RADY 403 Case Presentation: "Wrist Pain"

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Focused patient history and workup

- 11 y.o. female presenting with left wrist pain and swelling for 5 weeks.
  - Similar episode last year involving right wrist.
- Labs: CBC and CMP wnl. Negative ANA, CRP, CCP, HLA-B27, HepB, TB.
  - Elevated RF and ESR.
- Physical exam
  - Swelling of the left 1st and 2nd MCP.
  - Large cyst over the dorsum of the left wrist, without TTP.
  - Decreased flexion and extension of the bilateral wrists and ulnar deviation.
  - Right knee effusion.
  - Right ankle effusion.
  - Right 1st IP and MTP swelling.

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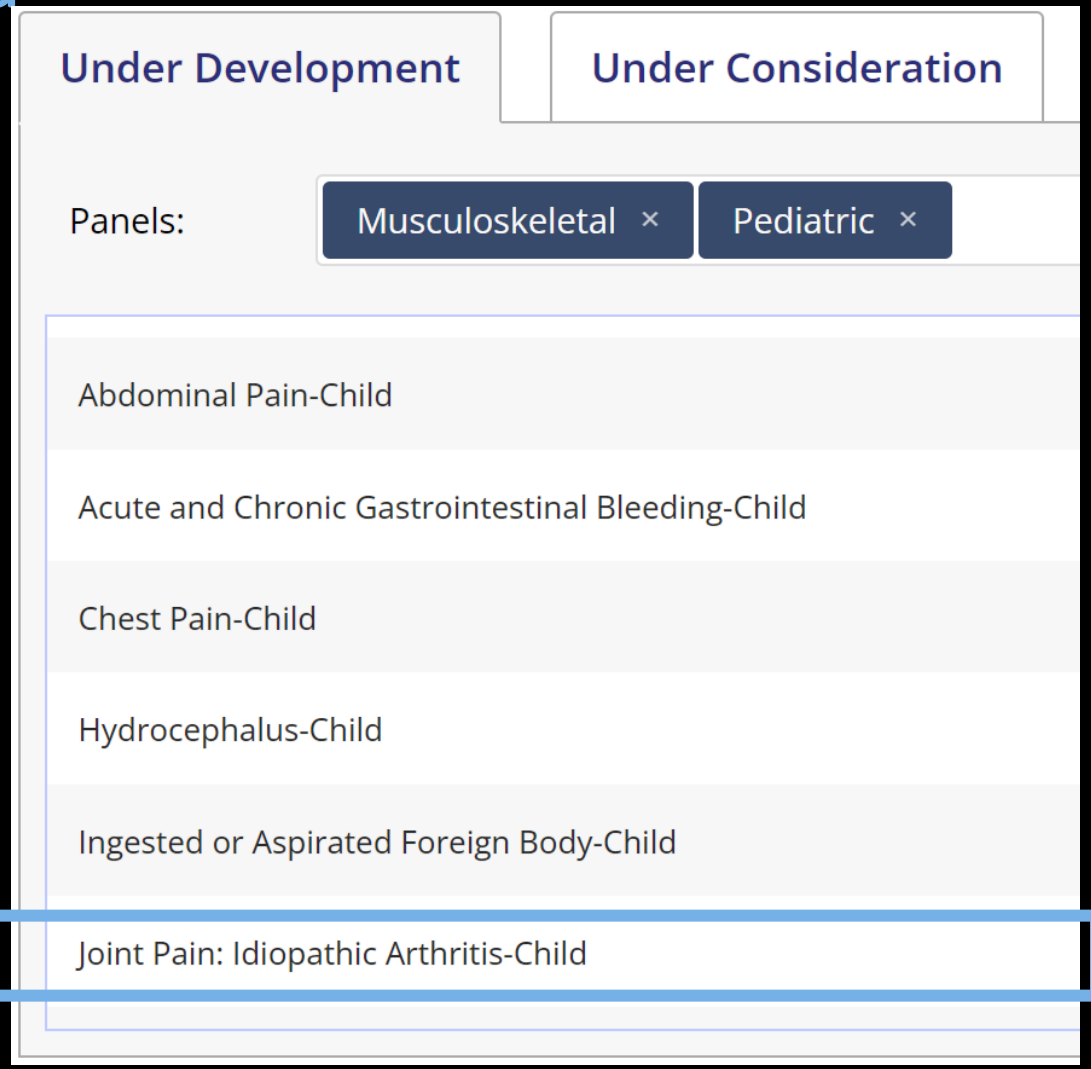
ACR Appropriateness Criteria

- Unfortunately, there is no current ACR appropriateness criteria to evaluate for pediatric patient's chronic wrist pain.
- ACR appropriateness criteria is being developed for "Joint Pain: Idiopathic Arthritis" in a child.
- In the meantime, we will use adult criteria for chronic hand or wrist pain found on the following slide.



