

AMSER Case of the Month

August 2026

75-year-old man with fever and left wrist swelling.

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Patient Presentation

- A 75-year-old man with a medical history of gout, prediabetes, hyperlipidemia, subarachnoid hemorrhage, and a recent admission for *Proteus* bacteremia complicated urinary tract infection was transferred from a skilled nursing facility due to hypotension, left wrist swelling, and suspected sepsis.

Pertinent Labs

- WBC: $14.7 \times 10^3/\mu\text{L}$ (ref: $4.0 - 10.0 \times 10^3/\mu\text{L}$) ↑
 - 80.6% neutrophils (ref: 40 - 70%) ↑
- Lactate: 1.3 mmol/L (ref: 0.5 - 2.0 mmol/L)
- ESR: 103 mm/hr (ref: 3 - 46 mm/hr) ↑
- CRP: 15.8 mg/dL (ref: <0.5 mg/dL) ↑

Hospital Course

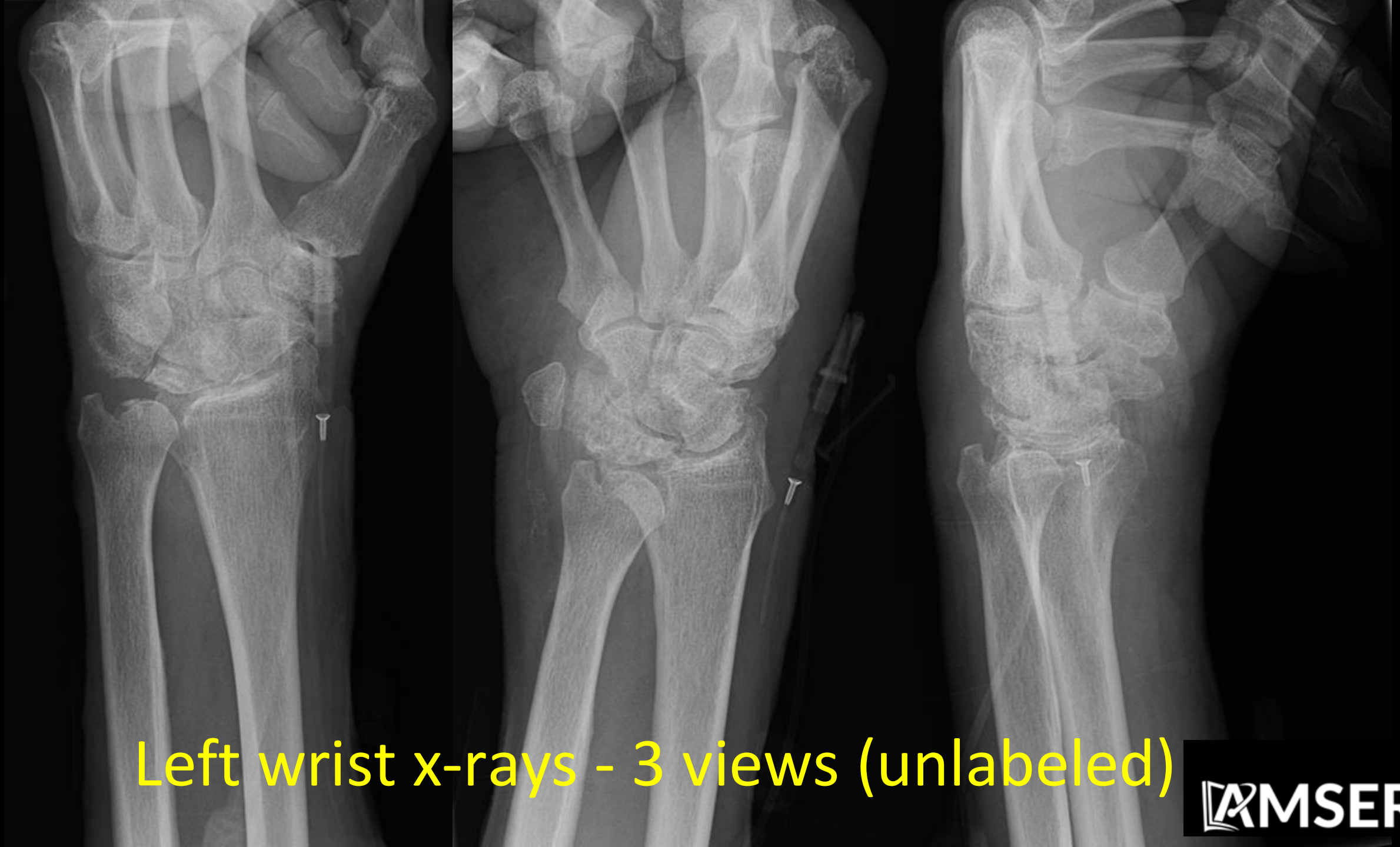
- . During a prior hospitalization, the patient had polyarthrosis and suspected tophi on examination, and received prednisone for gout. Allopurinol and colchicine were withheld due to elevated liver function tests.
- . During the current admission, the patient demonstrated persistent left wrist swelling with fever, leukocytosis, elevated inflammatory markers, and negative rheumatoid factor (RF) and cyclic citrullinated peptide (CCP) antibodies—raising suspicion for septic arthritis-osteomyelitis.

