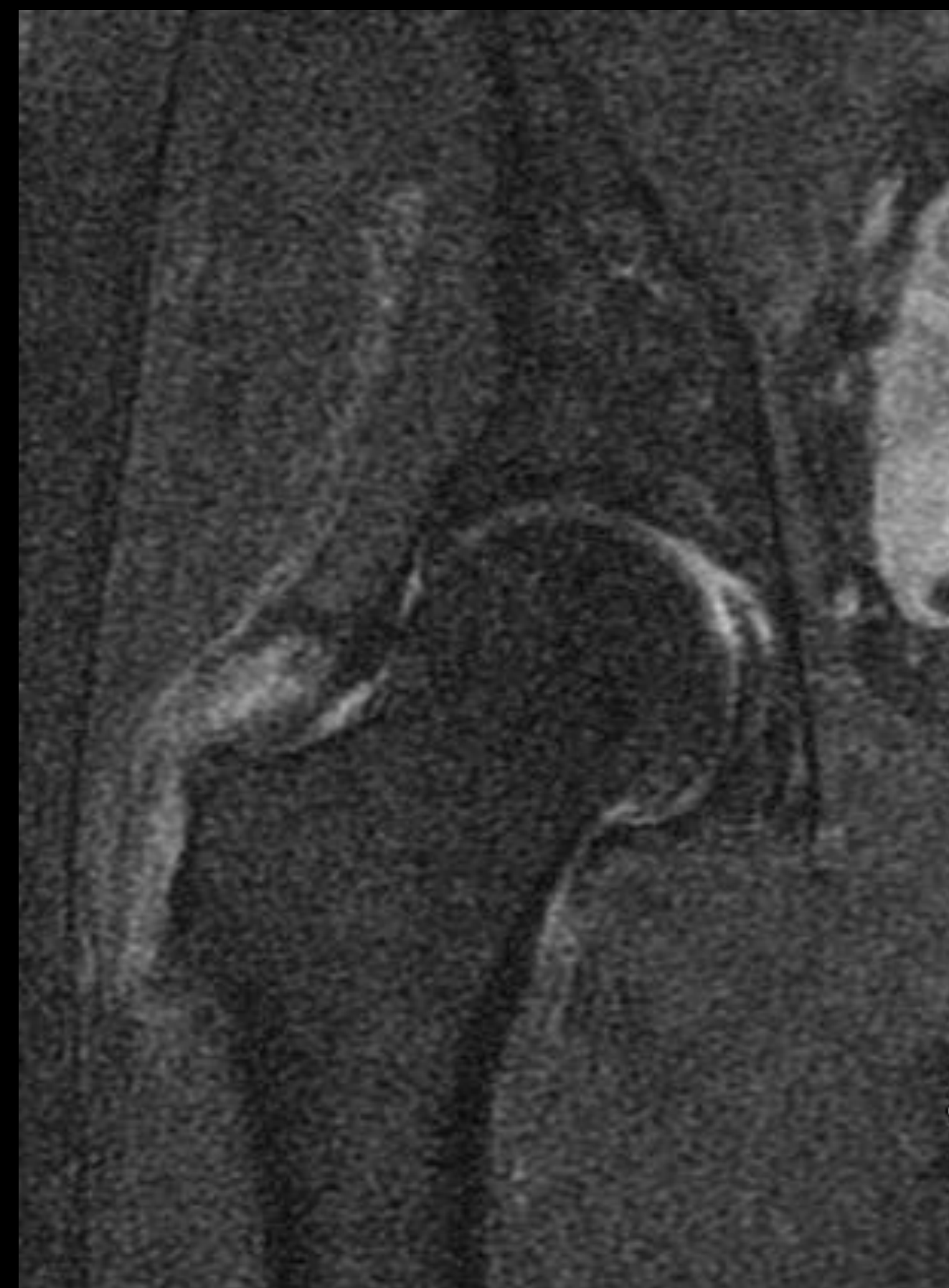
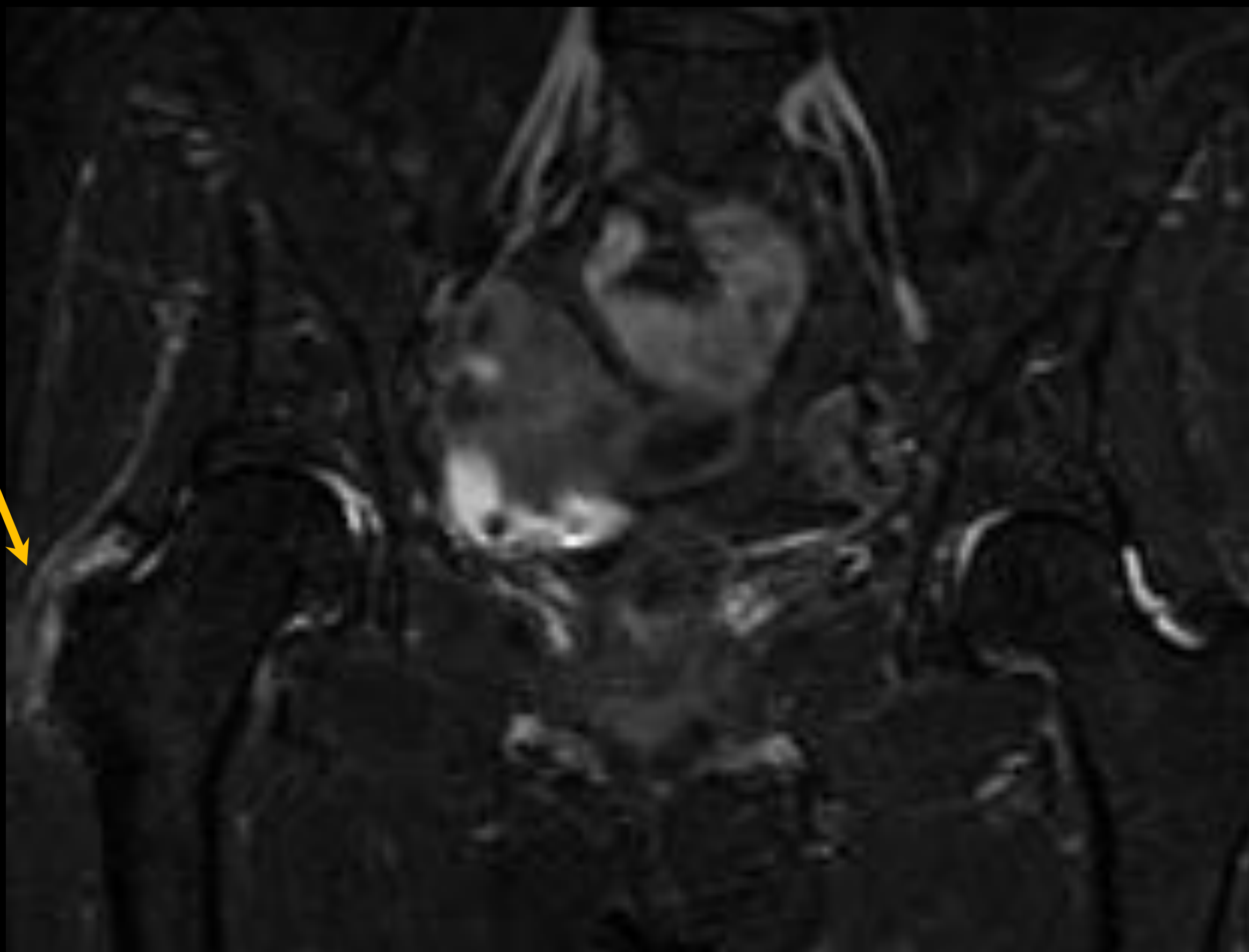
Gluteus Minimus Injury



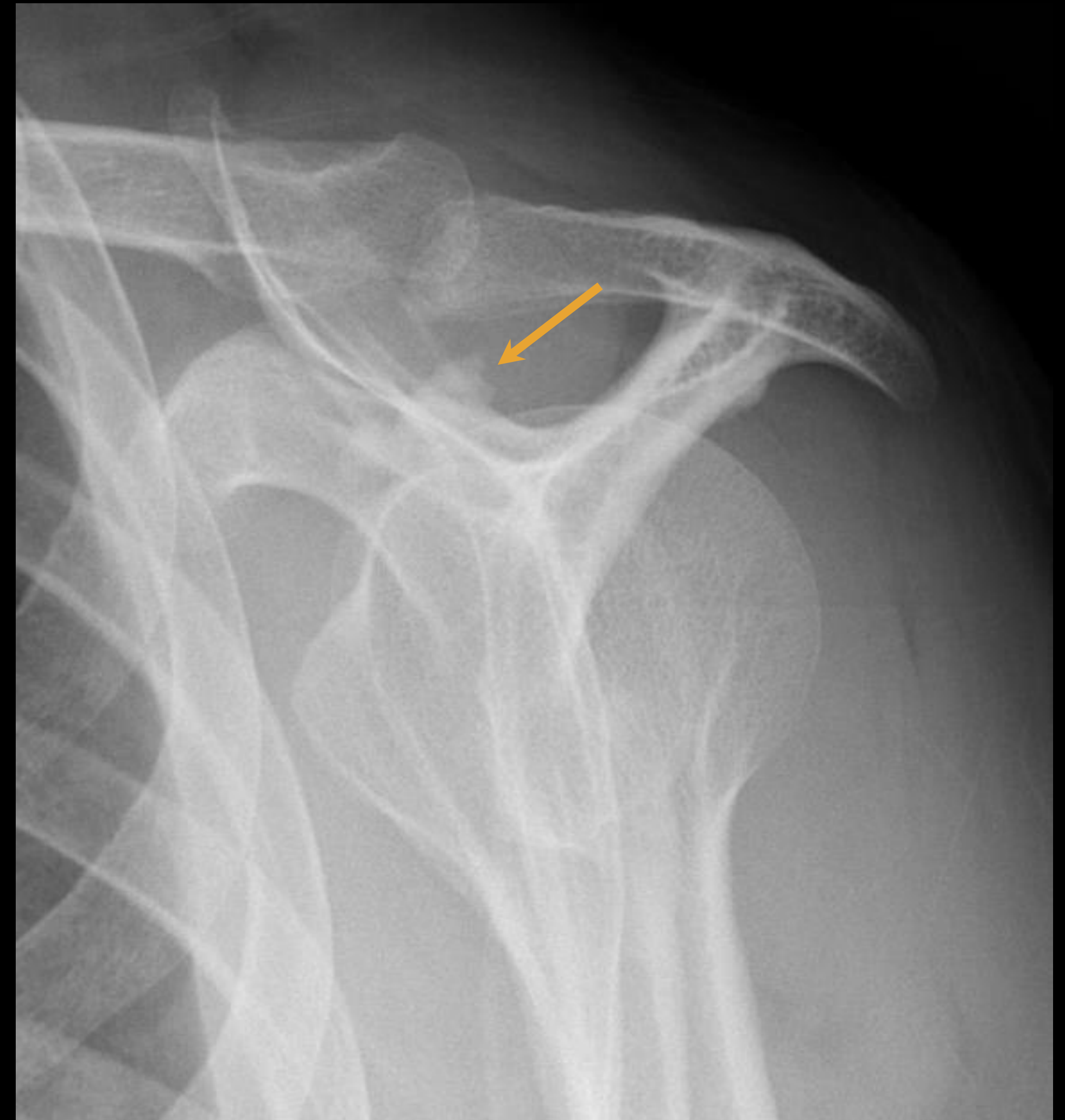
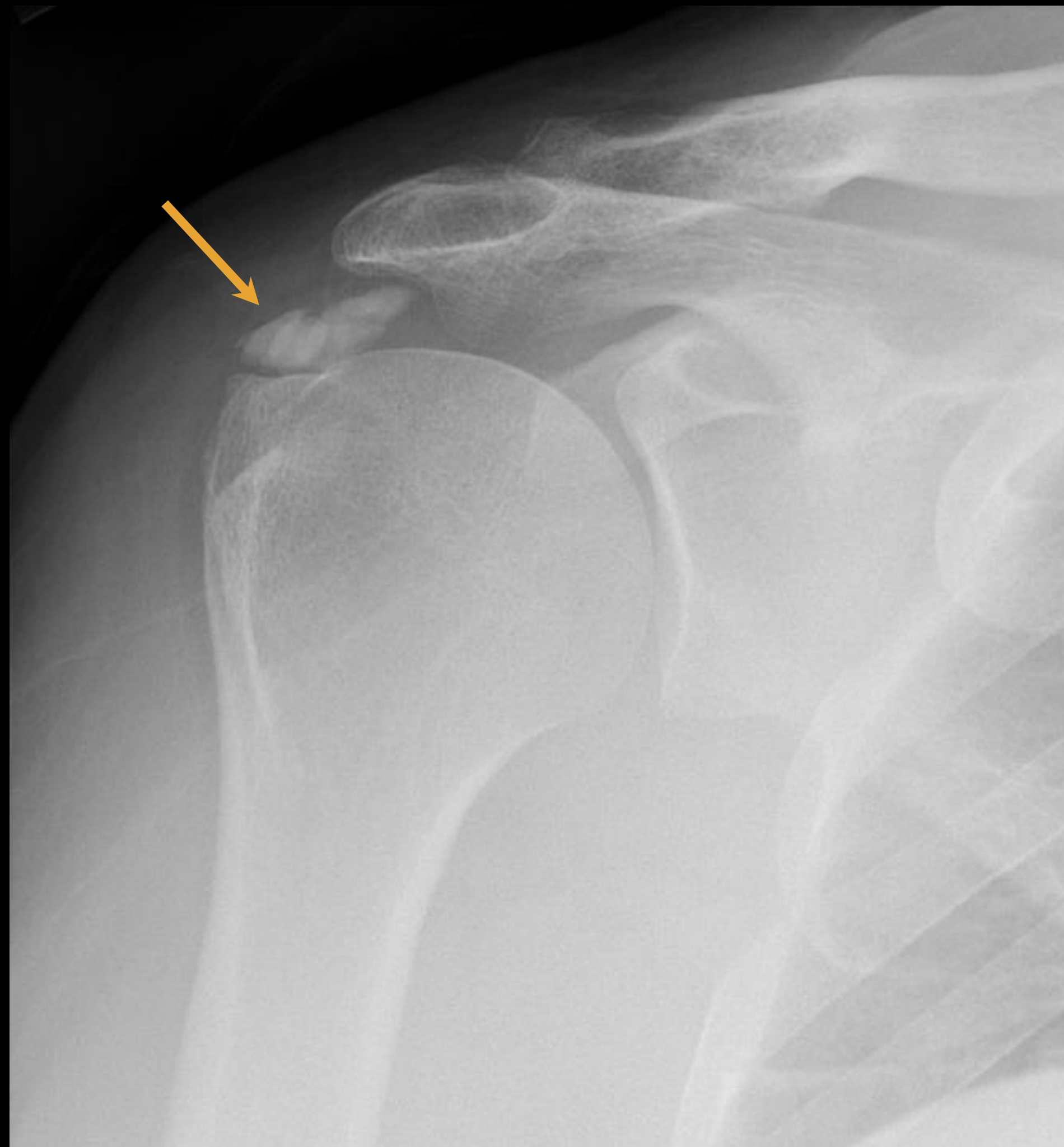
STIR Cor

STIR Cor

Gluteus Medius Injury



A 45-year-old male with acute shoulder pain, no trauma



Calcific Tendinopathy: Four Stages

Pre-calcific

Calcific

Resorptive

Post-calcific

Physiology

Regional hypoxia causes fibrocartilaginous transformation

Deposition of Hydroxyapatite

Deposits phagocytosed by multinucleated giant cells

Repair of damaged tendon as granulation tends to scar

Symptoms

Asymptomatic

Low-level symptoms

ACUTELY PAINFUL

Asymptomatic

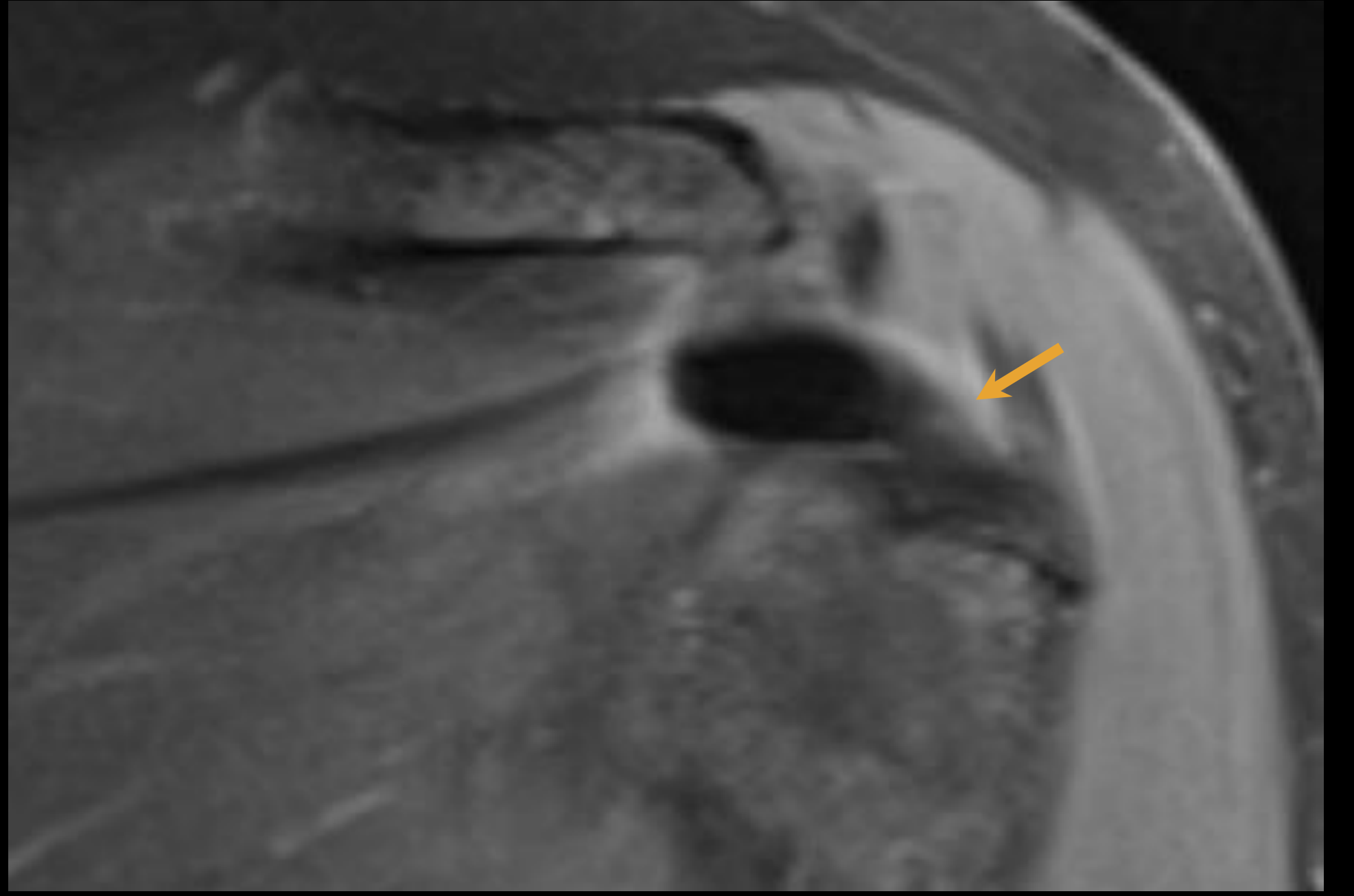
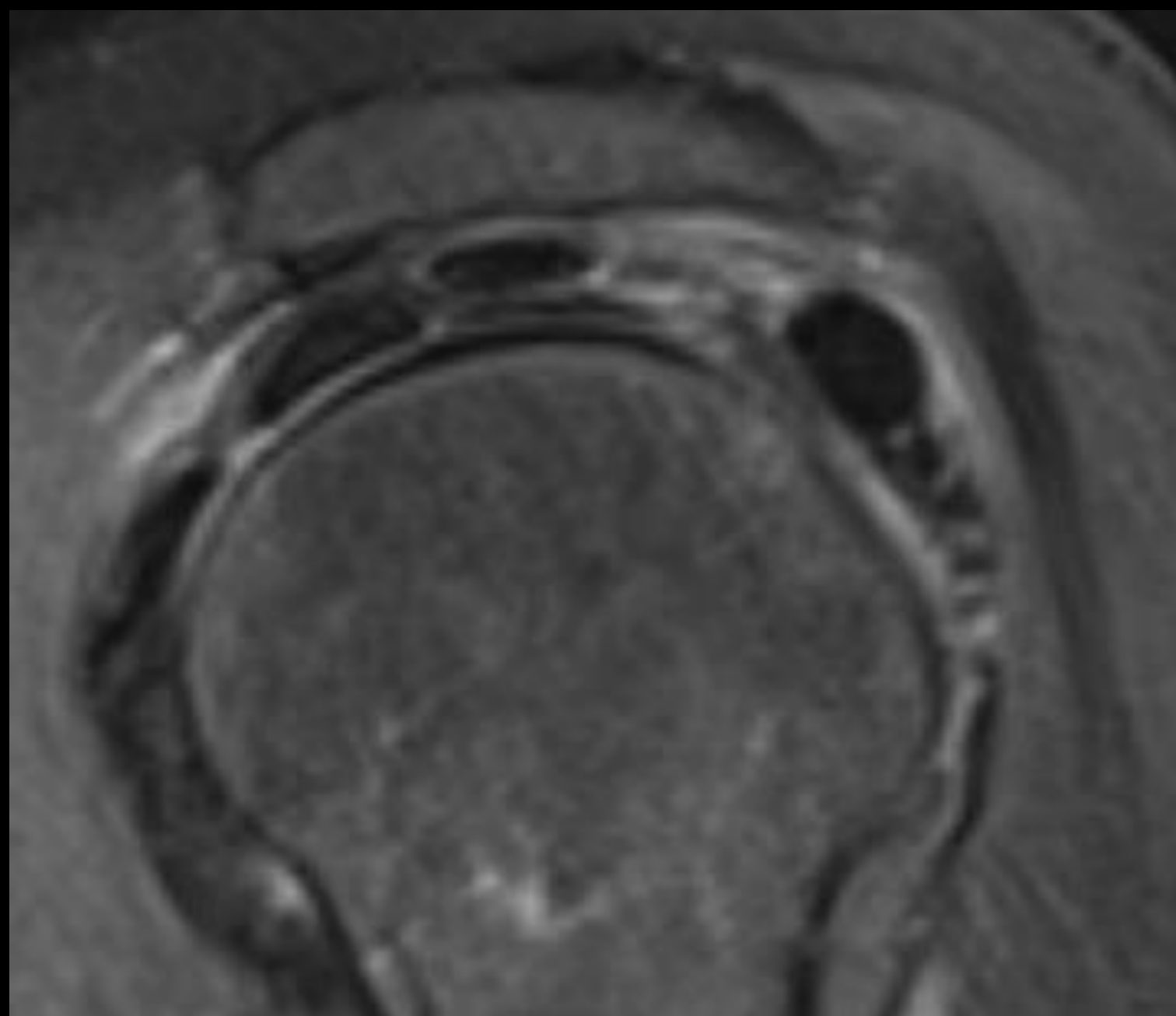
Radiographs

Normal

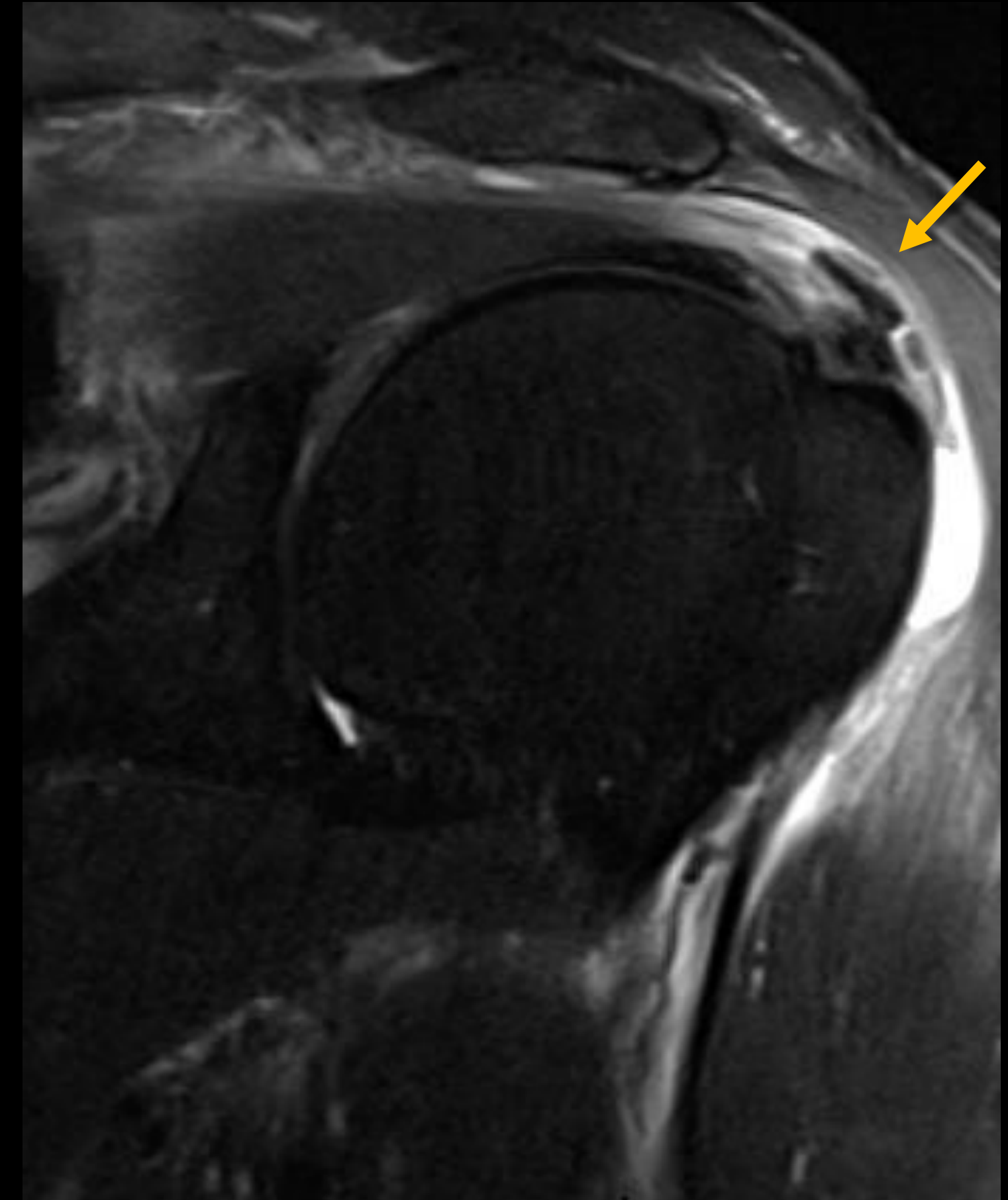
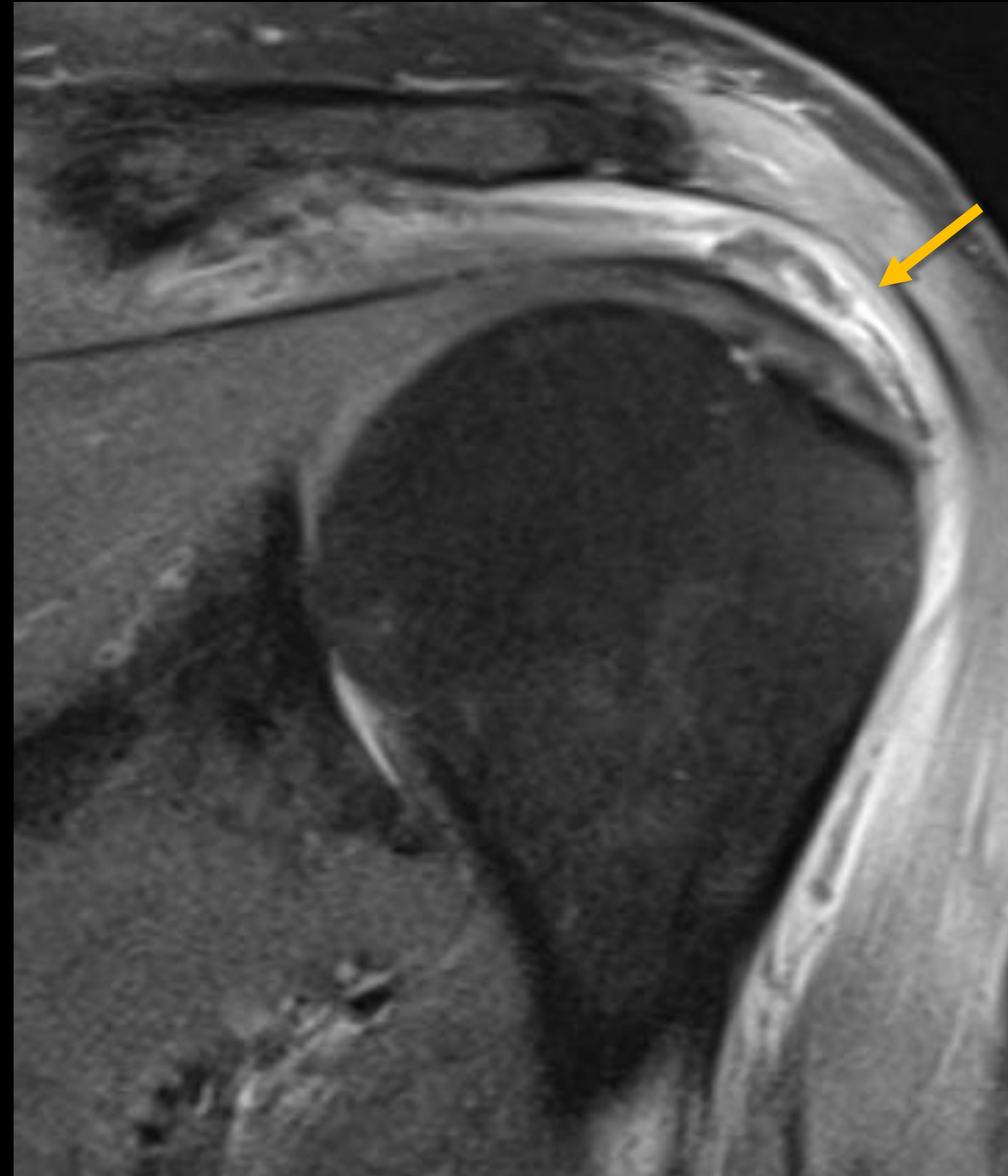
Well defined homogenous calcifications

