Emergency approach to patients with Orthopaedic emergencies

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Orthopaedic Emergencies

- Open Fractures
- Acute Compartment Syndrome
- Dislocations
- Neurovascular injuries
- Septic Joints
- Cauda Equina Syndrome

-PRIMARY SURVEY:
(ABCDE) including pain mgt

-SAMPLE HISTORY

-SECONDARY SURVEY

-DISPOSITION AND HANDOVER

LIFE-THREATENING CONDITIONS

-Femur fractures that disrupt the femoral artery or its branches.

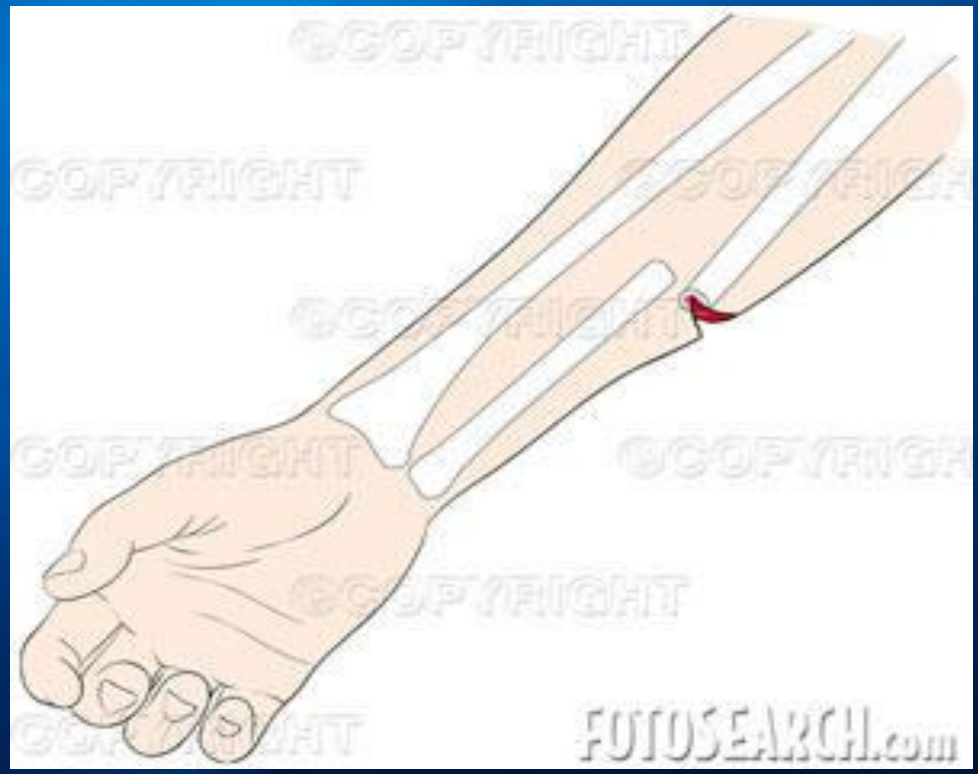
-Pelvic fractures can damage pelvic arteries or veins causing life-threatening hemorrhage; the more displaced the pelvic fracture, the greater the potential blood loss .

-Hip fractures, particularly in older adults, may prevent ambulation: pneumonia, thromboembolic disease, and possibly rhabdomyolysis.

- Patients with multiple rib fractures are at substantial risk for pulmonary contusion and related complications.

Open Fractures

- **An open (or compound) fracture** occurs when the skin overlying a fracture is broken, allowing communication between the fracture and the external environment.



Open Fractures- Management

- **ABCDE**
- Check neurovascular status, fluid resuscitation
- Remove large pieces of debris and
  cover with sterile wet dressing

- ***Immediate parenteral antimicrobials***
  - 1st generation cephalosporin
  - add aminoglycoside for types ii and iii

- Urgent orthopedic consultation
- most require irrigation and debridement in OR

Open Fractures- Complications

- **Wound infection** – 2% in Type I , >10% in Type III
- **Osteomyelitis** – staph aureus, pseudomona sp.
- Gas gangrene
- Tetanus
- Non-union/malunion

