

PHTY3090 ADVANCED MUSCULOSKELETAL PHYSIOTHERAPY NOTES

LECTURE 1: LOWER LIMB ORTHOPAEDICS

- **Fracture management**
 - Aim is to restore function.
 - Reduction of fractures- 1st step. Only if #s are displaced.
 - Maintenance of reduction
 - Stability of the fracture (metastable # requires reduction but likely to maintain position with immobilisation. Usually maintained with PoP. Unstable # requires reduction & IF).
 - Plaster of Paris (Malleable, can change angle with wedges, can cut windows e.g. for wounds. Acutely- back slab or cylinder. After few days- full plaster).
 - Traction (used to counteract pull of muscle to maintain reduction. Commonly used in #s of femur, tibia, C spine).
 - External fixation (hole drill into bone bar inserted and tightened externally. Used in cases of multiple #s. Surrounding joints can remain mobile while # site immobilised. Only tends to be used on subcutaneous bones).
 - Internal fixation (E.g. rods, pins, screws. Some #s routinely IF. Stronger stabilisation. Periosteum often damaged. May compromise healing and higher infection risk).
- **Complications of fractures**
 - Infection
 - Delayed union- more common in high velocity injuries. May occur due to damage to callous from invasive fixation. Most common in scaphoids and tibias.
 - Non-union
 - Atrophic- blood supply compromised. “Freshening up” surgery.
 - Hypertrophic- Soft tissue between # ends. Bone ends surrounded by callous. Mx surgical- reduction & EF.
 - Infected- infected bone removed, normal bone attached.
 - Avascular necrosis- # disrupts blood supply to bone- bone dies. Common in scaphoid, head of femur, and talus.
 - Osteoarthritis- Joint alignment affects congruity of joint → damage.
 - Compartment syndrome
 - When compartment pressure exceeds the arterial supply pressure, the muscle dies.
 - Fasciotomy
 - E.g. # tibia in PoP. Days of intense pain that suddenly eases- muscle dead. Need to monitor cast tightness.
 - Venous thrombosis (clotting #s change as result of inflammation and/or surgery).

- **Fractures of the femoral shaft**

- Cause by direct trauma, twisting or a blow to the front of a flexed knee (often in MVA passengers).
- Fractured thigh is shorter and fatter than normal and lies with the distal fragment in external rotation and abduction.
- Immobilisation methods;
 - Traction- now rarely used. Used in children and people with high anaesthetic risk. Long term bed rest/immobilisation required.
 - Cast bracing- allows the patient to leave hospital and begin rehabilitation more rapidly. Would normally follow on from traction when # stable (~6 weeks).
 - Internal fixation
 - Intramedullary nail (rod put up femur via knee). Need to work on knee function in rehab- flexion often affected.
 - Locking screws (prevent rotation)
 - External fixation
 - Contaminated or unstable open fractures.

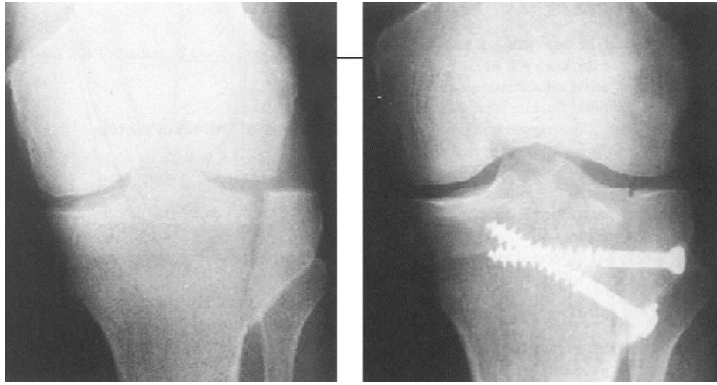


- **Fractures of tibial plateau**

- 4 patterns of fracture can occur;
 - The lateral condyle acts like a blunt chisel and splits the lateral tibial plateau vertically splits the lateral tibial plateau vertically.
 - Part of the tibial plateau may be thrust downwards into the tibia to produce a depressed plateau fracture.
 - Both of these can occur together.
 - The entire plateau may be depressed.
- Management;
 - If a large fragment is split off, it is screwed back to restore the contour of the tibia.
 - Large depressed fragments are elevated to restore the joint surface, the chondral surface reconstructed and the underlying cavity filled with cancellous bone graft cavity filled with cancellous bone graft.
 - If there is only slight depression in the plateau, the fracture can be managed conservatively with early mobilisation.

- **Tibial fractures**

- Direct trauma
- Twisting injury (rare)
- Repeated stress causing fatigue fracture.
- Management;
 - Stable fractures are treated with cast immobilisation and later a PTB.
 - Unstable fractures may be internally fixated.
 - Fractures that are contaminated and unstable are treated with external fixation.



- **ACL reconstruction**

- Patella graft (medial 1/3rd) or hamstring graft (semi-membranous or semi-tendinous).
- Performed arthroscopically.
- 1st knee cleaned out, any meniscal tear repaired, then graft taken. Holes drilled into tibia and femur, graft inserted.
- Aims of physiotherapy;
 - Should commence pre-operatively.
 - Patients with pain free, mobile and healthy joints recover from the surgery more rapidly and with fewer complications.
 - Patients who have learnt their exercises preoperatively also have fewer problems performing their exercises post-operatively.
 - Rehabilitation continues around 6 months.
- Treatment goals;
 - ↓ Post-operative pain and swelling from the joint effusion AND from the graft donor site.
 - Restoration of full range of movement.
 - Restoration of muscle tone and strength.
 - Maintenance and development of aerobic conditioning.
 - Proprioceptive retraining
- Staged program;
 - Day 1 to 14
 - First goal- restore full extension.
 - Wound healing
 - Manage graft donor site morbidity (i.e. pain and swelling).
 - Decrease joint swelling
 - Establish muscle control emphasising co-contraction (Contraction quads and hamstrings together- less pressure on immature graft).
 - Get patient off crutches and walking normally.
 - Day 2 to 6 weeks
 - Obtain full unrestricted range of motion by 6 weeks.
 - Develop good muscle control and early proprioceptive skills.