What is the appropriate initial imaging?

ACR Appropriateness Criteria

Suspected osteomyelitis or septic arthritis or soft tissue infection (excluding spine and diabetic foot). Initial imaging.

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Osteomyelitis suspected, wrist, initial imaging	3195476	● Radiography wrist	<0.1 mSv ⚡		Usually appropriate
		● US wrist	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● MRI wrist without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● MRI wrist without IV contrast	0 mSv O	0 mSv [ped] O	Usually not appropriate
		● CT wrist with IV contrast	<0.1 mSv ⚡		Usually not appropriate
		● CT wrist without and with IV contrast	<0.1 mSv ⚡		Usually not appropriate
		● CT wrist without IV contrast	<0.1 mSv ⚡		Usually not appropriate
		● 3-phase bone scan wrist	1-10 mSv ⚡⚡⚡		Usually not appropriate



Left wrist x-rays - 3 views (unlabeled)



- Scattered subcentimeter erosions (blue arrows) and soft tissue fullness with subtle soft tissue calcifications (orange arrows).

Left wrist x-rays - 3 views

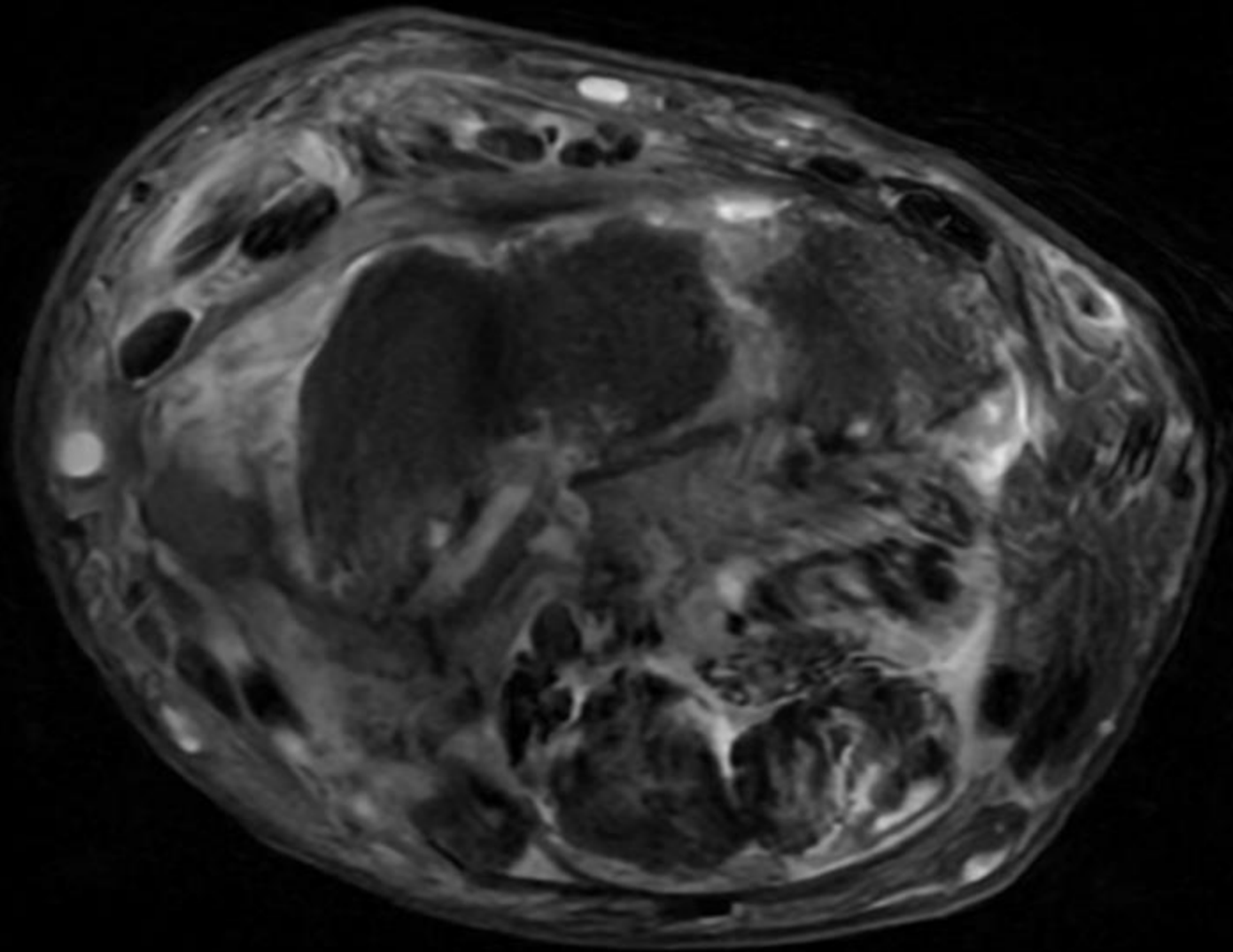
Hospital Course (cont'd.)