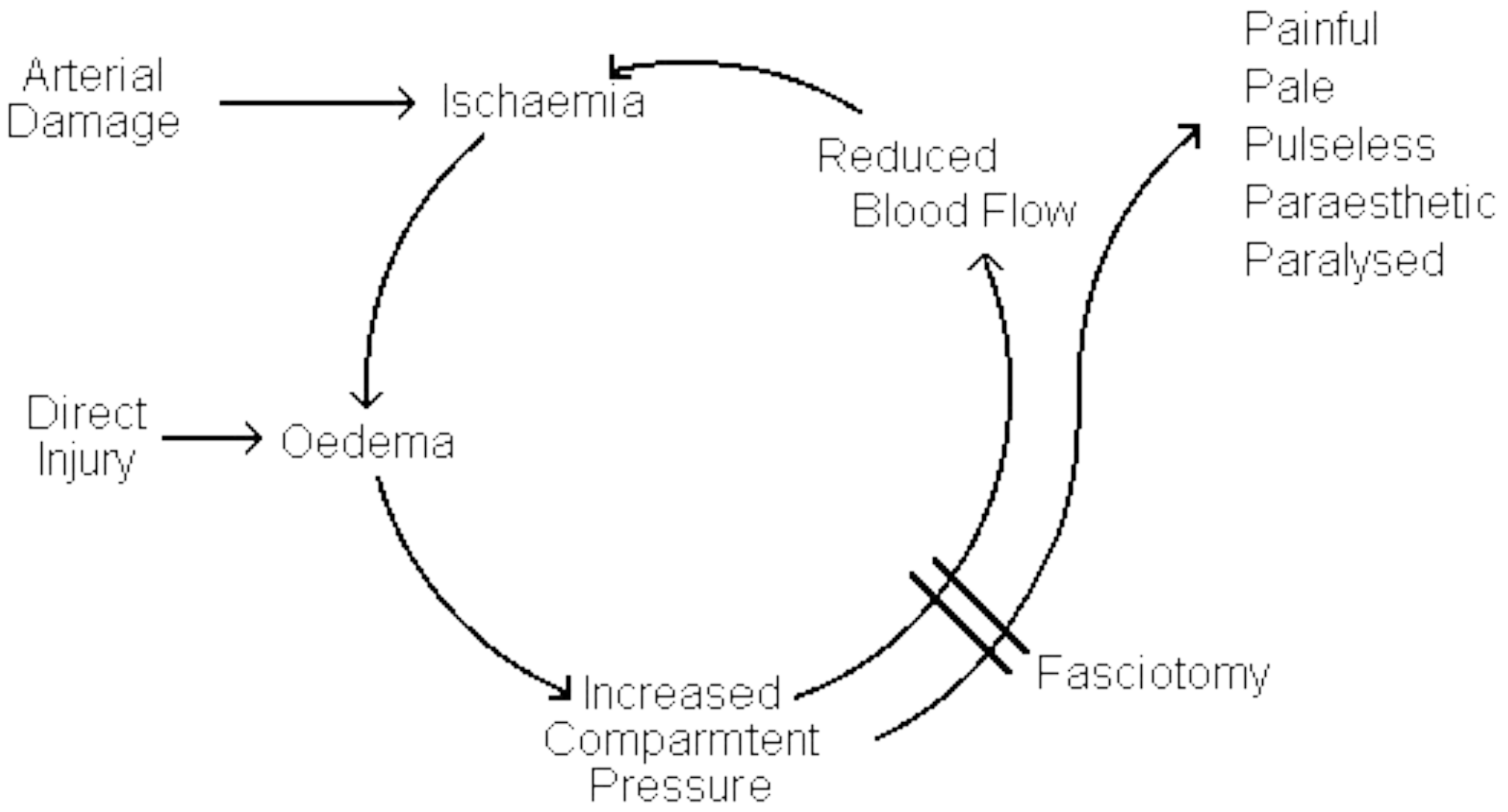
Acute Compartment Syndrome

Epidemiology

- **Compartment syndrome (CS)** is a serious life and limb threatening complications of extremity trauma

- ***ACS- Etiology:-***
  - Crush injury
  - Circumferential burns
  - Snake bites
  - Fractures – 75%
  - Tourniquets, constrictive dressings/plasters
  - Haematoma – pt with coagulopathy at increased risk