ACR Appropriateness Criteria

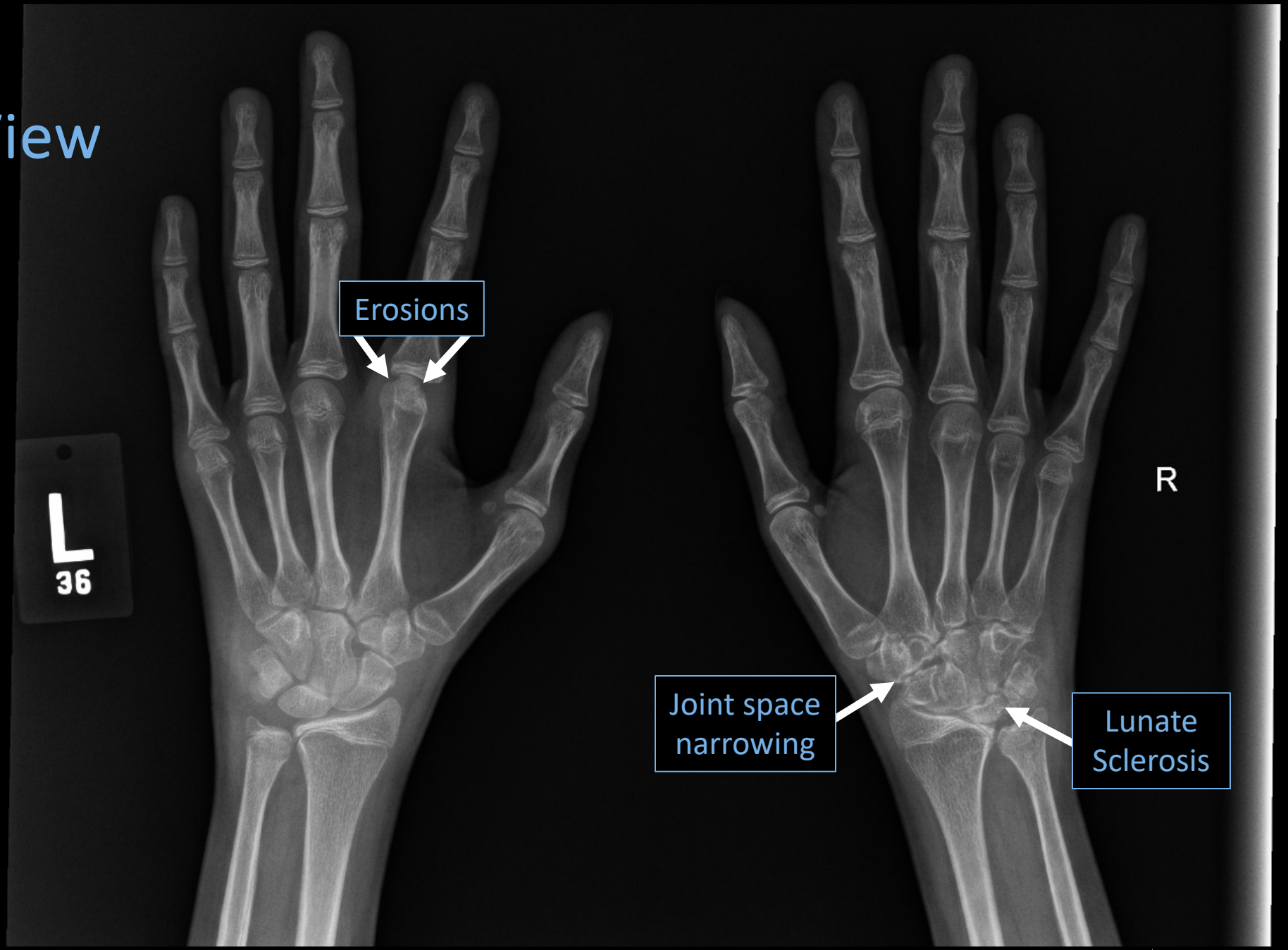
Variant 1: **Adult. Chronic hand or wrist pain. Initial imaging.**

Procedure	Appropriateness Category	Relative Radiation Level
Radiography area of interest	Usually Appropriate	Varies
US area of interest	May Be Appropriate	O
Radiographic arthrography area of interest	Usually Not Appropriate	Varies
MR arthrography area of interest	Usually Not Appropriate	O
MRI area of interest without and with IV contrast	Usually Not Appropriate	O
MRI area of interest without IV contrast	Usually Not Appropriate	O
Bone scan area of interest	Usually Not Appropriate	☢☢☢
CT area of interest with IV contrast	Usually Not Appropriate	Varies
CT area of interest without and with IV contrast	Usually Not Appropriate	Varies
CT area of interest without IV contrast	Usually Not Appropriate	Varies
CT arthrography area of interest	Usually Not Appropriate	Varies

