

Arthritis Presenting Acutely



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Objectives

- Extremities only
- Only the most common presentations
- Case-based for ER



RA

Symmetric
Synovitis

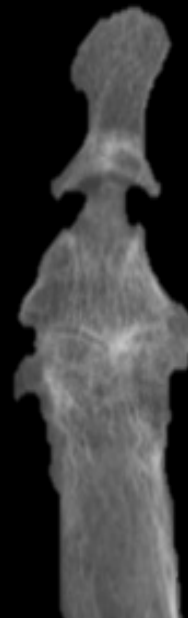


OA

Mechanical
Osteophytes

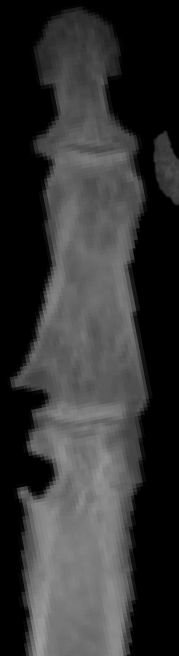


EOA



PsA

Asymmetric
Enthesitis
Pencil-and-cup



Gout

Crystalline
Rat bite

Watch out for “stingers”

Don't forget: if it's monoarticular,
consider septic joint



Case 1:



60 yo male, acute
pain and swelling



This is gout

How do we know?

Key Features

Sclerotic erosions with
overhanging edges



Gout



RA

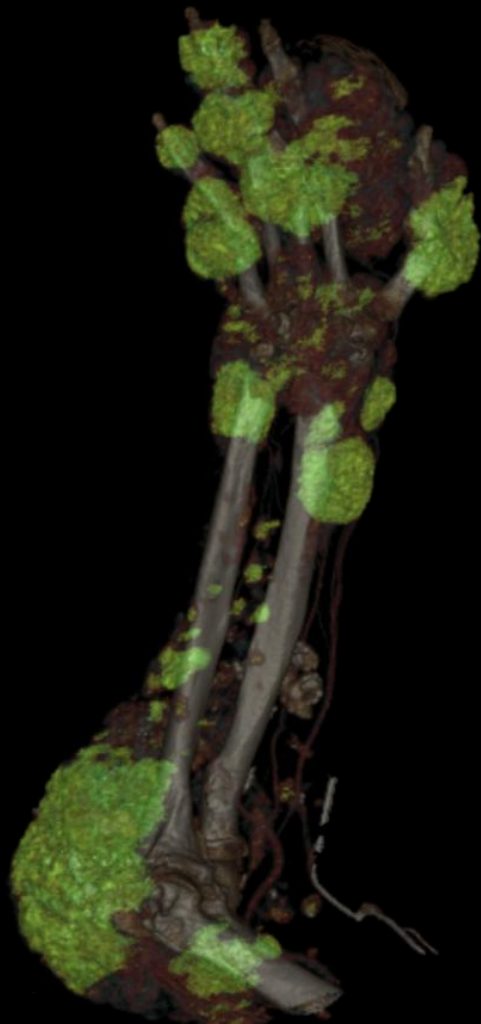
Key Features

Compare the **sclerotic margins** of the gout erosions to this pt with RA



Key Features

Tophi often lightly calcified



Tophi: often show
up very well on CT

Gout

58 yo male, presents to the ER with acute pain.

Are there lightly calcified tophi?

Do those erosions have **sclerotic margins**? **

** bunions in isolation don't count





Gout



Joint space narrowing is late



RA

Gout

- Proximal and distal involvement: **asymmetric**
- **1st MTP** is most common (podagra)
- “**Rat bite**” erosions: sclerotic margin, overhanging edges
- Joint space narrowing is **late**
- Soft tissue tophi often **lightly calcified**



Case 2 — 74-year female with acute onset hand pain and swelling

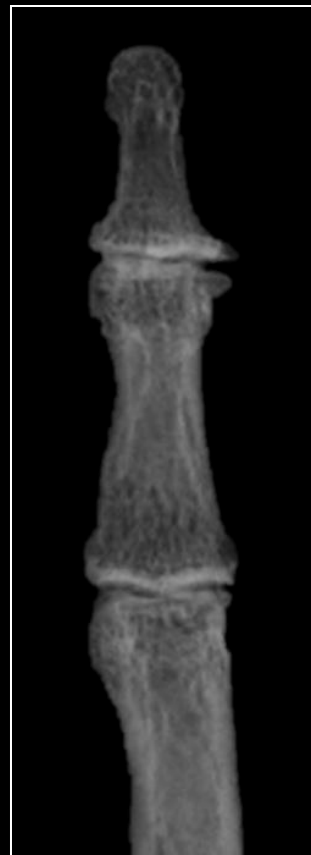


Erosive (inflammatory) osteoarthritis

- Older women (>60 yo). 12:1 F:M
- Similar distribution to OA
- “Sea gull” and “saw tooth” erosions
- Acute onset of PIP and DIP swelling => PsA may be questioned