Fluffy calcifications with indistinct margins

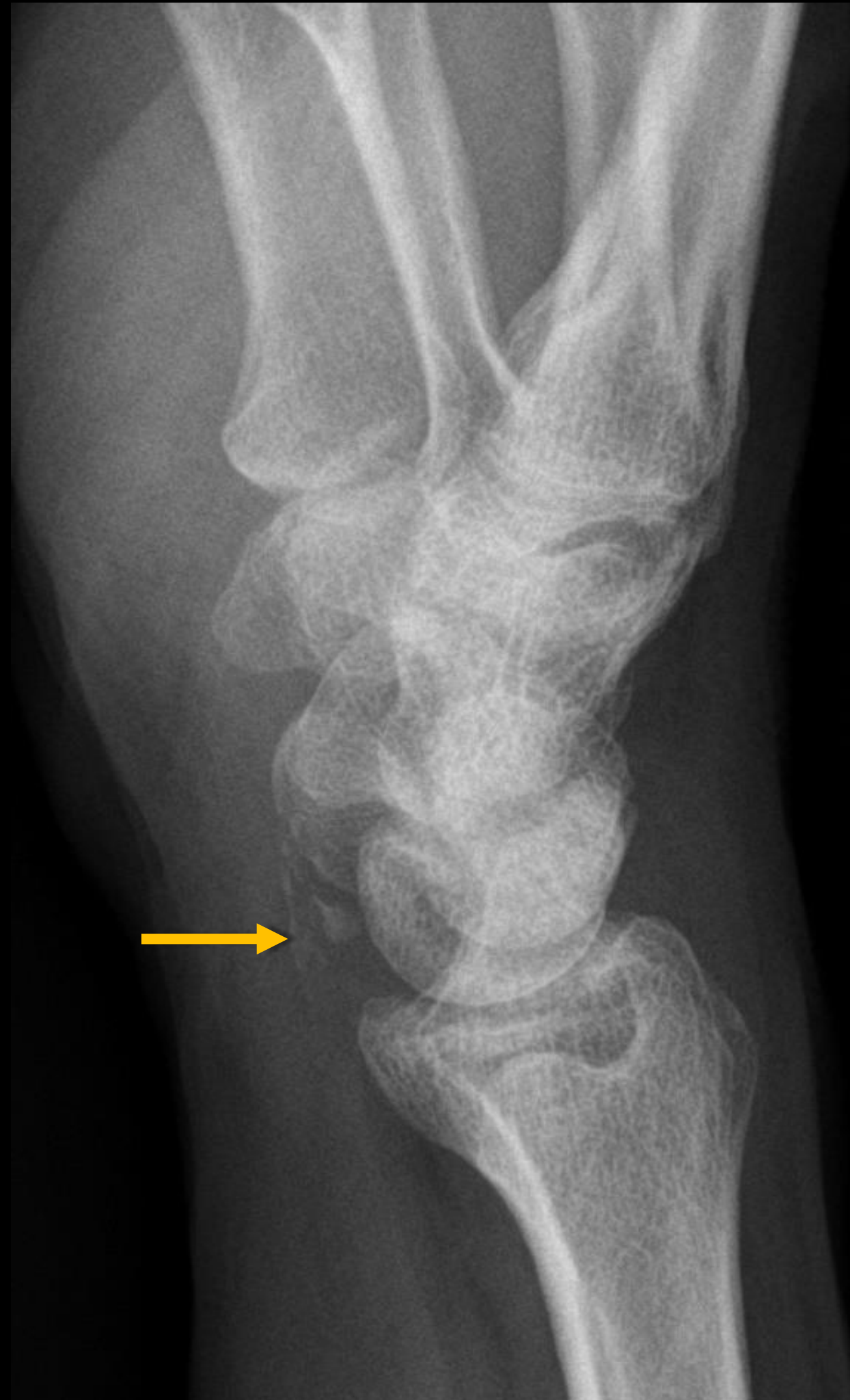
Normal



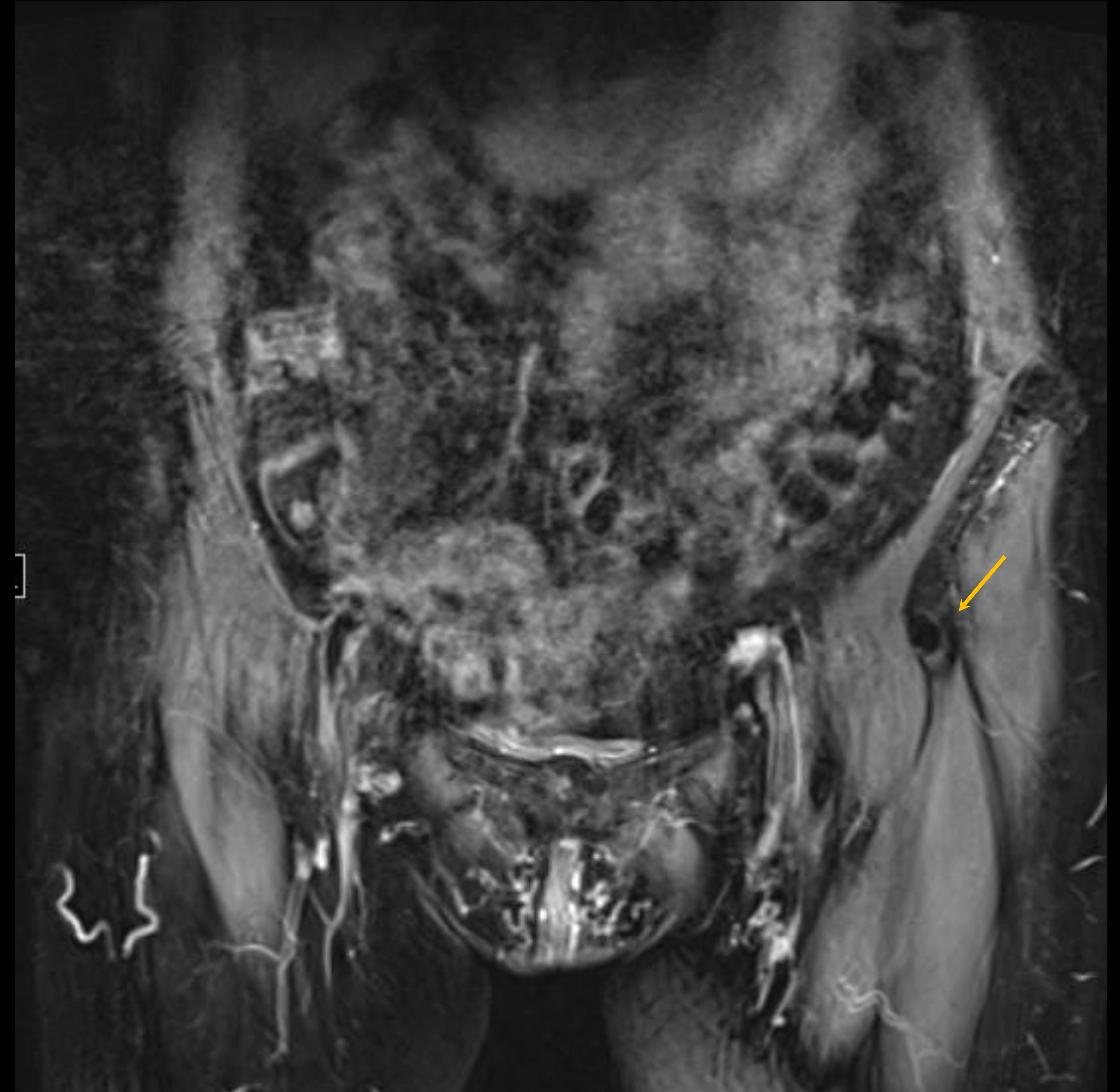
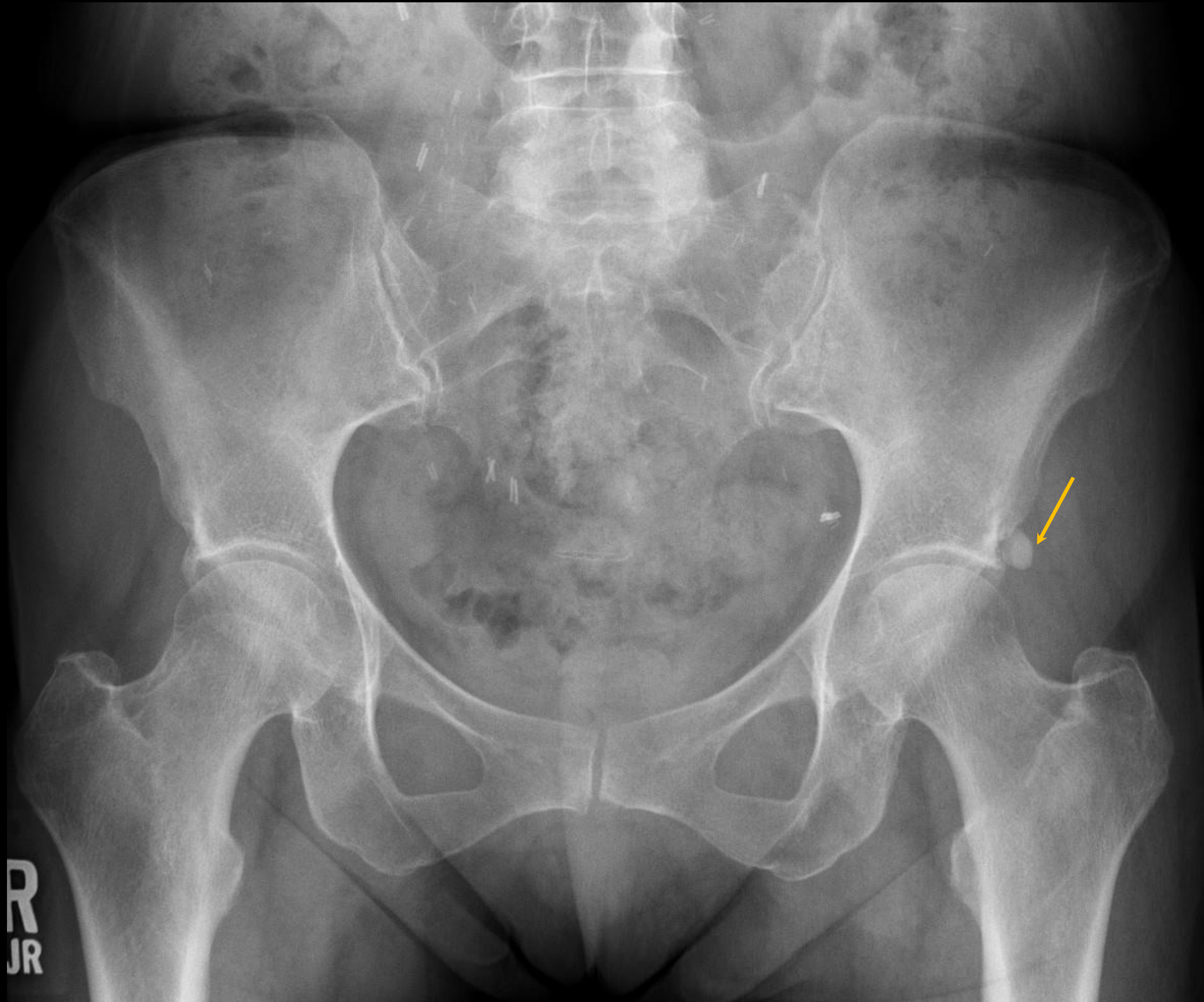
Calcific Tendinitis and Bursitis



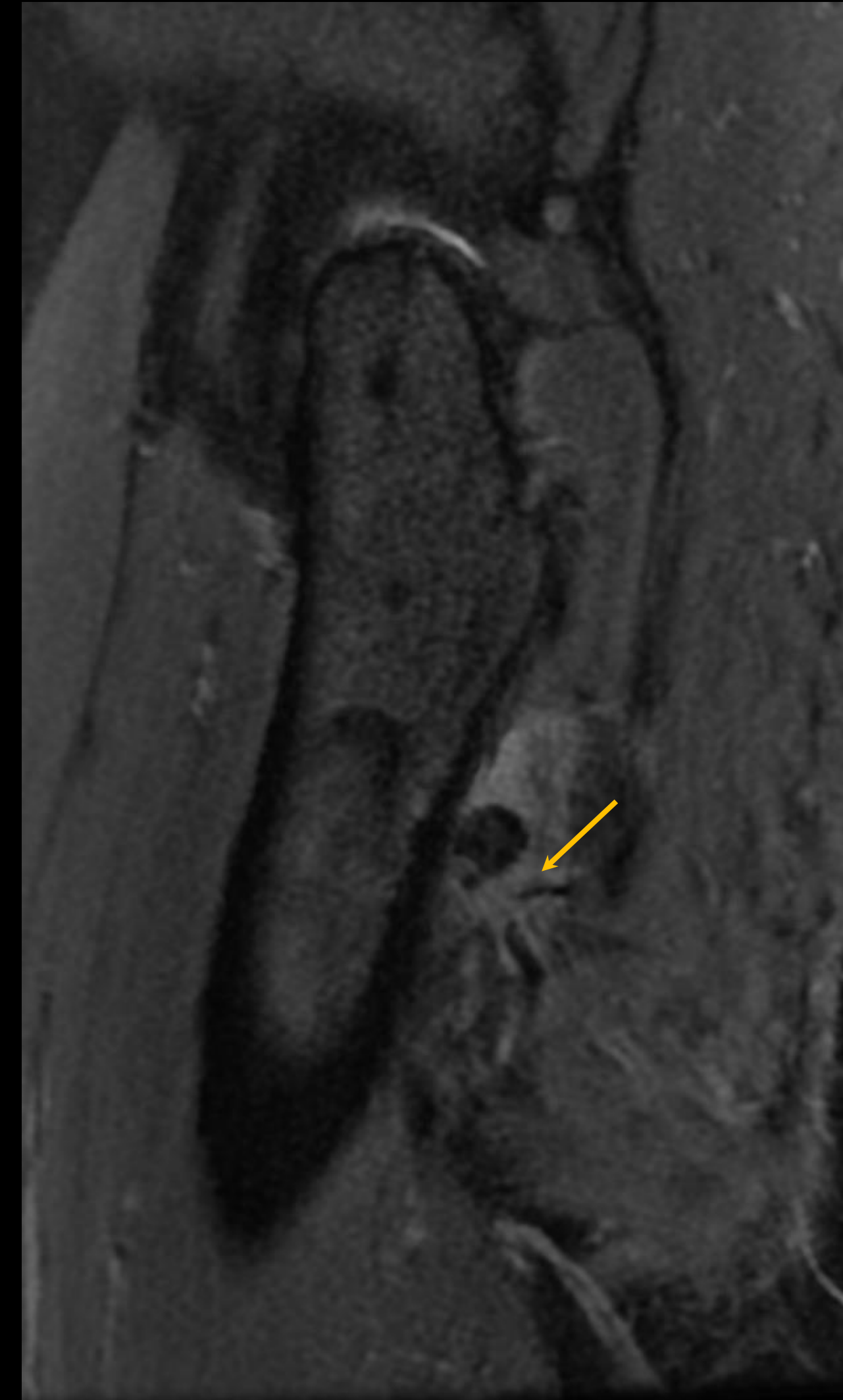
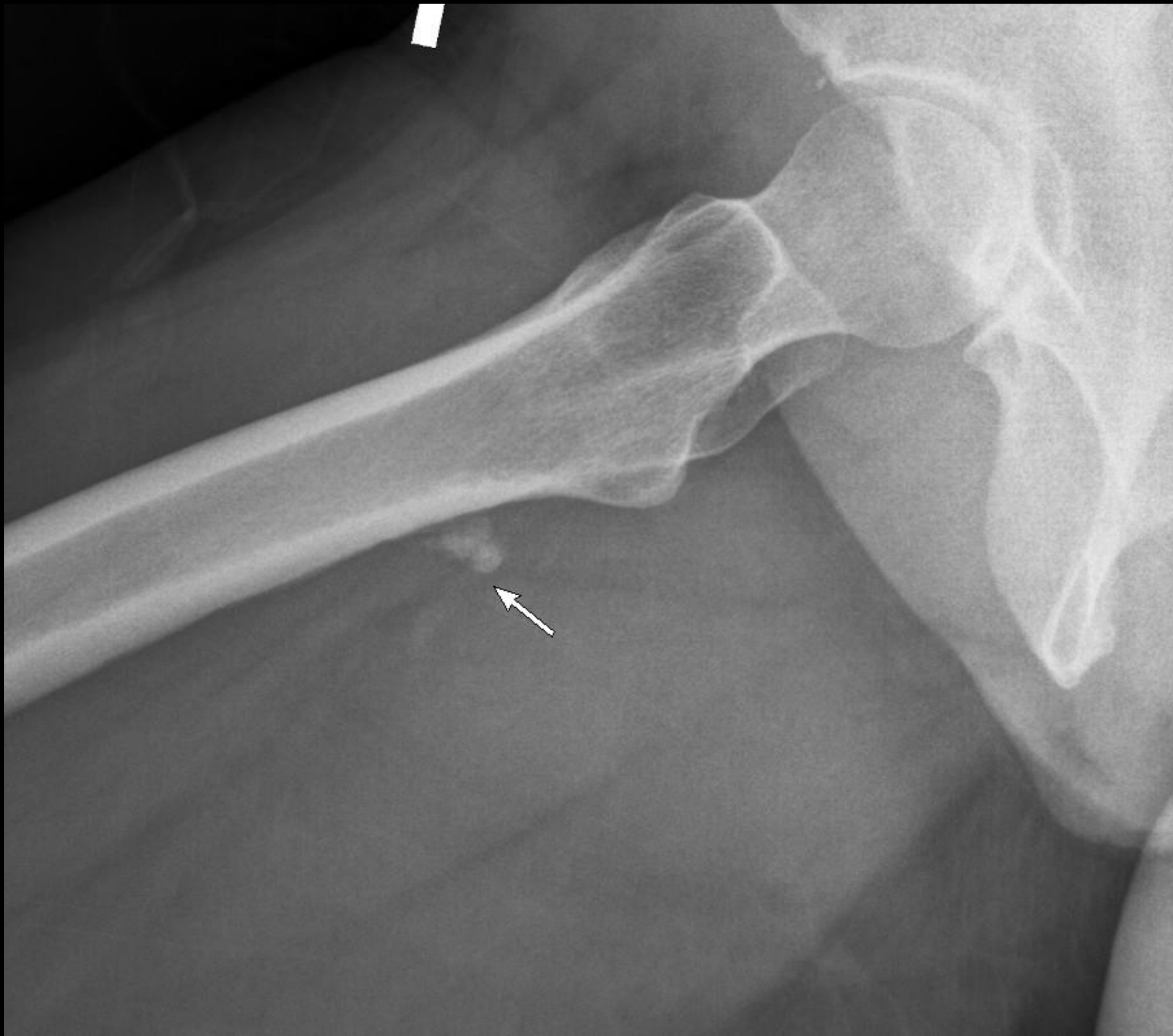
Calcific Tendinitis of Flexor Carpi Ulnaris



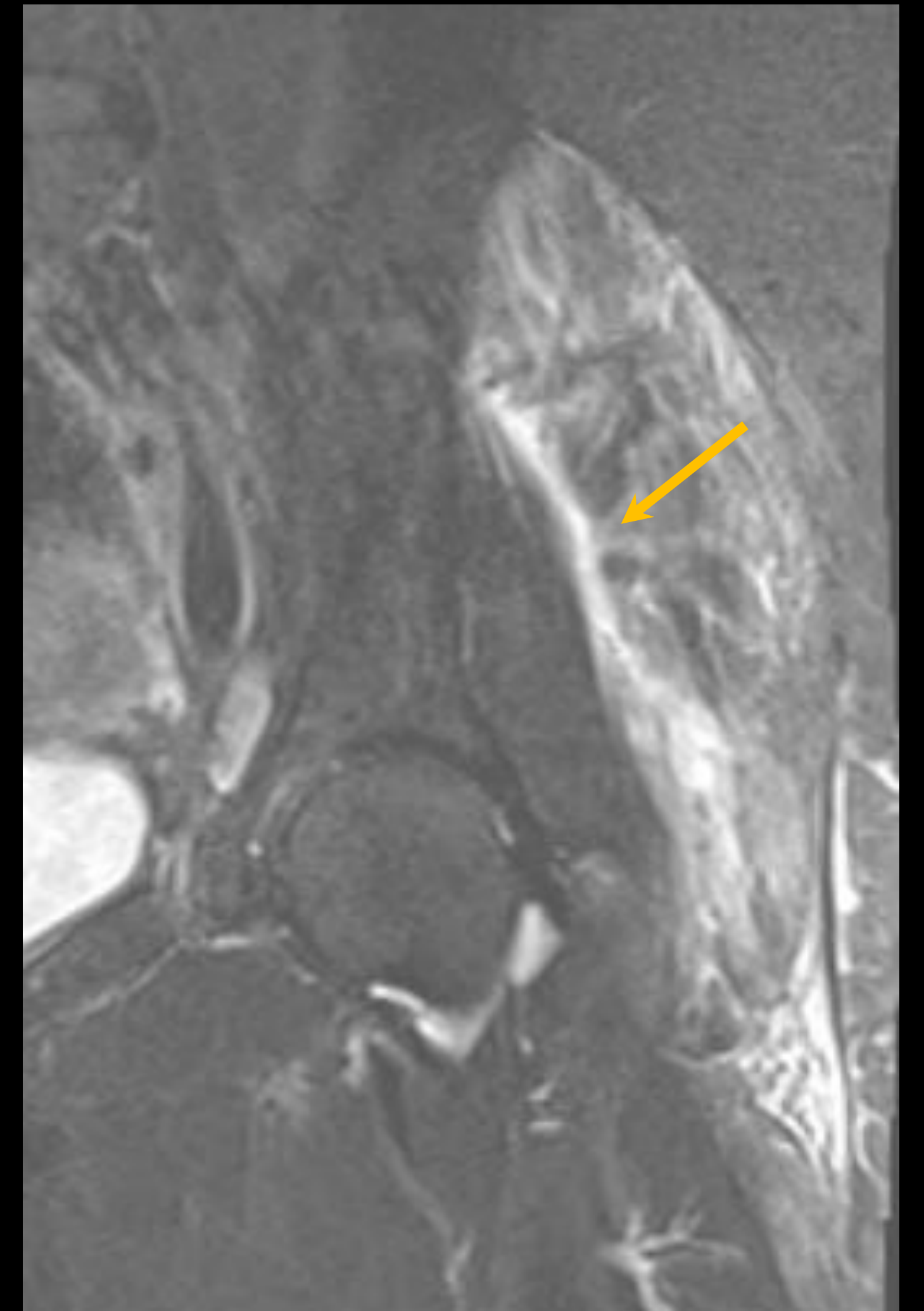
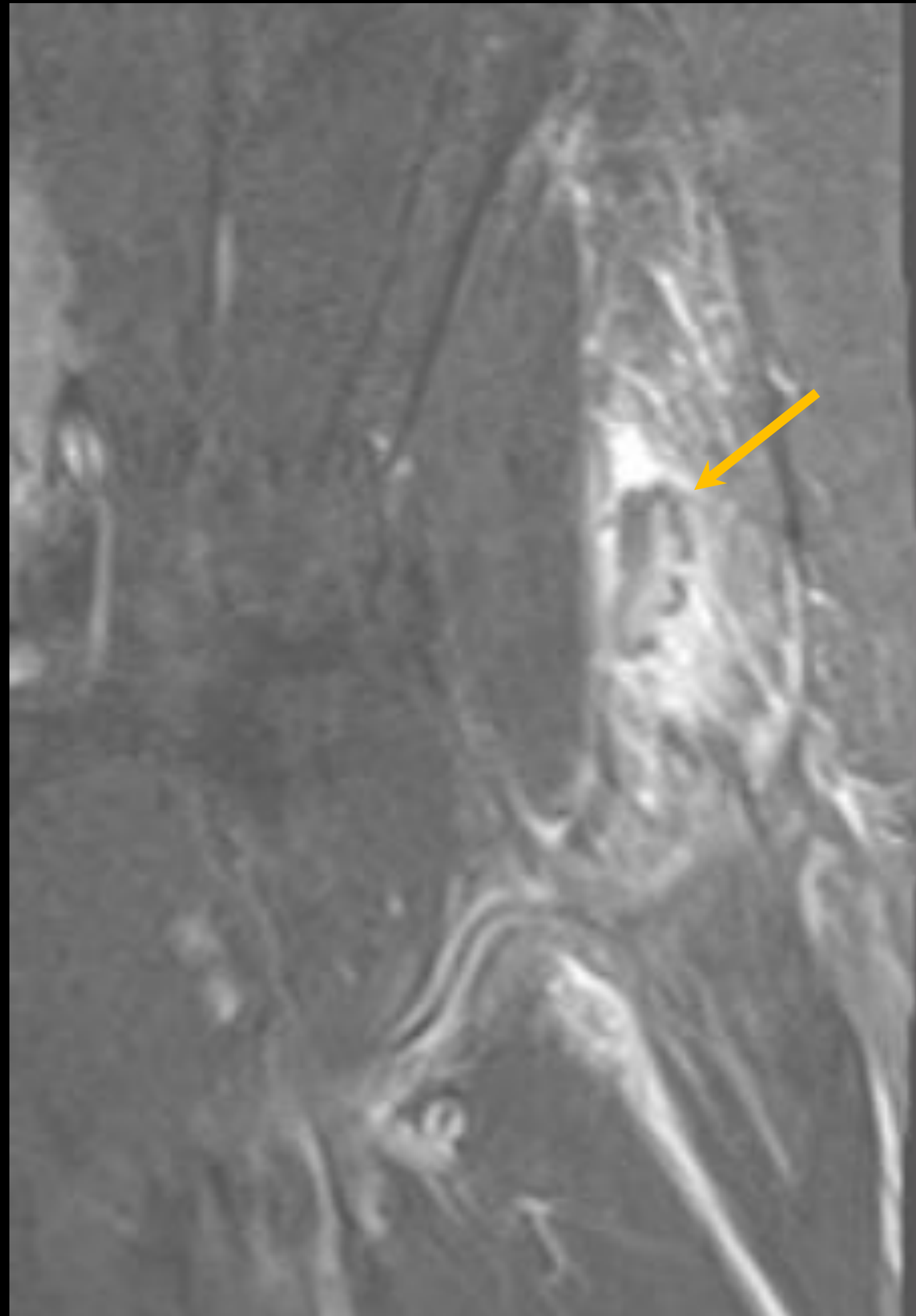
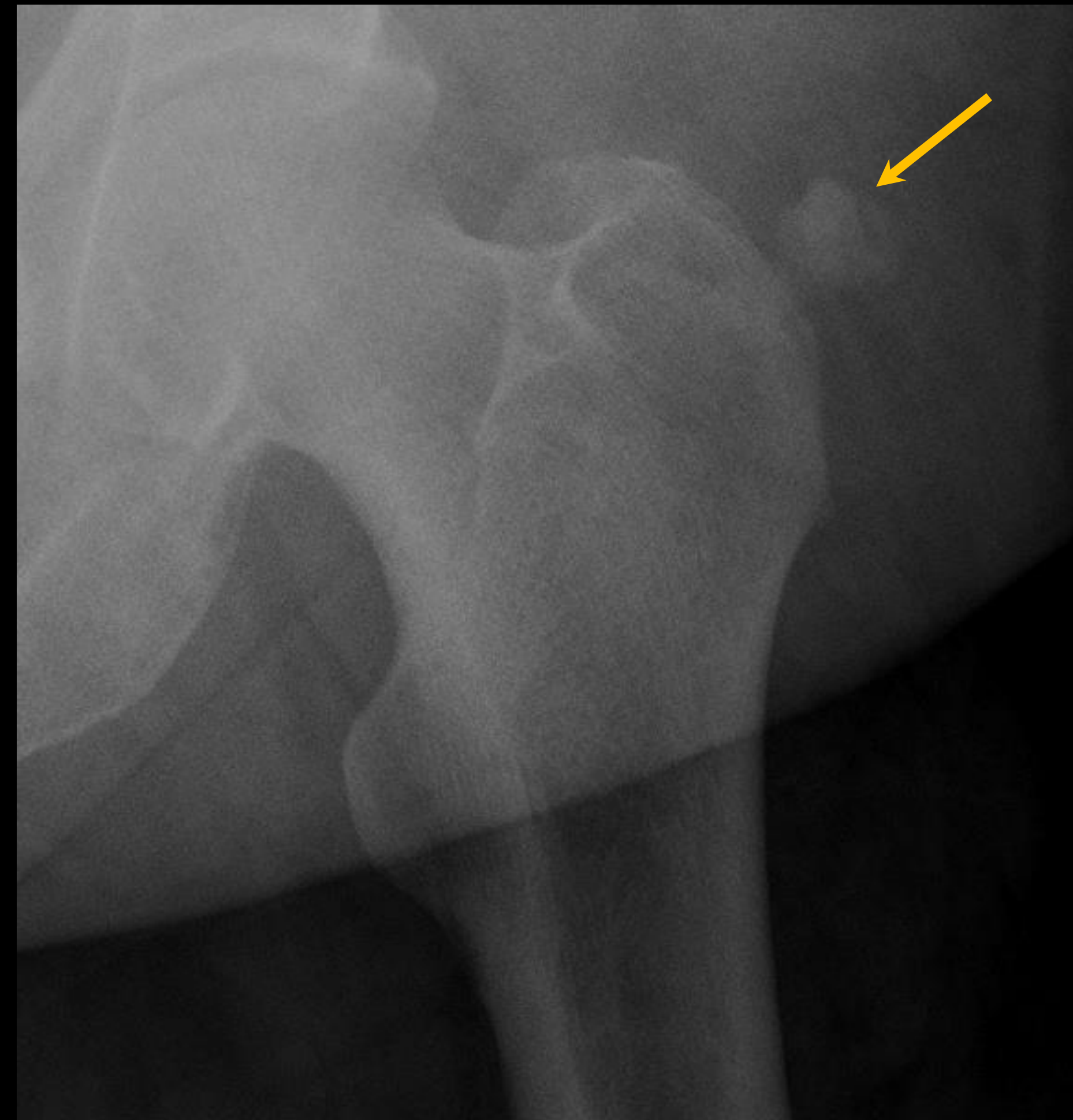
Calcific Tendinopathy of Rectus Femoris



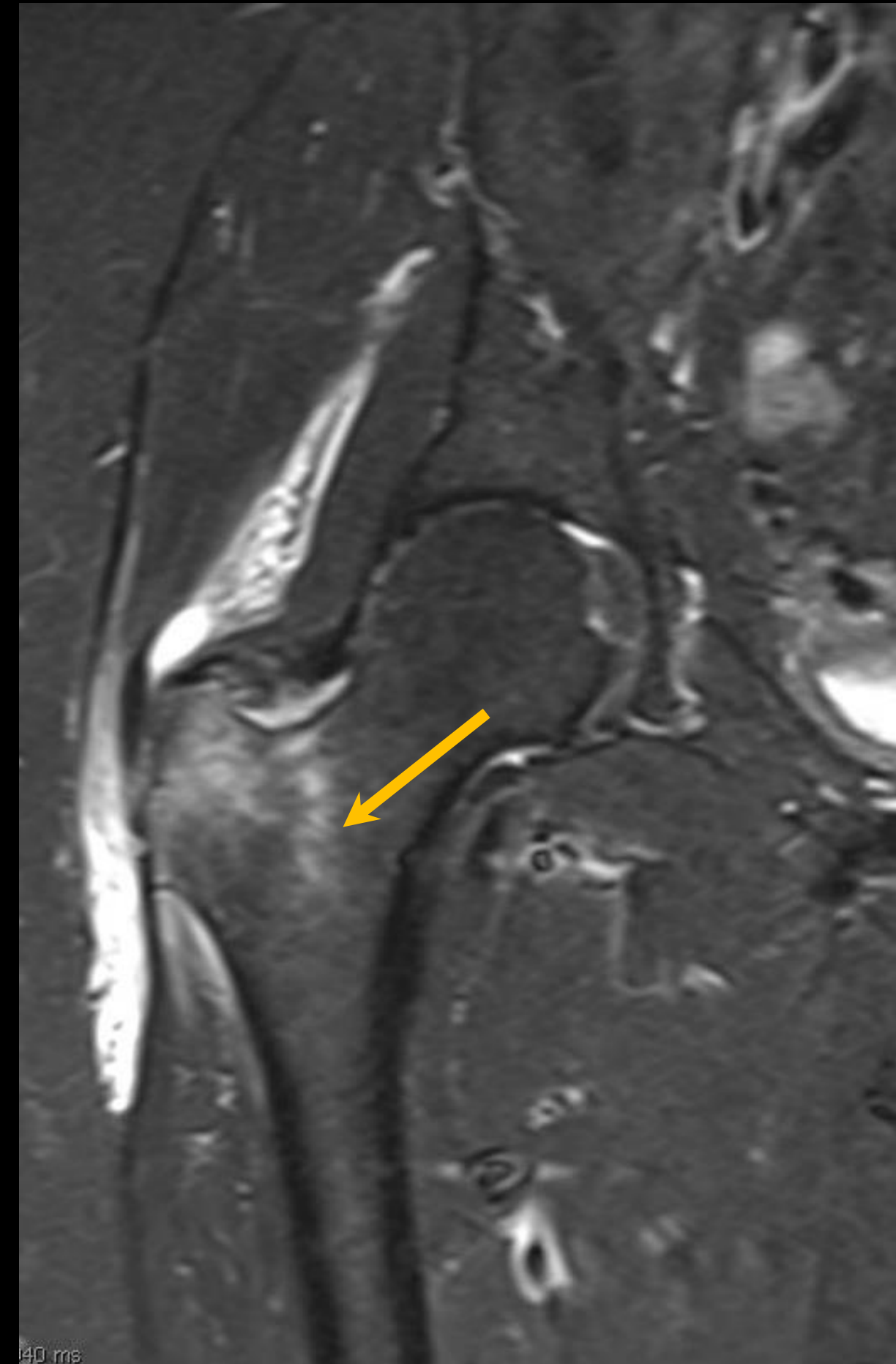
Calcific Tendinitis of Gluteal Max



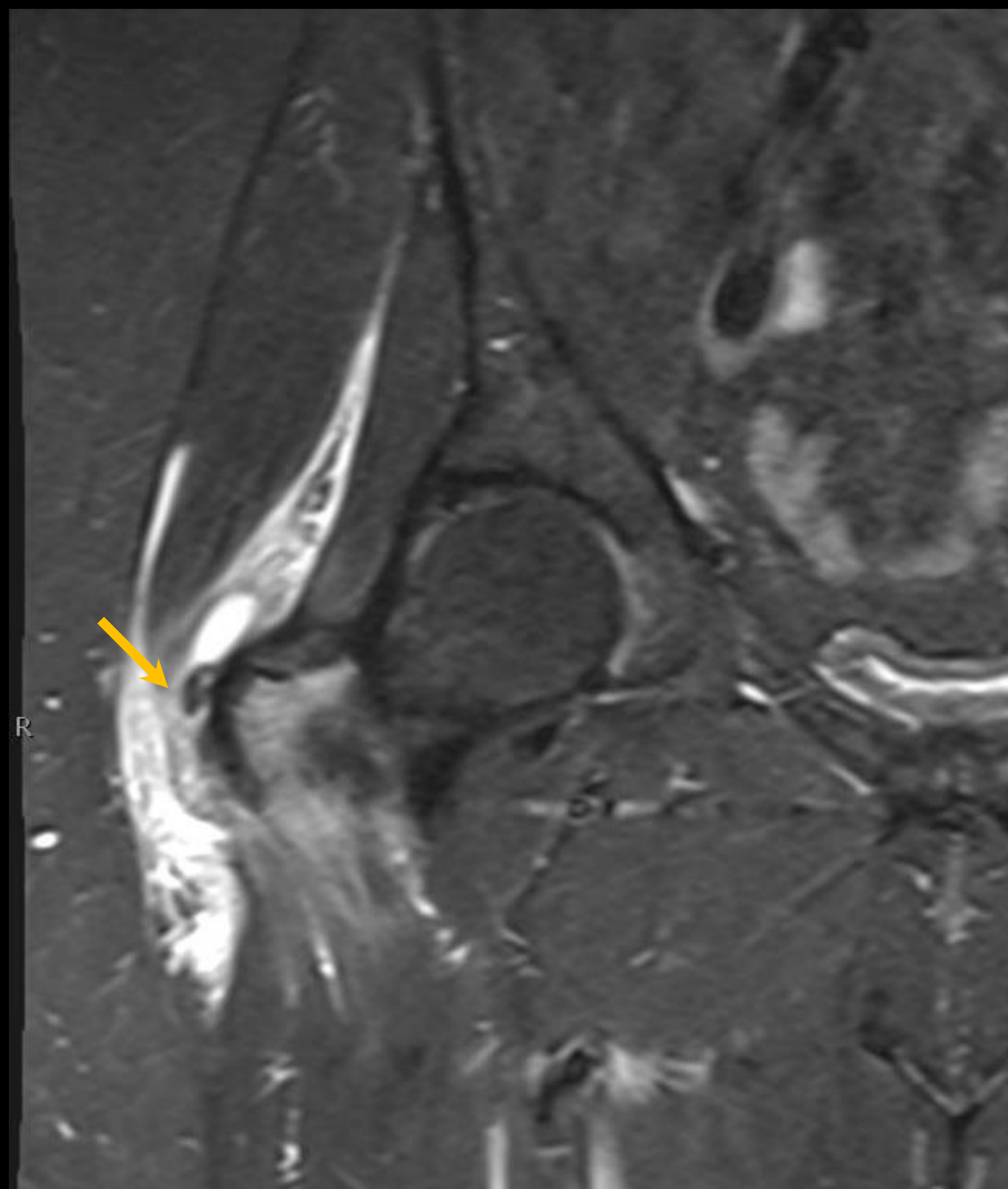
Calcific Bursitis



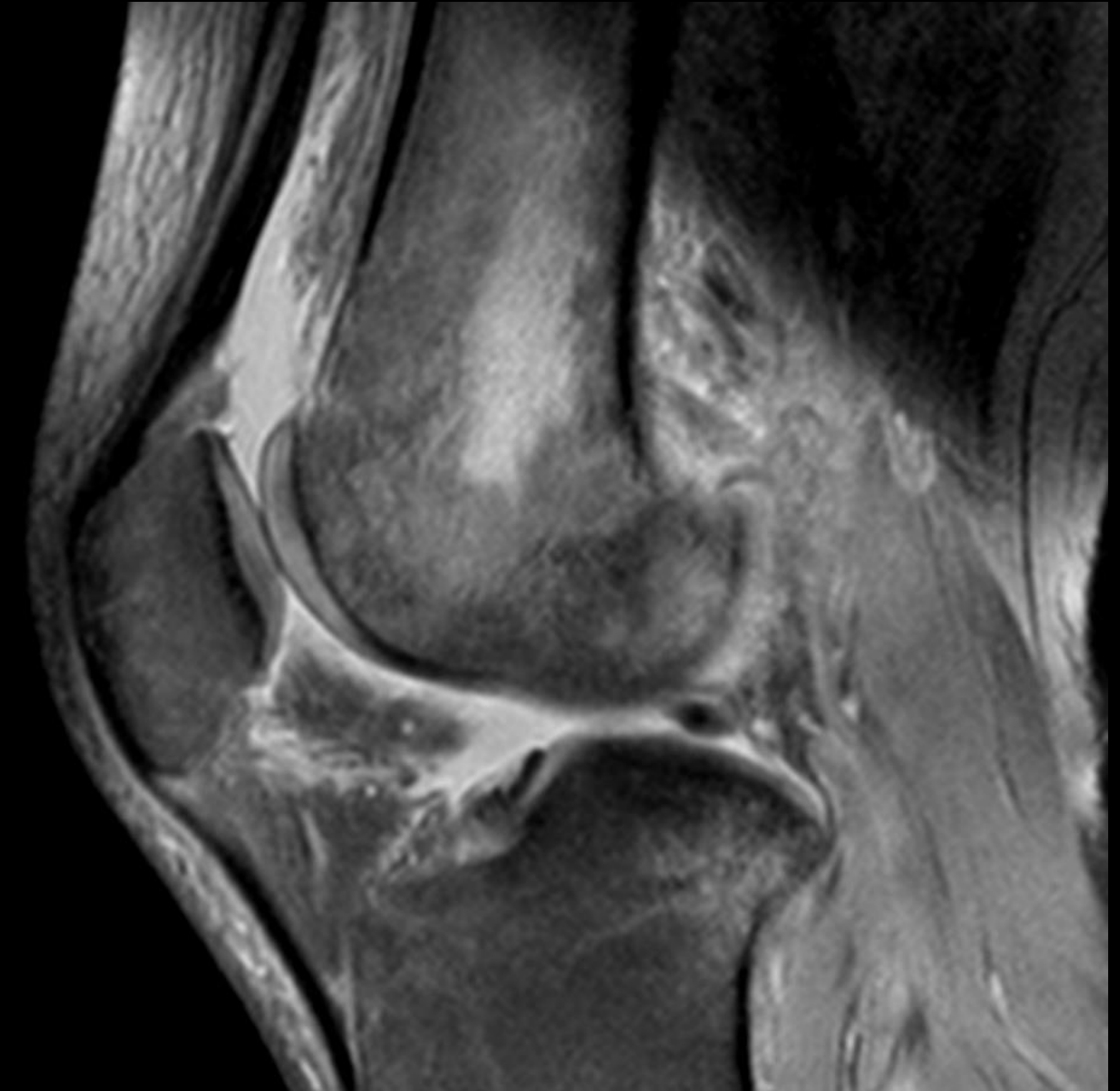
60-year-old woman with right hip pain after a fall from standing



