Perplexing Perthes

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Disclosure of Commercial Interest

Neither I nor my immediate family members have a financial relationship with a commercial organization that may have a direct or indirect interest in the content.
Objective

- To present a brief overview of Perthes Disease and the imaging modalities used for diagnosis and treatment evaluation
Pediatric Hip

• Pathophysiology
• Imaging
• Prognosis and Staging
• Treatment
Legg-Calvé-Perthes

- Avascular necrosis of the femoral head
- Affects 5-10/100,000 children 4-8yo
- Boys with delayed bone age
- One of the most common causes of permanent hip deformity in childhood
Legg-Calvé-Perthes
Pathophysiology

• Abnormal growth of the physis, and eventual remodeling of regenerated bone are the key features of this disorder
Legg-Calvé-Perthes Pathophysiology

- Biological and mechanical factors
- Interruption of blood supply to femoral head
- Necrosis bone and cartilage
  - Articular cartilage, epiphysis, physis and metaphysis
Legg-Calvé-Perthes Pathophysiology

- Microfx, subchondral fx and/or synovitis
- Femoral head and neck deformity
- Acetabular remodeling
- Late - Secondary degenerative changes
Legg-Calvé-Perthes Imaging

Pain worse with activity

- Radiograph:
  - AP and frog-leg lateral X-rays
  - Presence and extent of disease
Legg-Calvé-Perthes Imaging
Legg-Calvé-Perthes Staging

**Initial**
- Infarction
- Small sclerotic
- 3-6 months

**Fragmentation**
- Revascularization
- Collapse and resorption
- 8 months

**Reossification**
- Remineralization
- 1-3 years

**Healing**
- Revascularization
- Collapse and resorption
- 8 months
Legg-Calvé-Perthes Outcomes

NORMAL — OVOID — FLAT
Legg-Calvé-Perthes Imaging
Legg-Calvé-Perthes
Prognosis & Staging

• Goal of treatment is to prevent hip deformity
• Deformity leads to premature osteoarthritis
• Key to prognosis - Age and degree of disease
  – Younger the child the better prognosis
  – Lateral pillar involvement worse outcome
  – Early intervention improves outcome
Legg-Calvé-Perthes

- Differential Diagnosis:
  - Bilateral Perthes: (may require skeletal survey);
    - hypothyroidism
    - multiple epiphyseal dysplasia
    - spondyloepiphyseal dysplasia tarda
    - sickle cell
  - Unilateral Perthes:
    - septic arthritis
    - sickle cell
    - spondyloepiphyseal dysplasia tarda
    - gaucher's disease
    - eosinophilic granuloma
Legg-Calvé-Perthes Treatment

• Very controversial
  – Containment
    • Surgical
    • Non-surgical
  – Non-weight bearing
    • Crutches
    • Wheelchair
Summary

- Legg-Calve’-Perthes (LCP)
  - Waldenstrom’s staging X-ray
  - Occult by X-ray--- consider MR perfusion study
Thank you