Pediatric Musculoskeletal Infections

Robert C. Orth, M.D., Ph.D.
Texas Children’s Hospital
Baylor College of Medicine
Disclosure

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Learning Objectives

• Overview of acute hematogenous osteomyelitis (AHO)
• Preferred imaging modalities
• Imaging algorithm
• MRI technique
• Pitfalls
AHO

• 1 in 5000 U.S. children per year
• Half of cases <6 years old
• Signs and symptoms non-specific
• Location
  - <2 year old ➔ epiphyseal and metaphyseal
  - >2 years old ➔ metaphyseal
Imaging modalities

• Radiographs – all patients

• US

• CT – incidentally

• NM – rarely

• MRI
13 year-old girl 7 days s/p ovarian cyst drainage – POD 7
Imaging algorithm

• Radiographs – all patients
• MRI
Radiographs

• All patients
  - Diagnosis – very rarely
  - Alternative diagnosis – not uncommon

• Priors older than 7 days ➔ repeat

• Always review outside radiographs
Cuboid Toddler’s Fracture
MRI

- Osteomyelitis
- Septic arthritis
- Collections
- Extent of disease
MRI Technique

• Sedation
  - Under 4 – yes
  - Over 4 – maybe
  - Pre-contrast without sedation

• Coil selection
MRI technique

• Large FOV bilateral STIR
  - Under 3 ➔ continue bilateral
  - Subtle or questionable changes – continue bilateral
  - Over 3 – unilateral optional
3 year-old boy with 5 day history of fever and refusal to use left arm
MRI Technique

• Coned-down FOV for
  - Coronal T1
  - Axial STIR
  - Sagittal STIR
  - Repeat coronal STIR optional
MRI Technique

• Intravenous Gd contrast
  - 2-3 plane post-contrast
  - Under 2 – always
  - Sedated– usually
  - Non-sedated
    • Normal pre-contrast – No
    • Abnormal pre-contrast - Yes
Pitfalls

• Corner shot
2 year-old girl refusing to bear weight on right leg
Pitfalls

• Corner shot

• Cannot reliably differentiate between
  - Septic arthritis and reactive synovitis
  - Osteomyelitis and osteonecrosis
Pitfalls

- Corner shot
- Cannot reliably differentiate
  - Septic arthritis and reactive synovitis
  - Osteomyelitis and osteonecrosis
- Diffuse marrow process – T1
6-year old with right thigh pain
Conclusion

• Suspected AHO
  - Recent radiographs
  - MRI – Start with Large FOV STIR

• Intravenous contrast
  - Abnormal pre-contrast
  - <2 years old

• Corner shot