Calcific Tendinitis and Bursitis

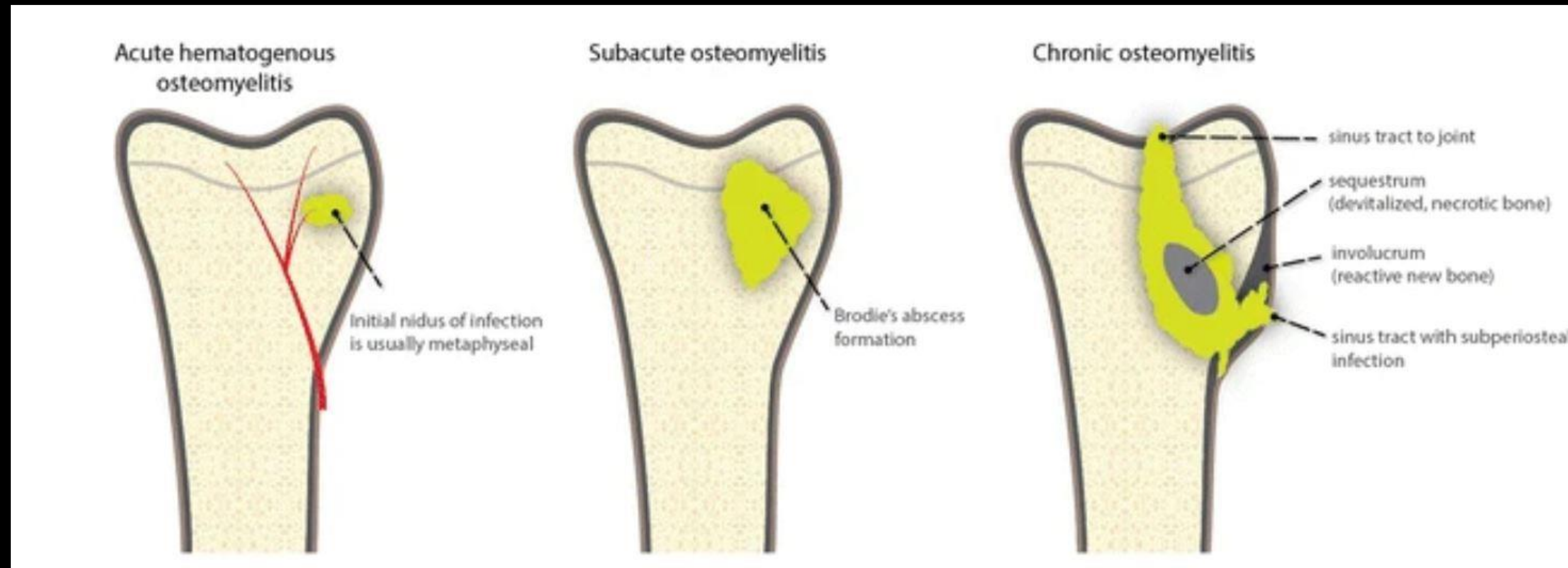


53-year-old male with knee pain



Always keep infection in your differential

Osteomyelitis



Acute: Less than 10 days or less than 2 weeks

Subacute: Less than 3 months but lacking acute symptoms

Chronic: > 3 months. Pathologic hallmark is development of bone necrosis

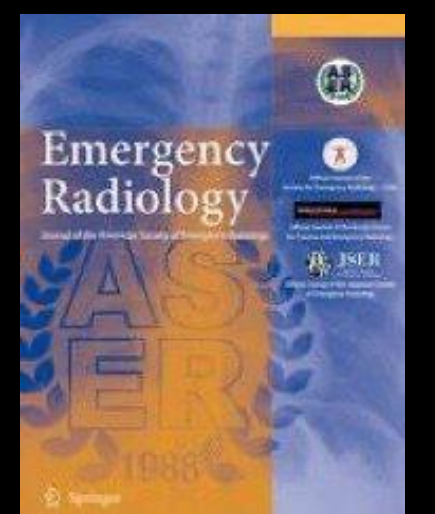
Emerg Radiol (2018) 25:175–188
<https://doi.org/10.1007/s10140-017-1564-9>



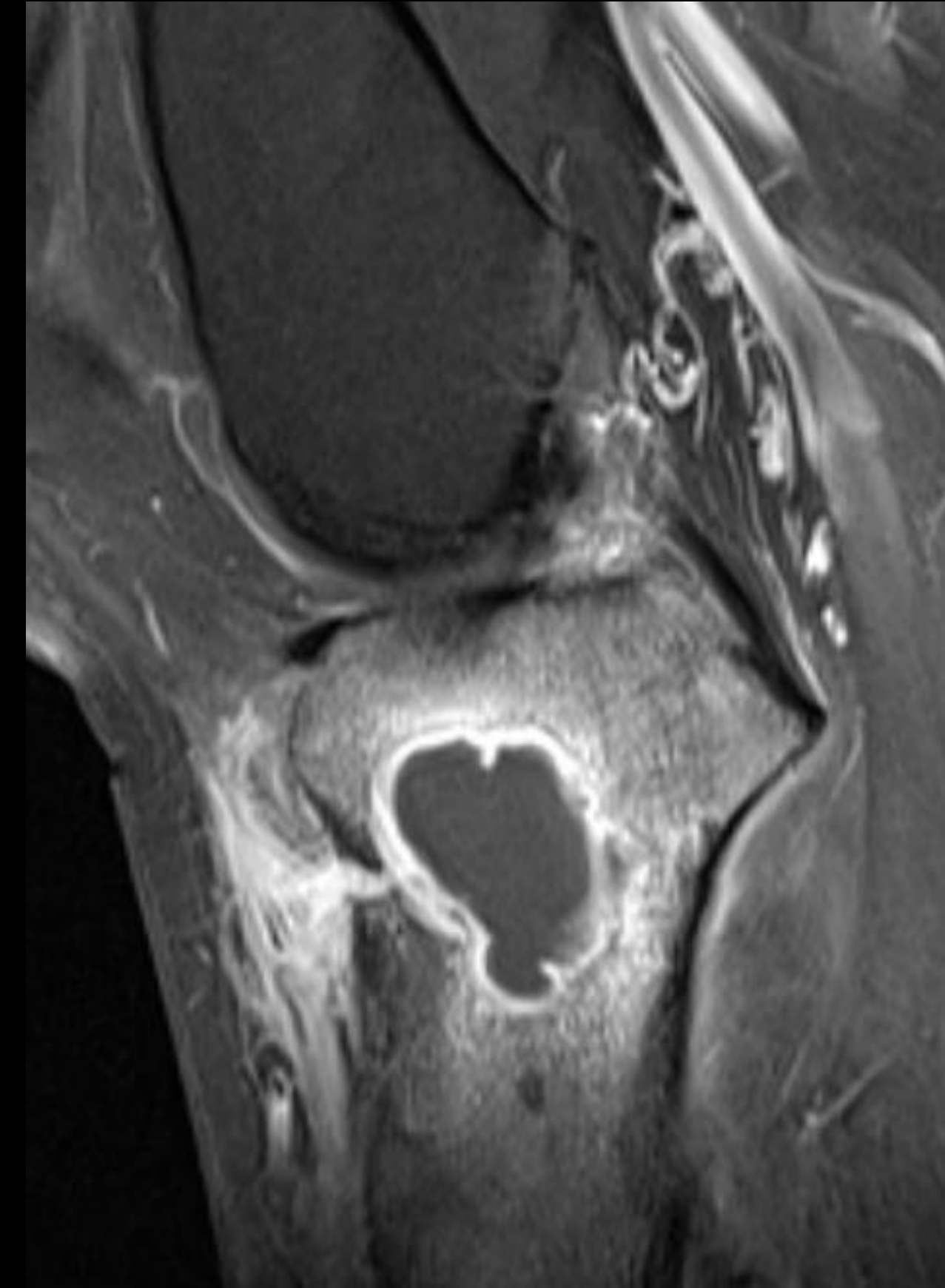
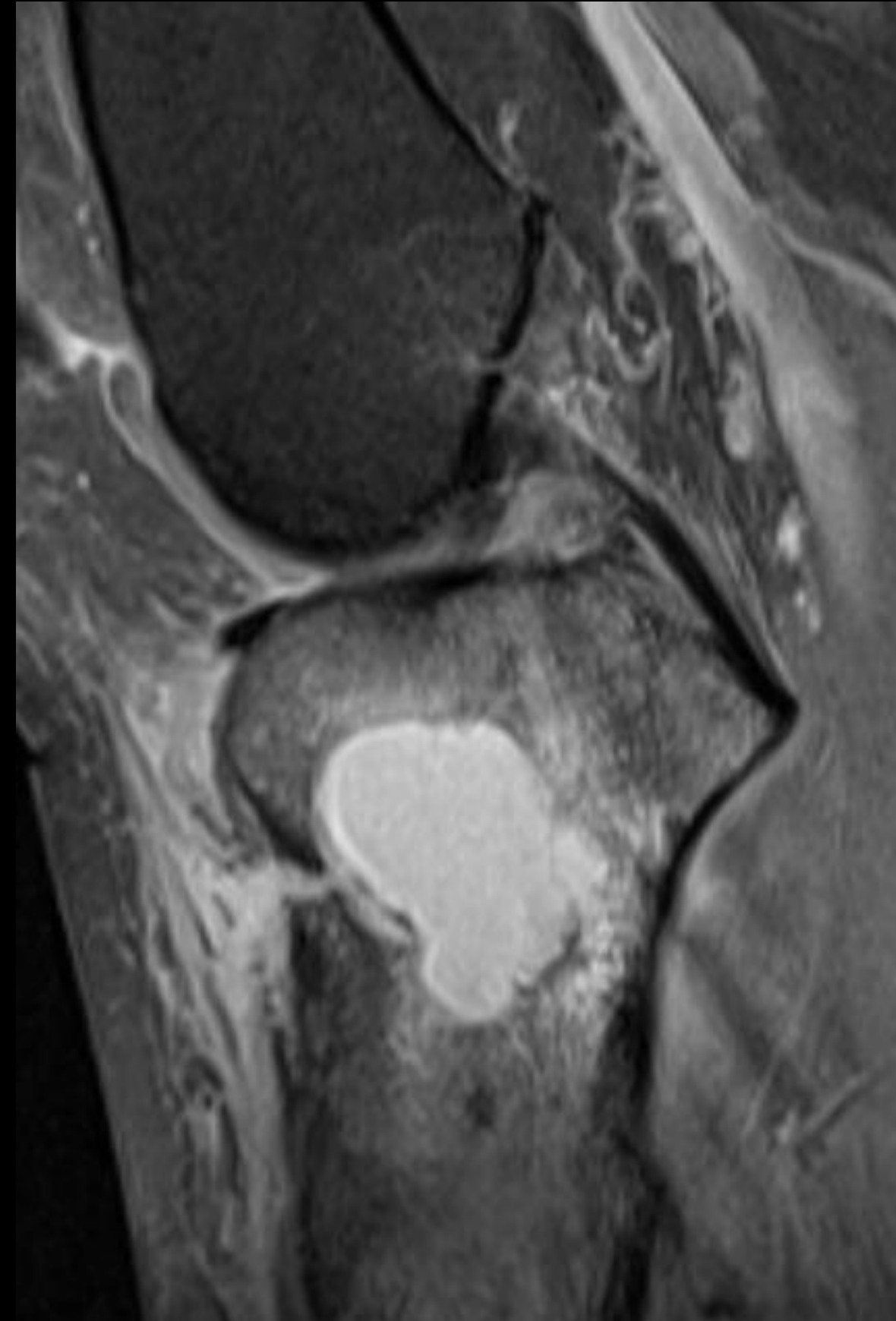
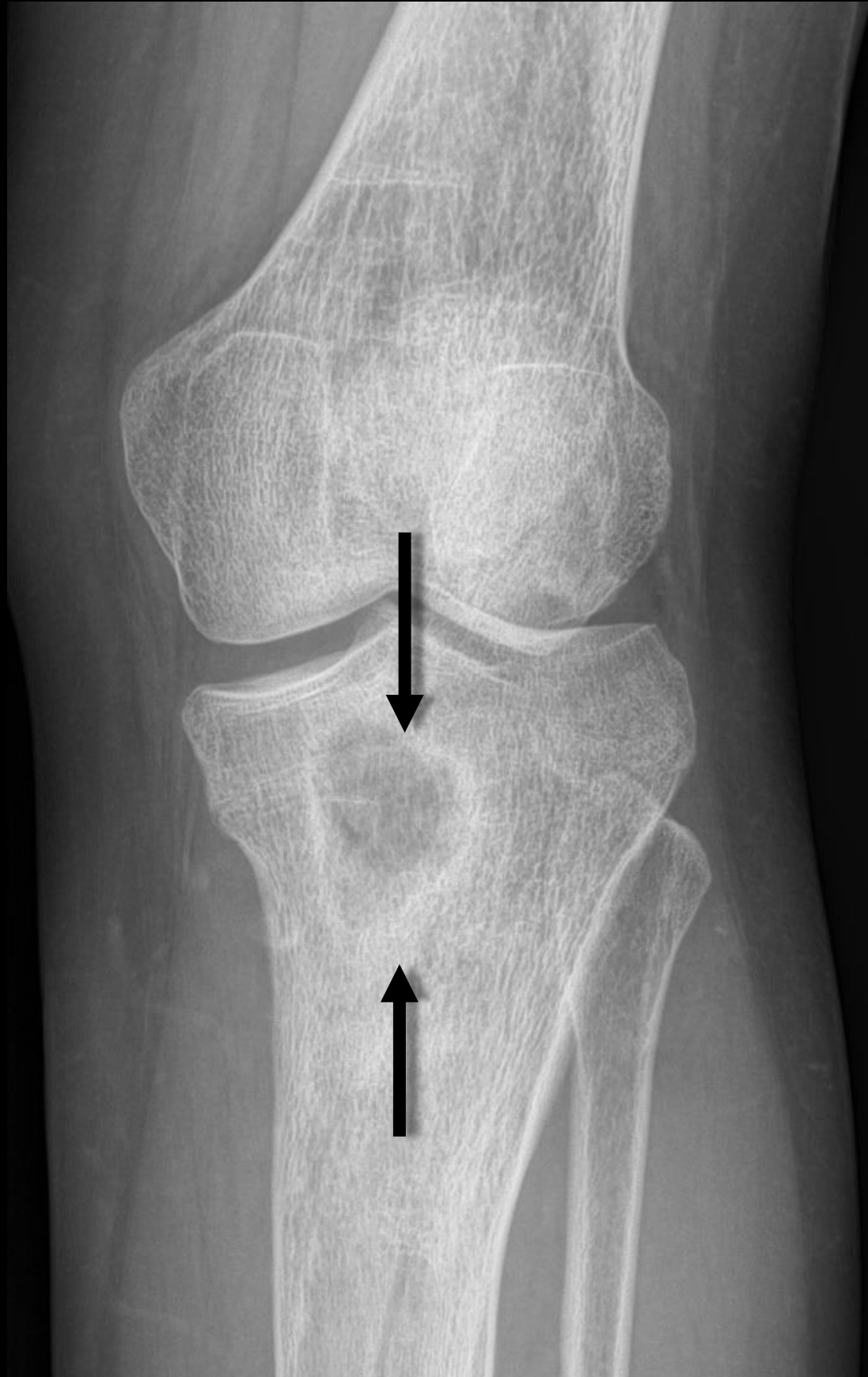
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Osteomyelitis of the lower extremity: pathophysiology, imaging, and classification, with an emphasis on diabetic foot infection

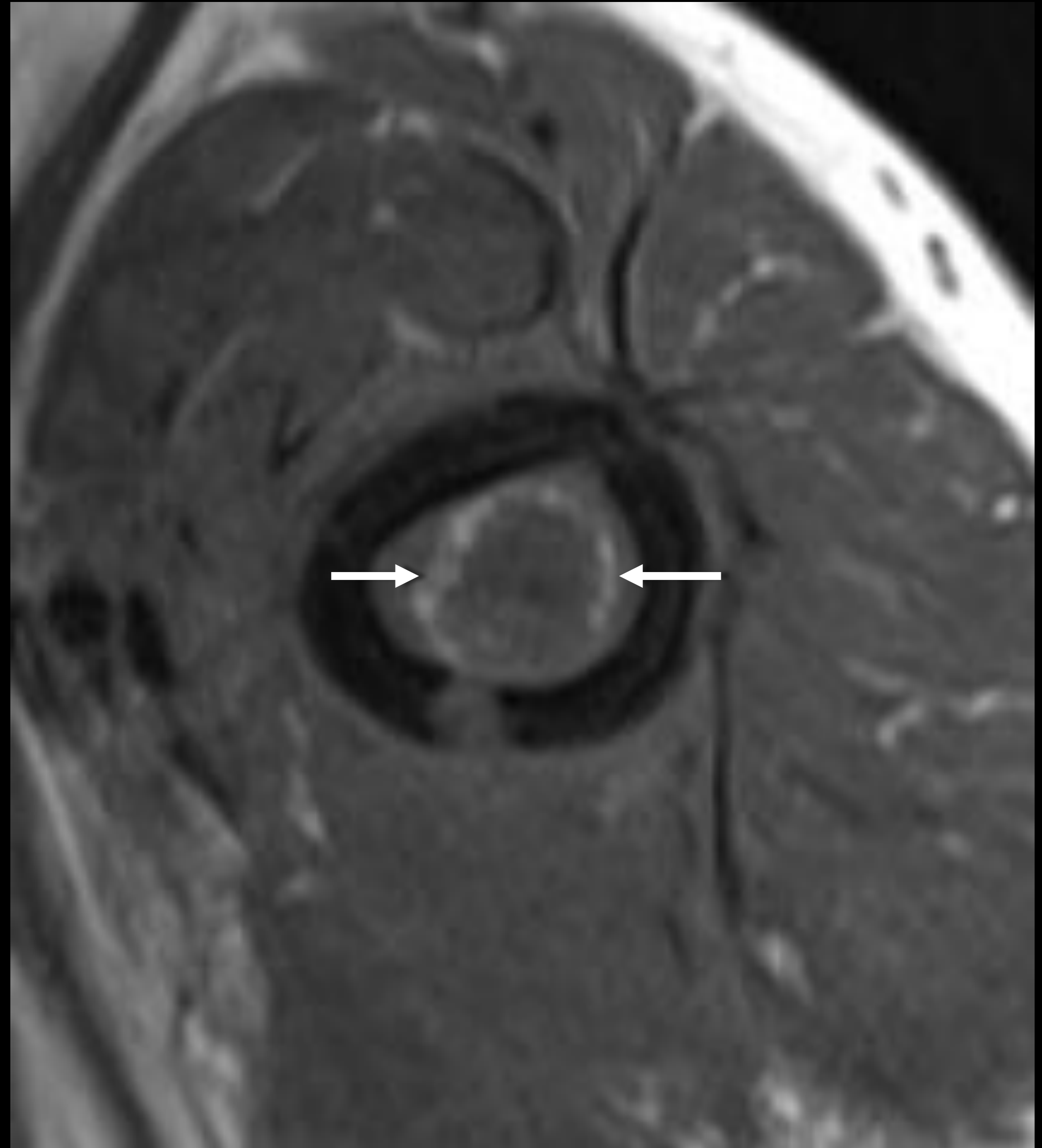
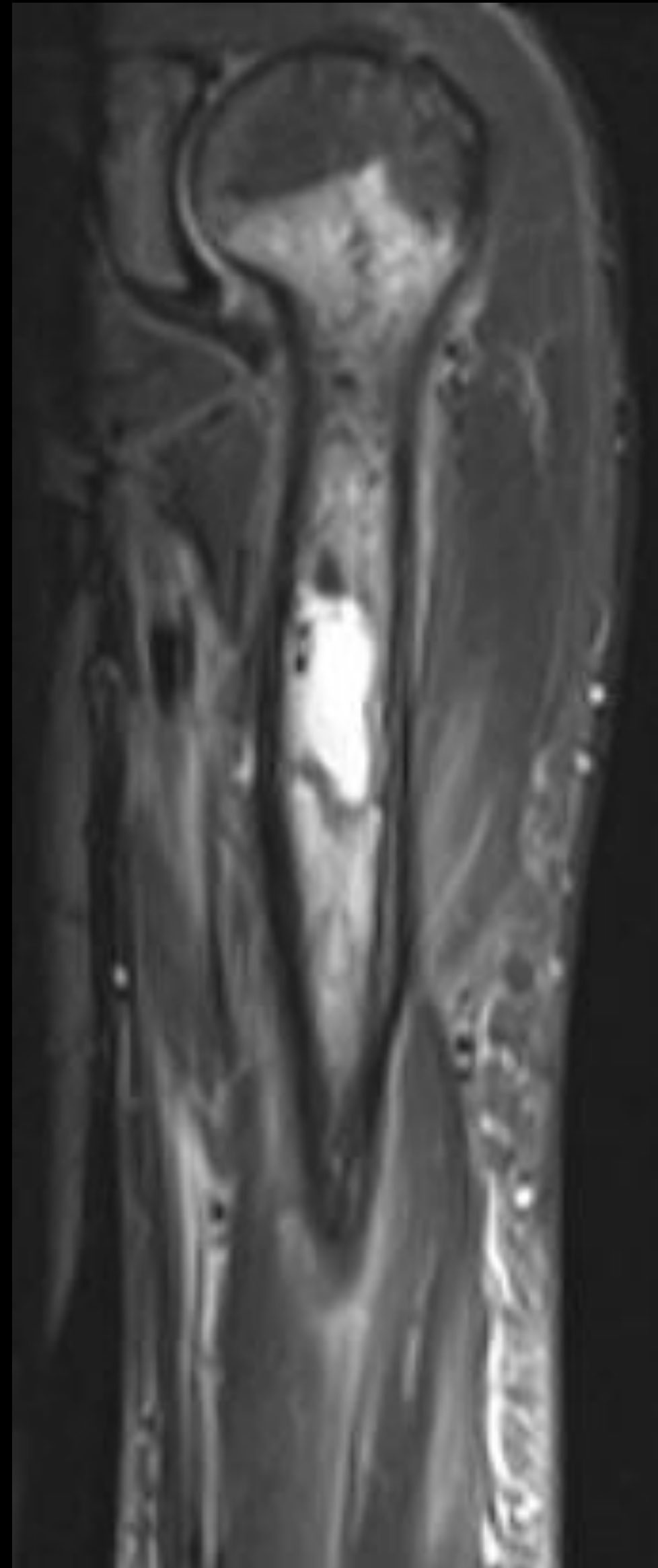
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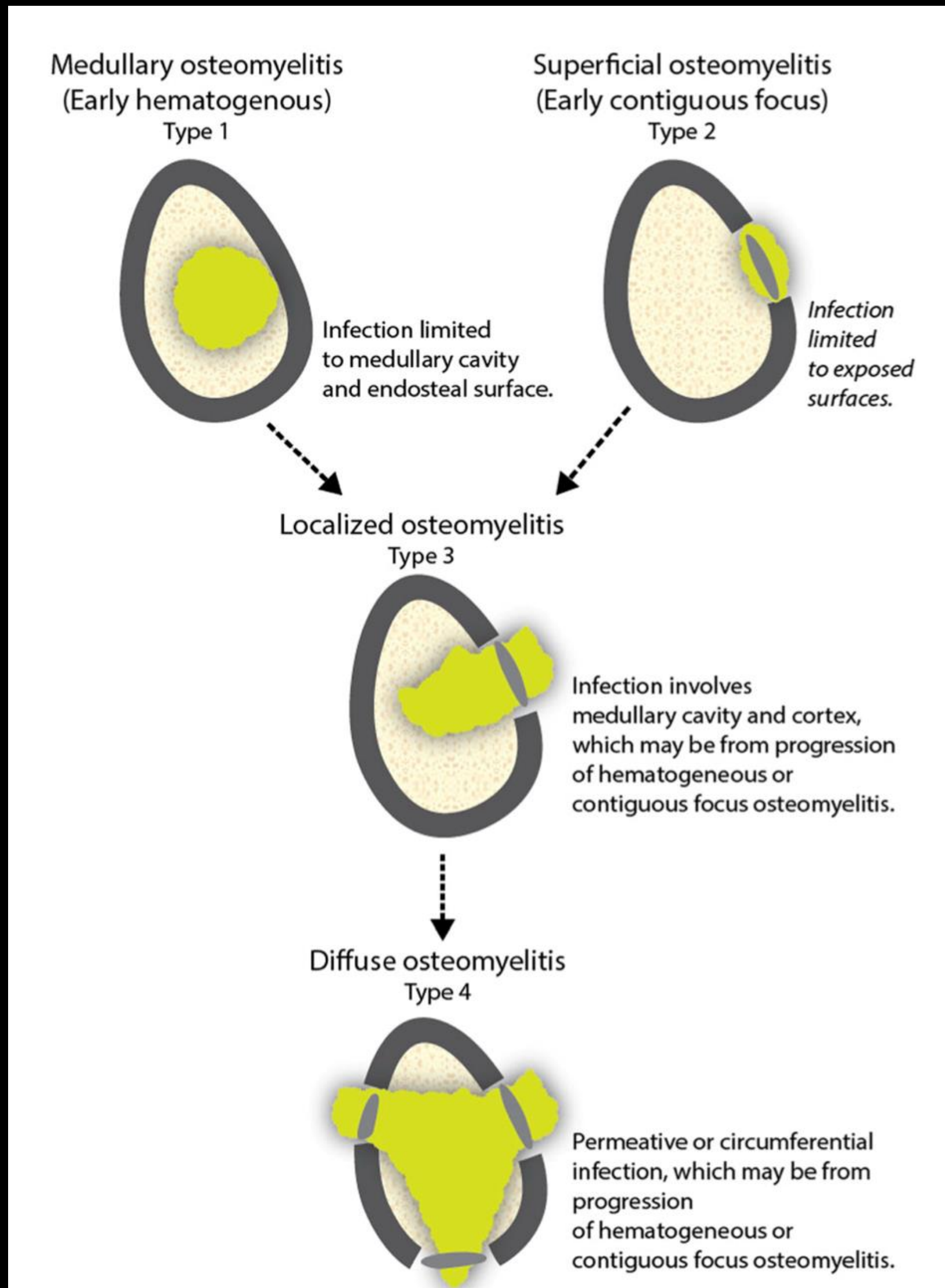
Osteomyelitis: Brodie's Abscess



Osteomyelitis: Brodie's Abscess



Osteomyelitis



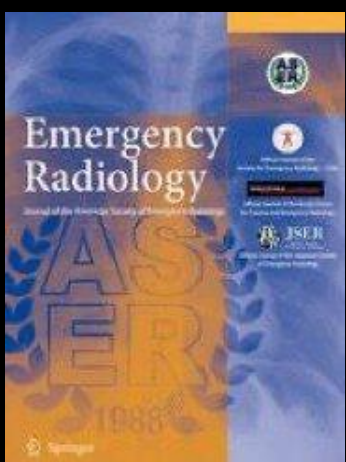
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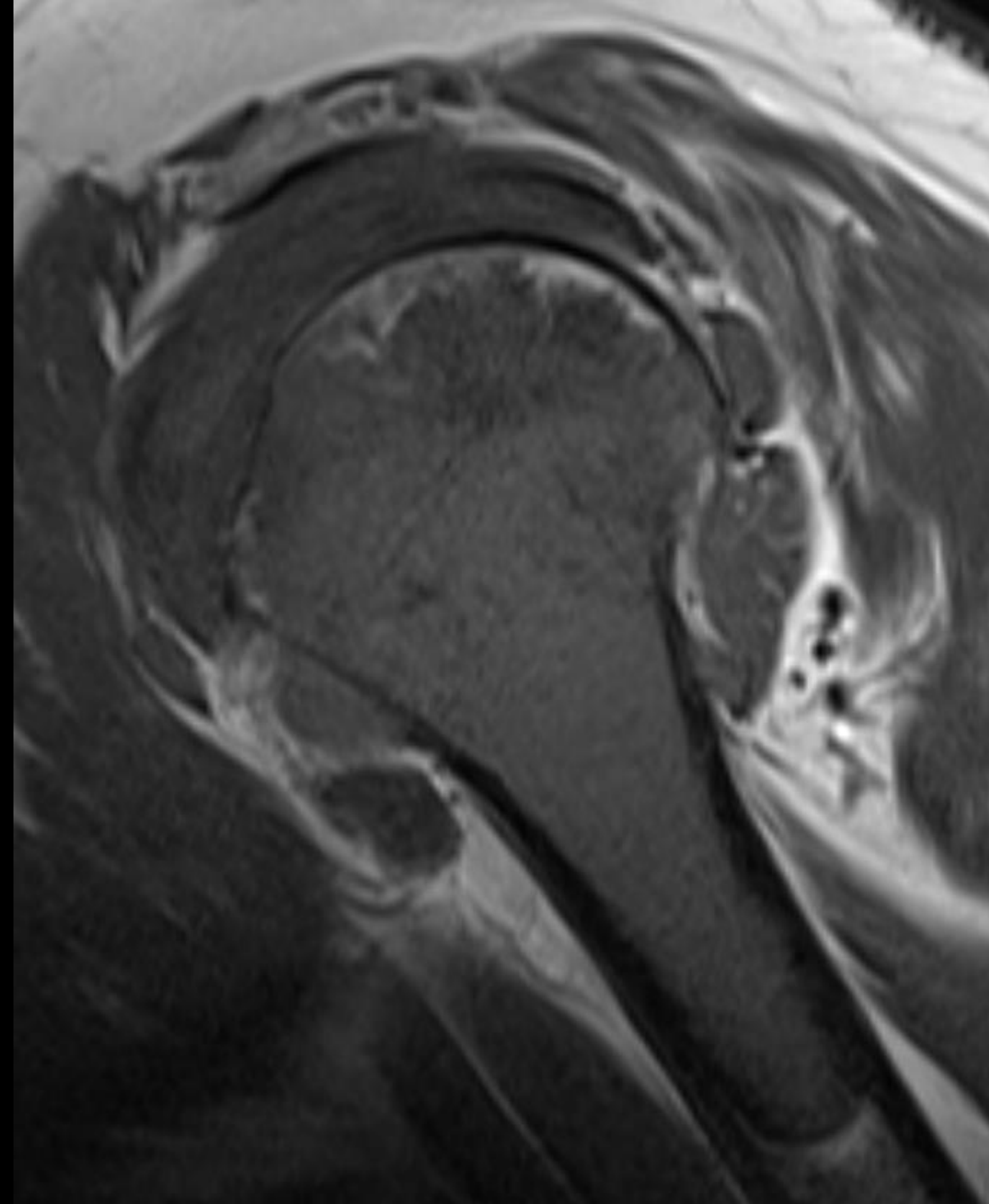
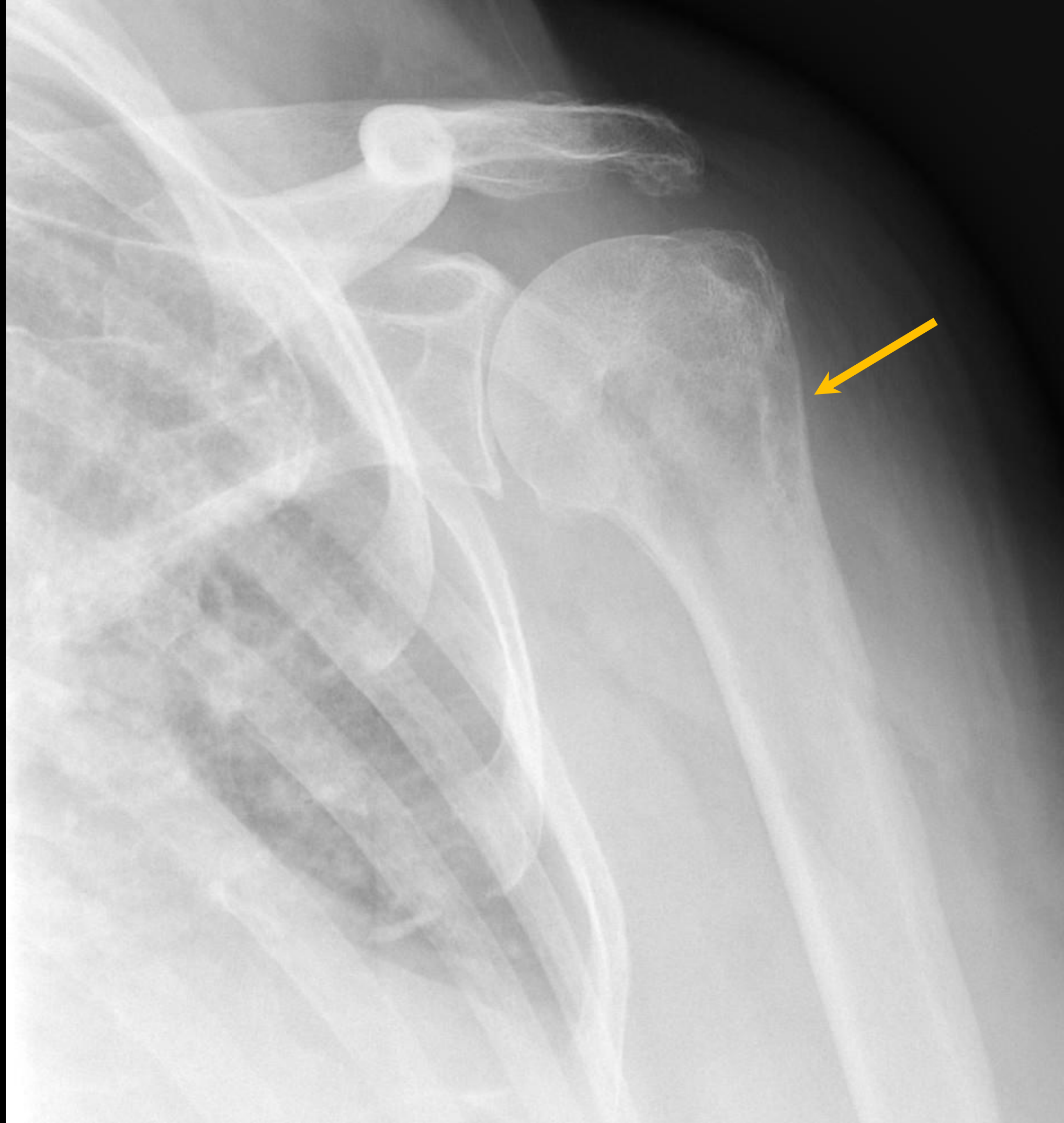
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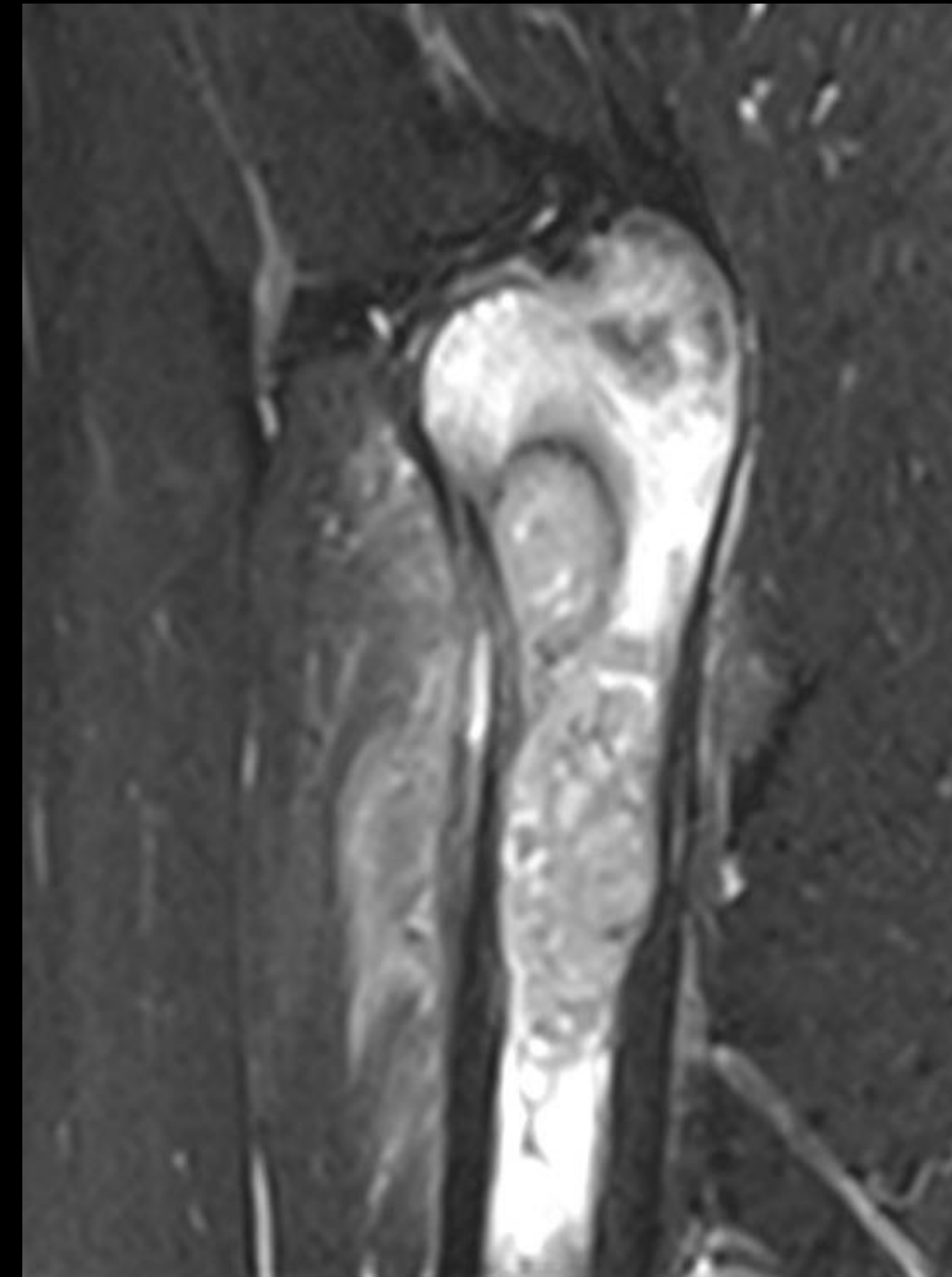
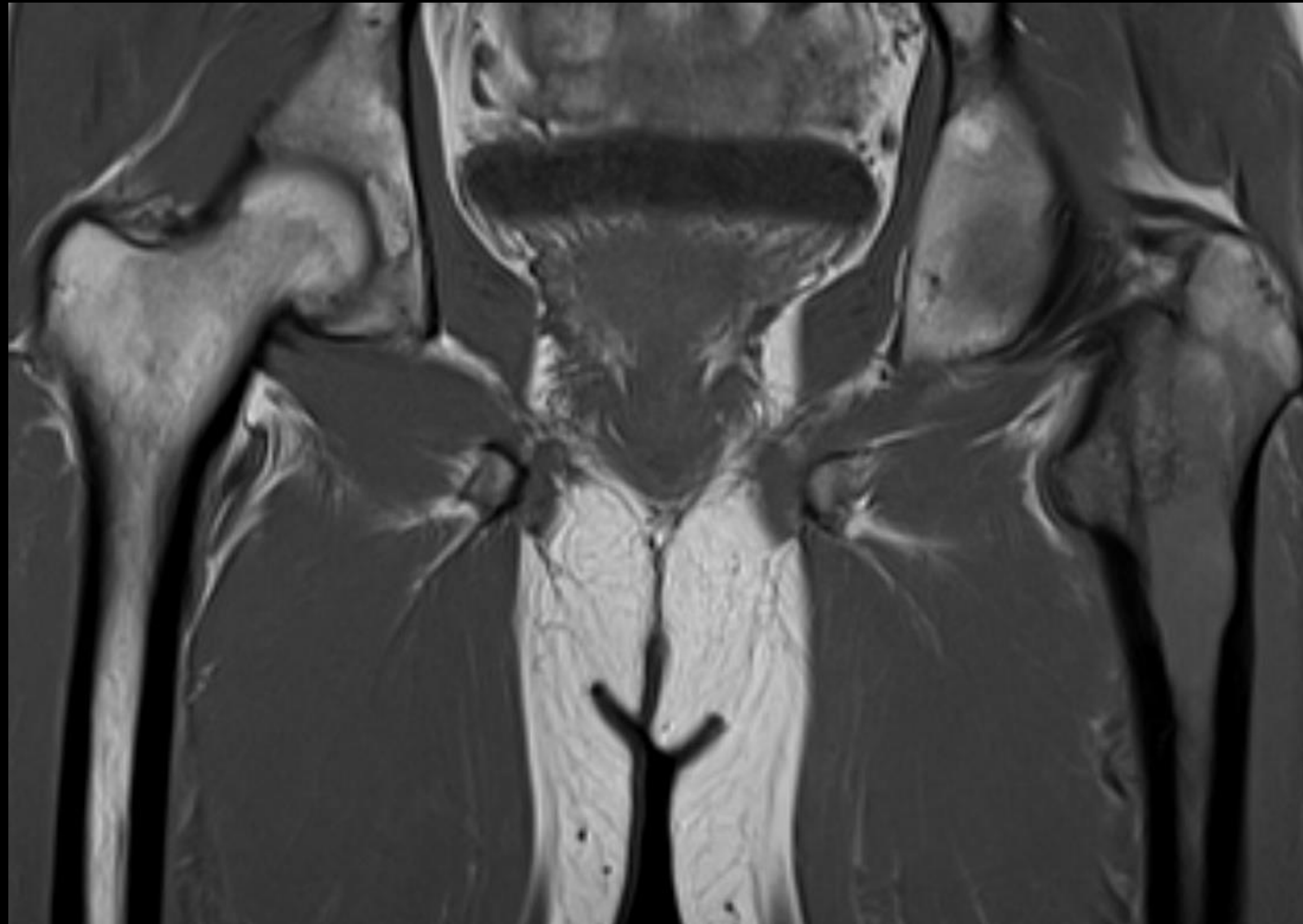
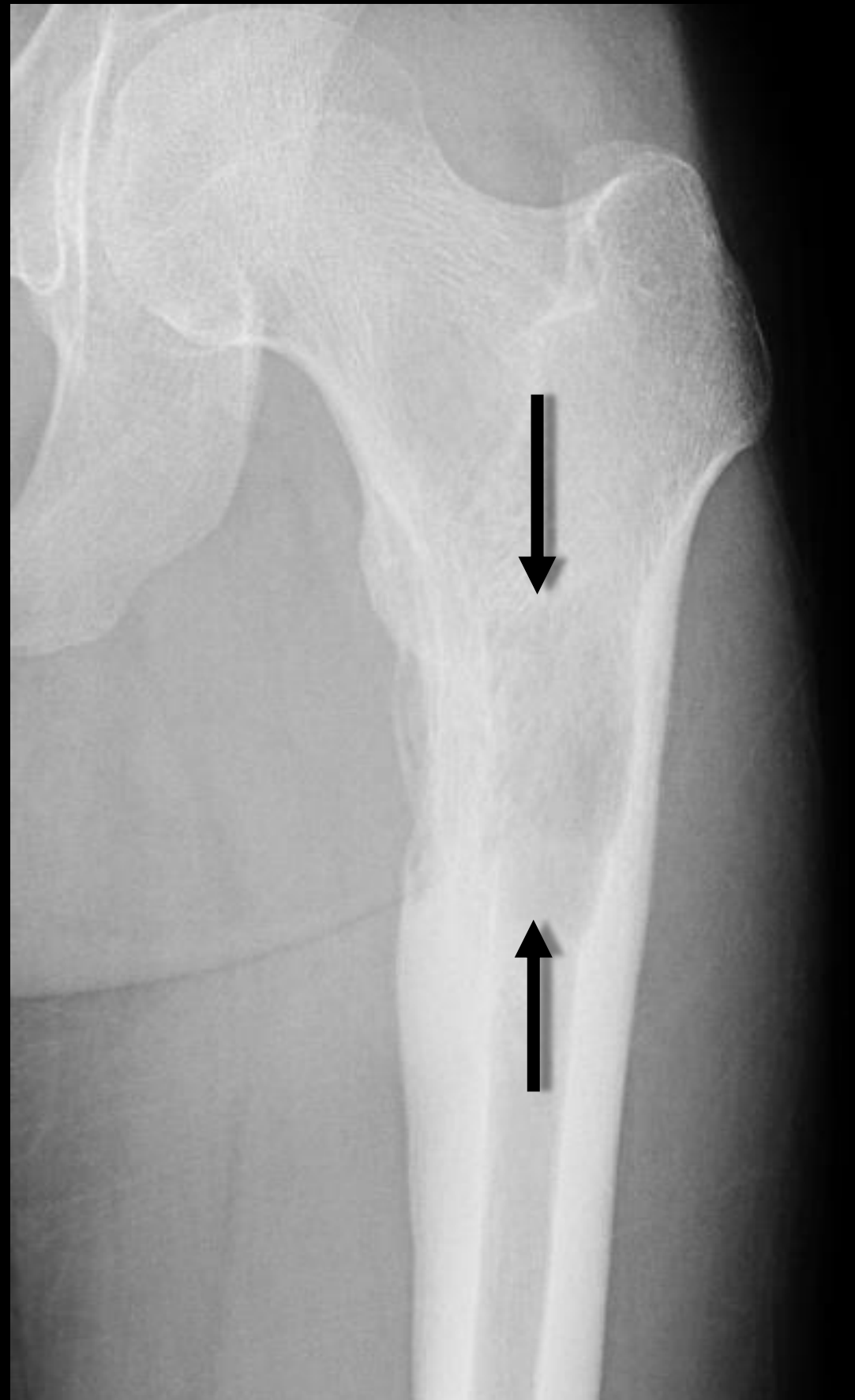
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Metastatic Dx

