



The Limping Child:

2.) Septic Arthritis



Miss Sophie Howles MBBCh MRCS
Trauma & Orthopaedic Registrar
Birmingham Orthopaedic Training Programme



Module Overview

- Lecture 1: Introduction

- Lecture 2: Septic Arthritis

- Epidemiology
- Pathophysiology
- Assessment
- Management
- Complications

- Lecture 3: Developmental dysplasia of the hip
- Lecture 4: Perthe's Disease
- Lecture 5: Slipped Upper Femoral Epiphysis

Epidemiology

- Incidence peaks in the *first few years of life*
 - 50% of cases occur in children younger than 2 years of age
- **Risk factors** for neonatal septic arthritis
 - Prematurity (due to relative immunocompromise)
 - Caesarean section
 - NICU treatment
 - Invasive procedures
 - (eg venous catheterization)
 - Can cause transient bacteraemia



Pathophysiology

Routes of Inoculation

1.) Direct inoculation

-(eg. from trauma or surgery)

2.) Haematogenous seeding

3.) Local extension

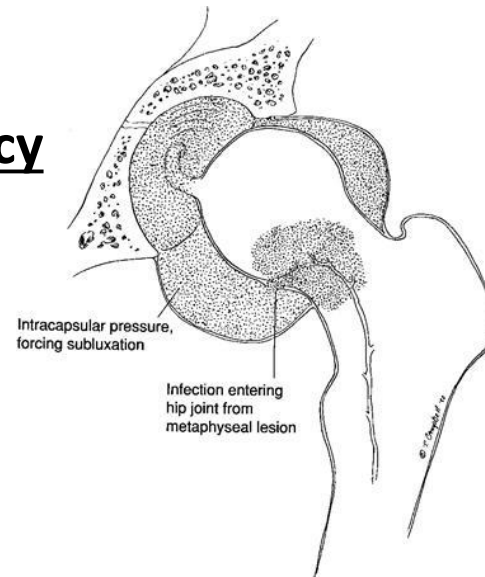
- of osteomyelitis from adjacent bone
- Most common site of OM in children = metaphyses



Pathophysiology

- Once inoculated, bacteria colonize vascular synovium
- Release of proteolytic enzymes cause **destruction**:
 - Can cause articular surface damage within 8 hours
 - Increased joint pressure may cause femoral head osteonecrosis if not relieved promptly

=> Hence - orthopaedic emergency



Causative Organisms

	Age	Organisms
1	Neonates	Streptococcus sp Gram-negative organisms
2	Infants	Staphylococcus aureus Haemophilus influenza
3	Children	Staphylococcus aureus Salmonella
4	Adolescent	Staphylococcus aureus Nesseria gonorrhoea
5	Adults	Staphylococcus aureus Streptococcus Gram-negative organisms
6	IV Drug Abusers	Suspect Pseudomonas and atypical organisms

Clinical Presentation: History

- Limp/refusal to use limb
- Pain (acute onset – more so than osteomyelitis)
- Systemic features (fever, evidence of SIRS)
- Irritability, lethargy, difficulty feeding

- Also ask about:
 - Recent history of travel/trauma/illness/infection
 - Immunisations
 - Pregnancy and birth
 - Family History



Clinical Presentation: Examination

- Initial **ABC** approach - assess systemically
- **Look:**
 - Limp/antalgic gait in ambulant child
 - Hip rests in position of comfort :
 - flexion, abduction, and external rotation (FABER)
- **Feel:**
 - Local Effusion, tenderness, warmth
- **Move:**
 - Unwilling to move joint / pseudoparalysis
 - Passive motion elicits severe pain/distress
- Always examine adjacent joints and spine