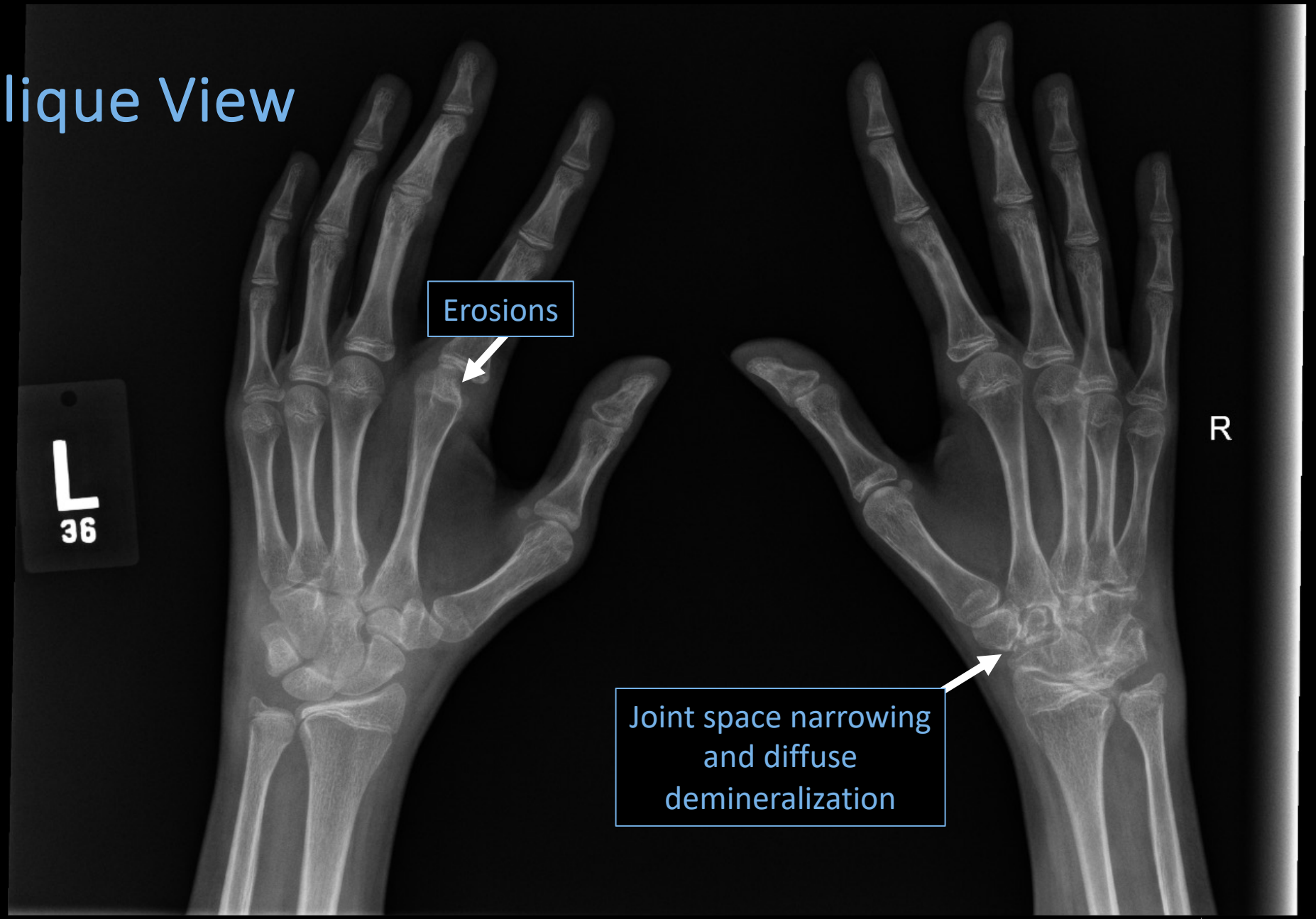
List of Imaging Studies

- XR Hand 3 or More Views Bilateral
  - PA
  - Oblique
  - Lateral

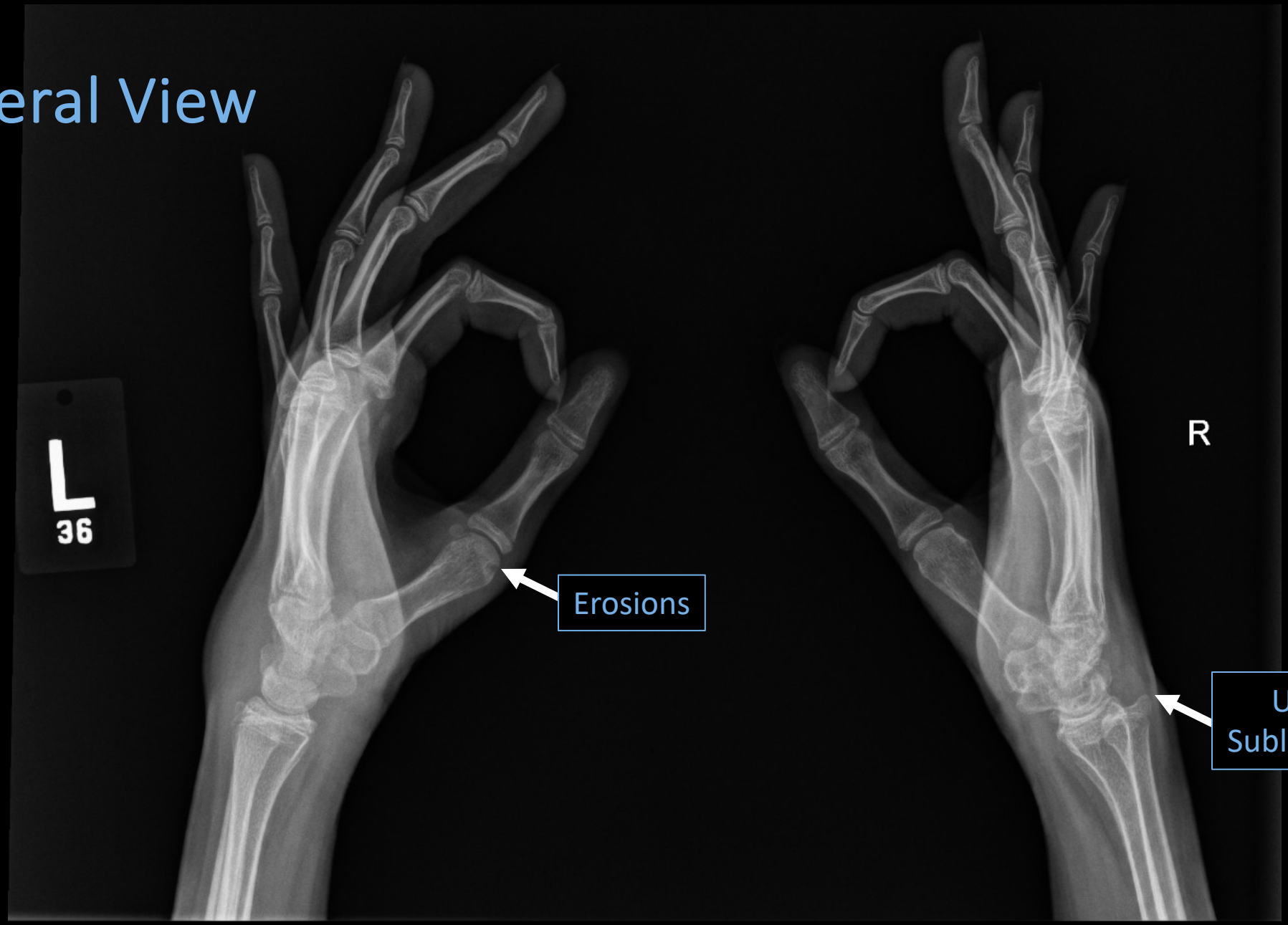
PA View



Oblique View



Lateral View



Differential Diagnoses

- Juvenile idiopathic arthritis
- Osteoarthritis
  - Initial presentation is during middle age due to joint wear and tear.
- Ankylosing spondylitis
  - Imaging will involve fusion of the spine and SI joints.
- Avascular necrosis (Kienbock's disease)
  - Imaging will demonstrate lunate osteonecrosis.
- Ulnar impaction syndrome
  - Wrist imaging will show positive ulnar variance.

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Patient Treatment & Outcome

- Dx: Juvenile Idiopathic Arthritis, polyarticular, RF+.
- Started on methotrexate and leucovorin.
- Follow up with Pediatric Rheumatology.
- Referral to ophthalmology to monitor for uveitis.