Pathophysiology



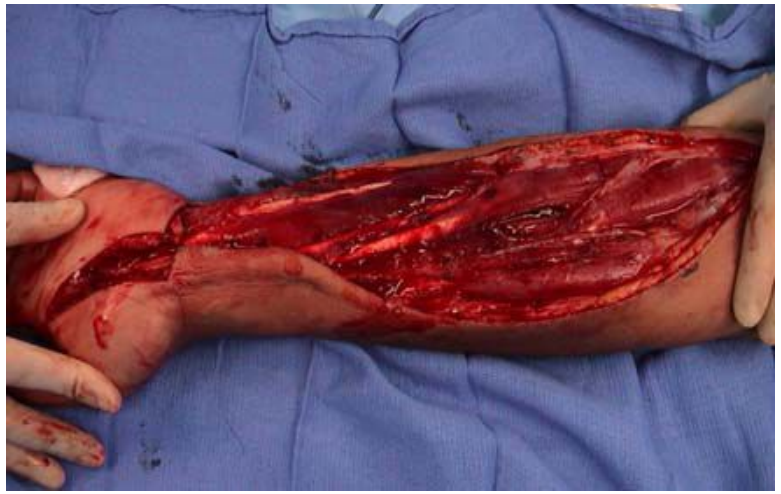
ACS- FINDINGS

- Severe pain (out of proportion to injury)
- **Pain with passive stretch**
- Tense compartment
- Tight, shiny skin

- ***(5 Ps)*** of ischaemia
  - **P**ain
  - **P**aresthesias
  - **P**aralysis
  - **P**ulselessness
  - **P**allor

ACS - Mangement

- ***Early recognition***
  - Irreversible injury 4-6 hrs
- Remove cast, bandages and dressings
- Arrange urgent fasciotomy



ACS- Complications

- Volkman ischaemic contractures
- Permanent nerve damage
- Limb ischaemia and amputation
- Rhabdomyolysis and renal failure