Compare to
osteoarthritis



Older woman
Typical erosions
Typical distribution
NI ESR/CRP
Lack of systemic
symptoms



Rheumatology at 2am? Maybe this stuff isn't so bad...

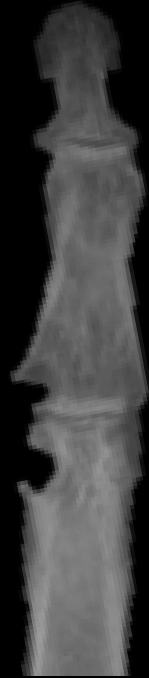


OA

Osteophytes



EOA



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Case 3 — 36 yo F w acute pain + swelling of the hand and wrist



1 year later

10 years later





Genetics (HLA-DR4) and **environmental factors** (smoking, periodontal disease) play a role in pathogenesis and progression



Common autoantibodies:

- RF (Rheumatoid Factor): IgM Ab against IgG
- Anti-CCP (**anti-cyclic citrullinated peptide**)

=> SYNOVITIS

Cytokine cascade + secreted enzymes destroy cartilage
Synovial proliferation → pannus which erodes bone

2010 ACR/EULAR Criteria

American College of Rheumatology/
European Alliance of Associations for Rheumatology

	Criteria	Score
Joint Involvement	1 Large Joint	0
	2-10 Large Joints	1
	1-3 Small Joints	3
	>10 Joints (at least 1 small joint)	4
Serology	Negative RF and anti-CCP	0
	Low-Positive RF or anti-CCP	2
	High-Positive RF or anti-CCP	3
Acute-Phase Reactants	Normal CRP and ESR	0
	Abnormal CRP or ESR	1
Duration of Symptoms	<6 weeks	0
	≥6 weeks	1
*Total score of greater than 6 is classified as RA		

What imaging findings
are required to
diagnose RA?

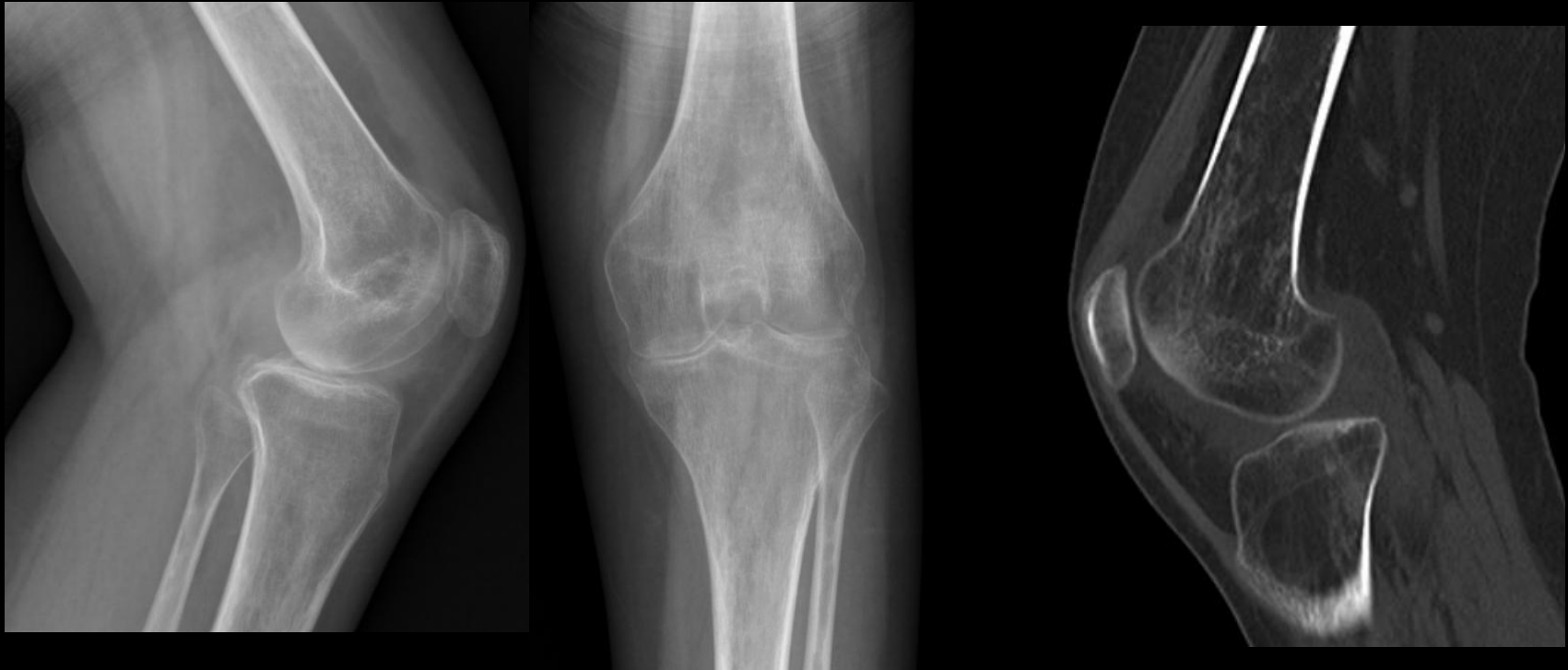
Where can imaging help?