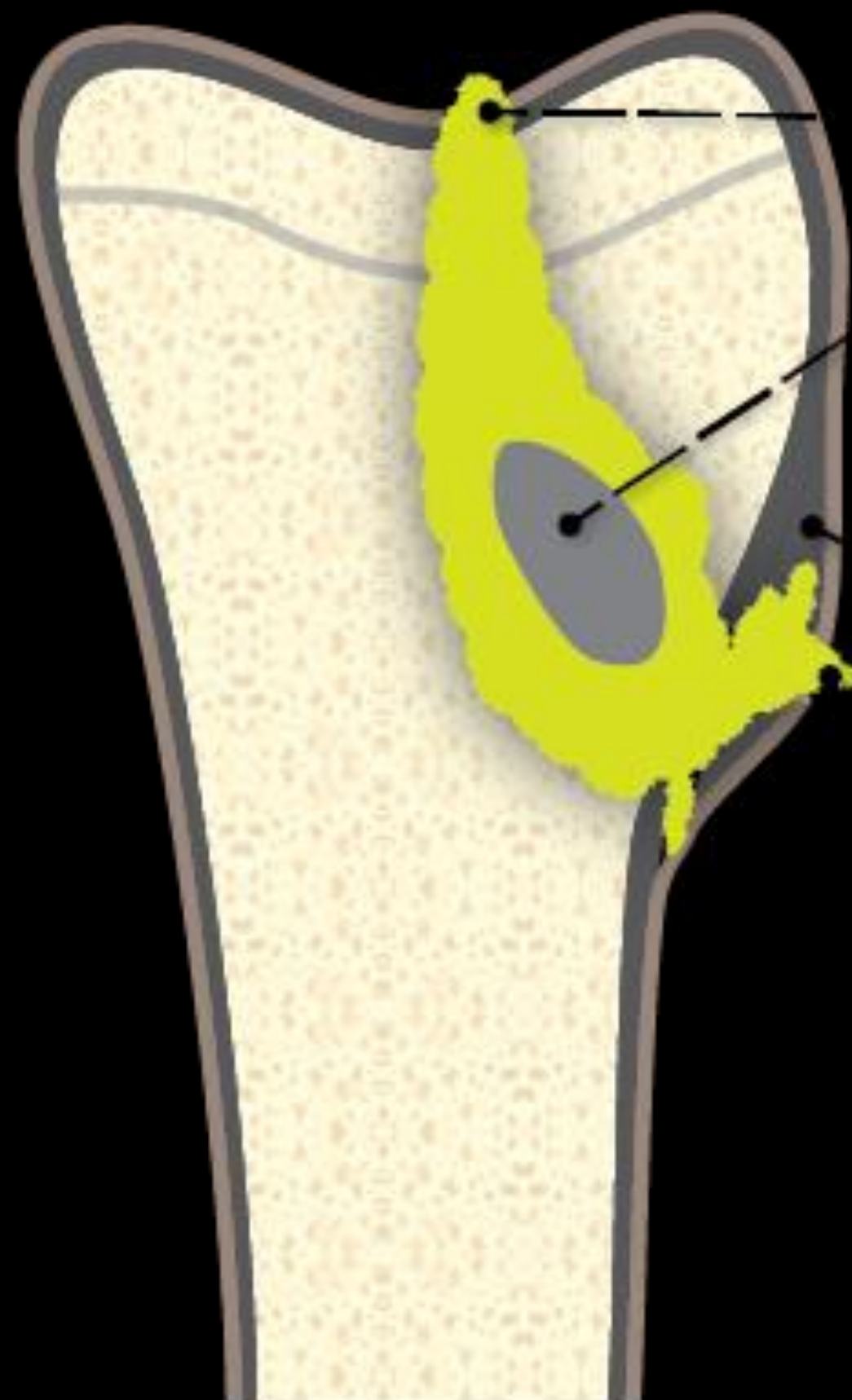


Ewing's Sarcoma



Chronic Osteomyelitis

Chronic osteomyelitis



sinus tract
sequestrum
(devitalized
necrotic bone)

involucrum
(reactive new
bone)

sinus tract with
subperiosteal
infection

- **Sequestrum:** Fragment of devascularized bone that becomes separated from the host bone due to surrounding necrosis, acting as nidus for recurrent infection.
- **Involucrum:** Reactive sclerosis that surrounds the sequestrum

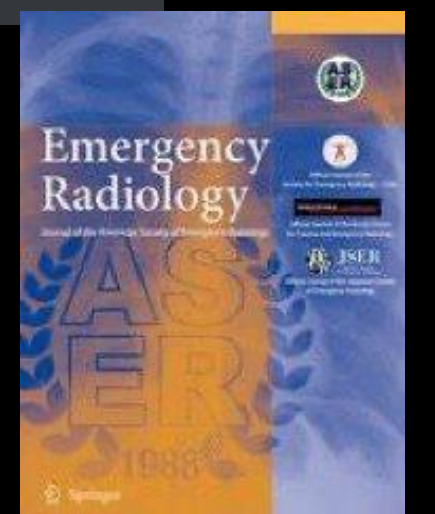
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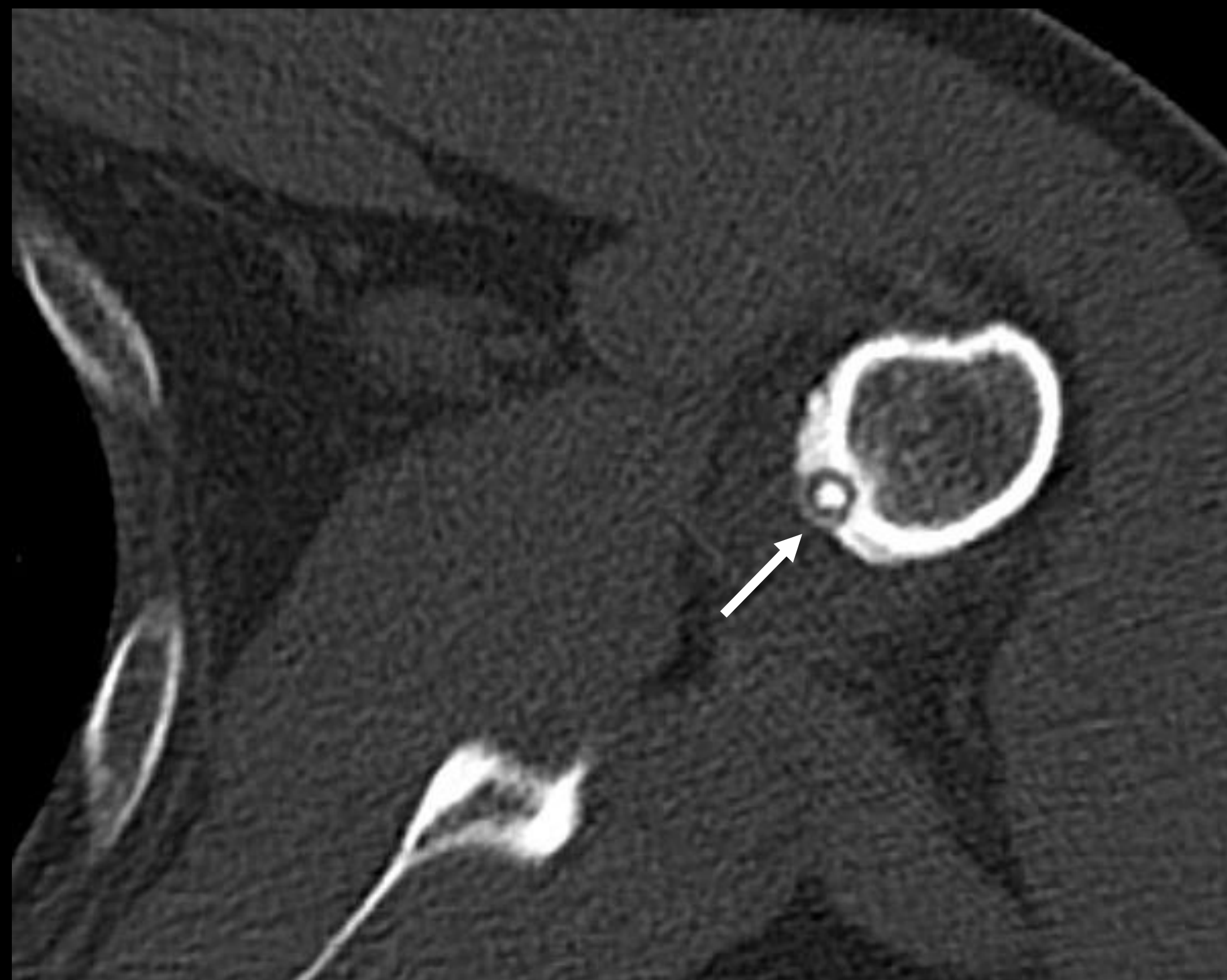
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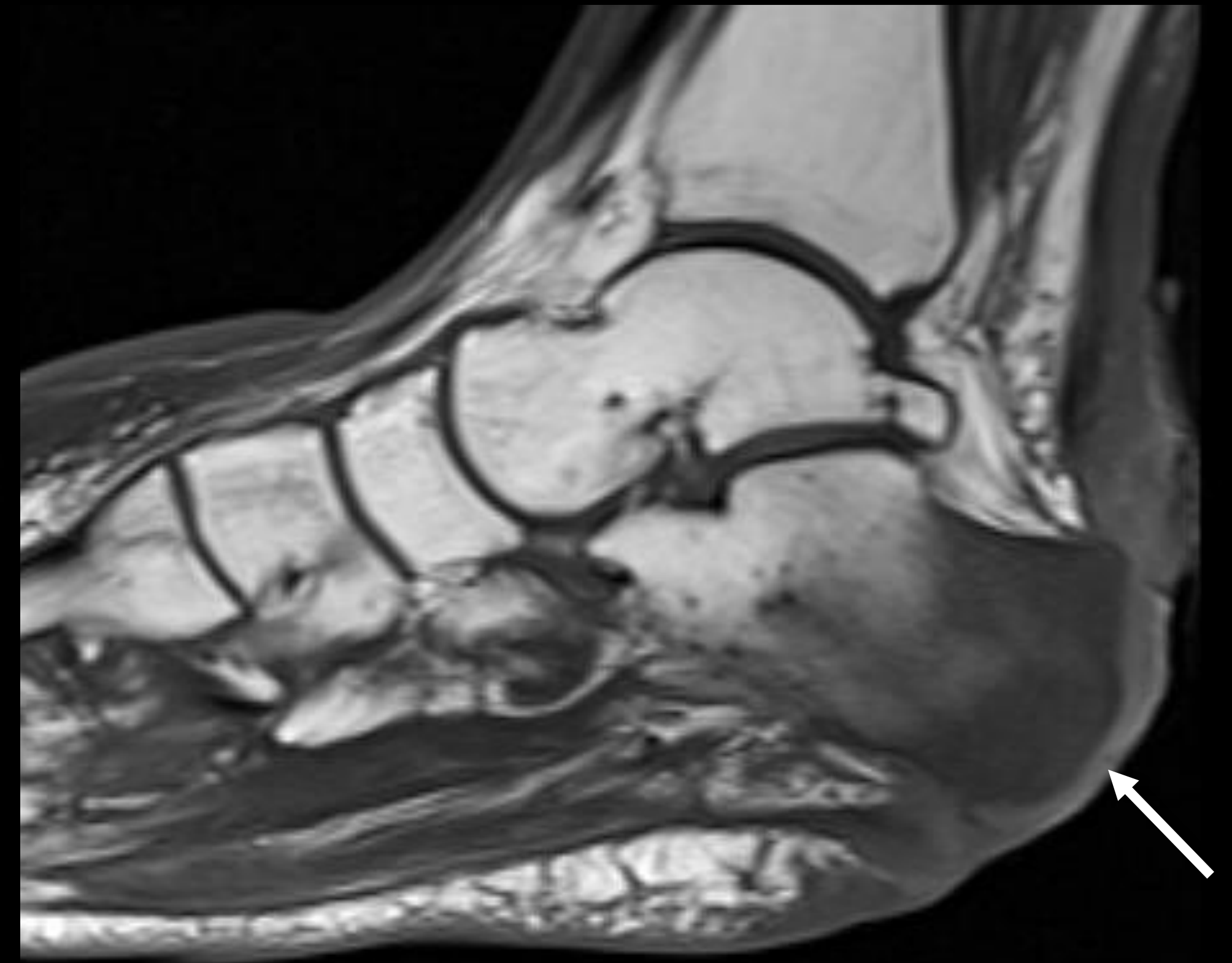
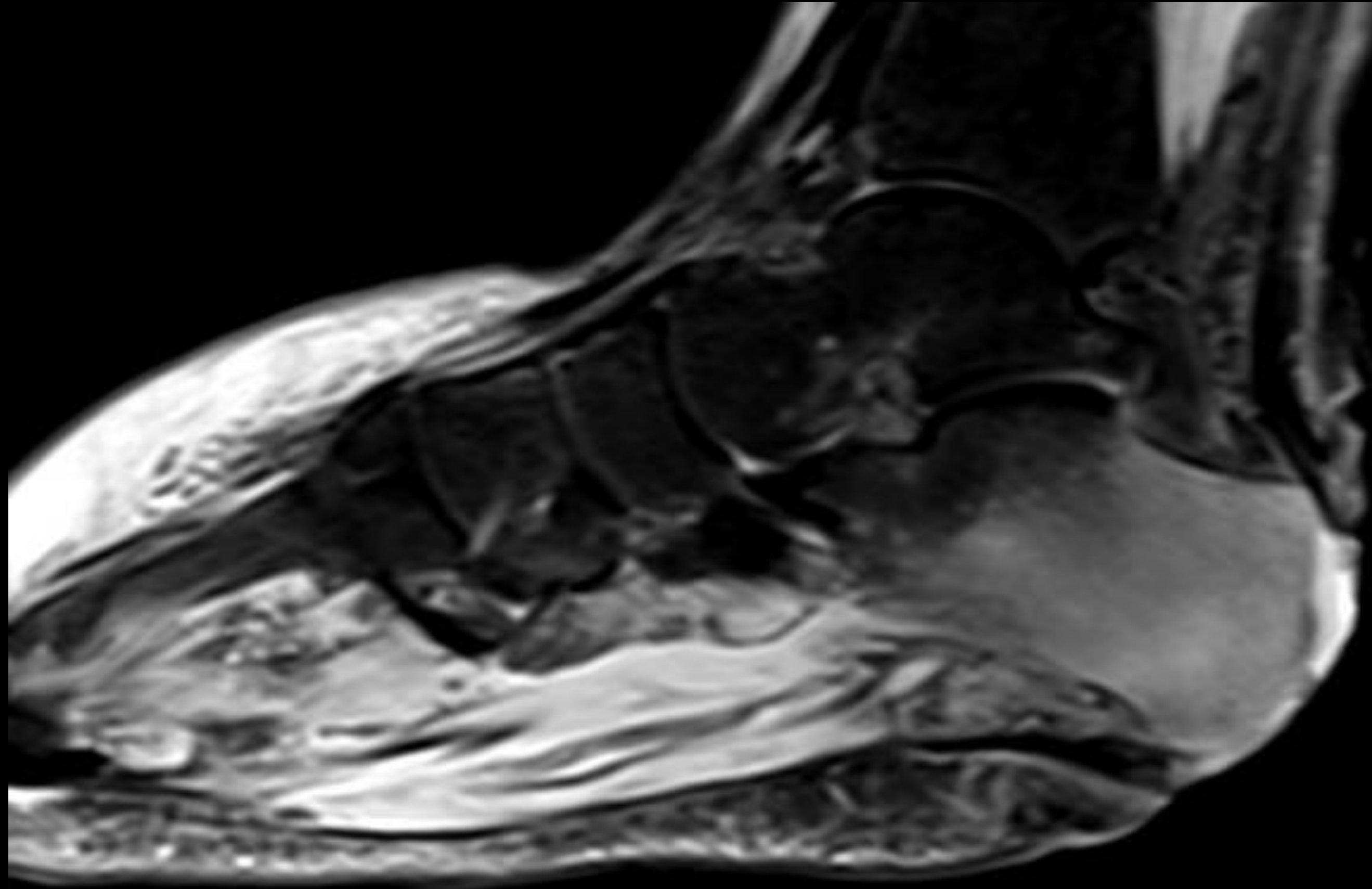
Chronic
Osteomyelitis



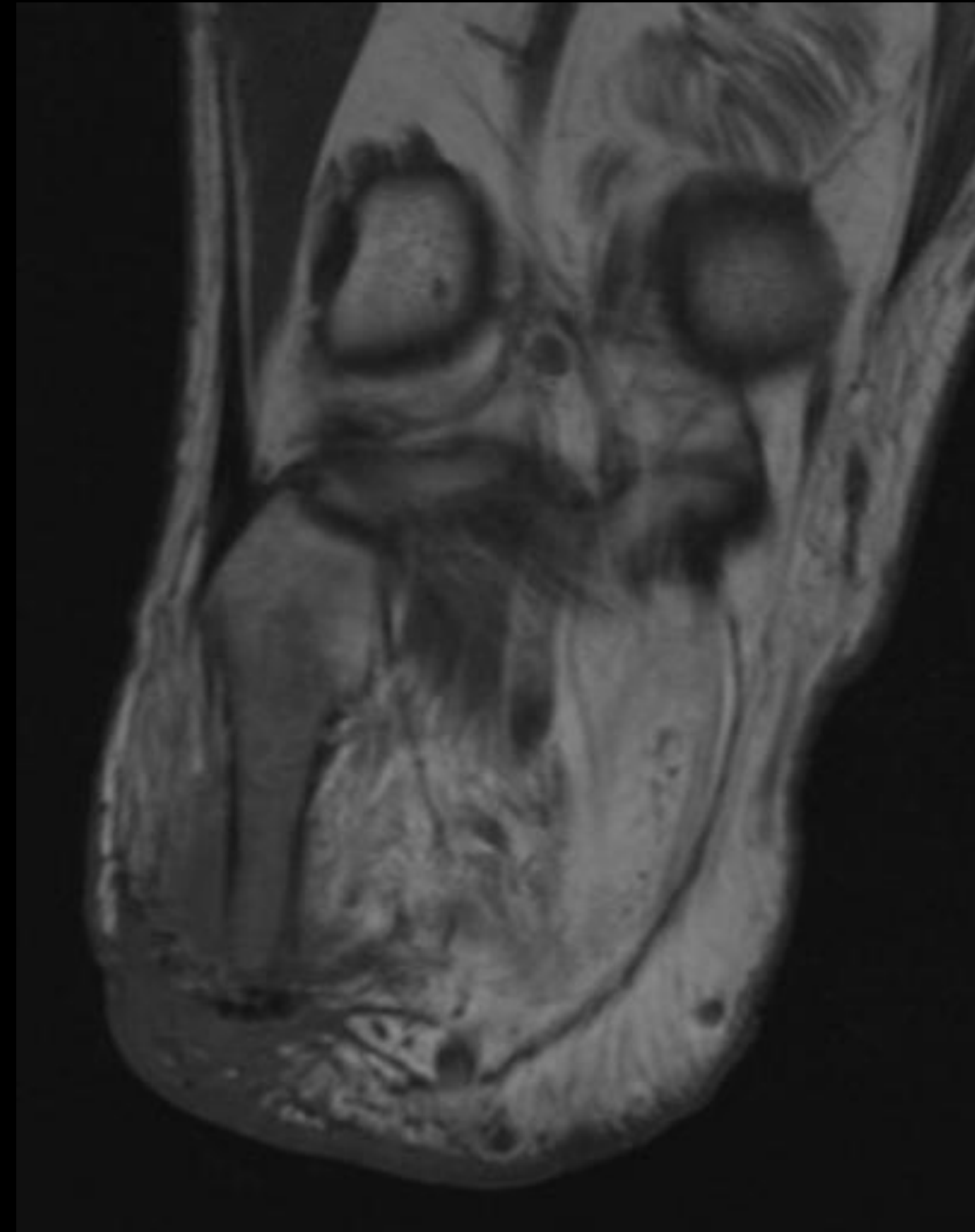
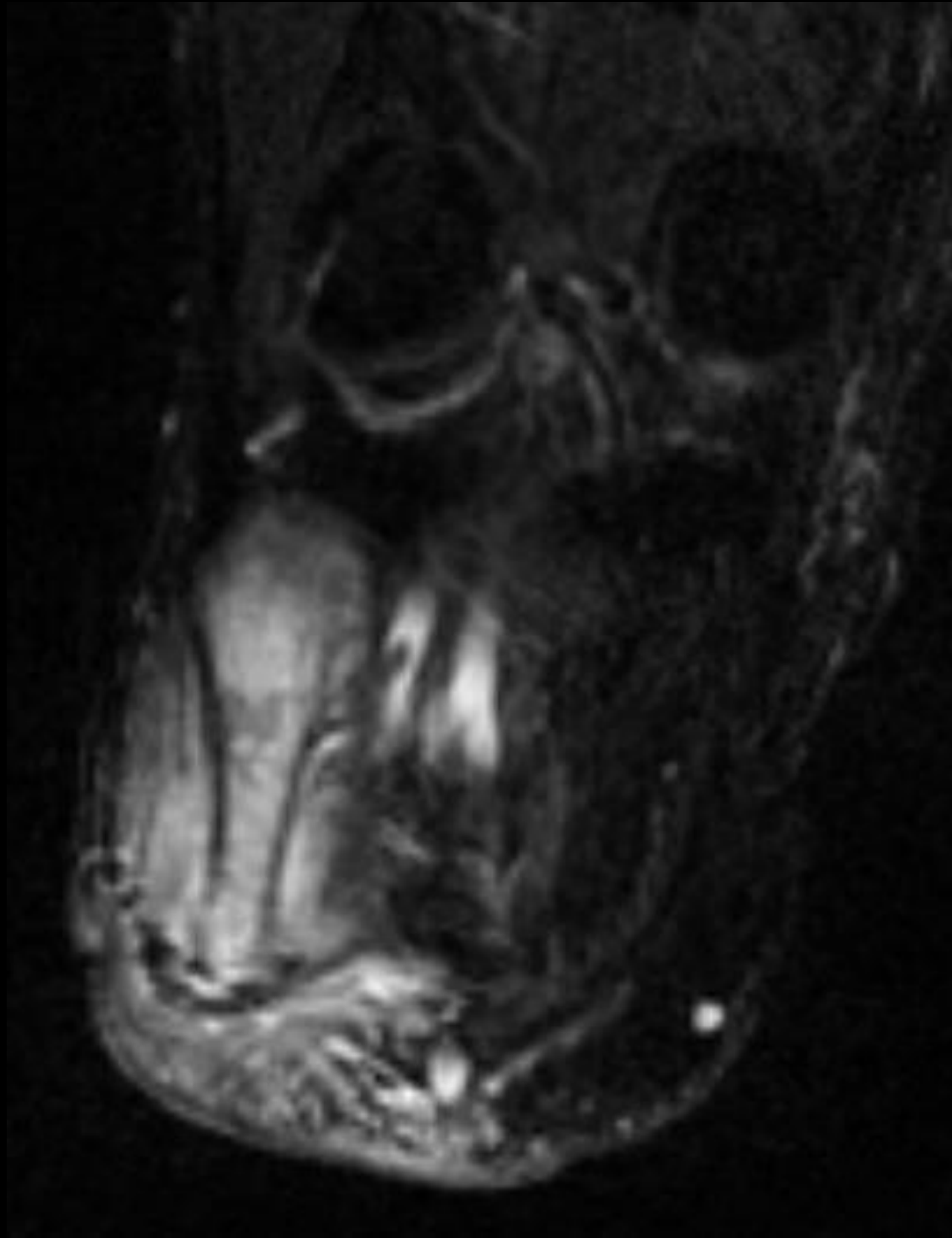
Osteoid Osteoma