Joints
Dislocations

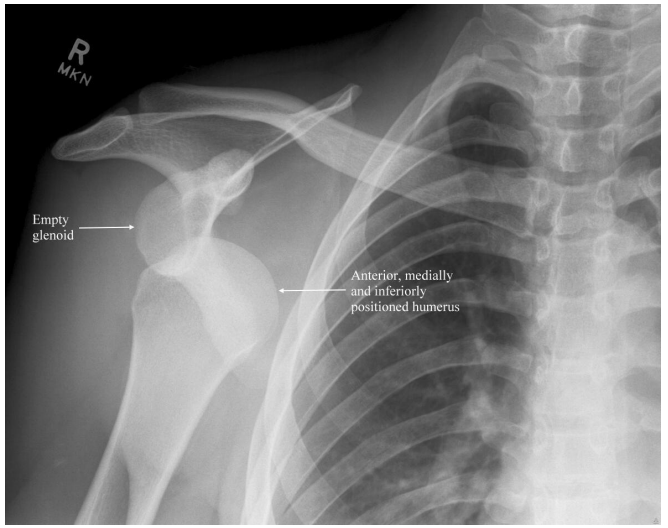
JOINT

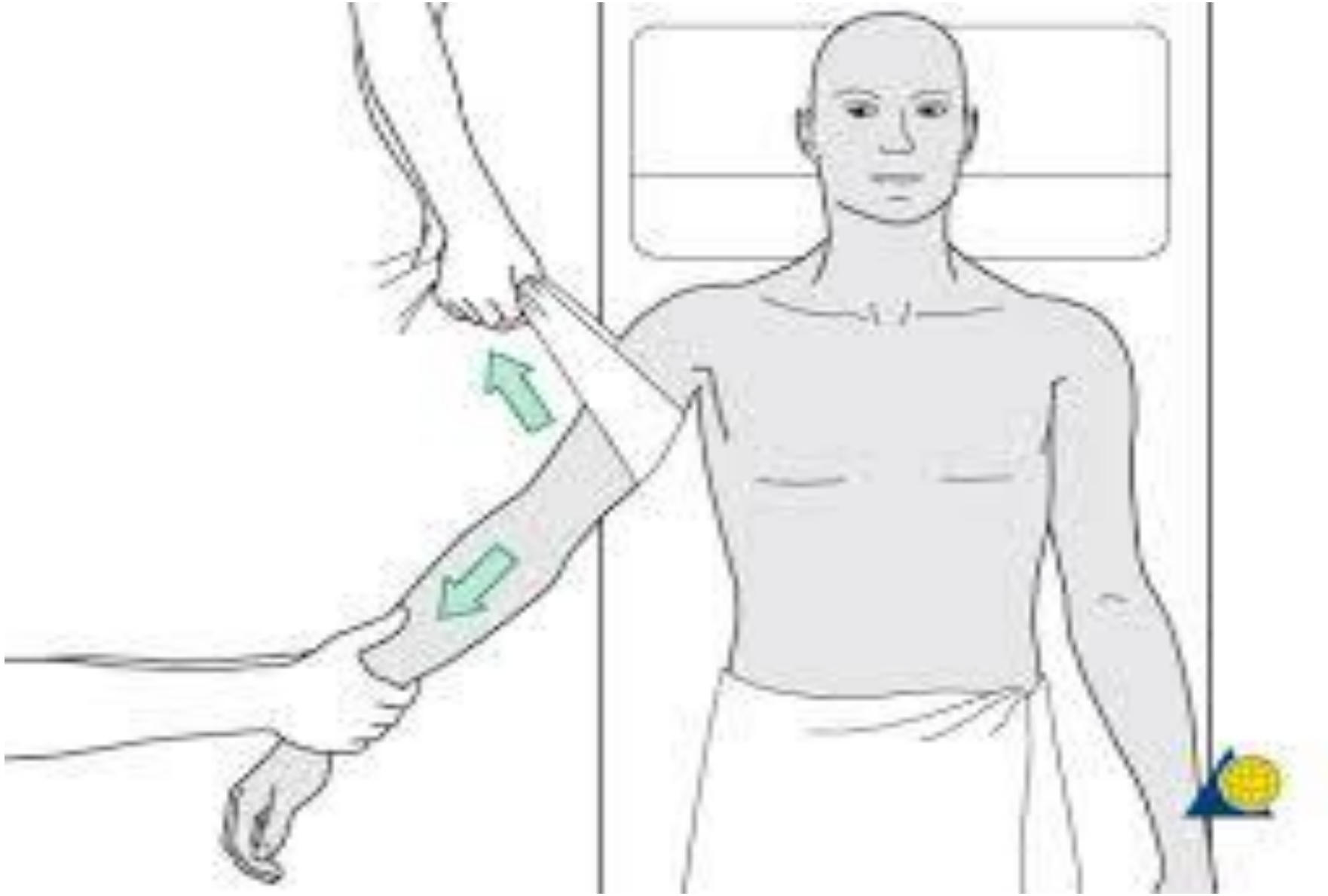
DISLOCATIONS

- Displacement of bones at a joint from their normal position
- Do x-rays before and after reduction to look for any associated fractures

DISLOCATION- SHOULDER

- Most common major joint dislocation
- **Anterior (95%)** - Usually caused by fall on hand
- **Posterior (2-4%)** – Electrocution/seizure
- May be associated with:
  - Fracture dislocation
  - Rotator cuff tear
  - Neurovascular injury





DISLOCATION- KNEE

- Injury to popliteal artery and vein is common
- Peroneal nerve injury in 20-40% of knee dislocations
- Associated with ligamentous injury
- Anterior (31%)
- Posterior (25%)
- Lateral (13%)
- Medial (3%)

DISLOCATION- HIP

- Usually high-energy trauma
- More frequent in young patients
- ***Posterior***- hip in internal rotation, most common
- ***Anterior-*** hip in external rotation
- ***Central*** - acetabular fracture
- May result in avascular necrosis of femoral head
- **Sciatic nerve injury in 10-35%**

Neurovascular Injuries

Neurovascular Injuries - Etiology

- Fracture
  - Humerus, femur
- Dislocation
  - Elbow, knee
- Direct/penetrating trauma
- Thrombus
- Direct Compression/

  Acute Compartment Syndrome
- Cast, unconscious

Common vascular injuries

Injury	Vessel
1st rib fracture	Subclavian artery/vein
Shoulder dislocation	Axillary artery
Humeral supracondylar fracture	Brachial artery
Elbow Dislocation	Brachial artery
Pelvic fracture	Presacral and internal iliac
Femoral supracondylar fracture	Femoral artery
Knee dislocation	Popliteal artery/vein
Proximal tibial	Popliteal artery/vein

CLINICAL FEATURES & MX.