The unsuspected diagnosis

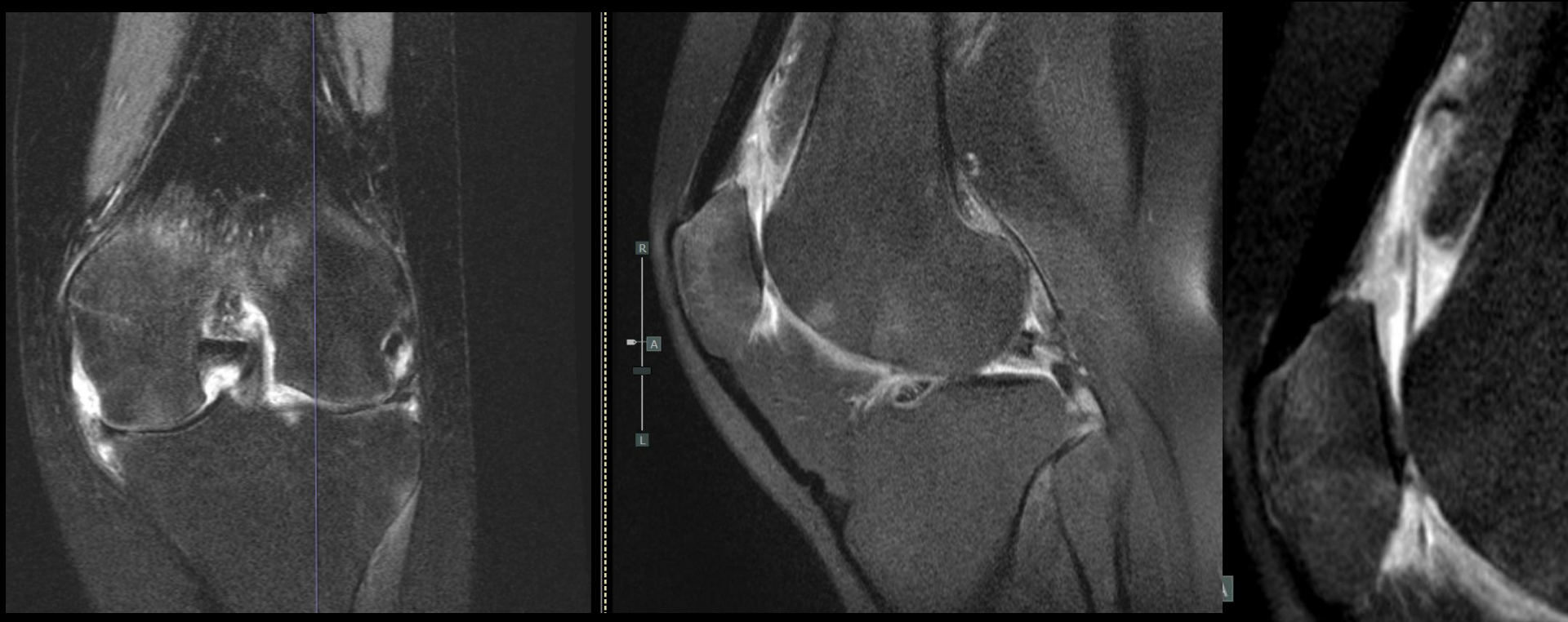
The story that doesn't fit

(Monitor treatment
effectiveness)