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Discussion: Juvenile Idiopathic Arthritis

- Chronic autoimmune synovial inflammation
- Symptoms before age 16 and present for > 6 weeks.
  - Joint pain, stiffness, or swelling
    - Stiffness that is worse in the morning.
    - "Gelling" phenomenon – stiffness following periods of inactivity.
    - Commonly involved joints: knee > hand/wrist > ankle > hip > C-spine.
  - Blurry vision, dry "gritty" eyes, nail pitting, rash, fever, fatigue.
- Female to male ratio = 2:1

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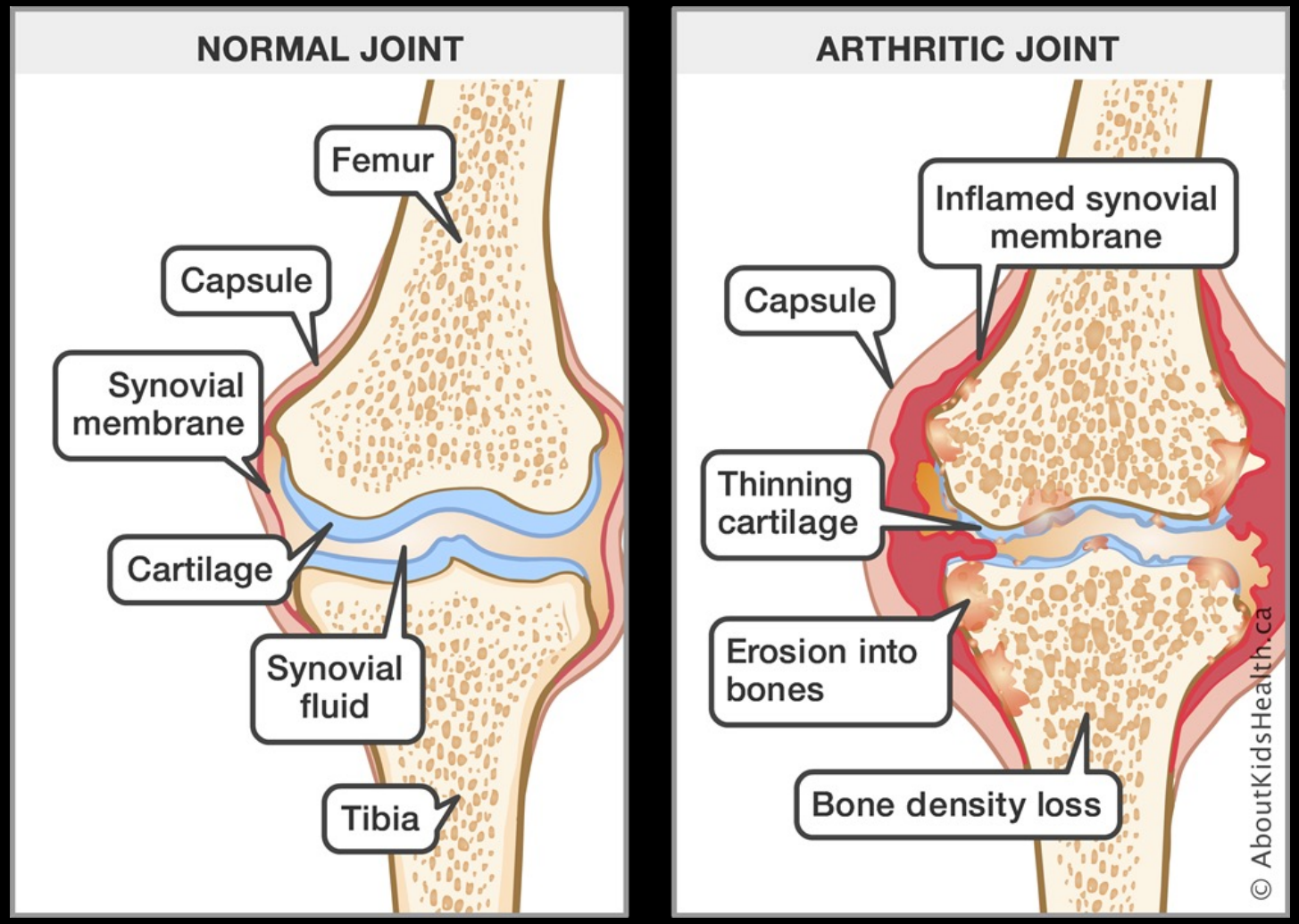
Discussion: Juvenile Idiopathic Arthritis

Classification	Symptoms	Demographic
Oligoarticular (~50%)	• ≤4 joints (can extend) • Medium and large joints • Uveitis (~25%)	• Peak age: 1-6 years • F>M (3:1)
Polyarticular (~25%)	• ≥5 joints • Small and medium joints • Uveitis (~20%)	• Peak age: 1-4 years; 7-10 years • F>M (10:1)
Systemic (~10%)	• Fever • Rash x 2 weeks • Pericarditis/pleuritis • LAD/HSM	• Peak age: 5-10 years • M=F
Psoriatic (<10%)	• Rash (ears, eyelids, scalp) • Dactylitis • Nail pitting • Uveitis (~15%)	• Peak age: 2 years; 6-14 years • F>M (2:1)