- . An orthopedic aspiration attempt was unsuccessful, necessitating further imaging to assess for the possible presence and extent of infection in the affected area.

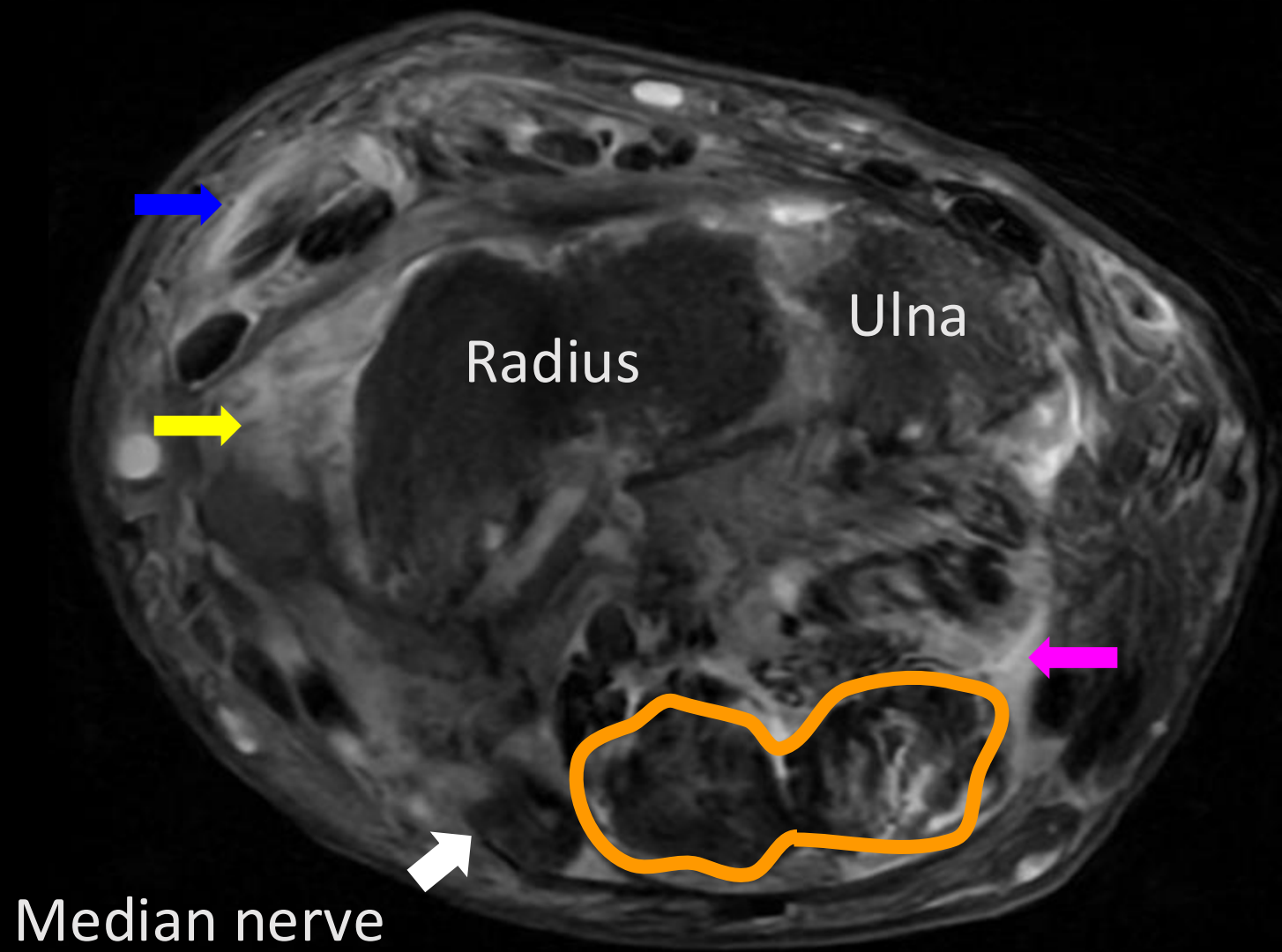
Persistent clinical concern for septic arthritis-
osteomyelitis, but no definitive findings on
radiograph; what is the next imaging study per
ACR Appropriateness Criteria?