21 yo F presents to ER: worsening knee pain that started while she was recently pregnant



Tricompartmental, symmetric, high grade
cartilage loss. Intra-articular synovitis



Finally someone got a hand x-ray



RF: **536**
(nl <14 IU/ml)

Anti-CCP: >**250** units
(nl <20, strong positive >59)

Rheumatoid arthritis

Distribution: like a “**ray**” of sunshine?



Rheumatoid arthritis

Distribution: like a “**ray**” of sunshine?



Symmetric involvement

SHORT LIST!

- Rheumatoid arthritis
- Multicentric reticulohistiocytosis –RARE!
- Systemic lupus erythematosus (subluxations, not erosions + narrowing)

Imaging patterns - Xray

- Proximal and **symmetric** (but small joints often first)
- Marginal erosions



No sclerotic margins unless healed/healing!

Imaging patterns - Xray

- Proximal and **symmetric** (but small joints often first)
- Marginal erosions
- Ulnar deviation/subluxation



Imaging patterns - Xray

- Proximal and **symmetric** (but small joints often first)
- Marginal erosions
- Ulnar deviation/subluxation
- Swan neck/boutonniere



Boutonnière



Swan neck



Imaging patterns - Xray

- Proximal and **symmetric** (but small joints often first)
- Marginal erosions
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- Swan neck/boutonniere
- Rheumatoid nodules

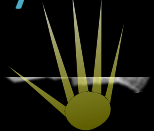


Review



RA

Symmetric
Synovitis

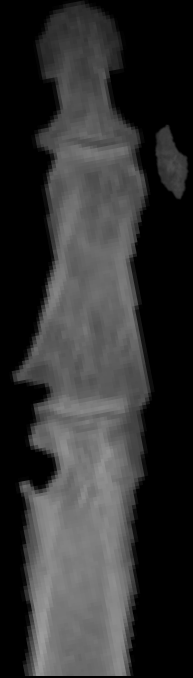


OA

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Case 5: 45 yo male presents to the ER with **acute, painful finger swelling** with loss of range of motion



Case 5: 45 yo male presents to the ER with **acute, painful finger swelling** with loss of range of motion



2 years later



Spondyloarthropathies (SpAs) are a fundamentally different group of diseases

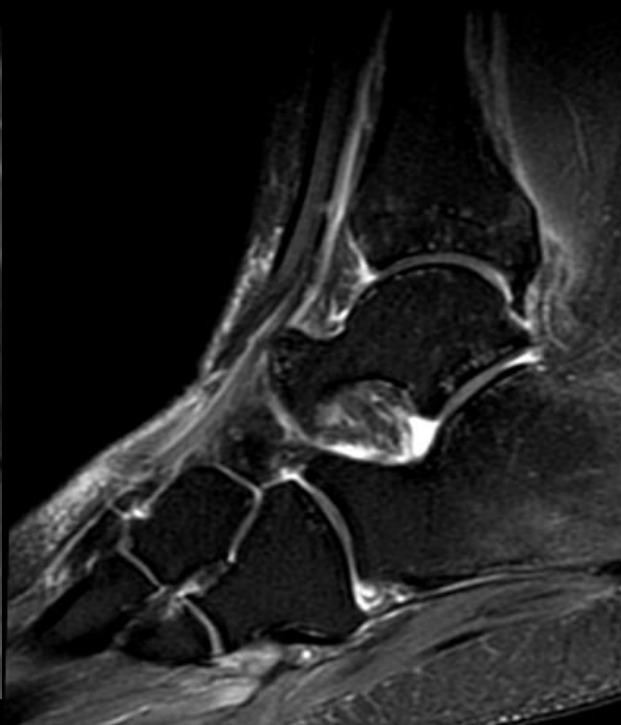
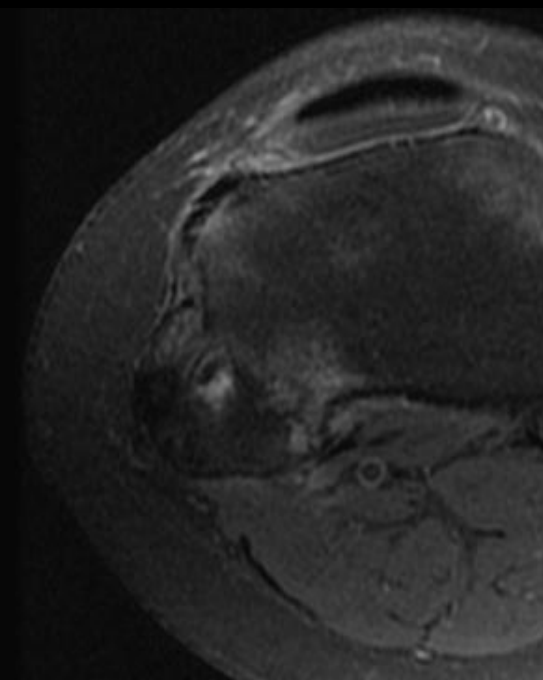
While the fundamental pathogenesis of RA is **synovitis**,
a fundamental pathogenesis of the SpA group is....