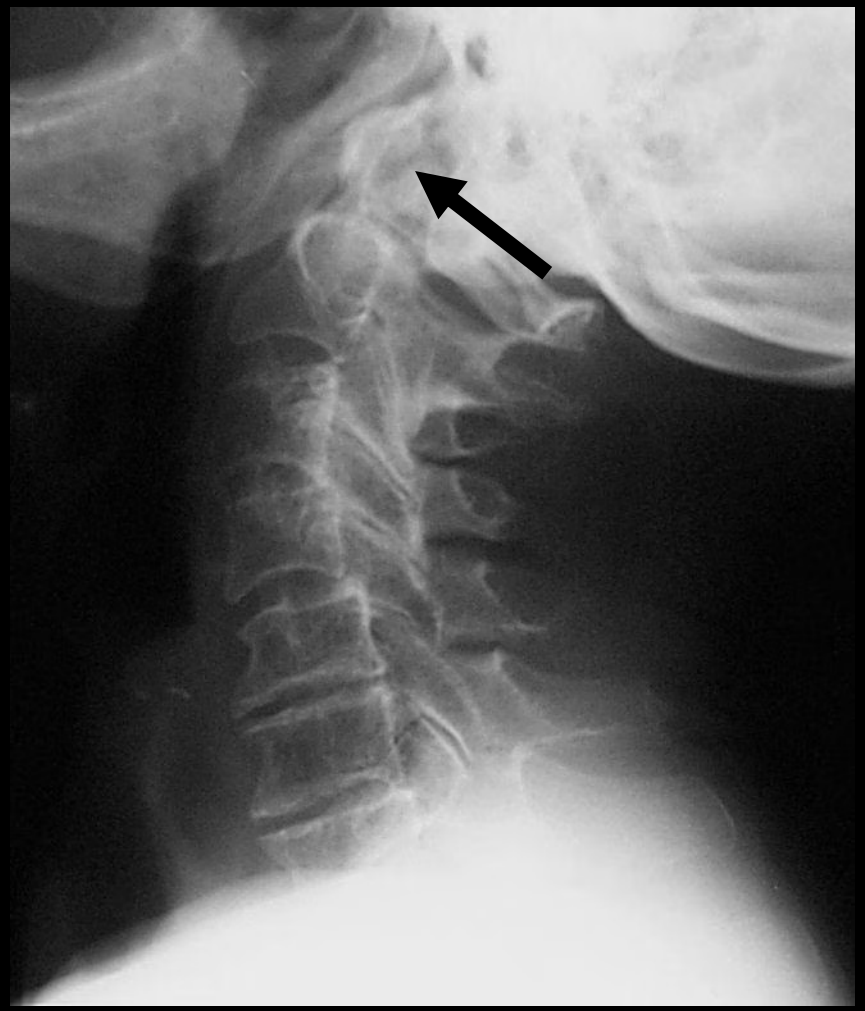
Discussion: Juvenile Idiopathic Arthritis



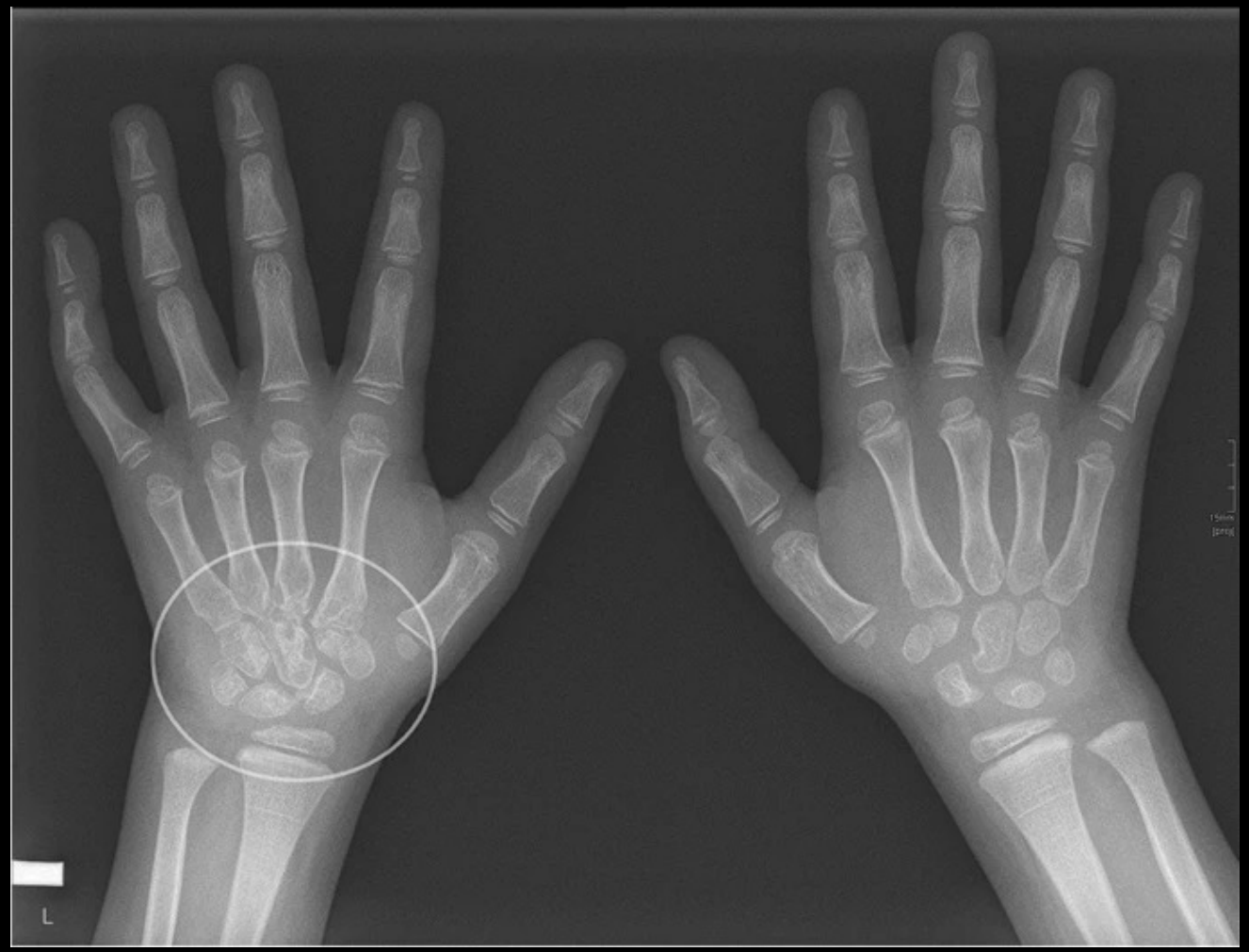
Discussion: Juvenile Idiopathic Arthritis

- Plain radiographs
  - Joint
    - Often negative joint findings at presentation
    - Erosions, osteopenia, and joint destruction with progression
  - Cervical spine
    - Atlantoaxial subluxation
    - Odontoid erosions
    - Ankylosis (facet joints)
  - Other
    - Hepatosplenomegaly
    - Pericardial or pleural effusions