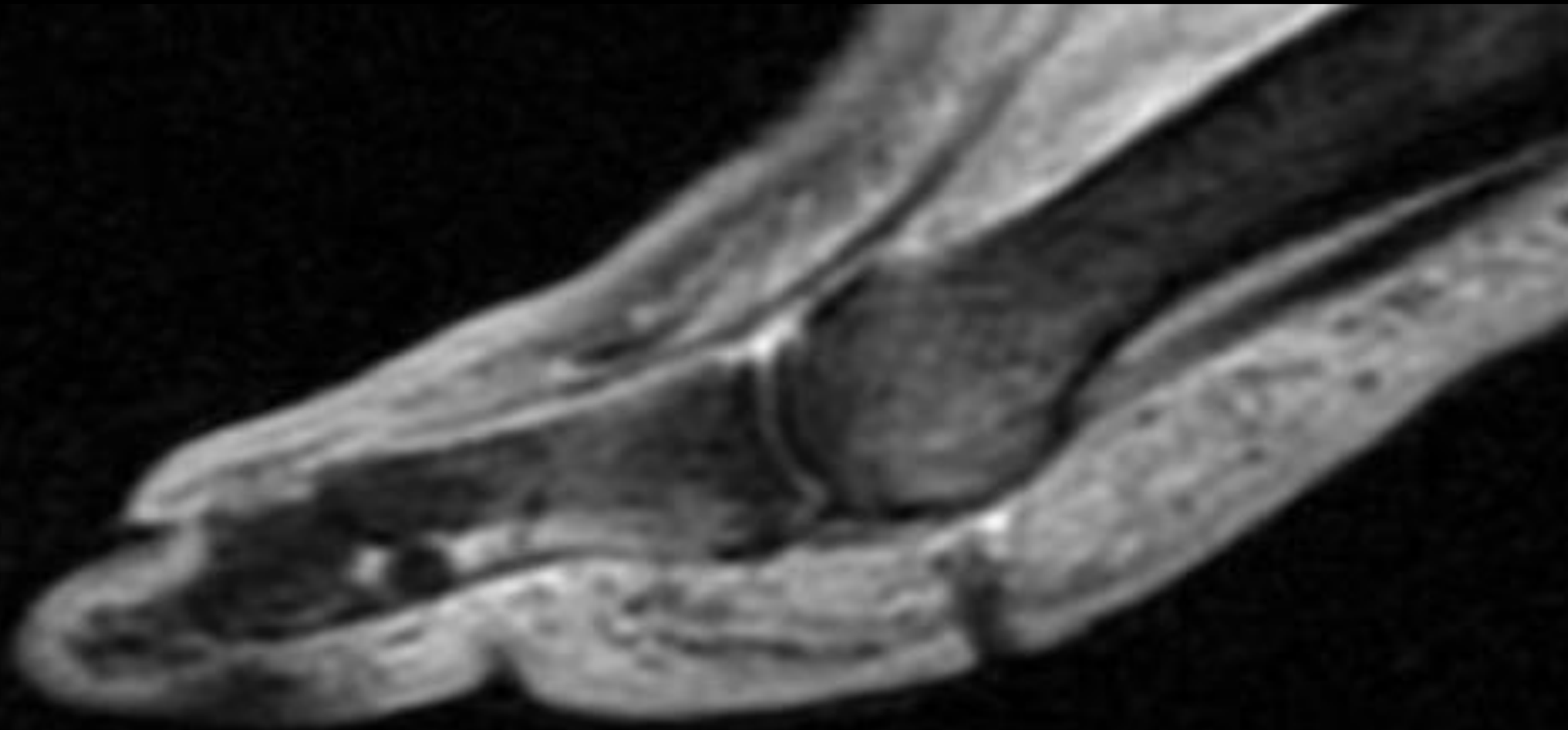
Rule out Osteomyelitis



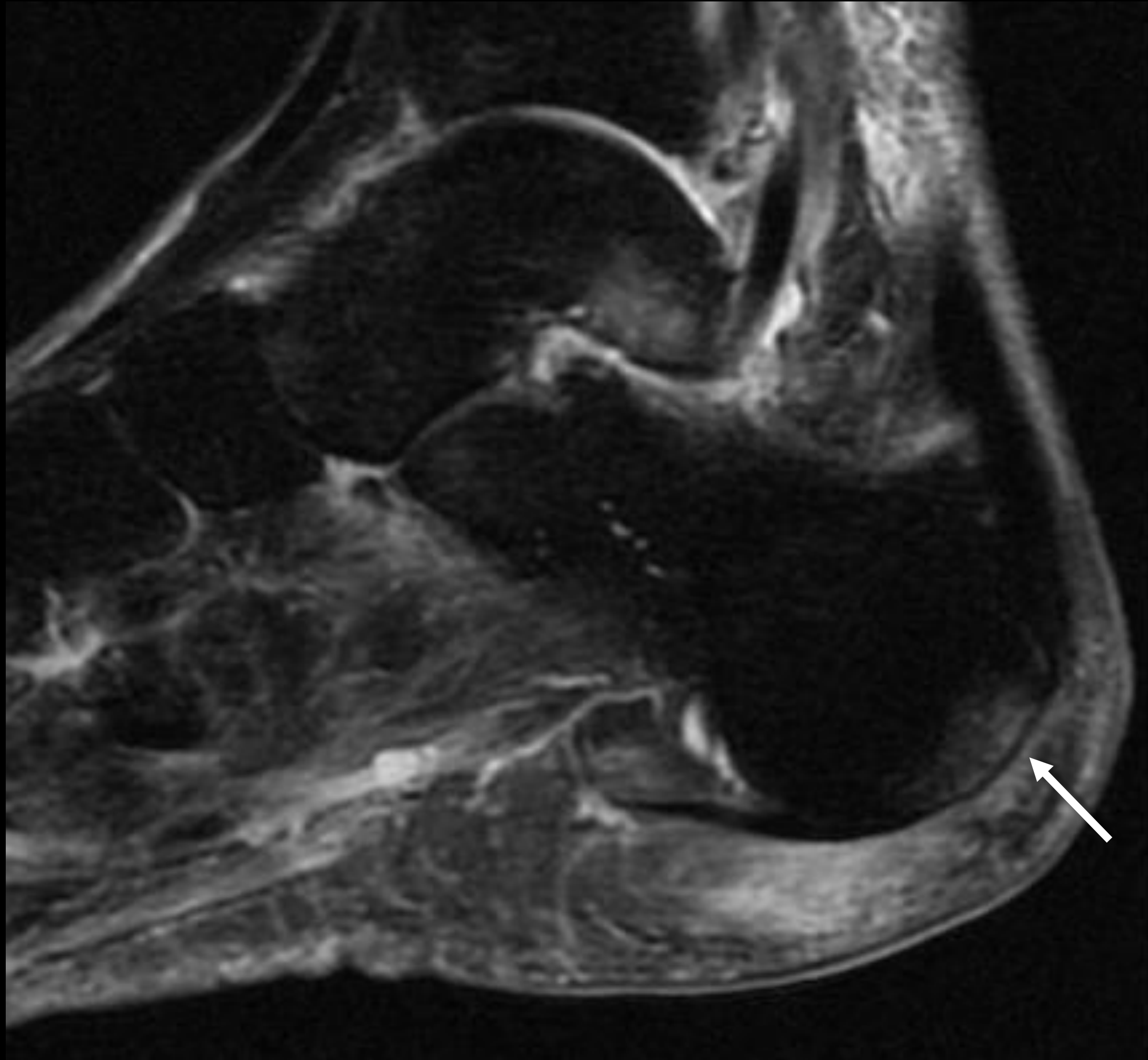
Rule out Osteomyelitis



Rule out Osteomyelitis

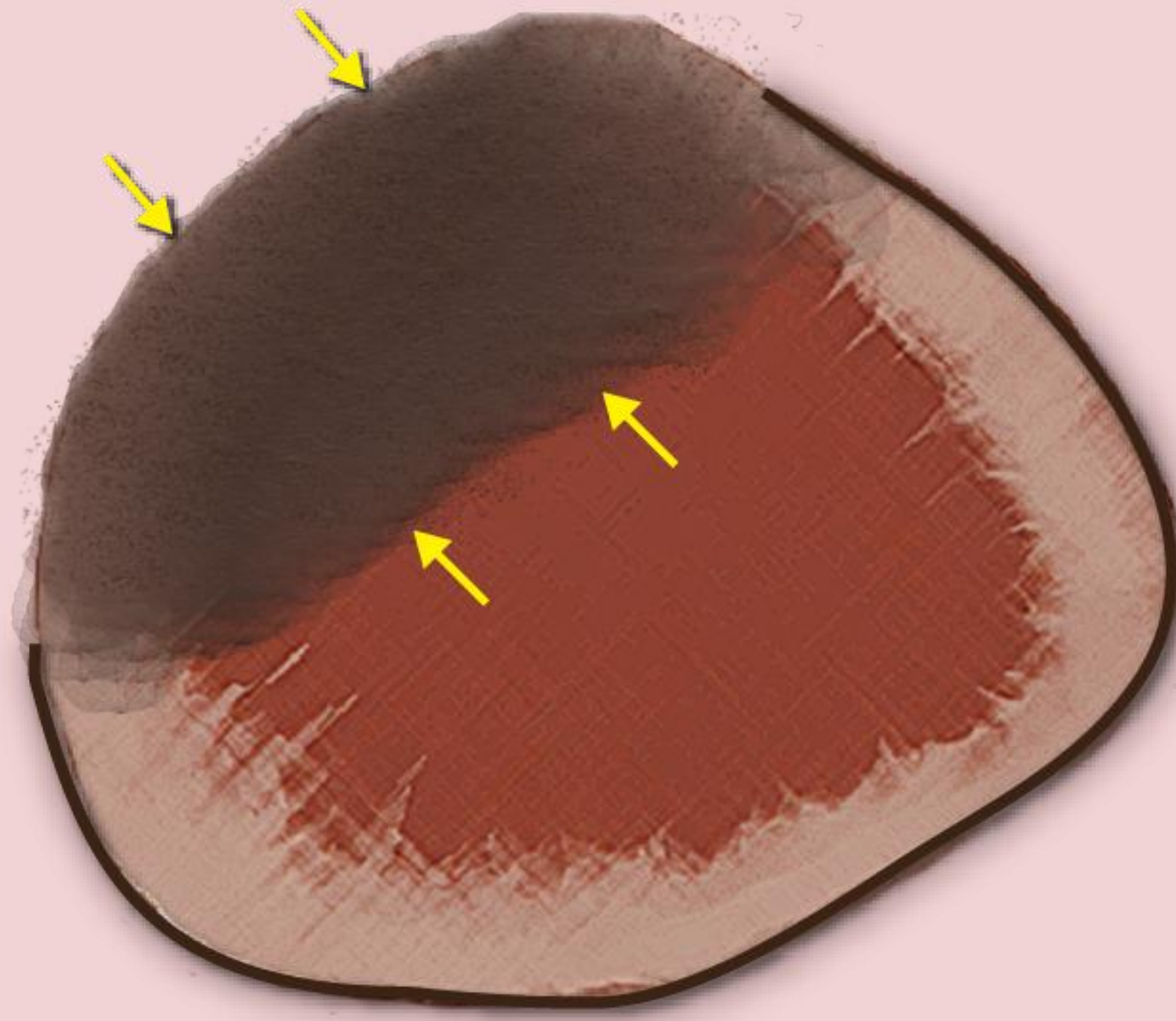


Rule out Osteomyelitis



confluent intramedullary

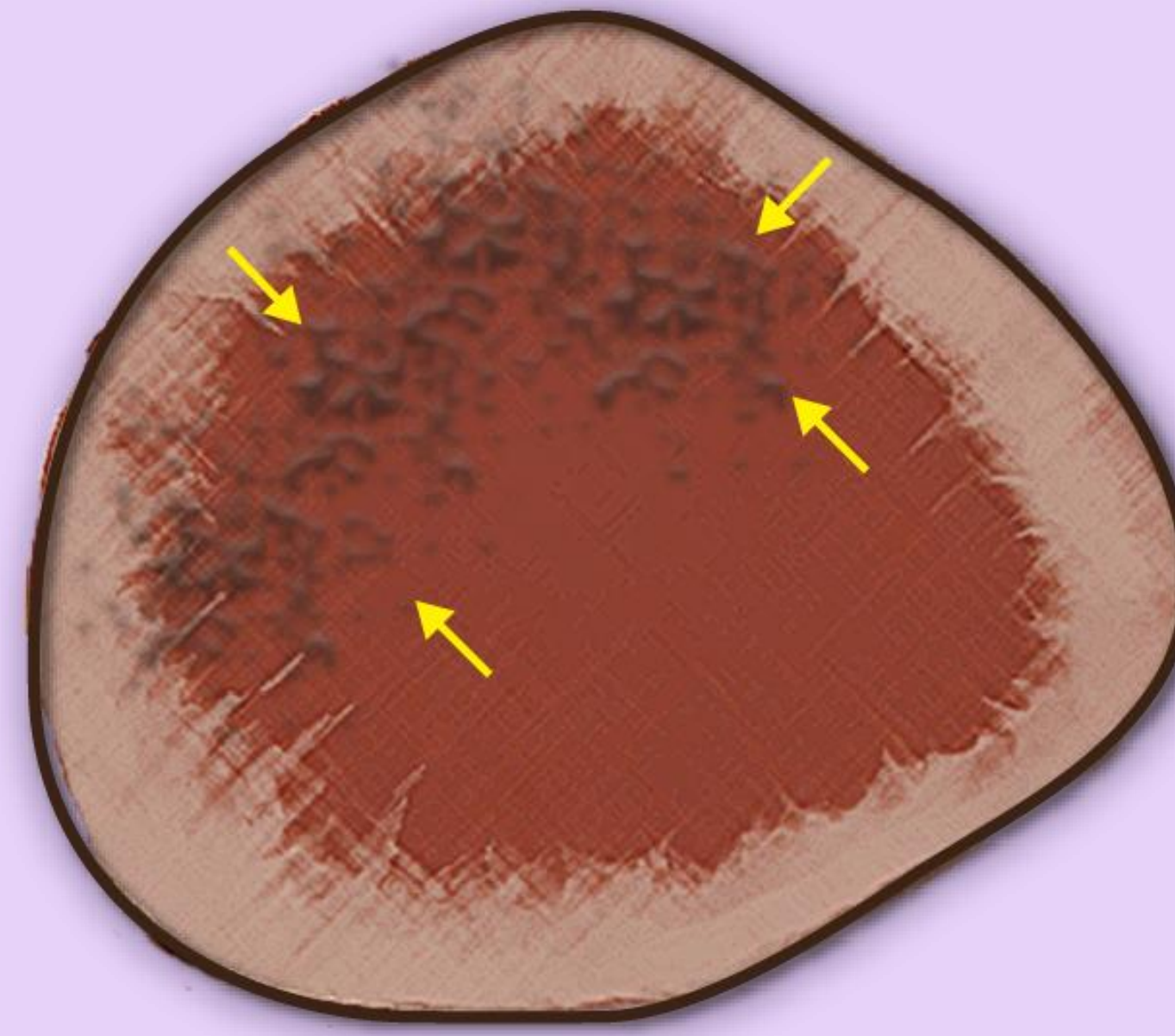
geographic area involving medullary canal



*Associated with osteomyelitis:
sensitivity of 95% and specificity of 91%.*

hazy reticular

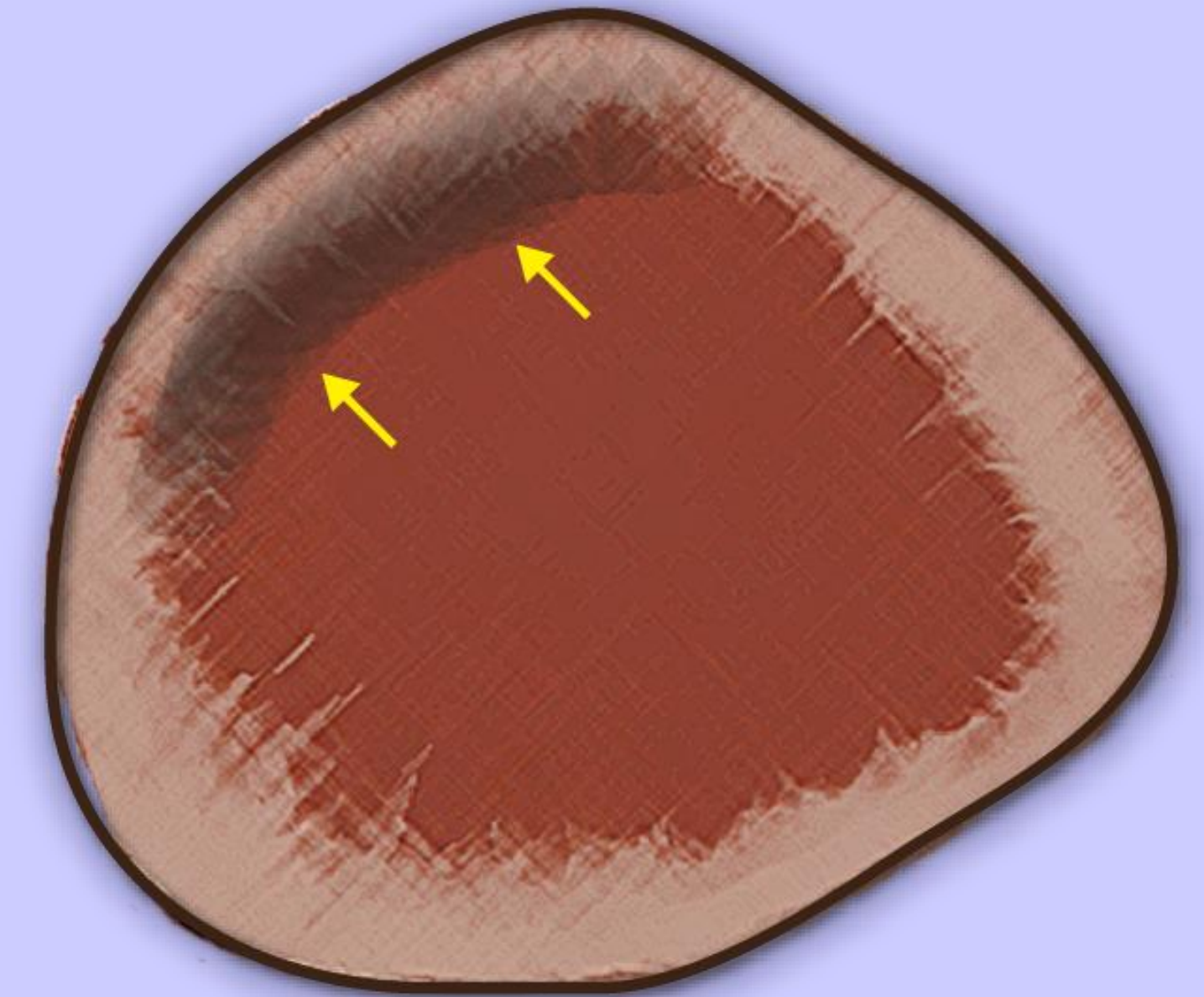
interspersed areas of normal marrow



*Not associated with
contiguous-focus osteomyelitis.
Rarely associated with
hematogenous osteomyelitis.*

subcortical

limited to thin linear region
subjacent to cortex



Not associated with osteomyelitis.

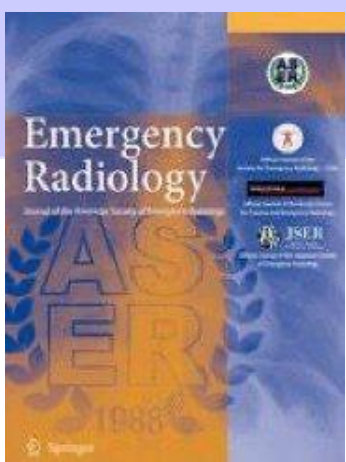
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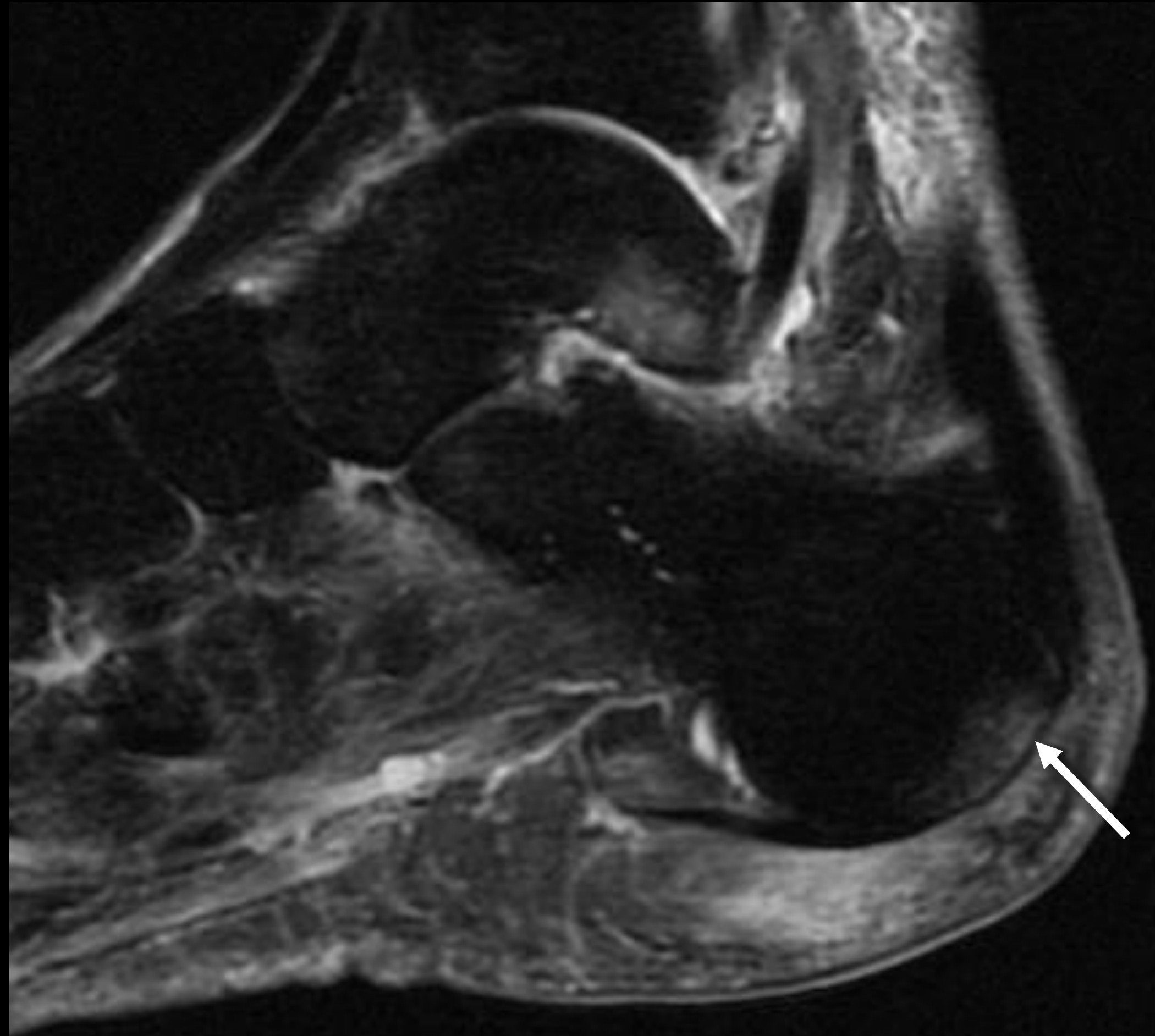
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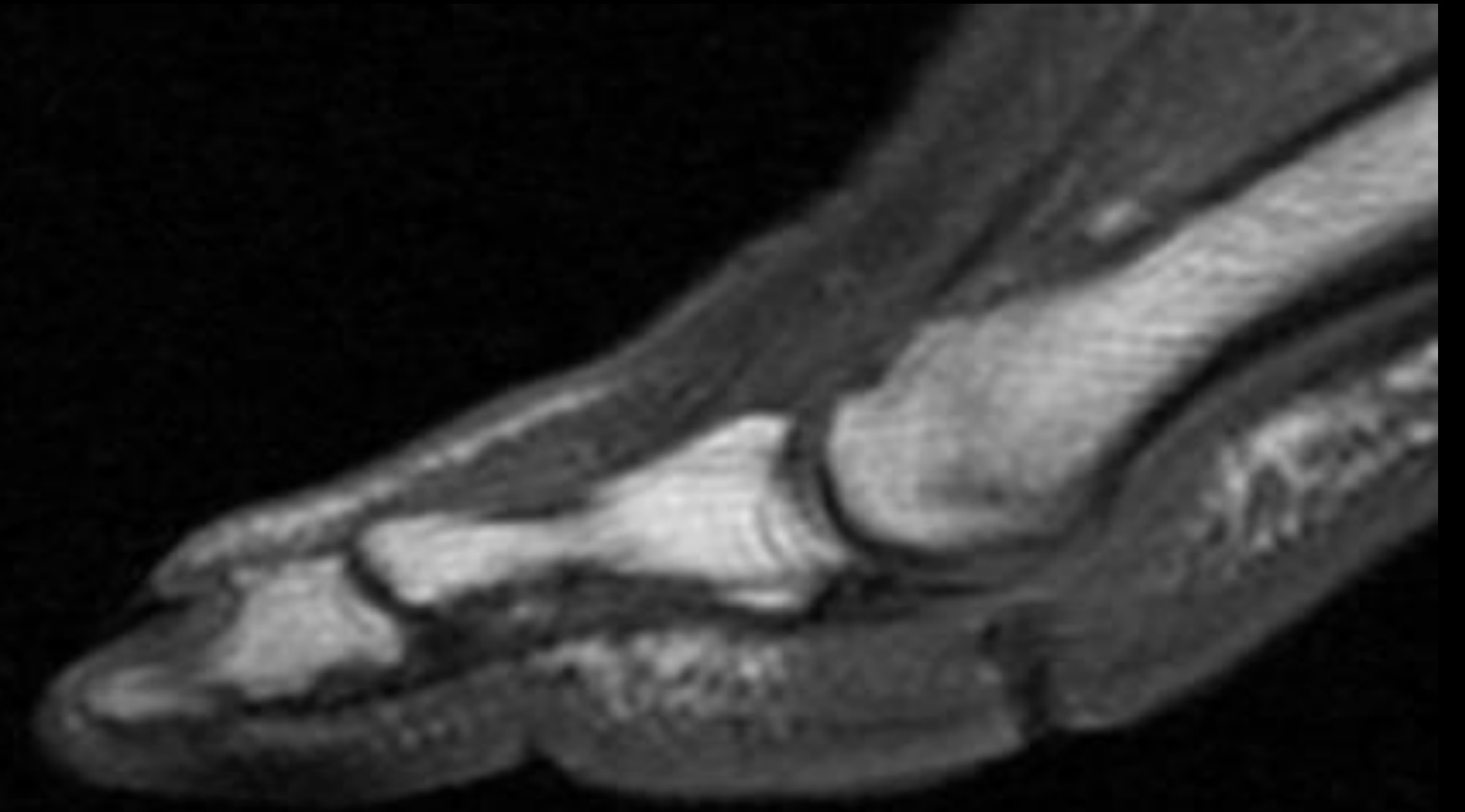
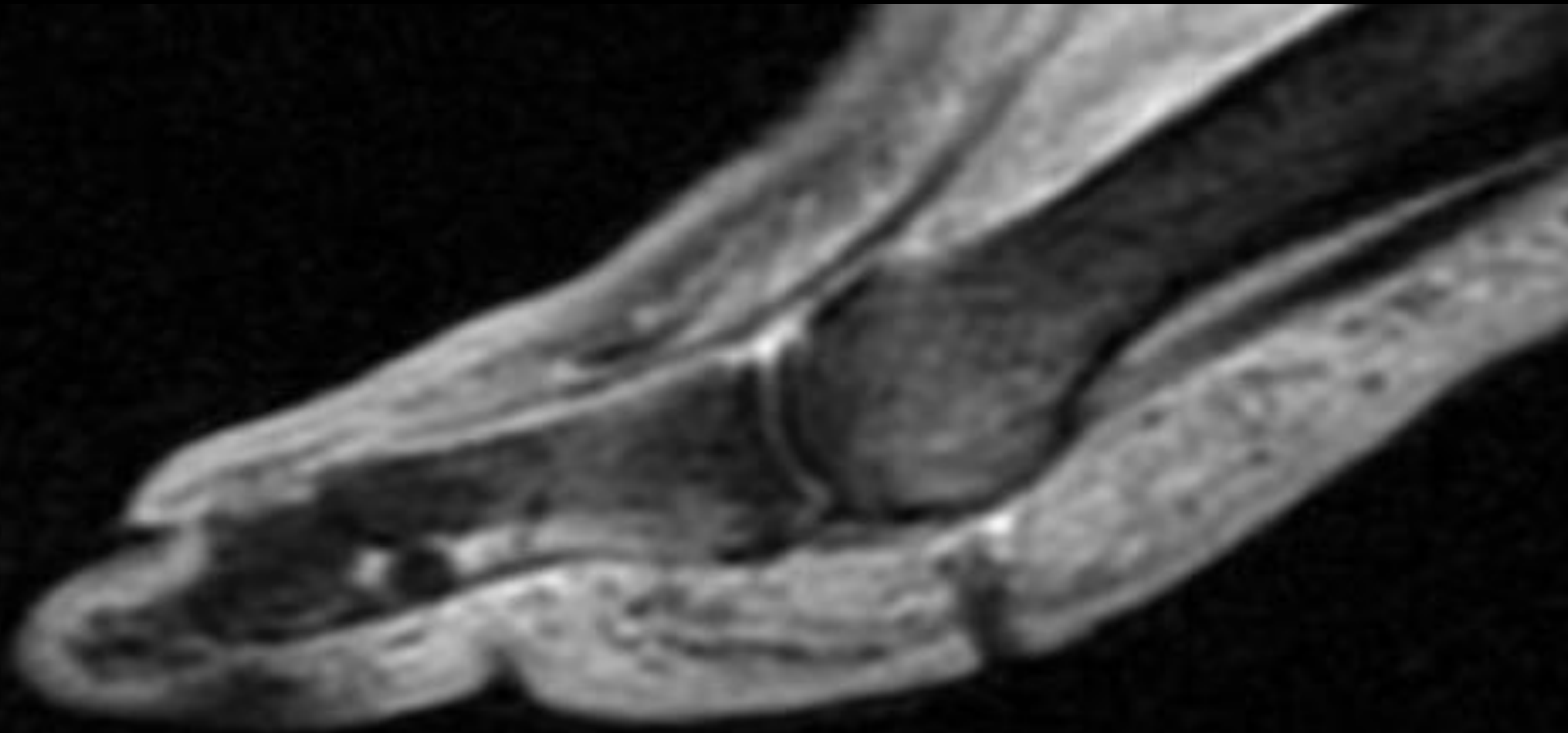
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Varand Ghazikhanian¹ • Stacy E. Smith¹



Subcortical



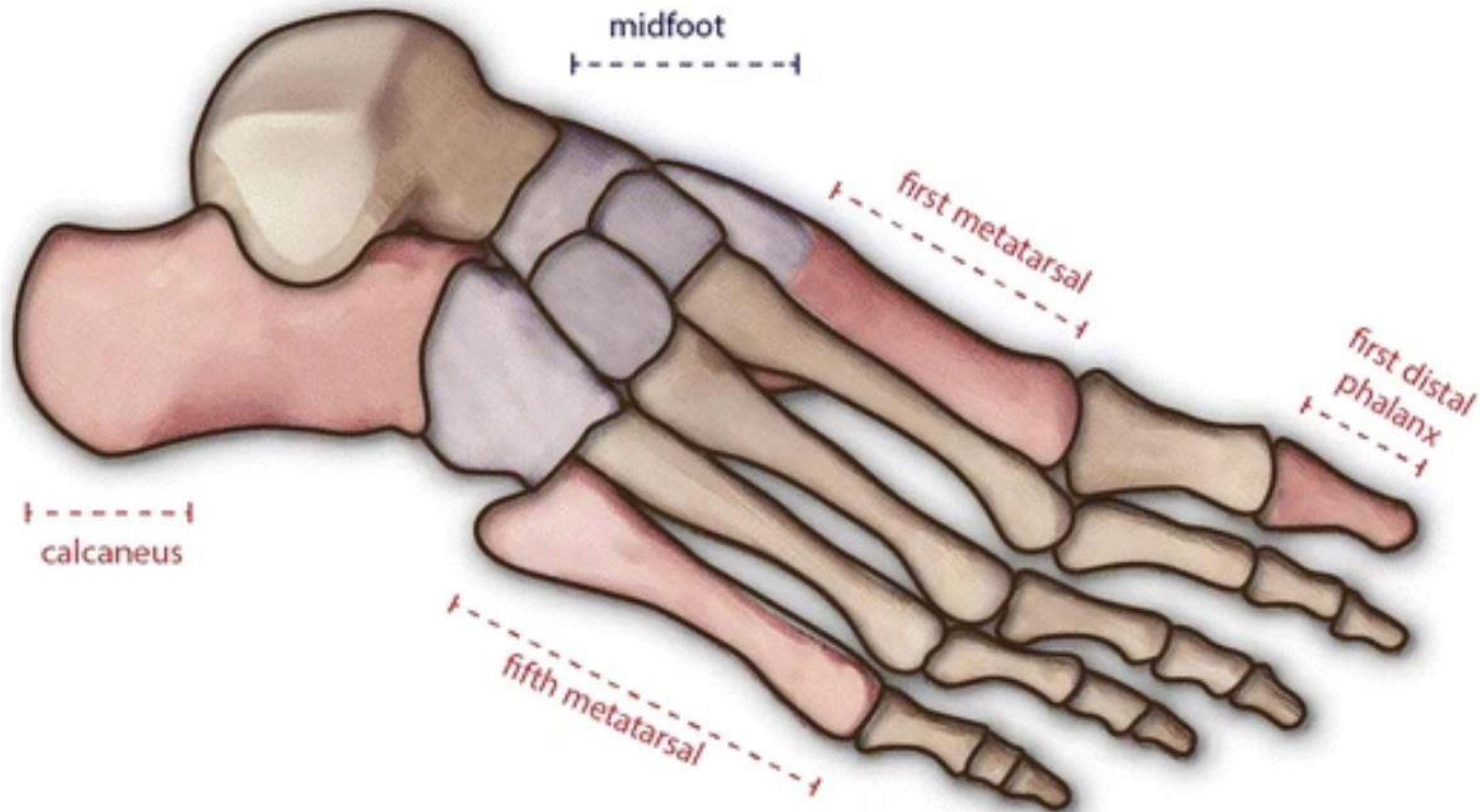
Hazy Reticular



Signal change adjacent to an ulcer: Be careful!