Enthesitis

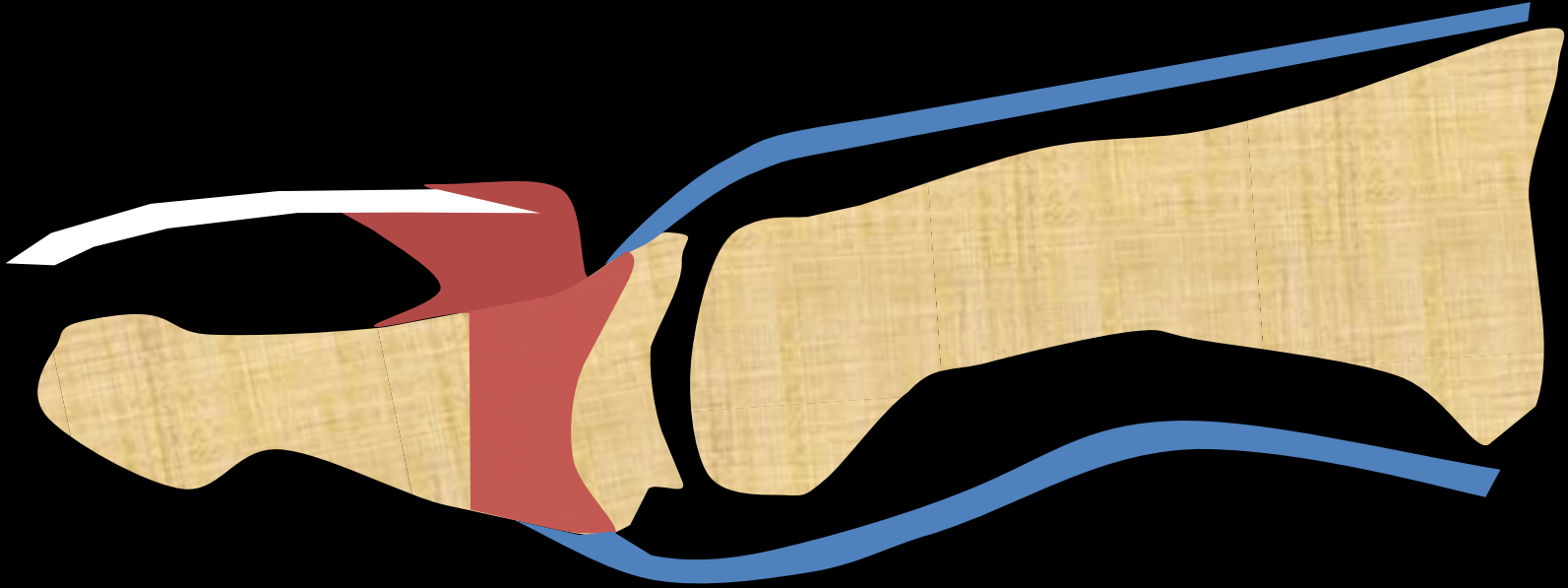
with secondary or more minor synovial inflammation

What is an enthesis?