- Paraesthesia/numbness
- Injured limb cold, cyanosed, pulse weak/absent
- **Call for help!**
  - Remove all bandages and splints
  - Reduce the fracture/ dislocation and reassess circulation
- If no improvement then vessels must be explored by operation
- If vascular injury suspected angiogram should be performed immediately

Common nerve injuries

Injury	Nerve
Shoulder dislocation	Axillary
Humeral shaft fracture	Radial
Humeral supracondylar fracture	Radial or median
Elbow medial condyle	Ulnar
Monteggia fracture-dislocation	Posterior-interosseous
Hip dislocation	Sciatic
Knee dislocation	Peroneal

Clinical Features & Mx

- Paraesthesia and weakness to supplied area
- **Closed injuries**: nerve seldom severed, 90% recovery in 4 months. If not do nerve conduction studies +/- repair
- **Open injuries:** Nerve injury likely complete. Should be explored at time of debridement/repair
- **Indications for early exploration:**
  - Nerve injury associated with open fracture
  - Nerve injury in fracture that needs internal fixation
  - Presence of concomitant vascular injury
  - Nerve damage diagnosed after manipulation of fracture

Septic JointS/ Septic Arthritis

SEPTIC JOINT/SEPTIC ARTHRITIS

- *Inflammation of a synovial membrane with purulent effusion into the joint capsule. Followed by articular cartilage erosion by bacterial and cellular enzymes.*

- Usually monoarticular

- Usually bacterial
  - Staph aureus
  - Streptococcus
  - Neisseria gonorrhoeae

SEPTIC JOINT- ETIOLOGY

- ***Direct invasion*** through penetrating wound, intra-articular injection, arthroscopy
- ***Direct spread*** from adjacent bone abcess
- ***Blood spread*** from distant site

SEPTIC JOINT- LOCATION

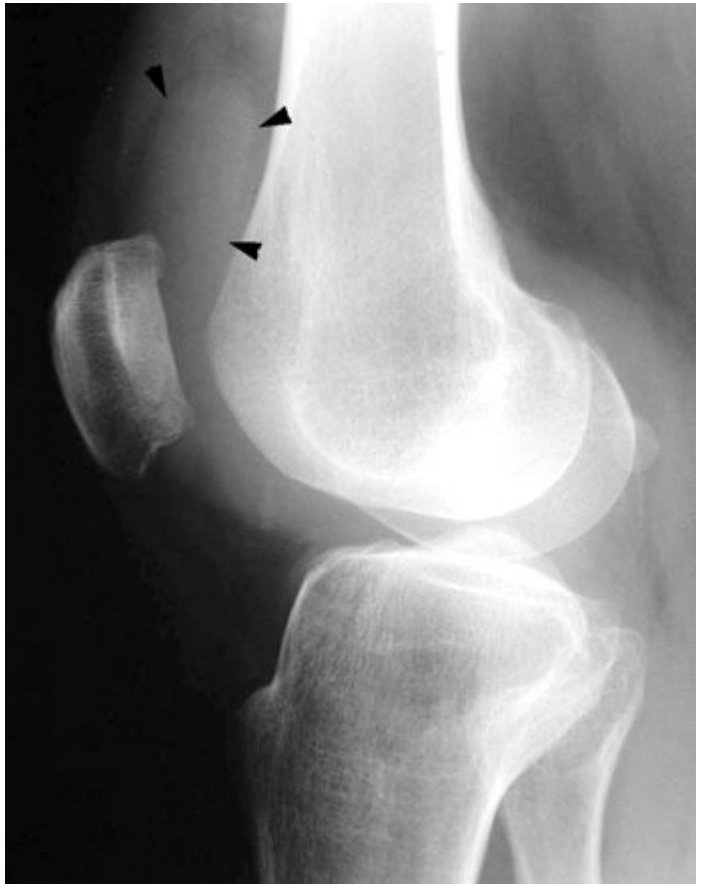
- Knee- 40-50%
- Hip- 20-25%*
  - *Hip is the most common in infants and very young children
- Wrist- 10%
- Shoulder, ankle, elbow- 10-15%

SEPTIC JOINT- RISK FACTORS

- Prosthetic joint
- Joint surgery
- Rheumatoid arthritis
- Elderly
- Diabetes Mellitus
- IV drug use
- Immunosupression
- AIDS

Septic Joint- Signs and Symptoms

- Rapid onset
- Joint **pain**
- Joint **swelling**
- Joint **warmth**
- Joint **erythema**
- ***Decreased range of motion***
- Pain with active and passive ROM
- Fever, raised WCC/CRP, positive blood cultures



Septic Joint- Diagnosis

Diagnosis by aspiration

Gram stain, microscopy, culture

Leucocytes >50 000/ml highly suggestive of sepsis

Septic Joint- Treatment

- Joint washout in theatre
- IV Abx 4-7 days then orally for another 3 weeks
- Analgesia
- Splintage