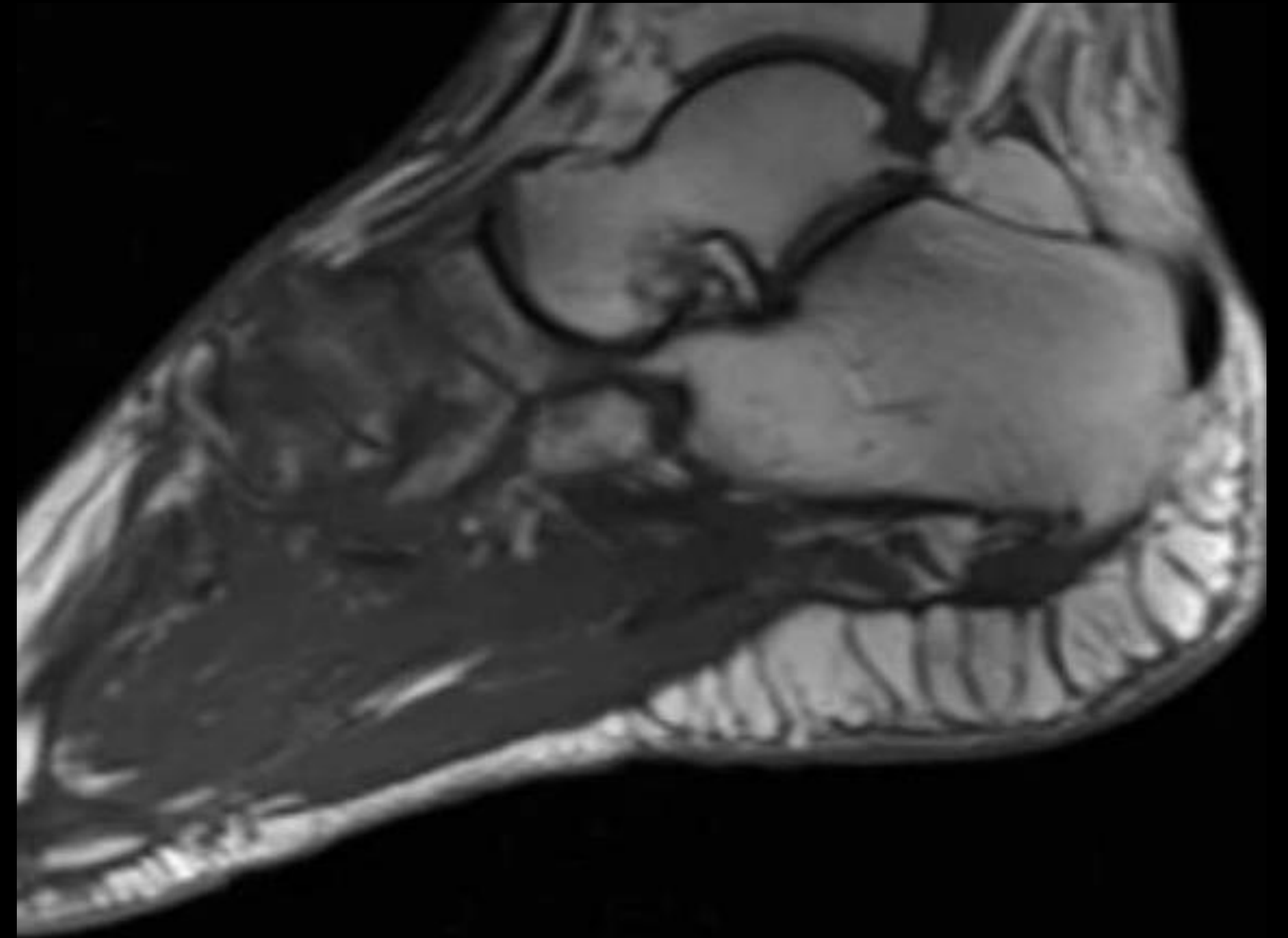
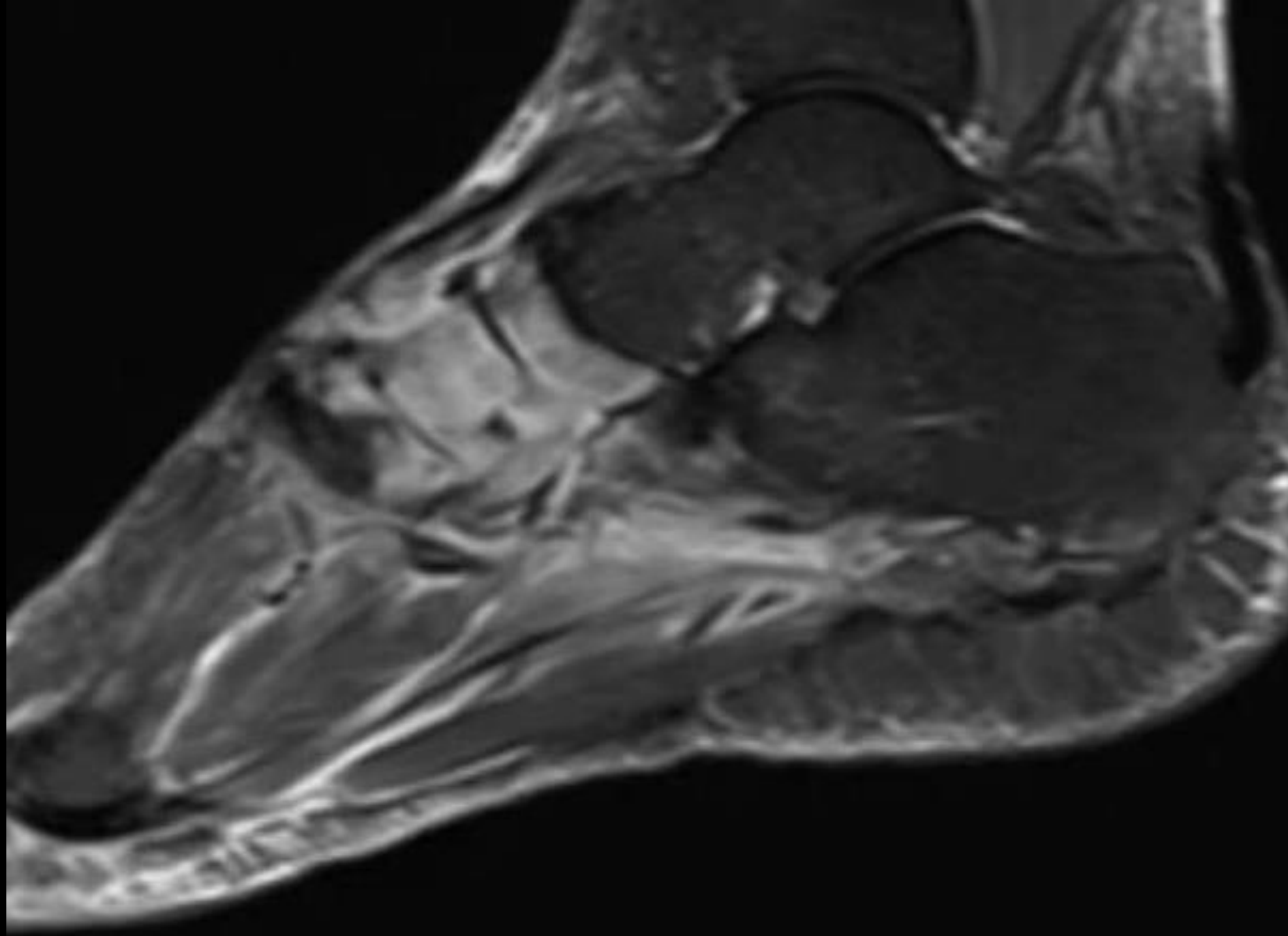
61% with T2-only signal change **sub**adjacent to an **ulcer** eventually diagnosed with osteomyelitis

Neuropathic Arthropathy and Osteomyelitis

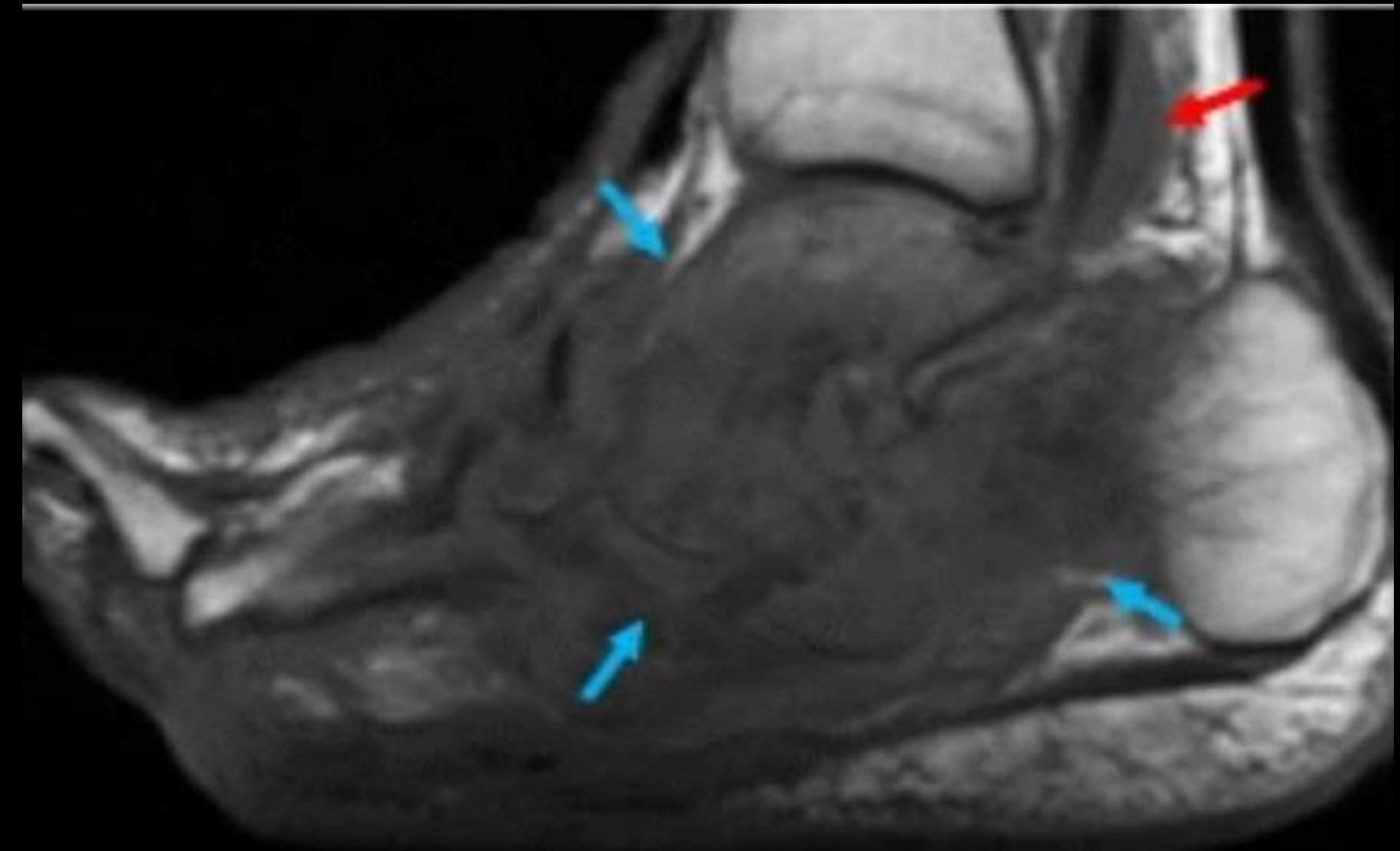
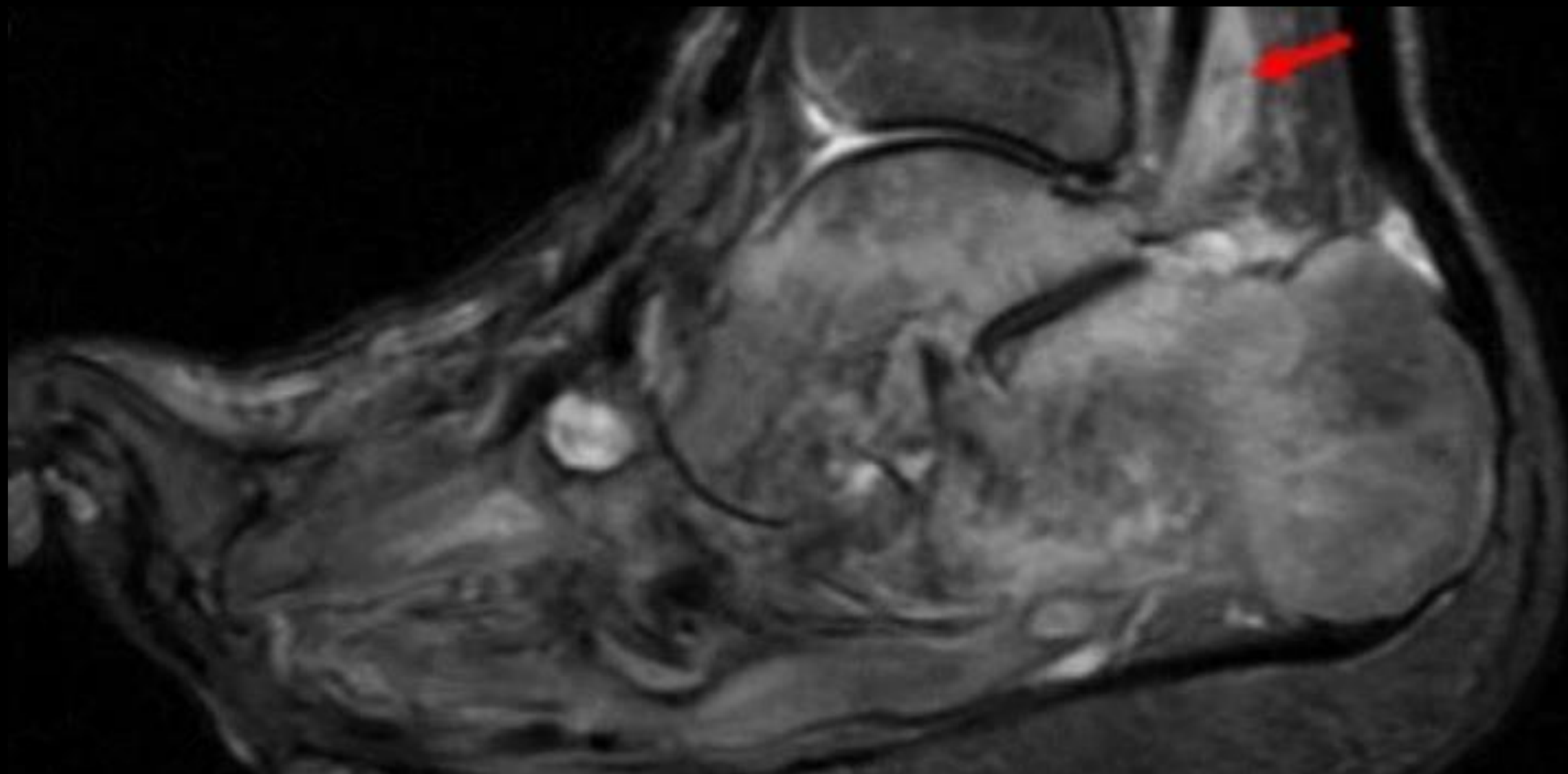


The **calcaneus**, **first** and **fifth metatarsals**, and **first distal phalanx** are the four most common sites of pedal **osteomyelitis**. Charcot arthropathy predominantly involves the midfoot.

Rule out Osteomyelitis



Rule out Osteomyelitis



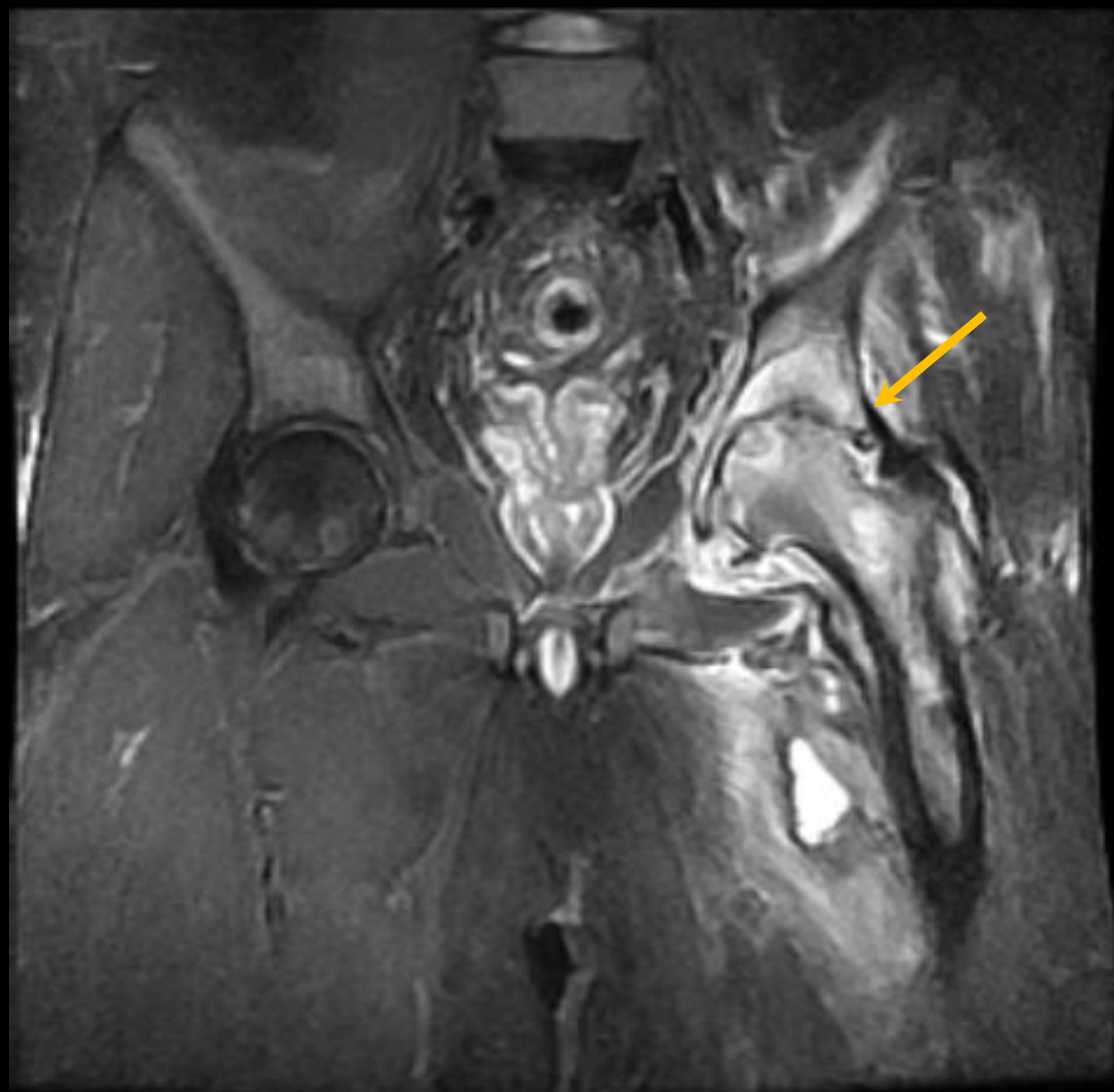
35-year-old with left hip pain

Septic Arthritis



- May be present even in the absence of fever, white count, or other system signs of infection
- Rapid destruction mediated by host inflammatory response and synovial ischemia
- Cartilage destruction in 3 days

Septic Arthritis

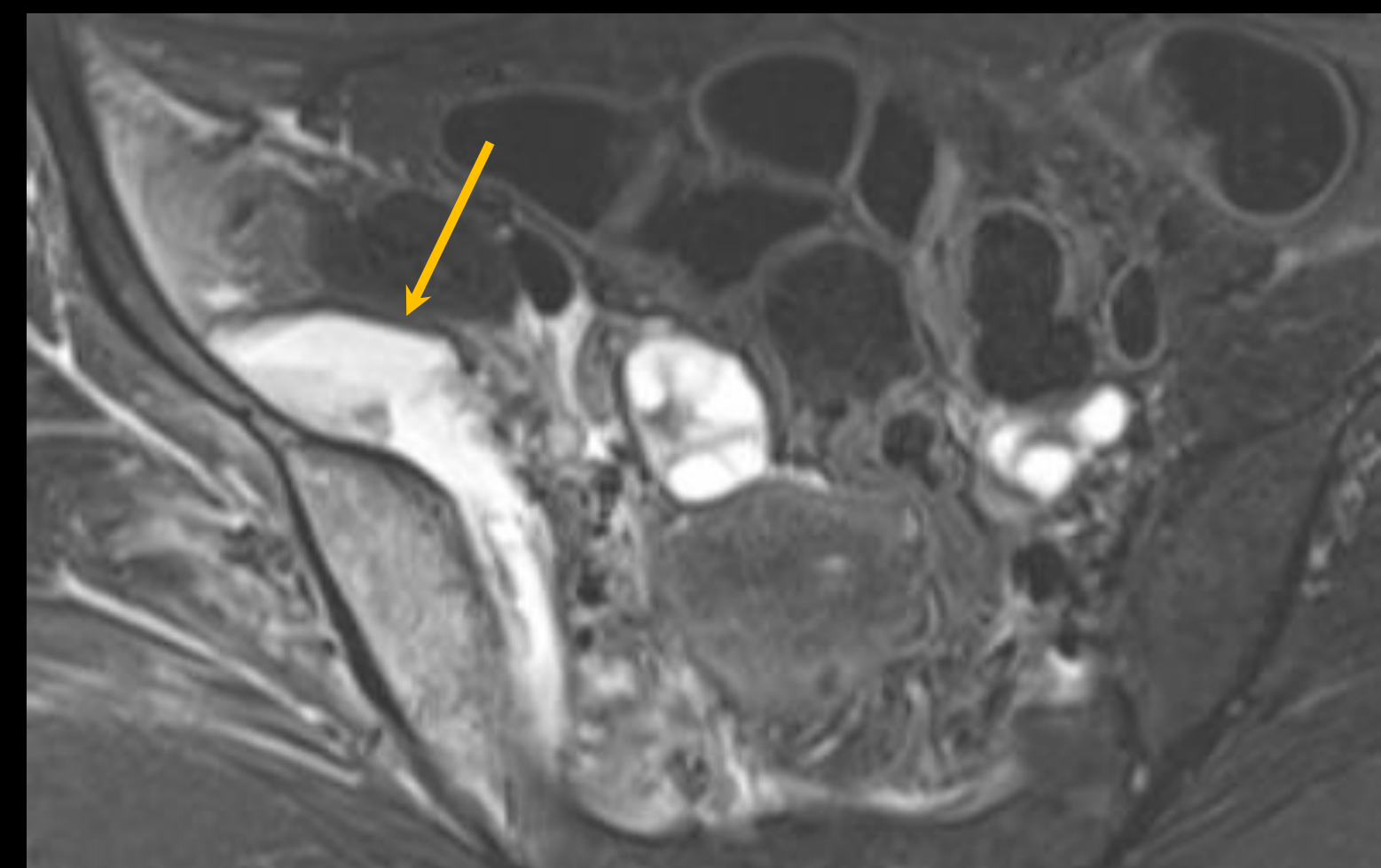
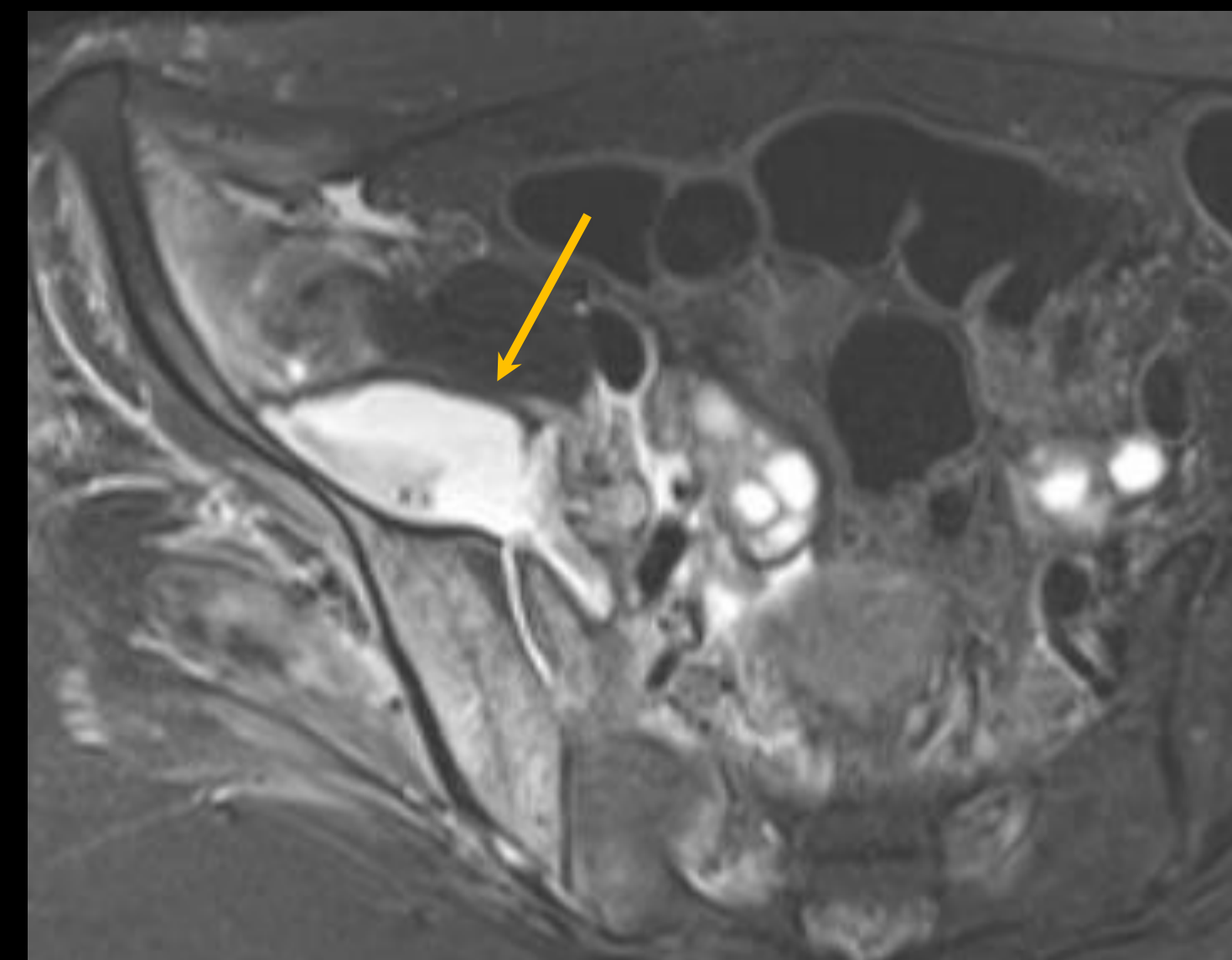
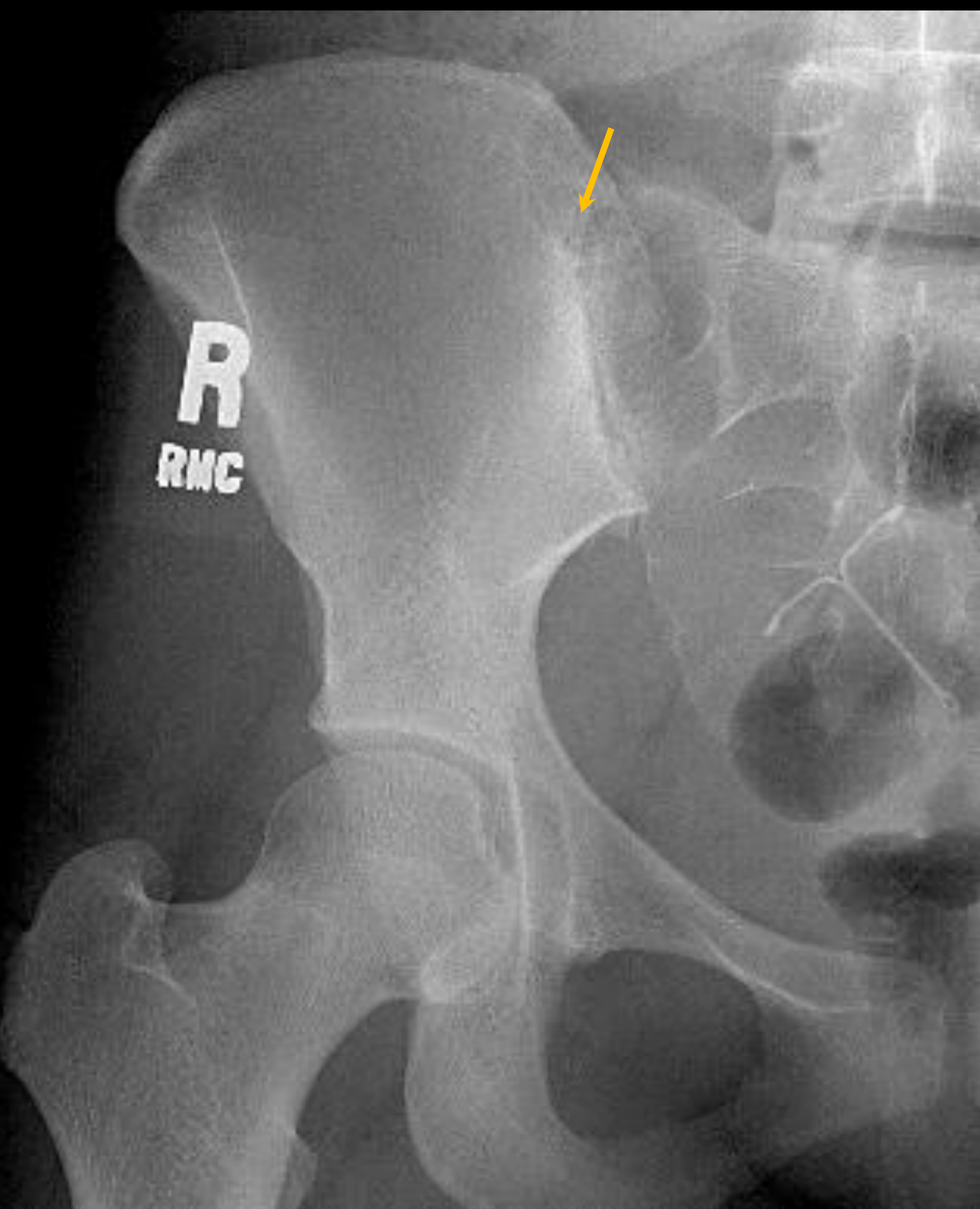


STIR Cor

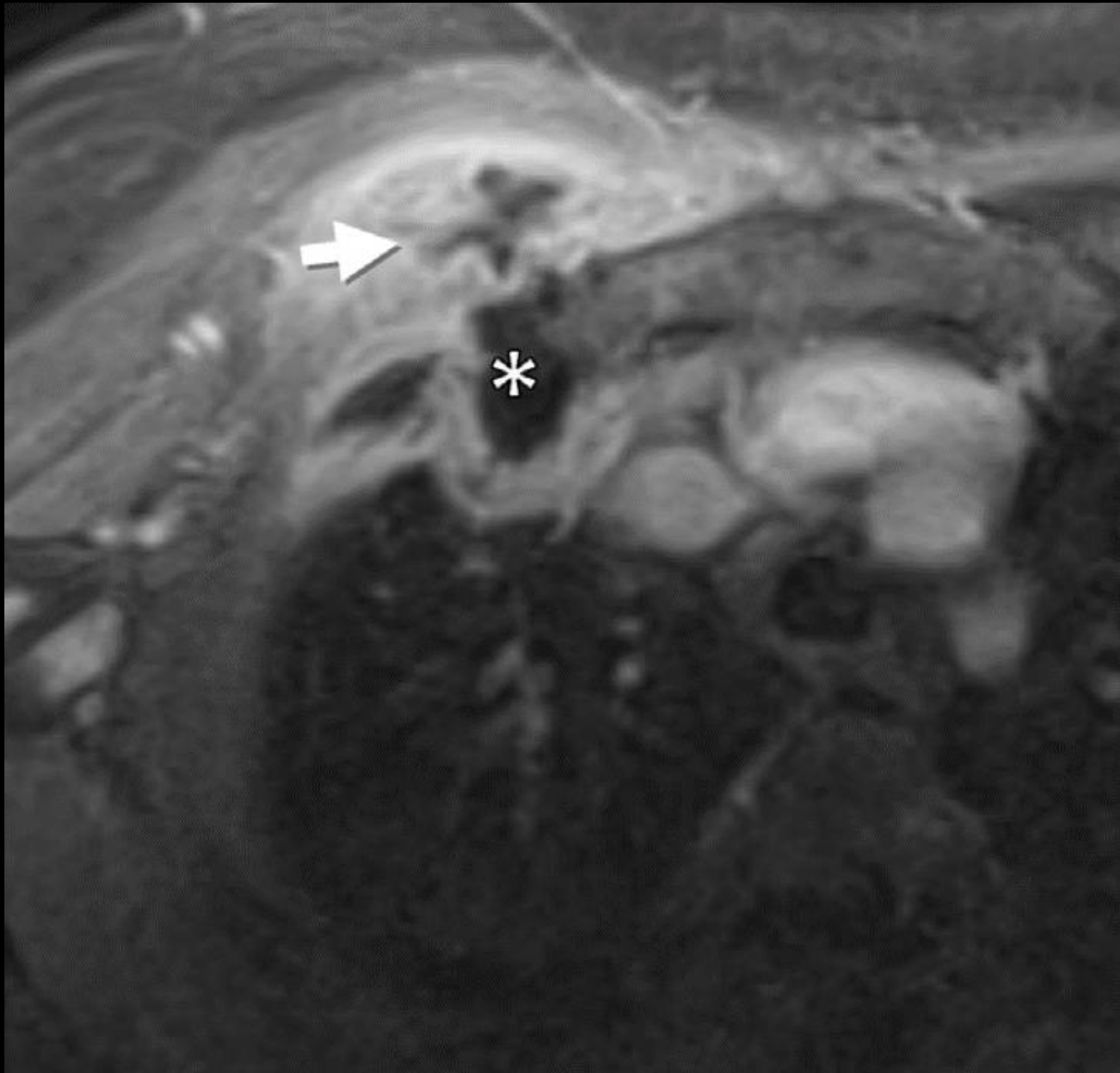


T1 Cor

27-year-old with right hip pain



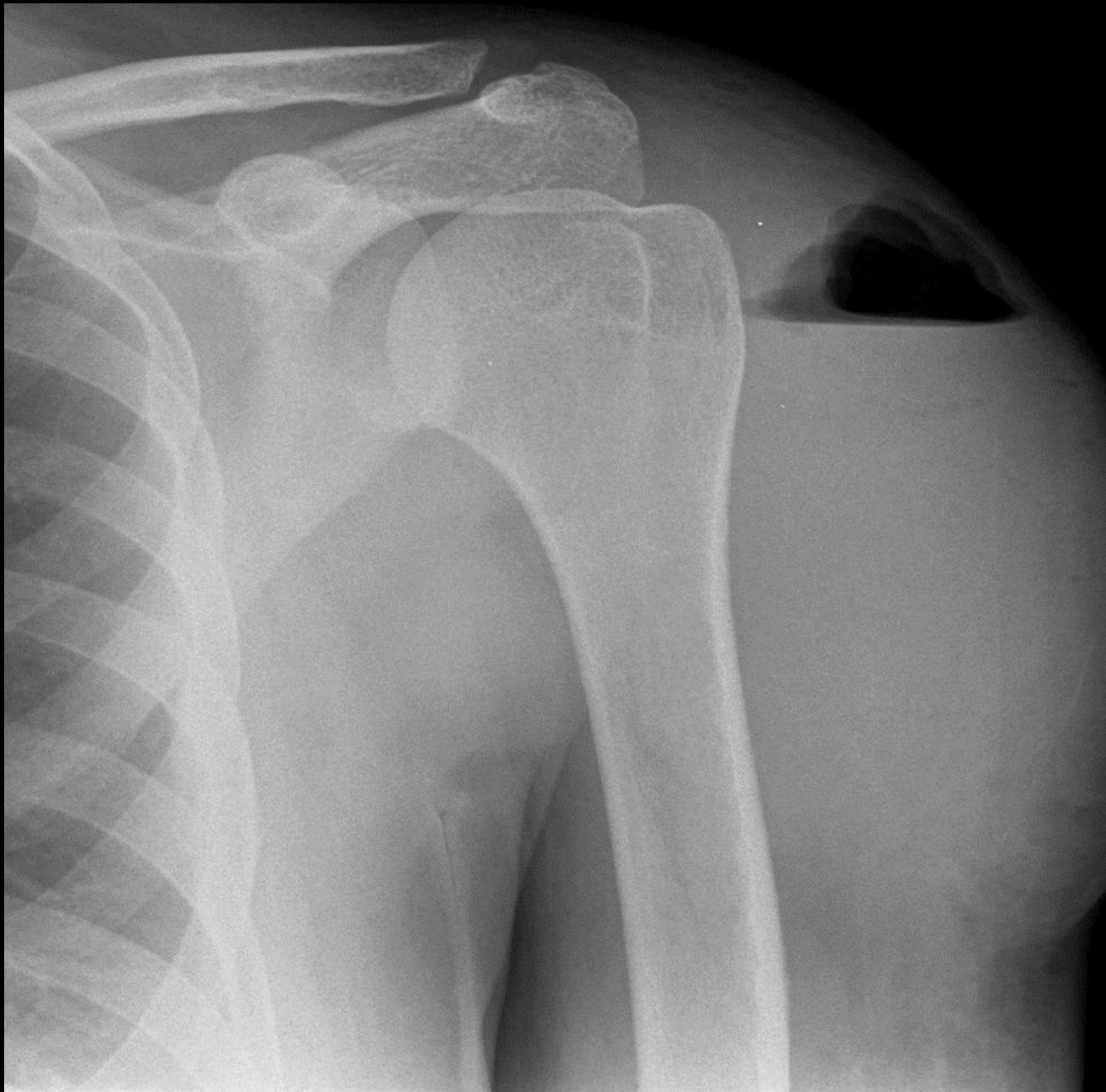
Costo-sternal septic arthritis



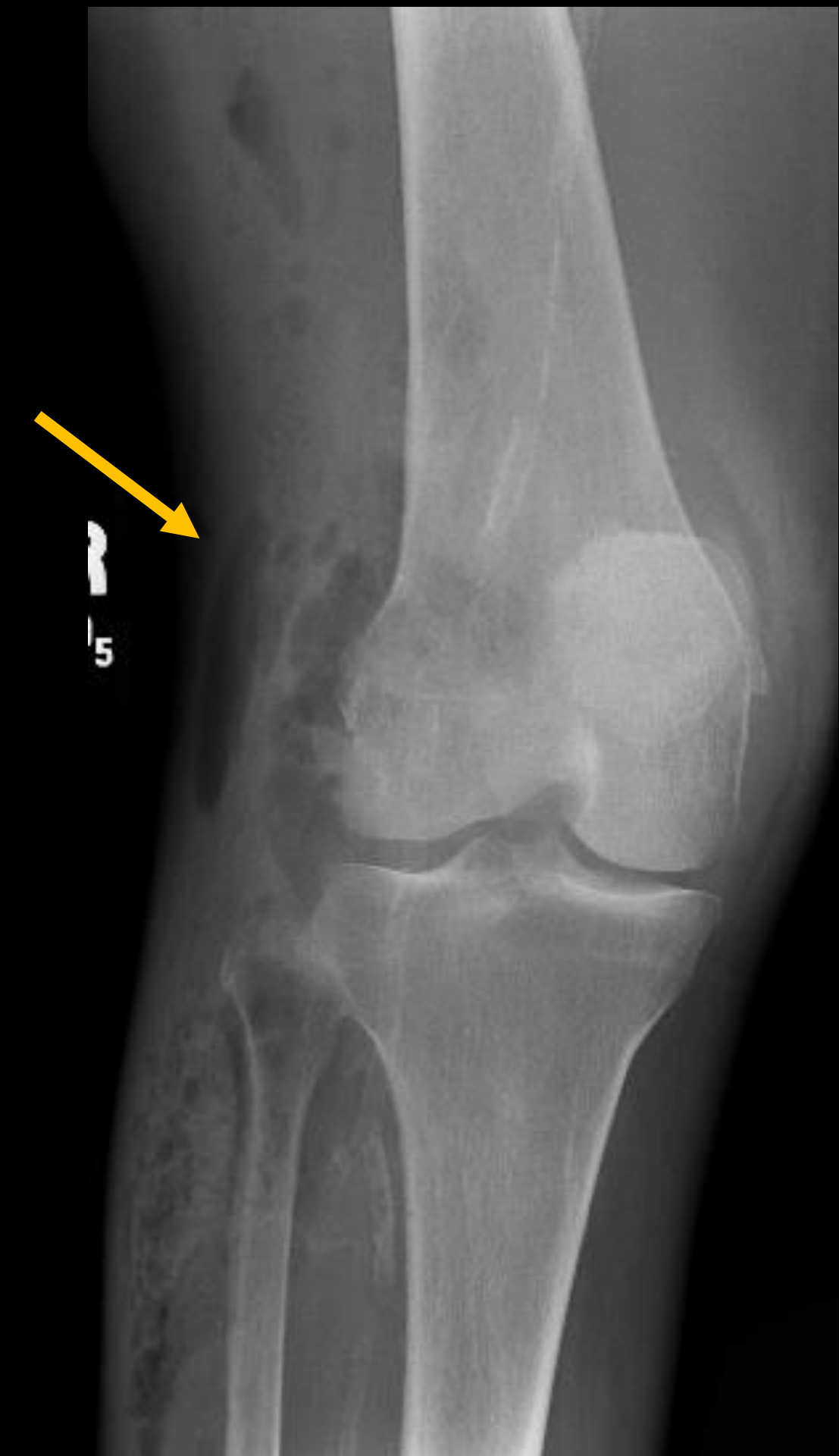
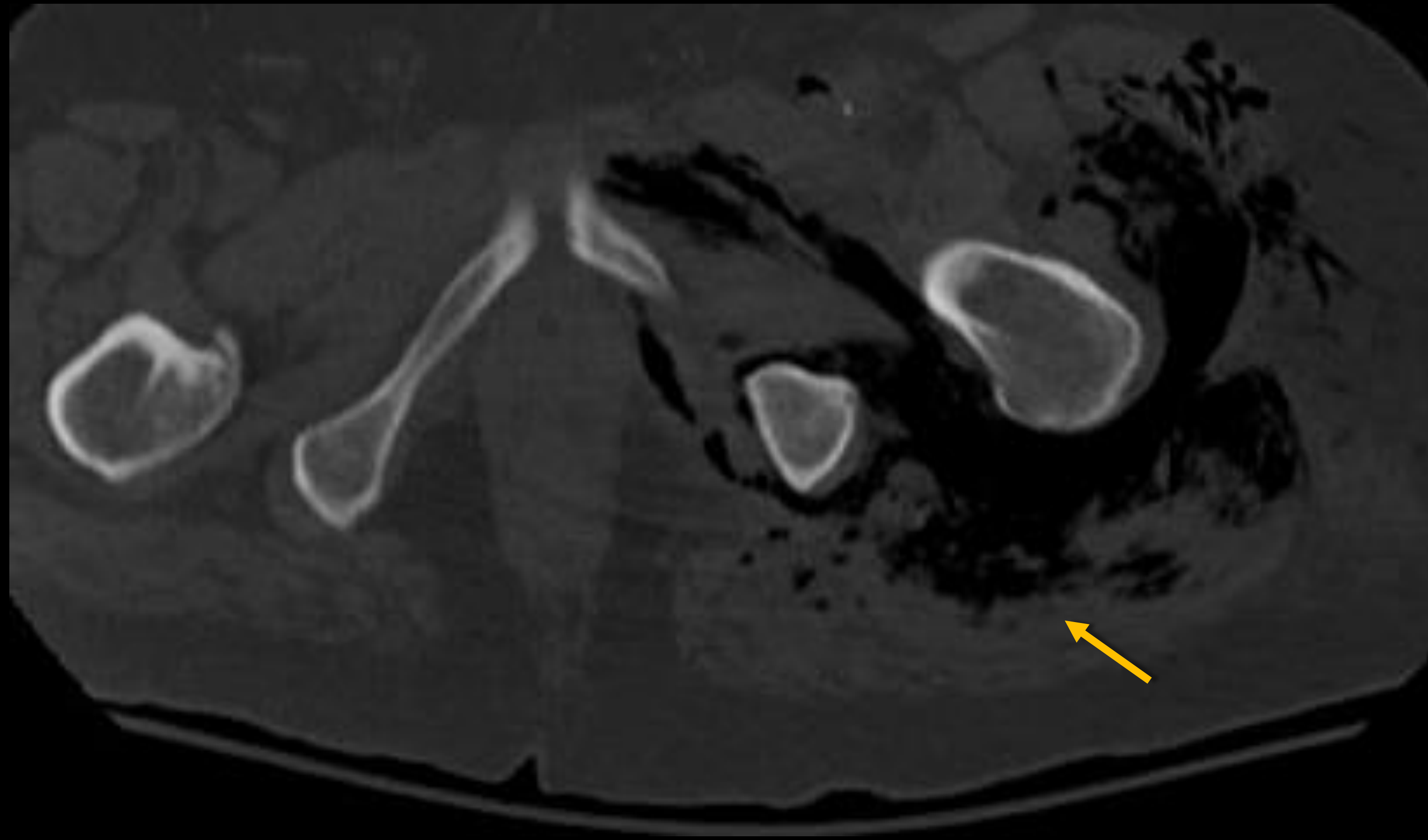
29-year-old with hand pain



