MUSCULOSKELETAL INFECTIONS IN CHILDREN

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MUSCULOSKELETAL INFECTIONS

- Common and uncommon infections
- Common and uncommon presentations
- Imaging modalities
- Problems and pitfalls
COMMON INFECTIONS

• Osteomyelitis
• Septic Arthritis

UNCOMMON INFECTIONS

• Discitis
• Pyomyositis
• SAPHO/CRMO
RISK FACTORS

- Age: younger > older
- Prematurity
- Umbilical vessel catheterisation
- Urinary Tract Infection
- Immunodeficiency
- Comorbidity
OSTEOMYELITIS

- Most common musculoskeletal infection
- Incidence is approximately 1 in 5000
- Boys > Girls
- 30% Staph aureus
- 50% occur < 5 years of age.
- 70% involve lower extremities.
MAKING THE DIAGNOSIS

- Xray
- Ultrasound
- Nuclear Medicine
- CT
- MRI
- Intervention
XRAY

- Plain radiography is not sensitive to the presence of osteomyelitis.
- Bone destruction may be seen.
- 80% have a normal xray in the first 2 weeks.
REPEAT XRAYS

At 1 week

At 1 month

At 2 months
MRI

- Magnetic resonance Imaging is the modality of choice.
- Oedema is the earliest feature on MRI
  - T2W
  - STIR
- Gadolinium?
TO ENHANCE OR NOT TO ENHANCE? THAT IS THE QUESTION …

- Controversial
- Gadolinium enhancement does not increase the sensitivity or specificity of osteomyelitis.
- If fluid sensitive images are normal gadolinium enhancement is of no value.
- If fluid sensitive images are abnormal gadolinium enhancement may be of value in identifying the presence of an abscess.

NB
If the abscess is confined to the epiphyseal cartilage the unenhanced scans may be normal.
SEPTIC ARTHRITIS

- 75% before age 3 years
- 75% in the lower extremity
  - Hip and Knee in 90%
- 75% Staph aureus

Neonates: Group B Strep

< 4yrs of age: HIB, Strep pyogenes, Staph aureus

> 4yrs of age: Staph aureus
MAKING THE DIAGNOSIS

- Xray
- Ultrasound
- MRI
- Intervention
BONE SCAN
HOW DO I PREVENT INFECTION FROM BITING INSECTS?

DON’T BITE ANY.
DISCITIS

- 2 peaks: 6 months – 4 years
  - Lumbar spine L3/4 and L2/3
  - Thoracic spine
- Staph aureus
- Atypical infections – Salmonella, TB.
MAKING THE DIAGNOSIS

- Xray
- Nuclear Medicine
- MRI
- Intervention
BONE SCAN
PYOMYOSITIS

- 5 – 9 years
- Male > Female
- Proximal Lower Limb and Pelvis
- 90% Staph aureus
- Previous trauma reported in 25 – 35% patients
- Iliopsoas infection associated with GI/GU/Spinal infection.
MAKING THE DIAGNOSIS

- Xray
- Ultrasound
- MRI
- CT
- Intervention
C.R.M.O.

- Multifocal non-pyogenic inflammatory bone lesions
- Most common between 9 and 14 years of age.
- Female > Male
- Unknown pathogenesis
  - Genetic susceptibility focus identified at 18q21.3-22
  - Associated with skin disorders and inflammatory bowel disease
- Most common in lower extremities
  - The tibia is the most common bone
  - The metaphysis is most common site
S.A.P.H.O.

- Most common site is upper anterior chest wall
  - 70-90% involve sternocostoclavicular region
- No known pathogenesis
- Usually seen in young adults, but can be seen in children
- Male = Female

Synovitis, Acne, Palmoplantar pustulosis, Hyperostosis, Osteitis
MAKING THE DIAGNOSIS

- Xray
- Nuclear Medicine
- MRI
- Intervention
BONE SCAN ...
AND MRI ...
MRI

- Increasing use
- Identify area(s) of pathology
- Whole body STIR
CRMO .... OR NOT CRMO?

- Isolated lesion

- Absence of other clinical features or comorbidity

- Rare locations
  - Spine
  - Mandible

If in doubt .... Biopsy
PROBLEMS AND PITFALLS

• The growing skeleton.

• What you can’t see.

• The differential diagnoses:
  
  Septic Arthritis  \textit{v.}  Inflammatory Arthritis
  
  Osteomyelitis  \textit{v.}  Osteolysis
  
  C.R.M.O  \textit{v.}  S.A.P.H.O.
UNOSSIFIED PATELLA

Left Knee Long
SOFT TISSUE COLLECTION

LT KNEE ANTEROMEDIAL TS

PATELLA
A SALUTARY TALE ...
Carpotarsal osteolysis
SUMMARY

- Consider musculoskeletal infection in any child with PUO
- Plain film and ultrasound as first line investigations
- Increasing use of MRI
- Multidisciplinary Team Approach
- Tertiary centre support
- Differential Diagnoses
THANK YOU

Any questions?