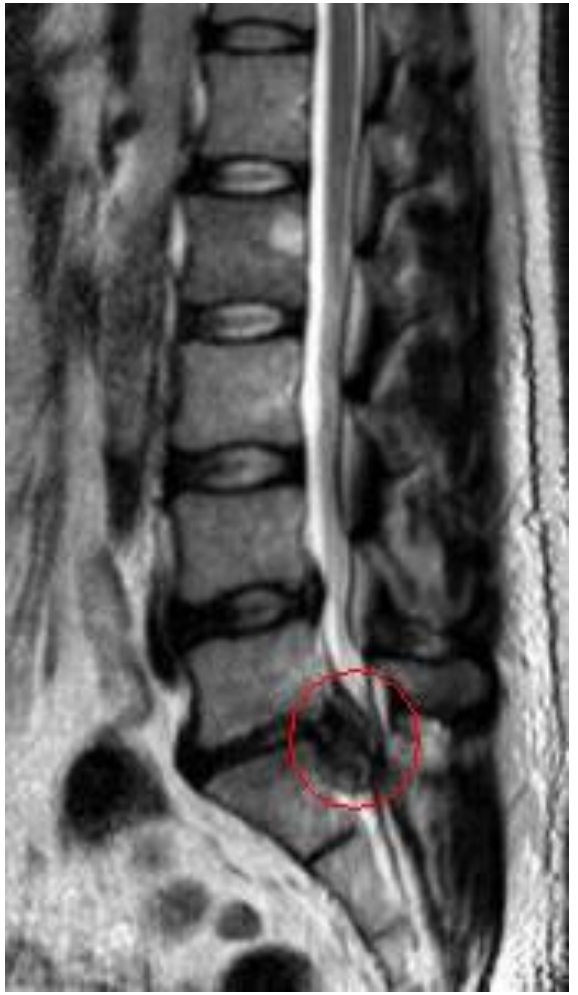
Septic Joint- Complications

- Rapid destruction of joint with delayed treatment (>24 hours)
- Growth retardation, deformity of joint (children)
- Degenerative joint disease
- Osteomyelitis
- Joint fibrosis and ankylosing
- Sepsis
- Death

Cauda Equina Syndrome

CAUDA EQUINA SYNDROME

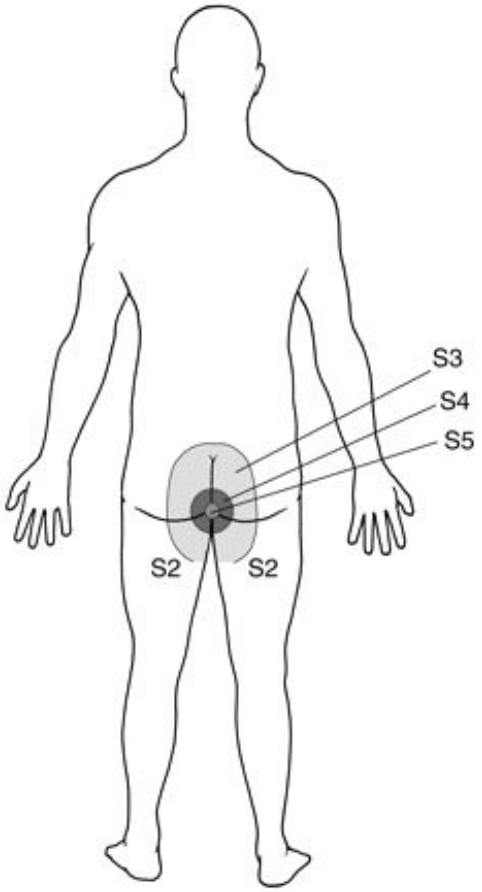
- **Compression of lumbosacral nerve roots below conus medullaris secondary to large central herniated disc/extrinsic mass/infection/trauma**



Clinical Features

- **Motor (LMN signs)**
  -weakness/paraparesis in multiple root distribution
  -reduced deep tendon reflexes (knee and ankle)
  -sphincter disturbance (urinary retention and fecal incontinence due to loss of anal sphincter tone)

- **sensory**
  -**saddle anesthesia** (most common sensory deficit)
  -pain in back radiating to legs, crossed straight leg test
  -bilateral sensory loss or pain: involving multiple dermatomes



Management

- Surgical emergency - requires urgent investigation and decompression (<48 hrs) to preserve bowel and bladder function


Thank
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