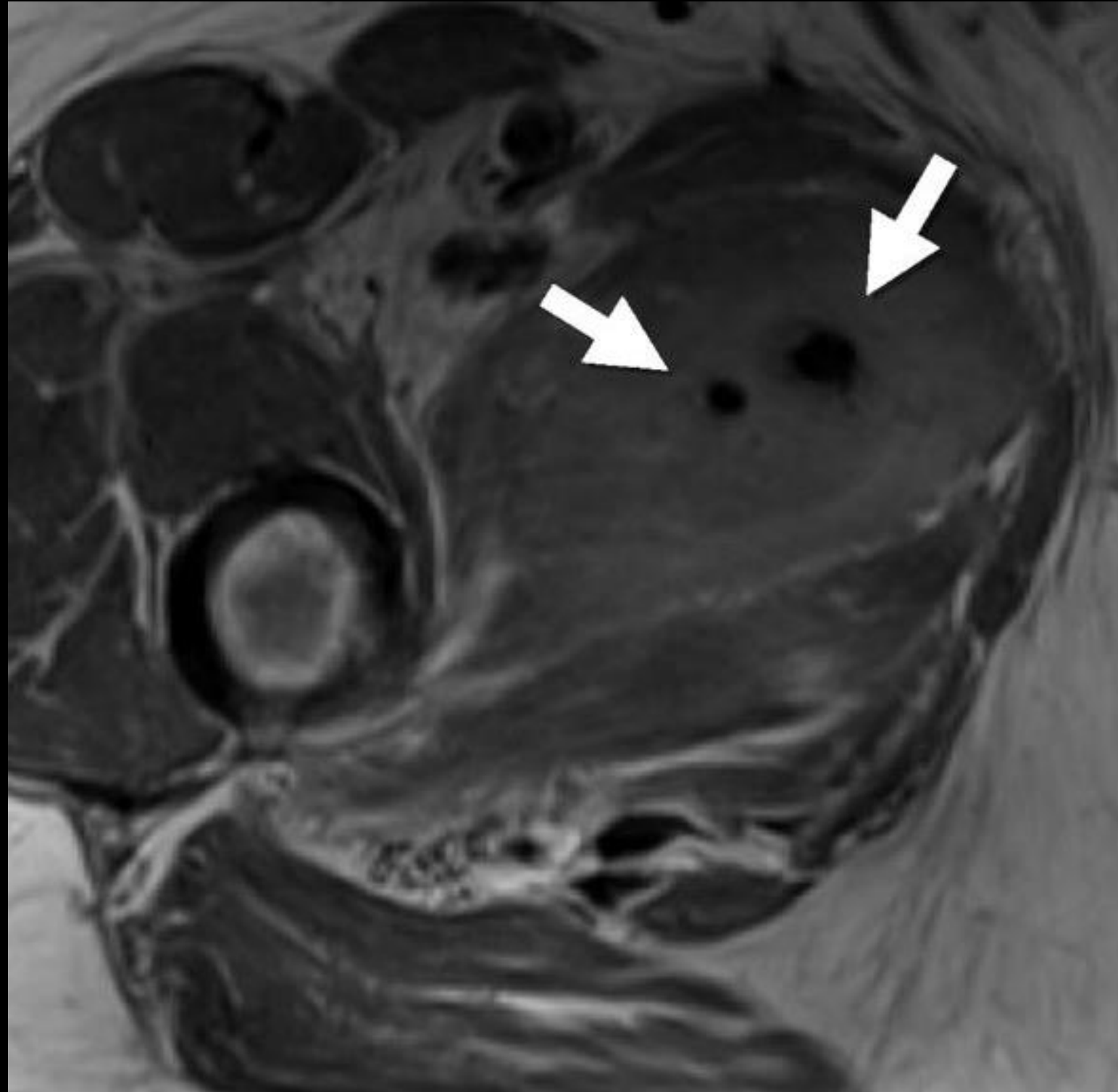
Don't forget to look at the soft tissues



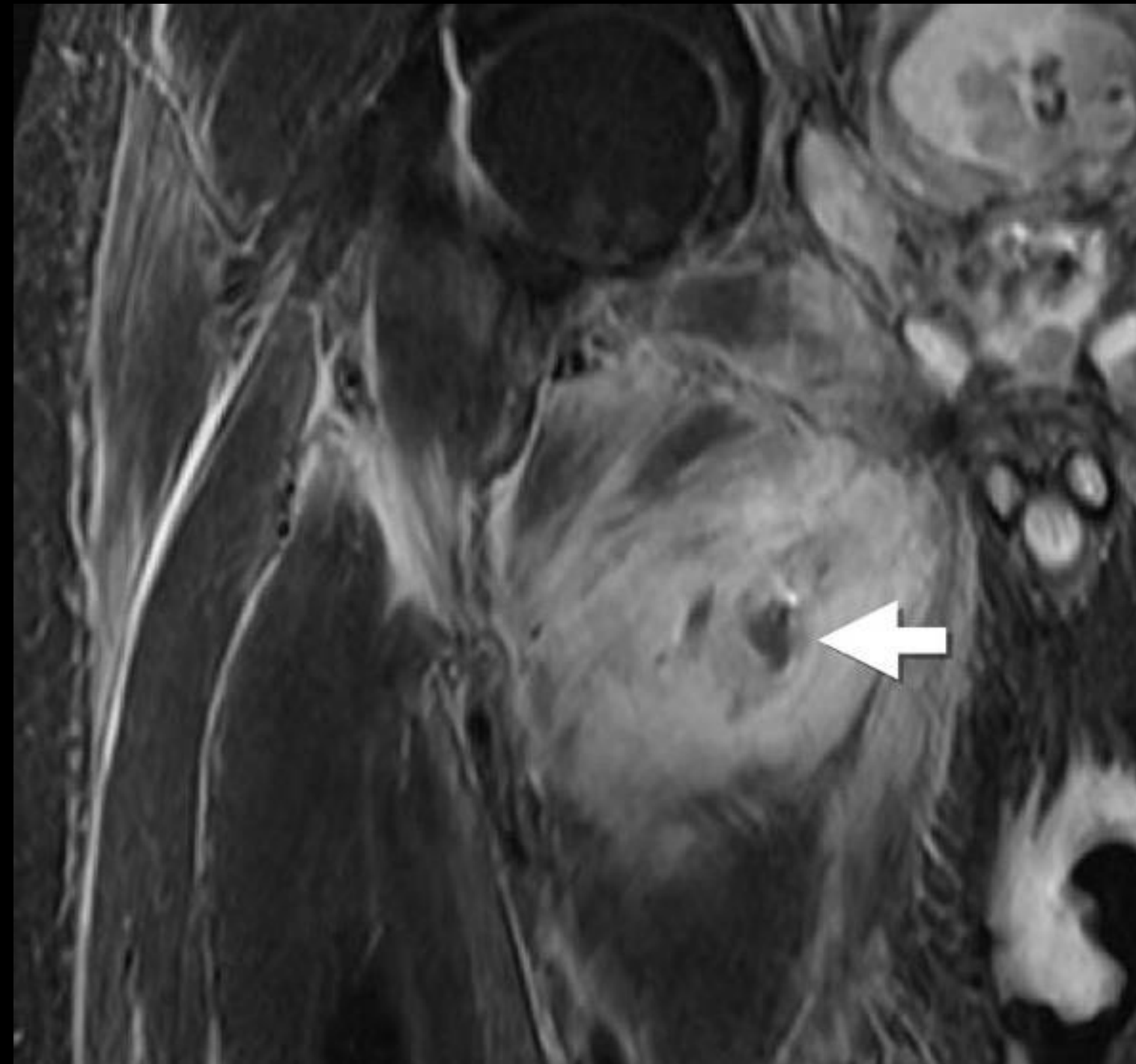
NECROTIZING FASCITIS



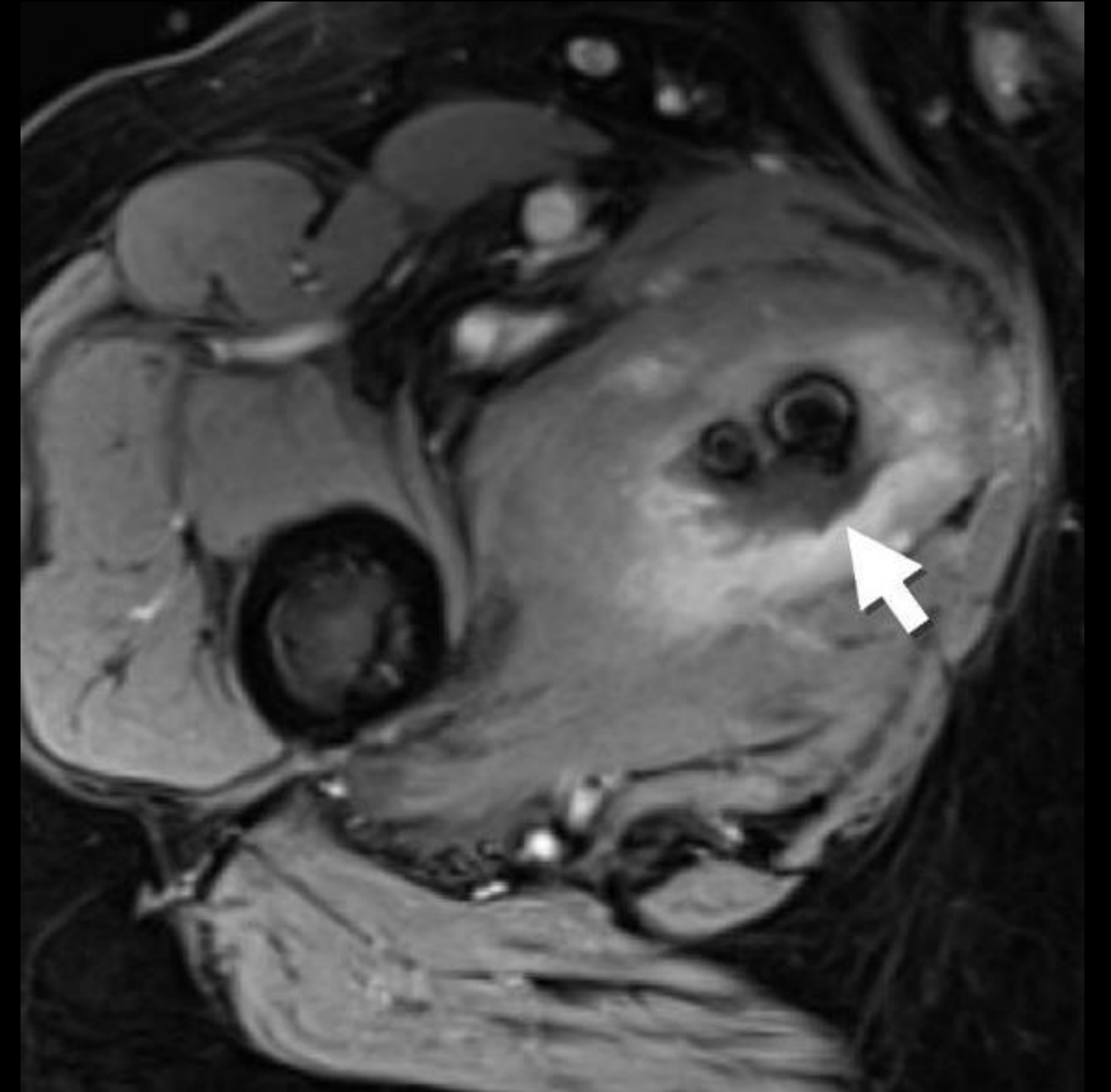
PYOMYOSITIS



Axial T1



Cor STIR

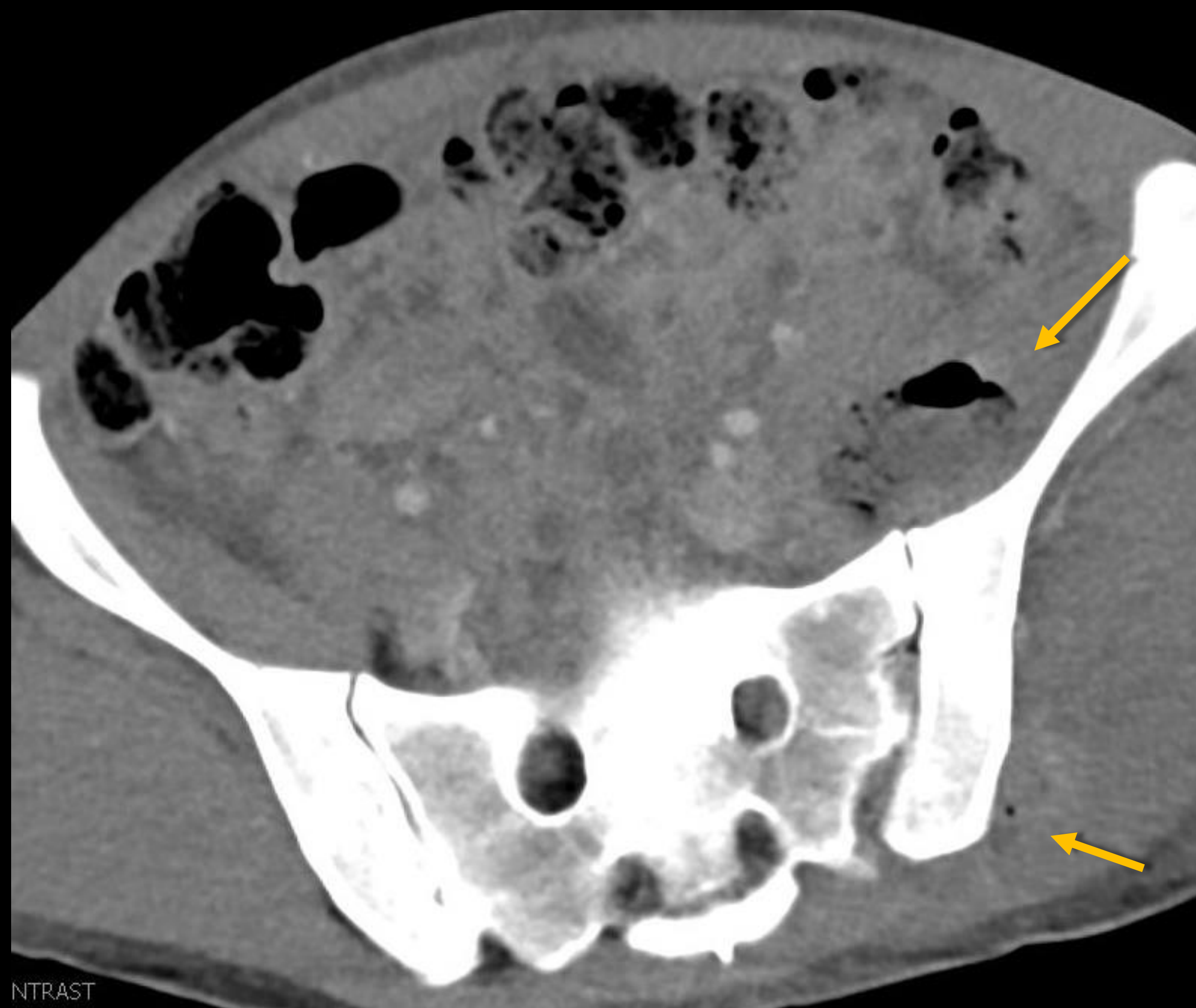


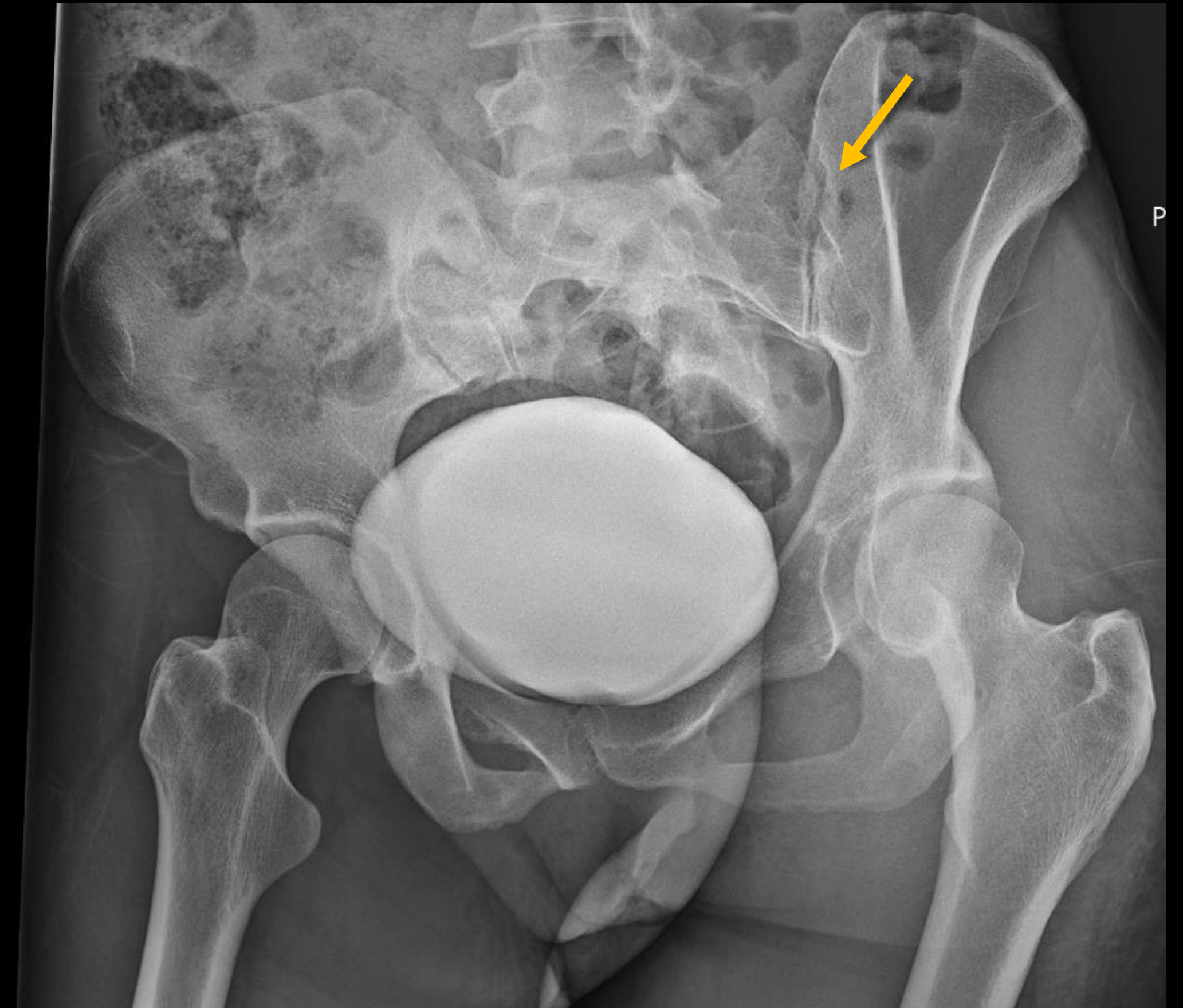
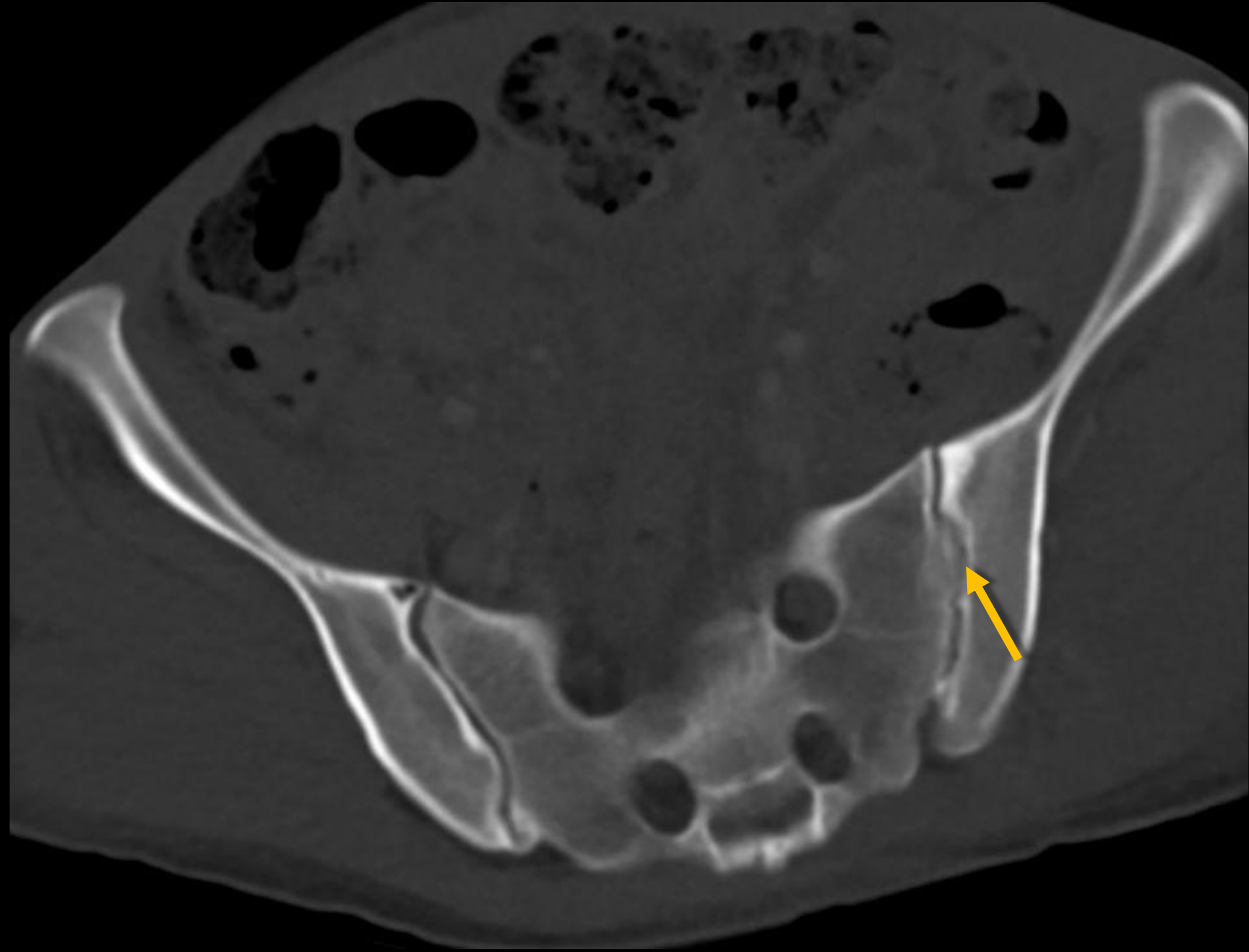
Axial T1 Post