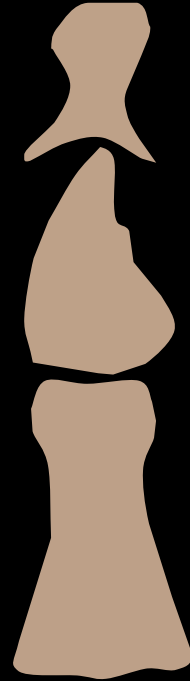
- The attachment of a tendon, ligament or muscle to bone
- Where something soft attaches to something hard



Nail bed, extensor tendon, flexor
tendon, joint capsule:
lots of entheses around this joint!



So wait a minute, with all those **entheses**, that would mean there's a lot of PsA involvement of the **DIP** joints, right? Maybe with **acroosteolysis** as well



Pencil and cup





Periostitis...why?

Reactive bone formation at **enthese**s

RA does NOT have bone proliferation at all

Psoriasis

I know where the **enthese**s are
so I can predict classic PsA

- Distal, **asymmetric**
- **So many entheses** at the fingers/toes =>
 - Pencil-and-cup
 - Sausage digit (dactylitis)
 - Acroosteolysis
- **Periostitis** => inflammation at **enthese**s



LAST ER CASE:
diagnosis?



Septic joint



Summary– Imaging Patterns

Rheumatoid Arthritis

- Proximal and symmetric
- Marginal erosions
- Ulnar deviation/subluxation
- Swan neck/boutonniere
- Rheumatoid nodules

Psoriatic Arthritis

- Distal, asymmetric
- Pencil-and-cup
- Sausage digit (dactylitis)
- Acroosteolysis
- Periostitis
- Ankylosis

Summary– Imaging Patterns

Erosive Osteoarthritis

- Older women (>60 yo). 12:1 F:M
- Similar distribution to OA
- “Sea gull” and “saw tooth” erosions
- Acute onset of PIP and DIP swelling
- Normal ESR/CRP
- Lack of systemic symptoms

Gouty Arthritis

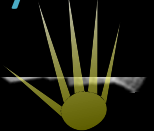
- Proximal and distal involvement: asymmetric
- 1st MTP is most common (“podagra”)
- Sclerotic erosions with overhanging edges: “rat bite”
- Joint space narrowing is late
- Soft tissue tophi may be lightly calcified

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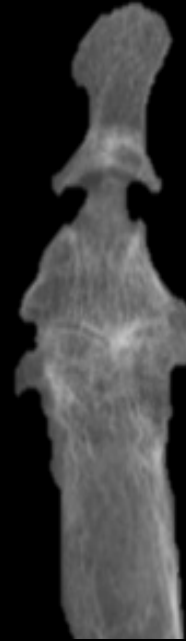


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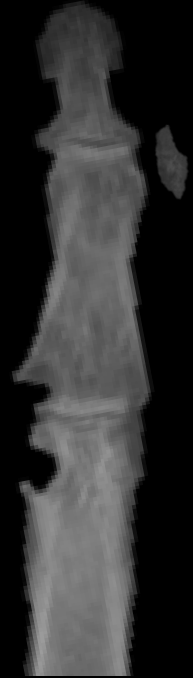


EOA



PsA

Asymmetric
Enthesitis
Pencil-and-cup



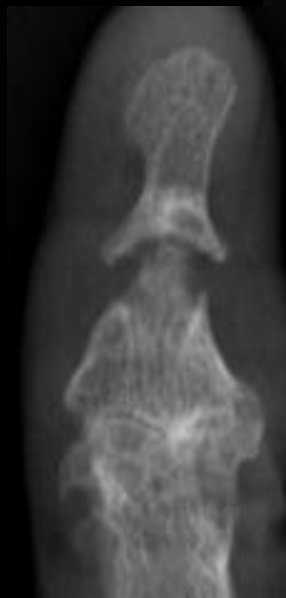
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Beware calling pencil-and-cup erosions on the lateral radiograph...



Erosive OA



Psoriasis

Test yourself: which one has PsA?



Test yourself: which one has PsA?



Test yourself: which one has RA?



Test yourself: which one has RA?

The one on the left has RA

Both have nodules, but the gout nodules (on the right) are lightly calcified
NO DIP JOINT involvement in RA, but lots of wrist involvement (see circled areas).



CHALLENGE: which one has Psoriatic Arthritis?



CHALLENGE: which one has Psoriatic Arthritis?



Proximal erosions at the wrist
not a feature of EOA



CHALLENGE: which one has Psoriatic Arthritis?



Magnified view of erosions. Remember in real life you'd also be looking at ESR, CRP and systemic symptoms, as well as any skin changes.

References

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Thank you!

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