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

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>Relative Radiation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiography area of interest</td>
<td>Usually Appropriate</td>
<td>Varies</td>
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<tr>
<td>US area of interest</td>
<td>May Be Appropriate</td>
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<tr>
<td>Radiographic arthrography area of interest</td>
<td>Usually Not Appropriate</td>
<td>Varies</td>
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<tr>
<td>MR arthrography area of interest</td>
<td>Usually Not Appropriate</td>
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<tr>
<td>MRI area of interest without and with IV contrast</td>
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<tr>
<td>Bone scan area of interest</td>
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<td>CT area of interest with IV contrast</td>
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</table>
List of Imaging Studies

• XR Hand 3 or More Views Bilateral
  • PA
  • Oblique
  • Lateral
PA View

- Erosions
- Joint space narrowing
- Lunate Sclerosis
Oblique View

- Erosions
- Joint space narrowing and diffuse demineralization
Lateral View

Erosions

Ulnar Subluxation
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.
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.
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
# Discussion: Juvenile Idiopathic Arthritis

<table>
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<tr>
<th>Classification</th>
<th>Symptoms</th>
<th>Demographic</th>
</tr>
</thead>
</table>
| 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

Bony erosions

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Discussion: Juvenile Idiopathic Arthritis

Ankylosis of C-spine

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

Coronal fat-suppressed T2

- Synovitis
- Synovial fluid
- Synovial thickening
- Bone marrow edema
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
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.
References