Discussion: Juvenile Idiopathic Arthritis

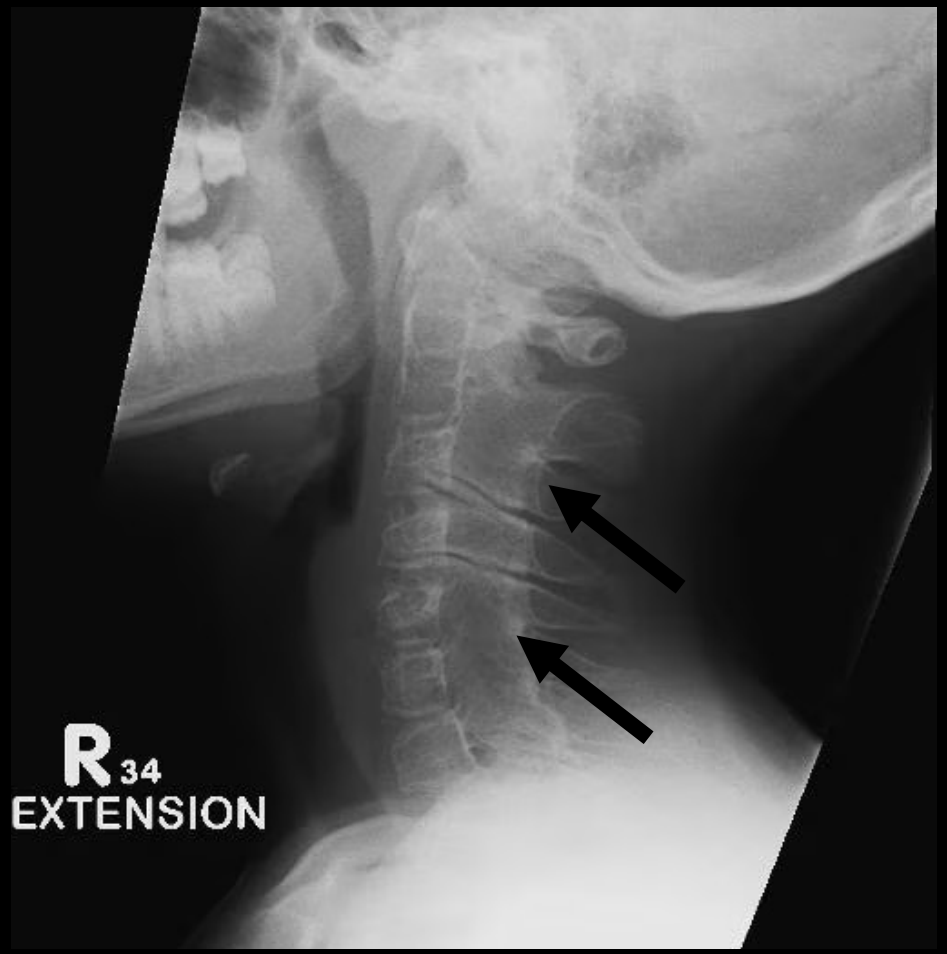


Odontoid erosion[2]



Bony erosions[10]

Discussion: Juvenile Idiopathic Arthritis

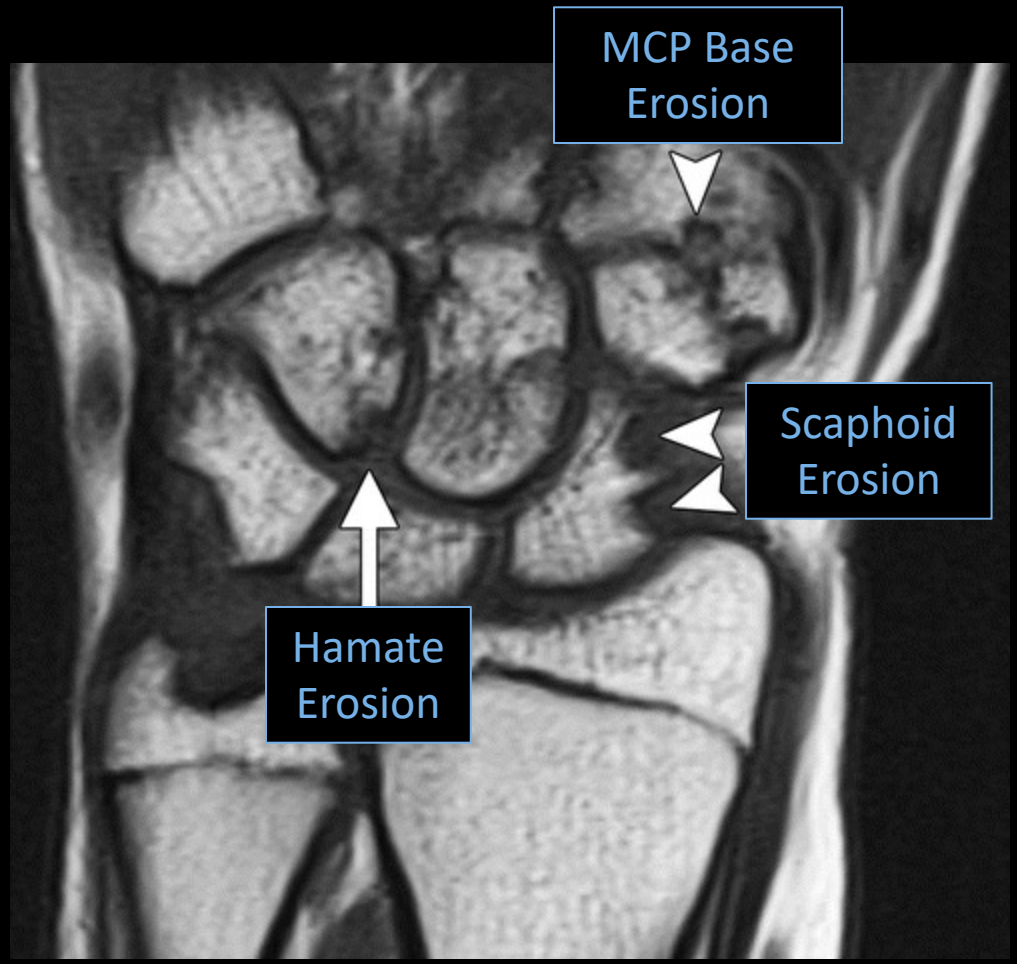


Ankylosis of C-spine[3]