NECROTIZING FASCITIS

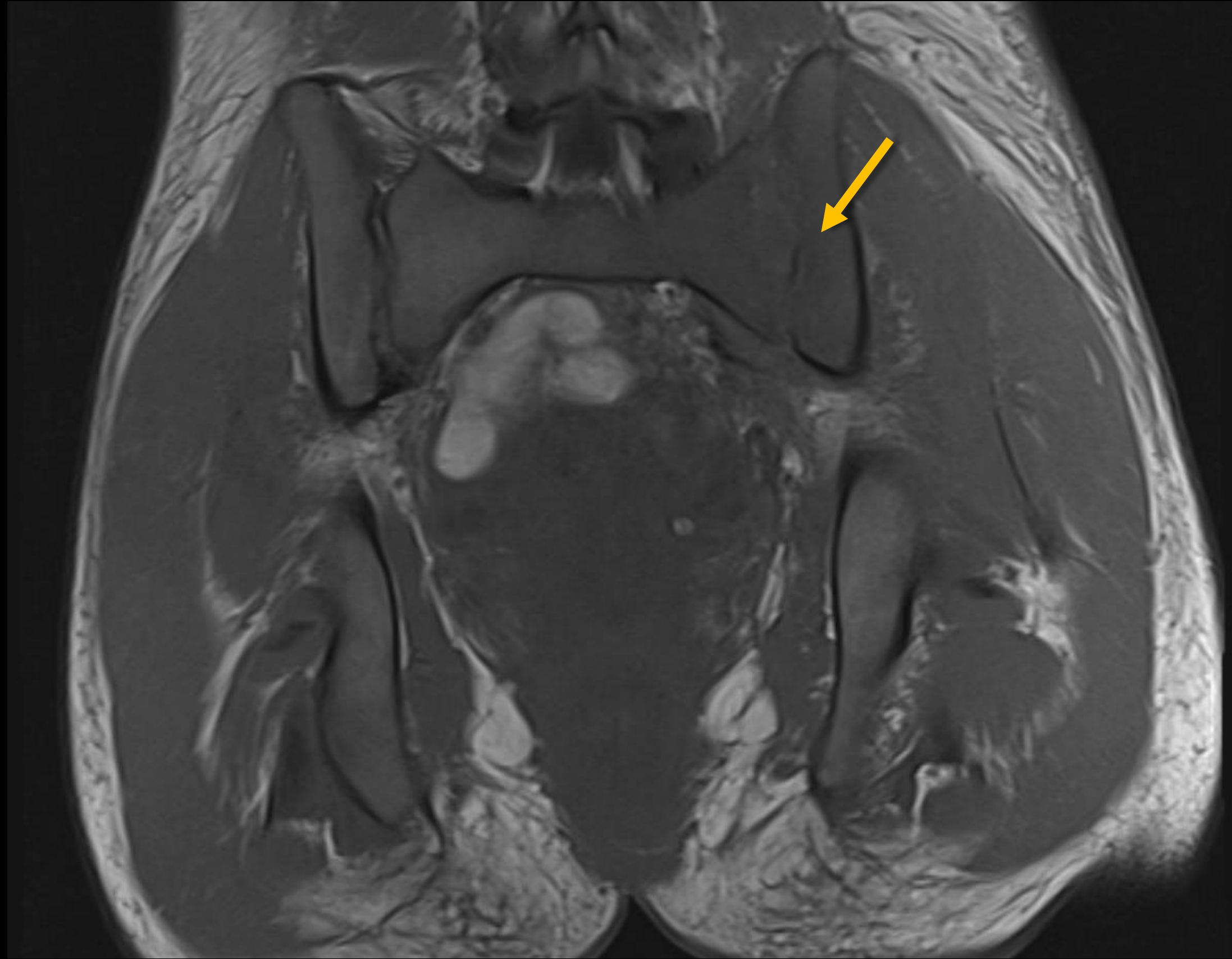


34-year-old woman with abdominal pain

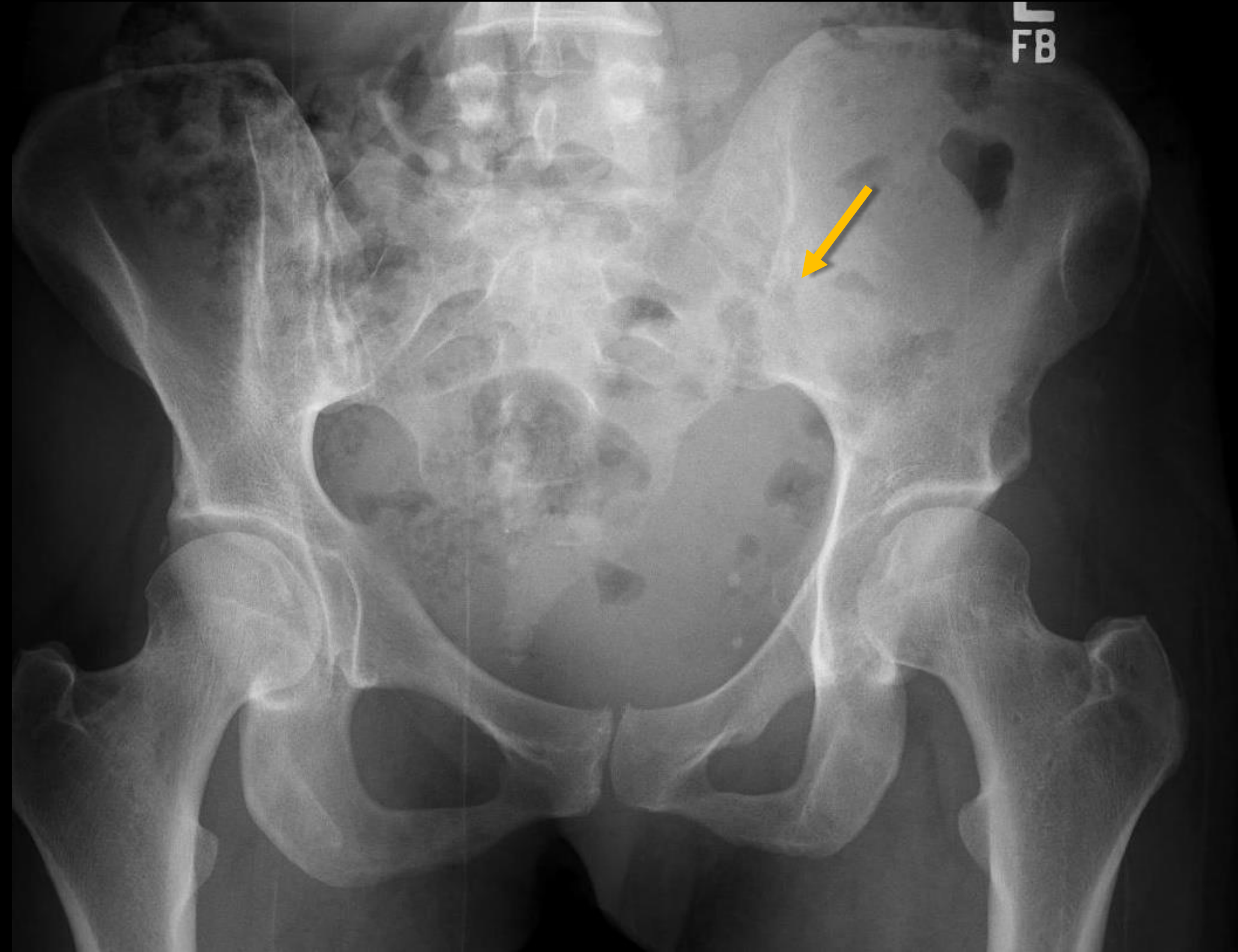




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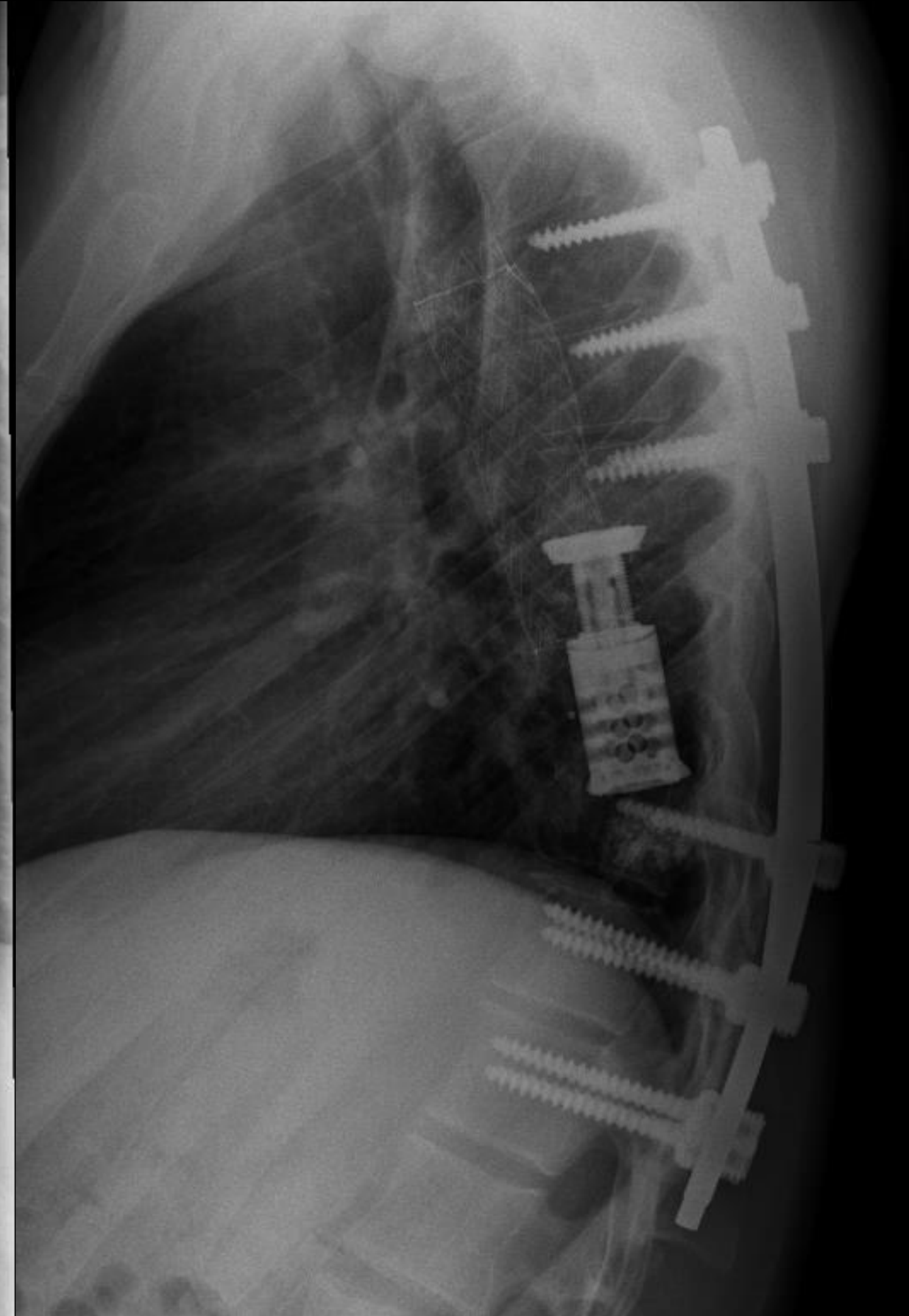
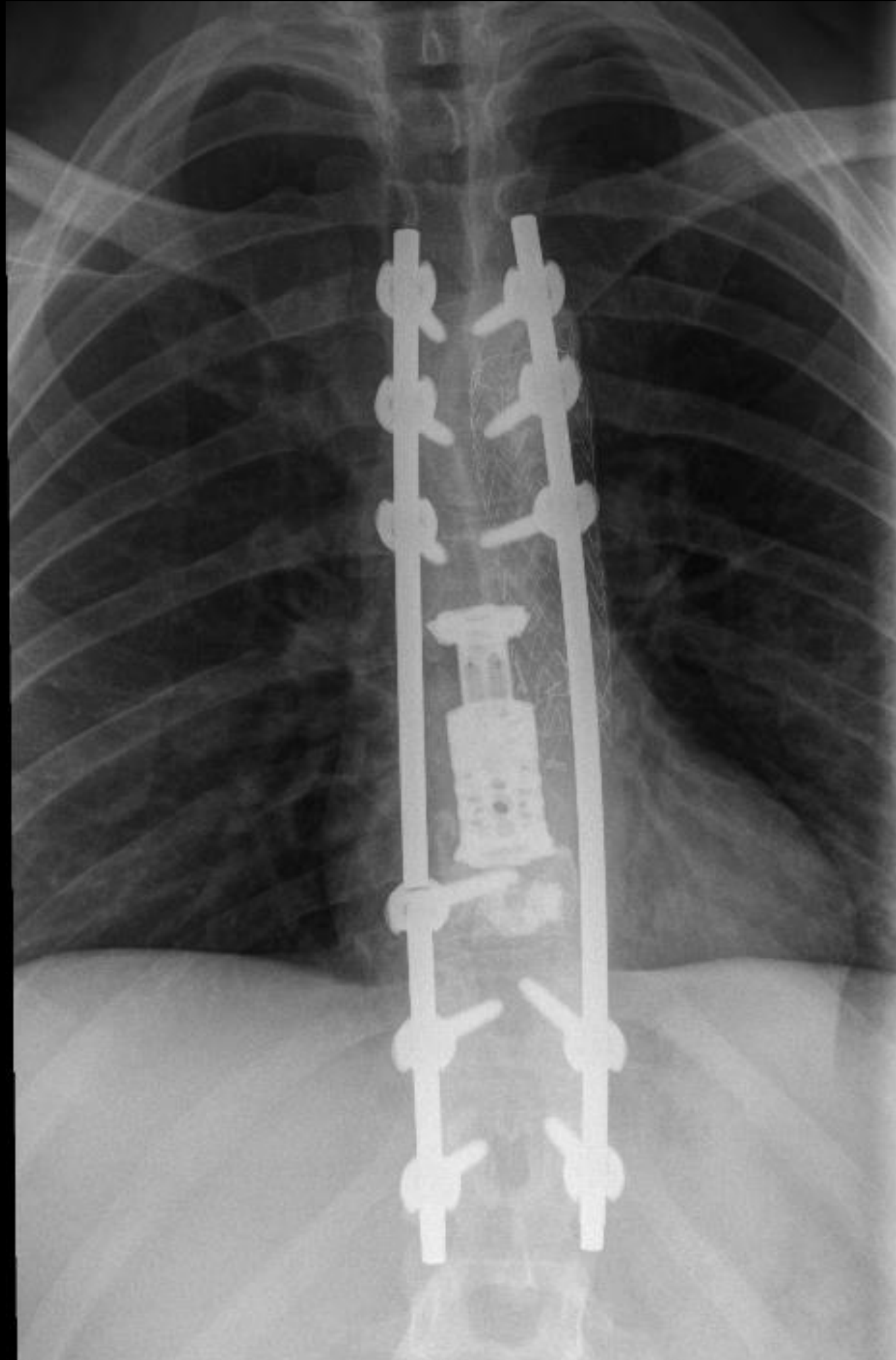


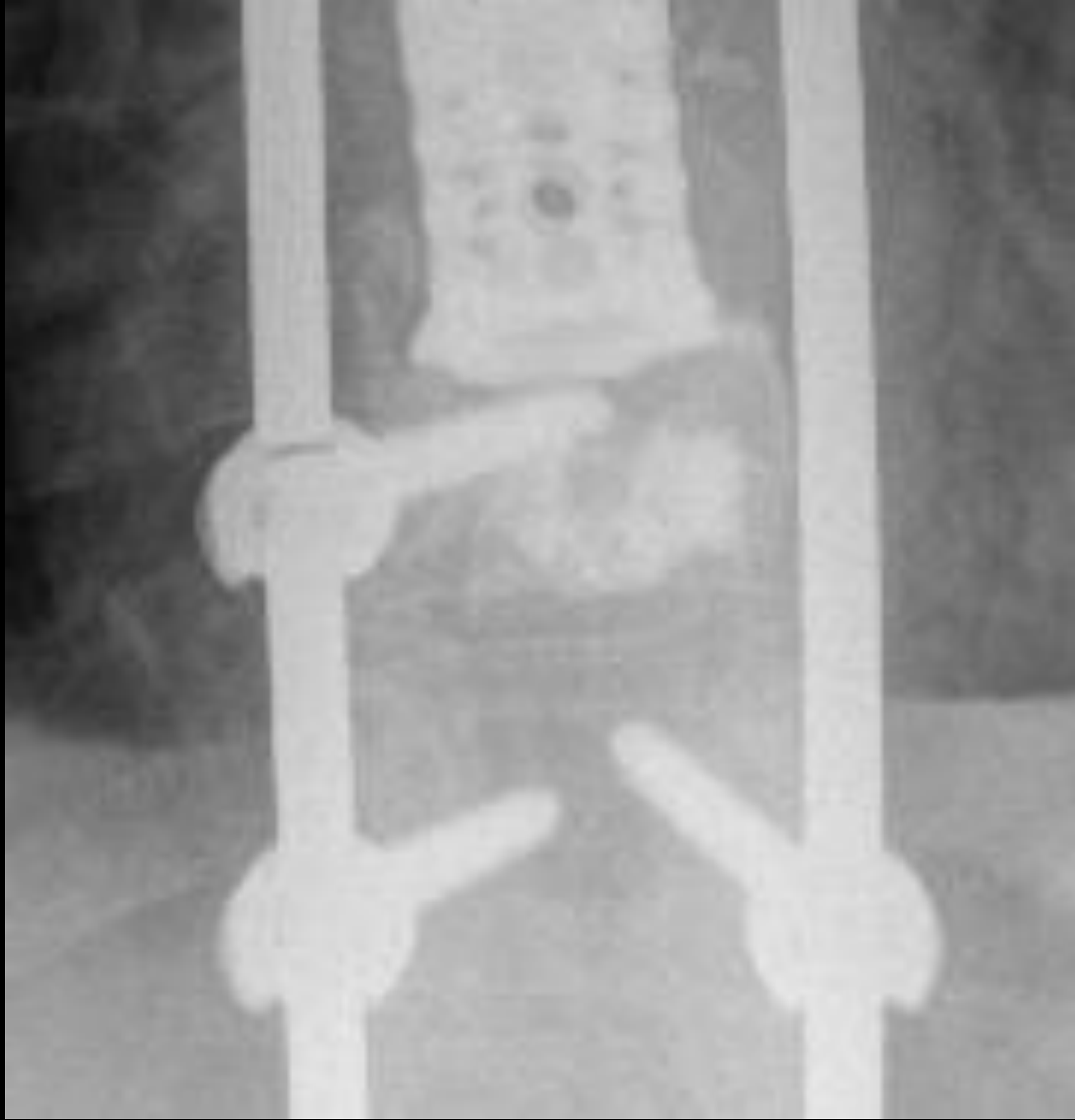
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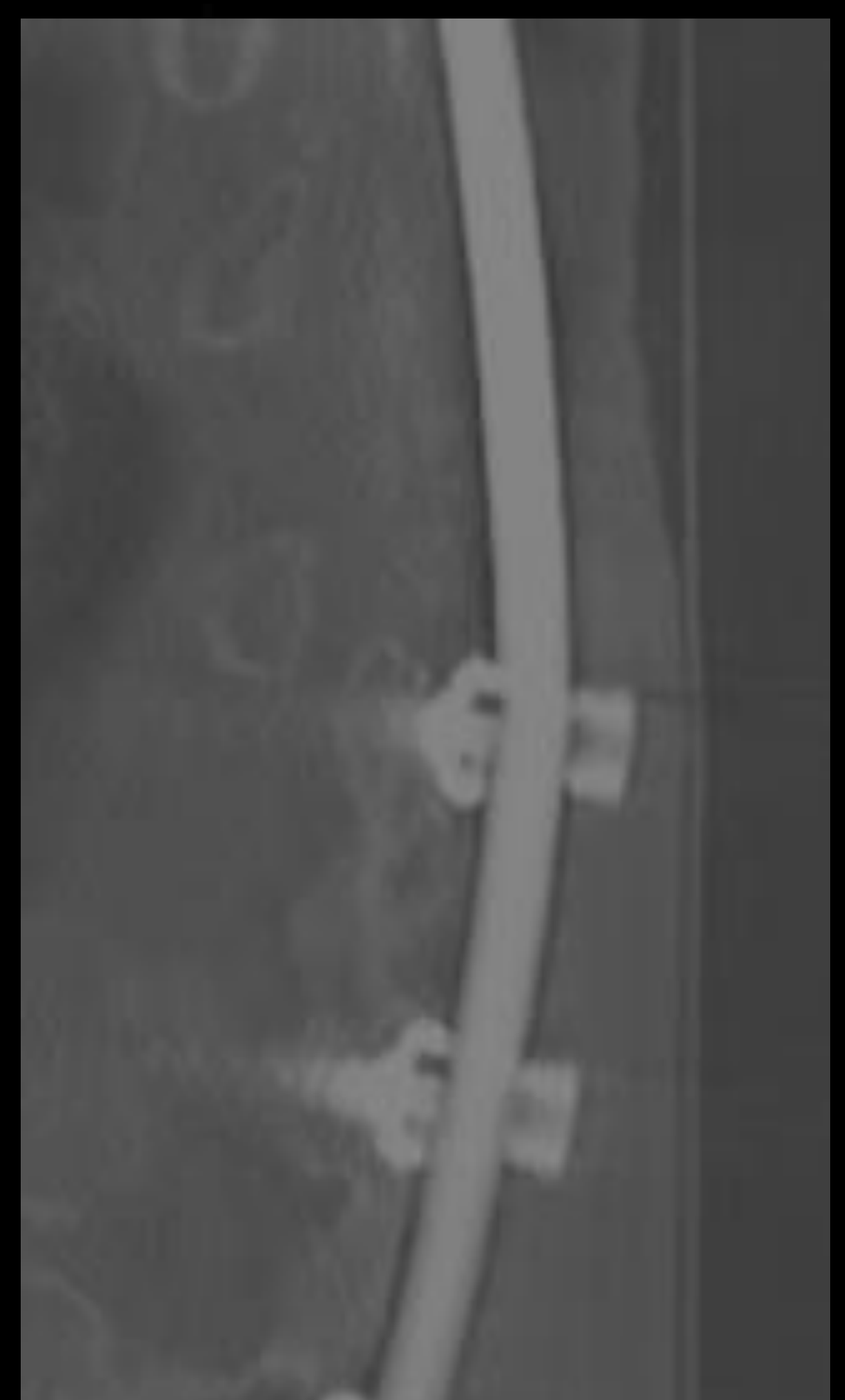
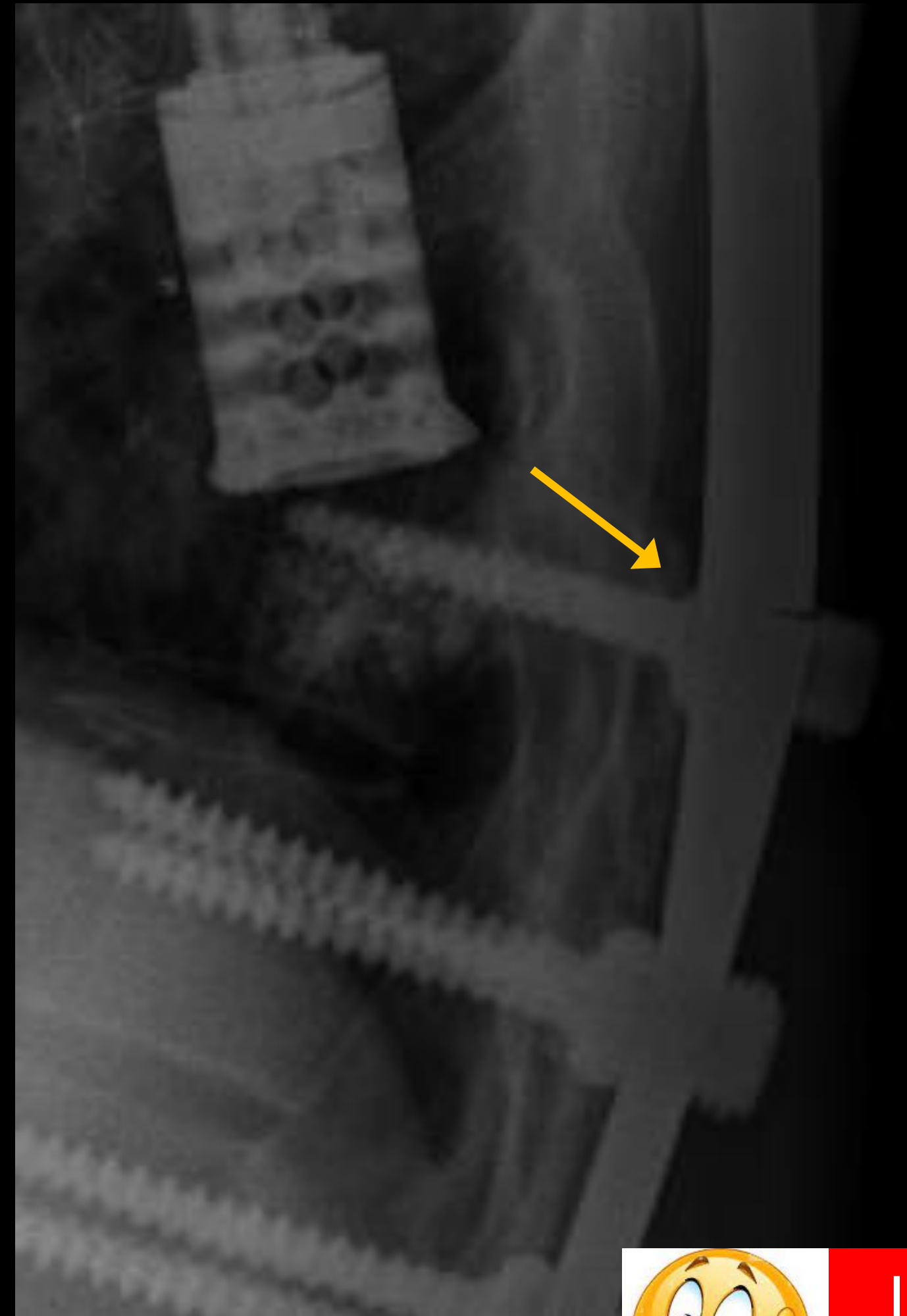
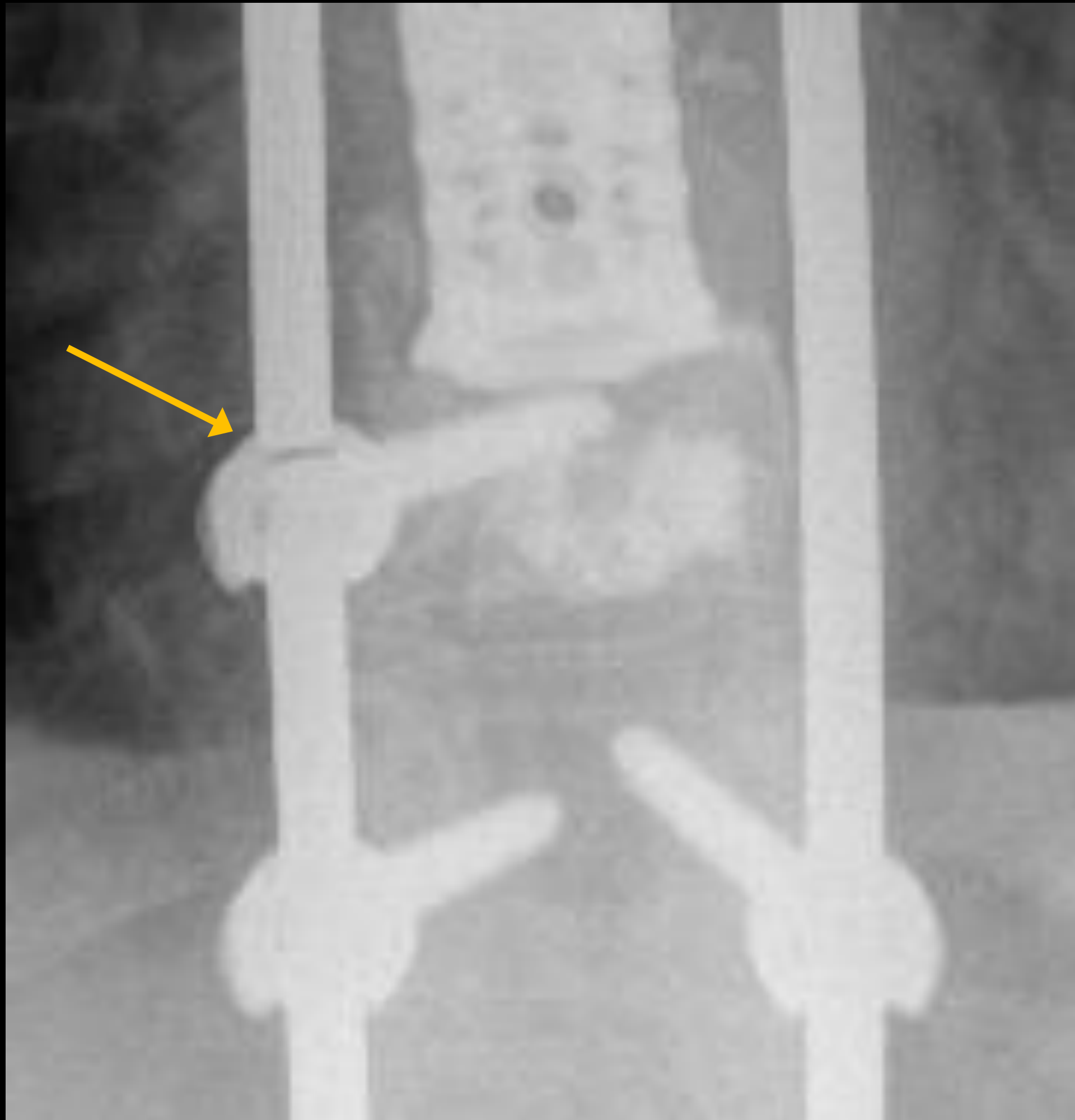


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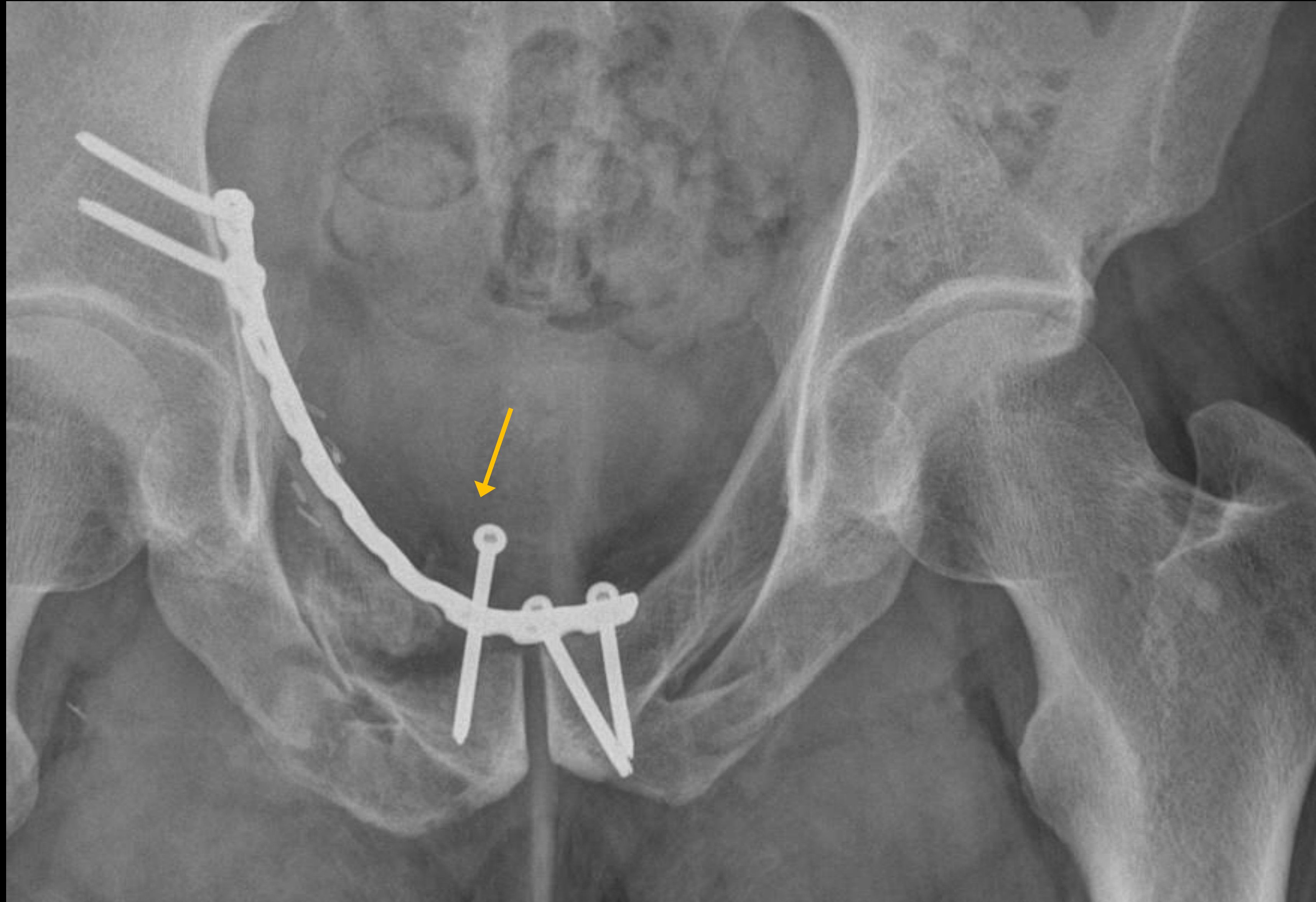
S/p bending, Heard a pop



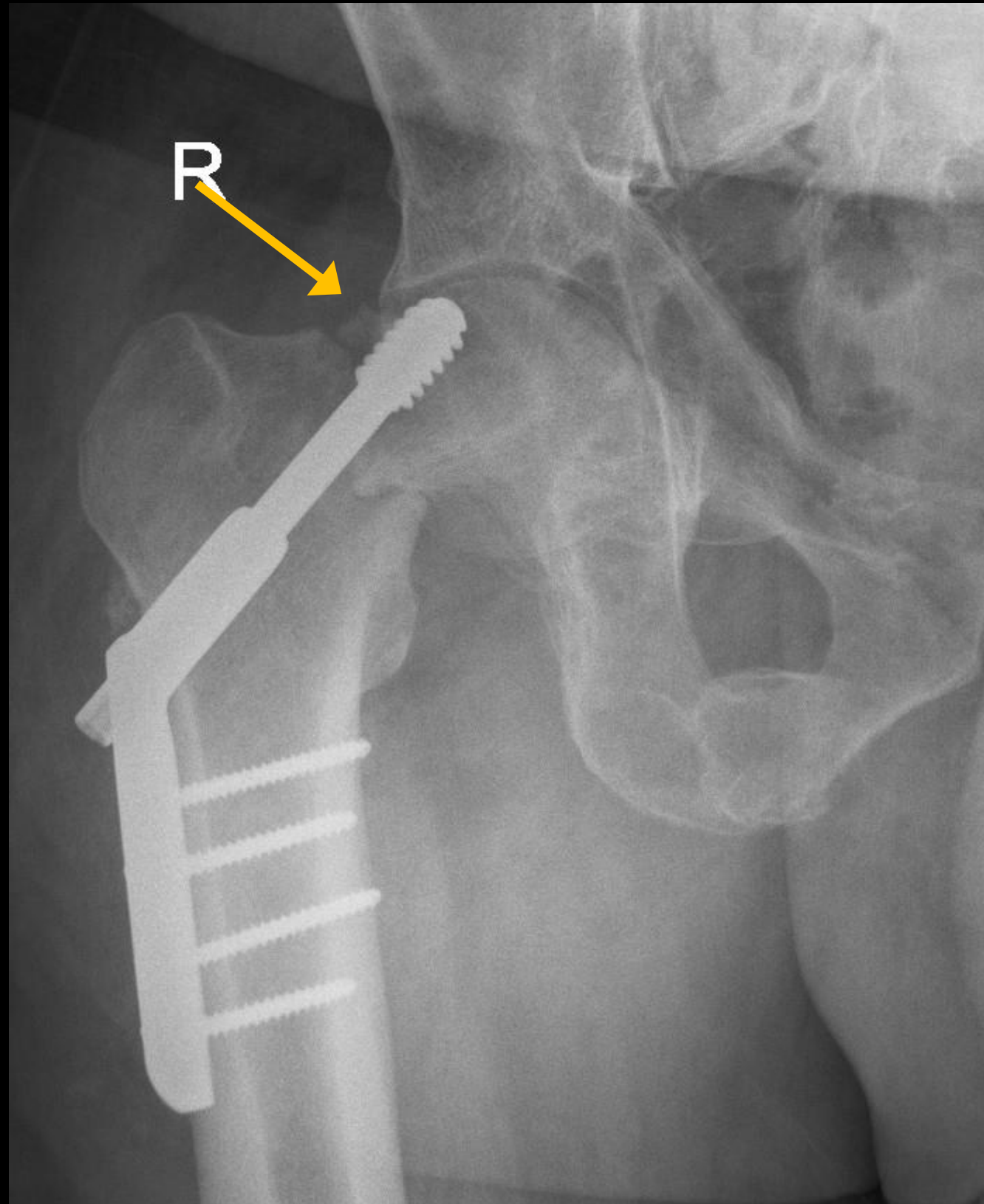




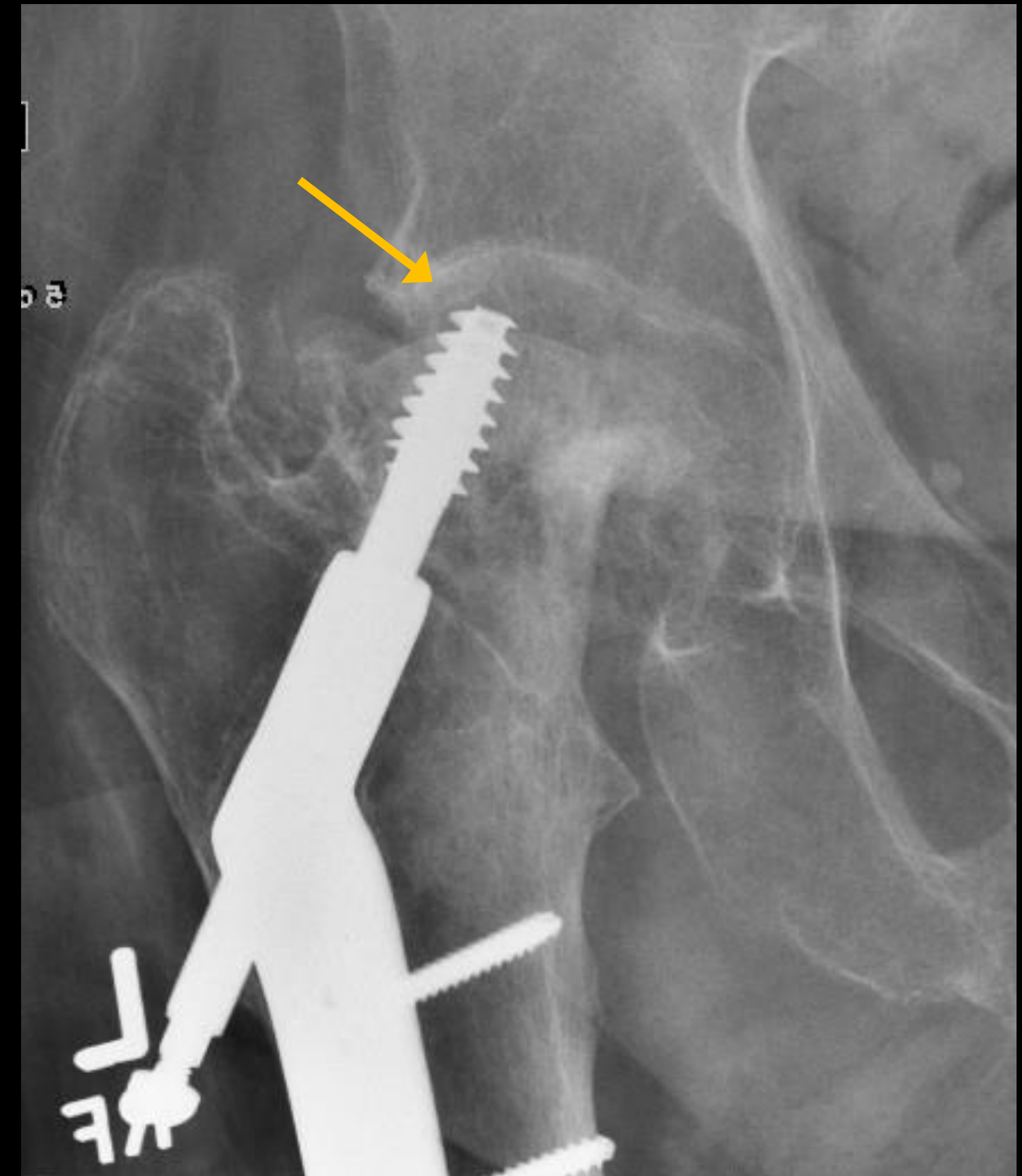
Look for a hardware fx; and not just peri-hardware fracture



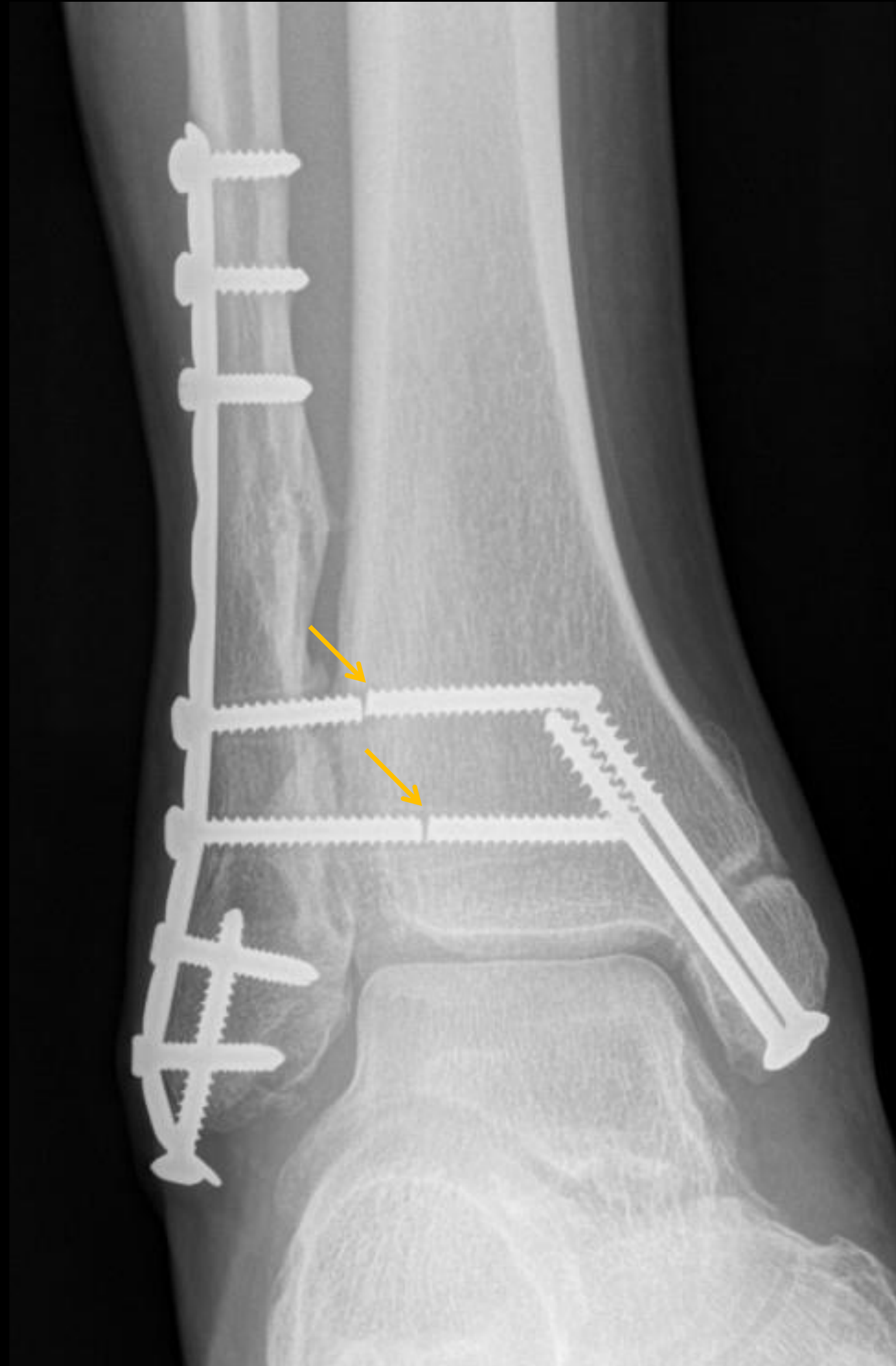
Cutting out



Screw in Joint



Fracture



Loosening



Fx Interlocking Screw



Fx and Loosening



Infection





One view is no view