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
Osteomyelitis suspected, wrist, radiography normal, next imaging study	3195546	● MRI wrist without and with IV contrast	0 mSv O	0 mSv [ped] O	Usually appropriate
		● MRI wrist without IV contrast	0 mSv O	0 mSv [ped] O	Usually appropriate
		● CT wrist with IV contrast	<0.1 mSv ☼		May be appropriate
		● CT wrist without IV contrast	<0.1 mSv ☼		May be appropriate
		● 3-phase bone scan wrist	1-10 mSv ☼☼☼		May be appropriate
		● 3-phase bone scan and WBC scan and sulfur colloid scan wrist	10-30 mSv ☼☼☼☼		May be appropriate
		● 3-phase bone scan and WBC scan wrist	10-30 mSv ☼☼☼☼		May be appropriate
		● FDG-PET/CT skull base to mid-thigh	10-30 mSv	3-10 mSv [ped]	May be appropriate

Noncontrast MRI of the wrist was ordered.



Axial T2 fat-suppressed at carpal tunnel
(unlabeled)



- Findings of gout/crystal deposition disease with palmar bursitis (pink arrow), dorsal extensor tenosynovitis (blue arrow), joint effusion with synovitis (yellow arrow), and crystal deposition of the flexor and extensor tendons that is most pronounced at the flexor digitorum superficialis (orange outline) at the level of the carpal tunnel.

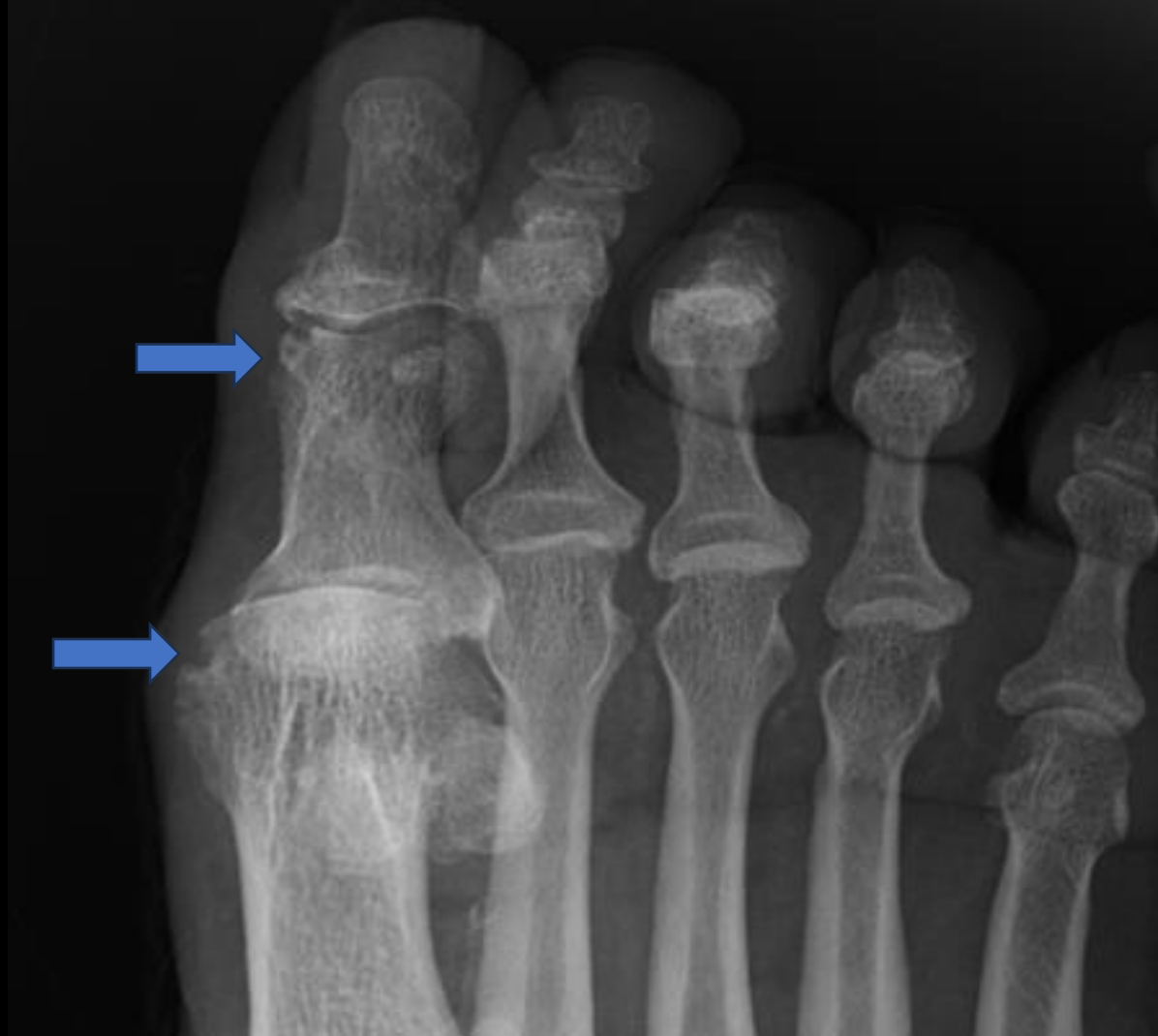
Axial T2 fat-sat at carpal tunnel (labeled)