Ankylosis of MTPs[10]

Discussion: Juvenile Idiopathic Arthritis

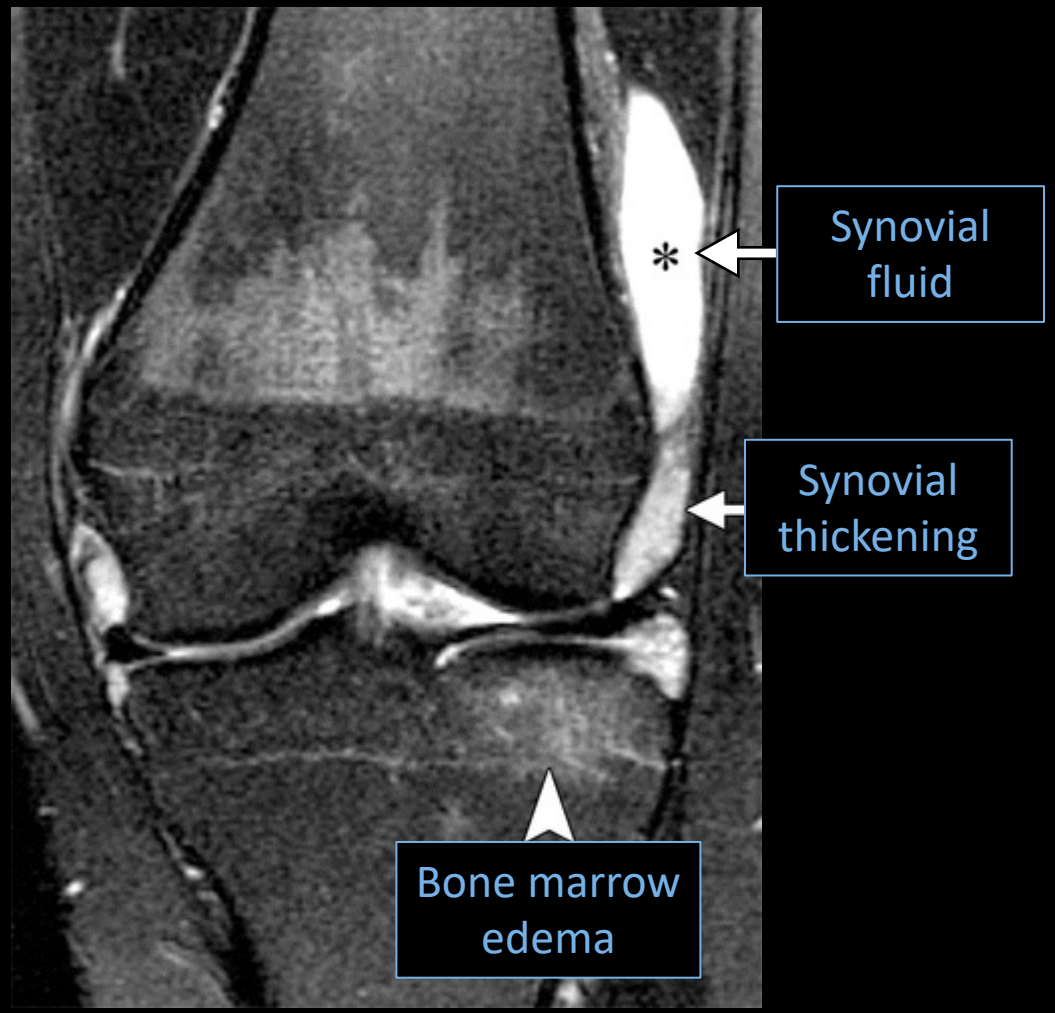
- MRI
  - Monitor disease progression
  - Findings
    - Synovial hypertrophy
    - Joint effusions
    - Intra-articular loose bodies



Coronal T1[14]

Discussion: Juvenile Idiopathic Arthritis

Coronal contrast-enhanced fat-suppressed T1[14]



Coronal fat-suppressed T2[14]

Discussion: Juvenile Idiopathic Arthritis

- Treatment
  - DMARDs + routine ophthalmology follow up
  - NSAIDs/high-dose aspirin
  - Intra-articular steroid injections
  - Synovectomy or arthroplasty
- Outcome
  - 50% resolve without sequelae
  - 25% slightly disabled
  - 25% crippling arthritis or blindness

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UNC Top Three Teaching Points

- Juvenile idiopathic arthritis (JIA) presents with joint symptoms lasting > 6 weeks, occurring before age 16.
- Radiographs will show bony erosions, osteopenia, and joint space narrowing.
- MRI can be used to monitor disease progression and visualize active synovitis.