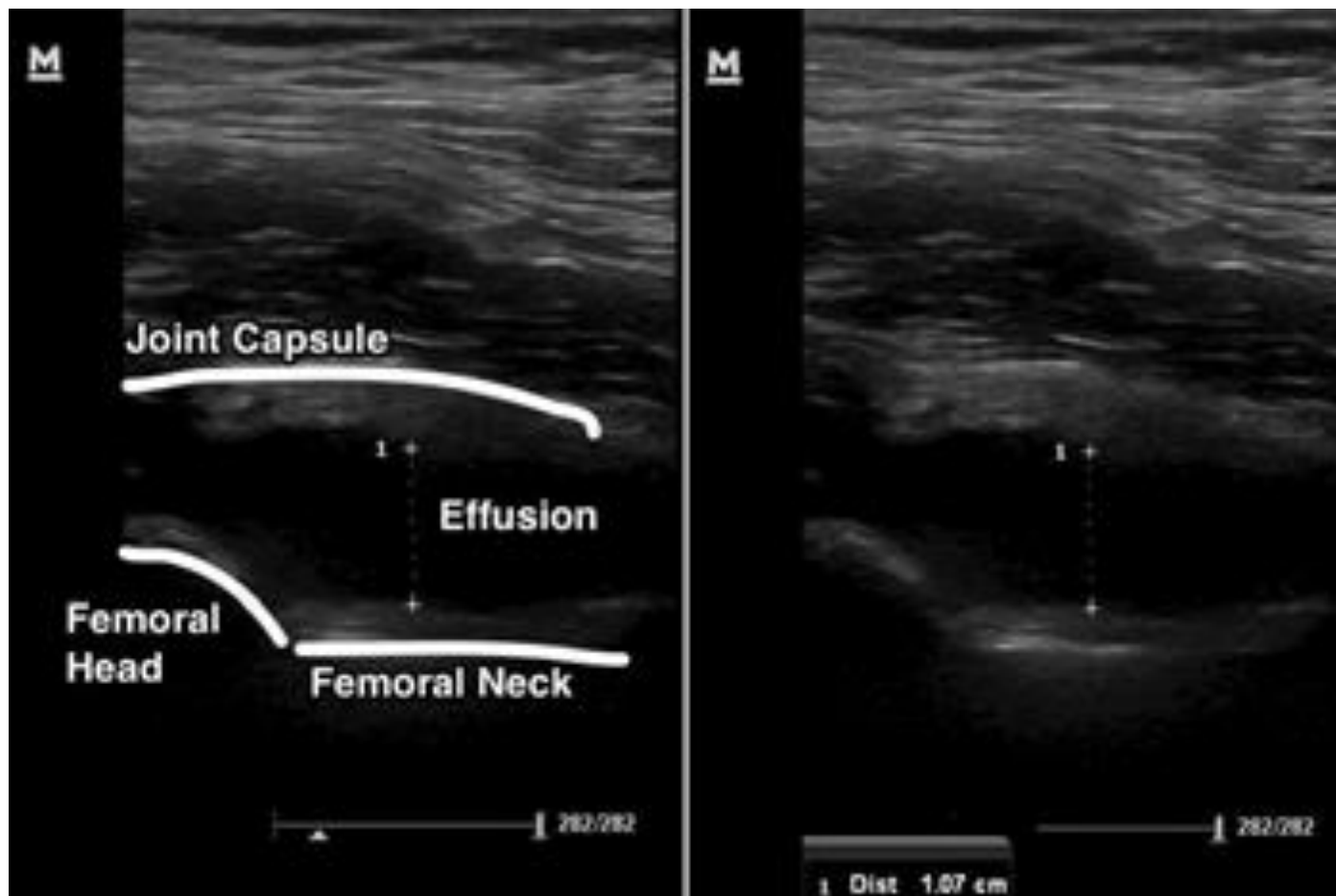


Investigations

- **Bloods**: FBC, U+E, Inflammatory markers (ESR and CRP)
+ Consider blood cultures
- **Radiographs**
 - AP and frog-leg lateral pelvic plain films
 - Early stages: normal
 - Later : widened joint space
 - (lateral displacement of proximal femur), subluxation, signs of associated osteomyelitis
- **Ultrasound**
 - Can help identify effusion – but cannot differentiate septic vs sterile effusion
- **MRI**
 - Can identify an effusion and any adjacent osteomyelitis
 - But can be difficult to get quickly
- **Aspirate**
- **If in doubt wash it out!**







Kochers' Criteria

TABLE 1.

Independent Predictors that May Be Used in the Diagnosis of Septic Hip

Predictor	Value
Refusal to bear weight	0 predictors: 2%
Fever >38.5°C	1 predictor: 10%
White blood cell count >12,000 cells/mm ³	2 predictors: 35%
Erythrocyte sedimentation rate >40 mm/hr	3 predictors: 75%
	4 predictors: >90%
C-reactive protein level <10 mg/dL	Negative predictive value: 87%
C-reactive protein level >20 mg/dL	Negative predictive value: 85%

Data from Kocher et al.⁹ and Caird et al.¹⁰



Management

- ***Joint aspiration***
 - In paediatric cases this is done under GA
 - Ideally prior to commencing antibiotics
 - Samples sent for diagnosis and to guide antibiotic therapy
- ***Early empirical IV antibiotics***
- ***Washout of joint***
 - Anterolateral/anterior approach to hip used
 - Arthroscopic techniques may be used for other joints (eg knee)
- ***Long term targeted antibiotic therapy***
 - At least 6 weeks
 - Guided by culture and sensitivity

Complications

- Femoral head destruction
- Deformity
- Physeal damage
- Osteonecrosis
- Joint contracture
- Hip dislocation
- Growth disturbance
- Limb-length discrepancy
- Gait abnormalities

In Summary

- Septic arthritis is an ***orthopaedic emergency***
- Potential for ***severe complications***
- Early ***identification, aspiration*** and ***washout*** helps reduce the risk of these by:
 - Reducing the load of bacteria and enzymes that damage the cartilage in the joint
 - Reducing intraarticular pressure and decreasing epiphyseal ischemia