- Correlating with prior lateral elbow radiographs, there is an olecranon erosion (**blue** arrow) and olecranon bursitis (**orange** arrows) further supporting the diagnosis of gout/crystal deposition disease.

Prior right elbow x-rays

MSER



- Correlation with a prior foot radiograph shows small erosions (blue arrows) at the medial heads of the first metatarsal and proximal phalanx further supporting the diagnosis of gout/crystal deposition disease.

Prior left foot x-ray

Final Diagnosis:

Acute Gout Flare

Case Discussion

- Gout is a crystal arthropathy caused by the deposition of monosodium urate (MSU) crystals.^{1,2}
- Gout typically affects the first metatarsophalangeal (MTP) joint; however, in chronic or polyarticular cases, the wrists, hands, elbows, and tendons may also be involved.^{1,2}
- Chronic gout may lead to erosive arthropathy, synovitis, tenosynovitis, bursitis, and tophi—mimicking infection clinically and radiographically.^{2,3}

Radiograph Findings

- Radiographs may show juxta-articular “punched-out” erosions with sclerotic margins and overhanging edges, soft tissue swelling, and soft tissue masses. ³⁻⁵
- Joint space is generally preserved until advanced stages of disease, a key distinguishing feature that differentiates gout from other inflammatory arthropathies, such as rheumatoid arthritis, which demonstrates joint space narrowing. ^{3,4}
- In this case, radiographs demonstrated classic polyarticular chronic erosive changes, olecranon bursitis, and first MTP joint involvement—diagnostic of crystal deposition disease.

MRI Findings

- Typical MRI findings associated with gout include:
 - Synovitis, characterized by post-contrast synovial thickening.
 - Joint effusion, indicated by high T2 signal fluid within joint space(s).
 - Erosions, as cortical defects with low T1 signal.
 - Bursitis, demonstrated by a distended bursae with high T2 signal intensity.
 - Tenosynovitis, identified by fluid and enhancement within tendon sheaths⁶⁻¹⁰
- Tophi may demonstrate low to intermediate signal intensity on T1-weighted images, while T2-weighted images can show variable signal ranging from low to heterogeneously increased, depending on calcium content. Post-contrast images may reveal homogenous, peripheral, or heterogeneous enhancement of tophi.^{4, 11-13}

MRI Findings (cont'd.)

- MRI is valuable for evaluating complications and excluding alternative or emergent diagnoses, particularly when radiographs are inconclusive.^{14,15}

For example, the presence of severe bone marrow edema on MRI has a reported 93% sensitivity and 92% specificity for detecting concomitant osteomyelitis in patients with gout.⁶

- MRI findings may overlap with those of infection; therefore, integrating clinical context, laboratory results, and joint aspiration remains essential for establishing a definitive diagnosis of gout.²

References

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