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References

1. "ACR Appropriateness Criteria®." *American College of Radiology*, www.acr.org/Clinical-Resources/ACR-Appropriateness-Criteria. Accessed 15 May 2024.
2. Michele Calleja, MD. "Rheumatoid Arthritis Spine Imaging." Practice Essentials, Radiography, Magnetic Resonance Imaging, Medscape, 30 Jan. 2023, emedicine.medscape.com/article/398955-overview#a2.
3. David D Sherry, MD. "Juvenile Idiopathic Arthritis Workup." *Medscape*, 3 May 2022, emedicine.medscape.com/article/1007276-workup#c12.
4. Hacking, Craig. "Kienböck Disease: Radiology Reference Article." *Radiopaedia*, Radiopaedia.org, 27 Mar. 2024, radiopaedia.org/articles/kienbock-disease-2?lang=us.
5. "Juvenile Idiopathic Arthritis (JIA): Arthritis Foundation." *Juvenile Idiopathic Arthritis (JIA) | Arthritis Foundation*, www.arthritis.org/diseases/juvenile-idiopathic-arthritis. Accessed 14 May 2024.
6. "Juvenile Idiopathic Arthritis." *Amboss*, next.amboss.com/us/article/w40hlT. Accessed 14 May 2024.
7. "Juvenile Idiopathic Arthritis." *Cincinnati Children's*, www.cincinnatichildrens.org/health/j/jia. Accessed 14 May 2024.
8. "Juvenile Idiopathic Arthritis." *Orthobullets*, www.orthobullets.com/basic-science/4108/juvenile-idiopathic-arthritis. Accessed 14 May 2024.
9. "Kienböck's Disease - Orthoinfo - Aaos." *OrthoInfo*, orthoinfo.aaos.org/en/diseases--conditions/kienbocks-disease. Accessed 15 May 2024.
10. Ključevšek, Damjana, et al. "The Role of Radiography in Diagnosing, Monitoring and Prognosing Juvenile Idiopathic Arthritis - Pediatric Radiology." *SpringerLink*, Springer Berlin Heidelberg, 29 Aug. 2023, link.springer.com/article/10.1007/s00247-023-05742-2.
11. "Psoriatic Arthritis in Children." *Children's Hospital of Philadelphia*, The Children's Hospital of Philadelphia, 24 Aug. 2014, www.chop.edu/conditions-diseases/psoriatic-arthritis-children.
12. "Psoriatic Arthritis in Children." *Stanford Medicine Children's Health*, www.stanfordchildrens.org/en/topic/default?id=psoriatic-arthritis-in-children-90-P01727. Accessed 14 May 2024.
13. Sharma, Rohit. "Juvenile Idiopathic Arthritis." *Radiopaedia*, Radiopaedia.org, 20 Apr. 2024, radiopaedia.org/articles/juvenile-idiopathic-arthritis?lang=us.
14. Sheybani, Elizabeth F, et al. *Imaging of Juvenile Idiopathic Arthritis: A Multimodality Approach*, 30 Aug. 2013, pubs.rsna.org/radiographics/doi/10.1148/rg.335125178.
15. Weerakkody, Yuranga. "Ulnar Impaction Syndrome: Radiology Reference Article." *Radiopaedia*, Radiopaedia.org, 11 Dec. 2022, radiopaedia.org/articles/ulnar-impaction-syndrome?lang=us.
16. "What Is Juvenile Idiopathic Arthritis (JIA)?" *AboutKidsHealth*, www.aboutkidshealth.ca/article?contentid=1049&language=english. Accessed 14 May 2024.

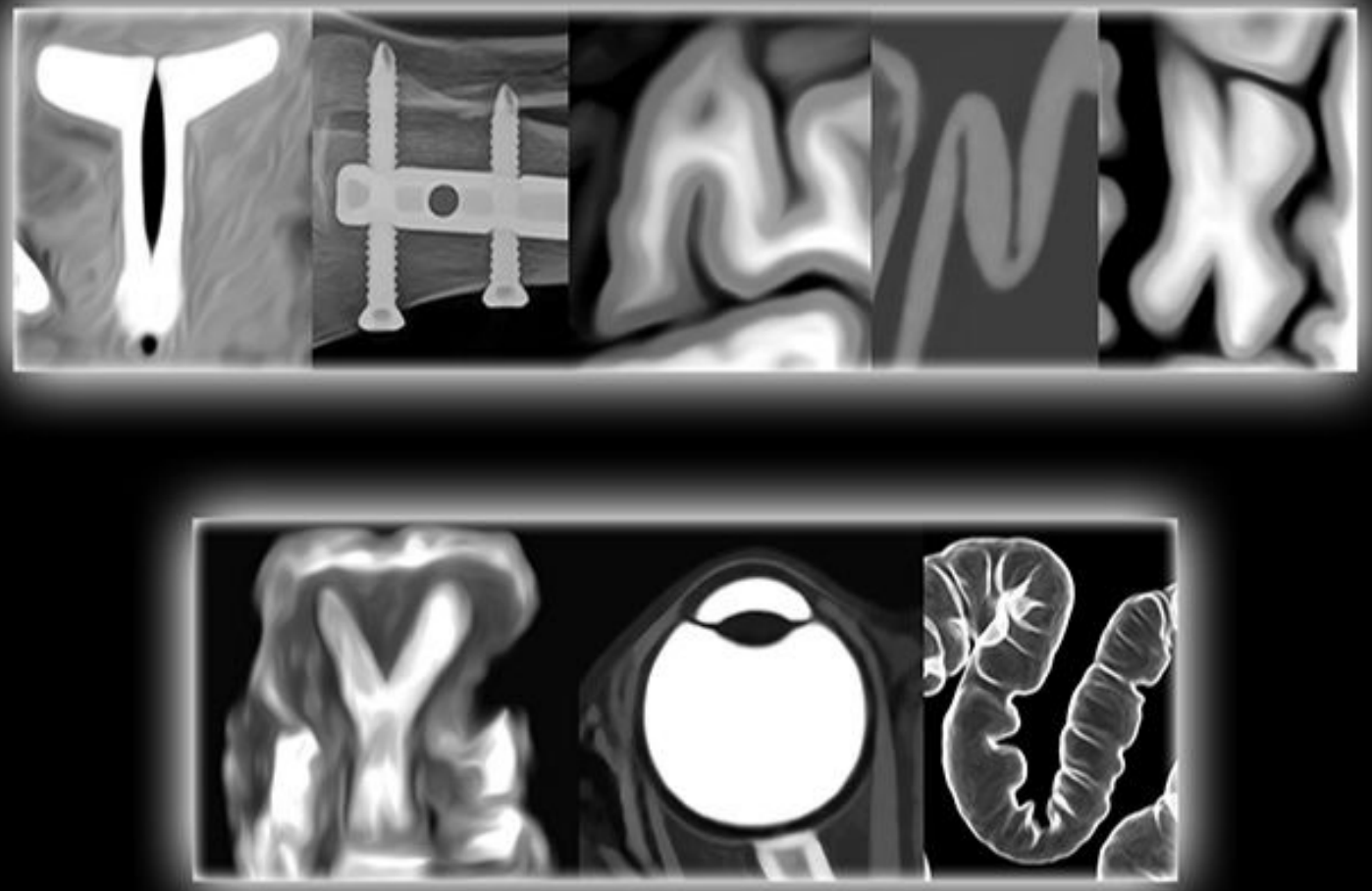

Photo: https://xrayartistry.com/xray-art-collection/

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