

ORTHOPEDIC

Lec.12

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Dislocations of the Hip Joint

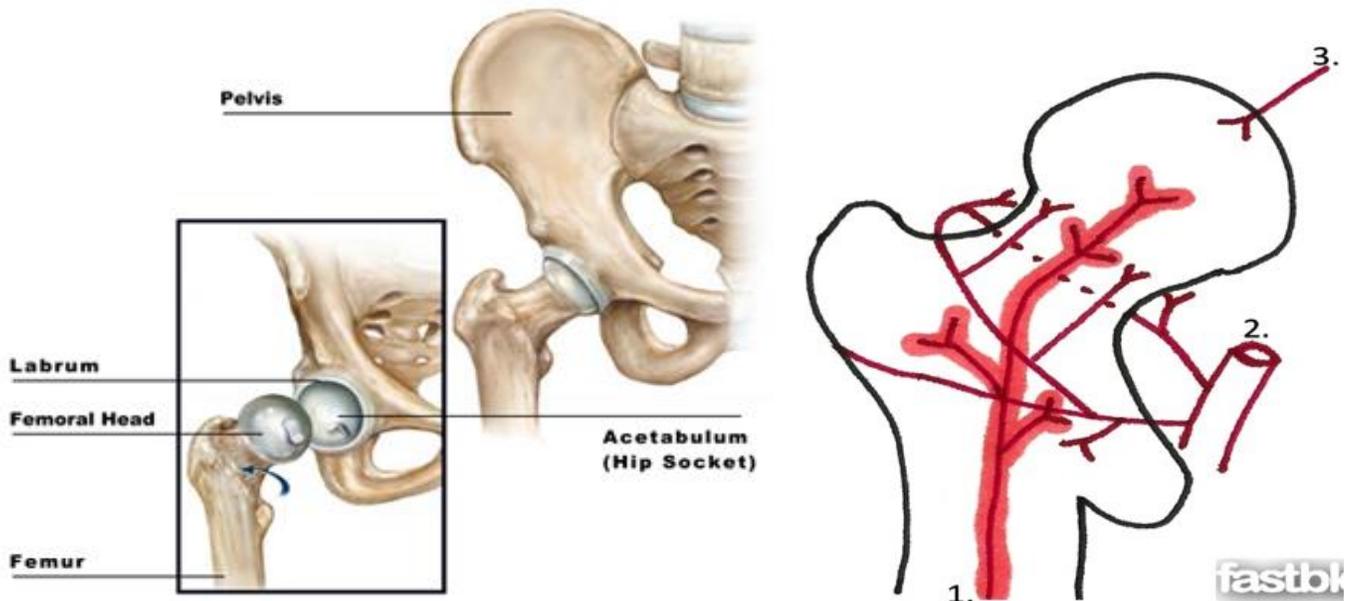
The incidence has been increased due to increased in the number of R.T.A. It is of 3 types according to direction of dislocation:

1. Posterior (most common 80 %)
2. Anterior
3. Central.

Blood supply of the femoral head:

The femoral head has special & critical blood supply that is easily affected after fracture, joint effusion or hemarthrosis. The blood comes from 3 main sources:

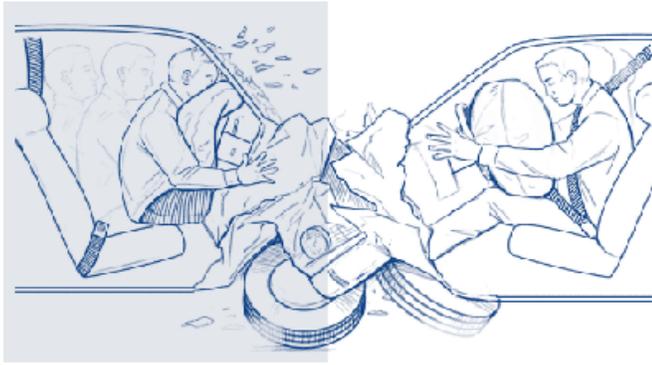
1. *Vessels through the ligamentum teres*: it supply ~10%.
2. *Intramedullary vessels*: passing through the medulla of the neck until reaching the head this is easily torn after fracture.
3. *Capsular or Retinacular Vessels*: these have special course turning around the post edge of the capsule then passing inside the joint till reaching the head. During this course it is easily impaired by pressure as with fracture. Hemarthrosis or effusion & sometime thrombosis.



Posterior Hip Dislocation:

Mechanism of injury: occurs in road accidents when a patient seated in a car is thrown forwards, striking the knee against the dashboard usually an associated with fracture of the acetabulum the size of the piece of bone fractured depends on:

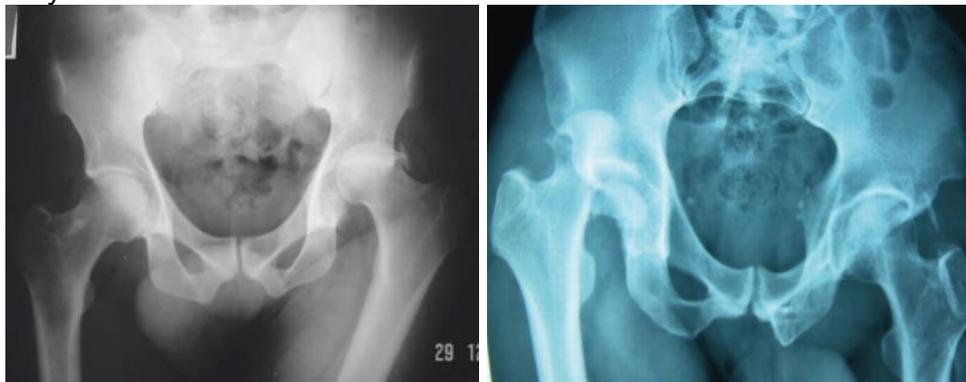
1. Direction of applied force.
2. Position of hip.
3. Strength of patient's bone.



Clinical Features: the diagnosis is easy & clinically the leg is short & lies adducted, internally rotated & slightly flexed but notice that if there is fracture of long bone these feature may be absent & the diagnosis can be missed so the golden rule is to x-ray the pelvis in every case of fracture femur. The limb should be examined for vascular & nerve functions.



X-ray: AP. view will show the femoral head out of the acetabulum & there may be fracture in the acetabulum & may need C .T. scan

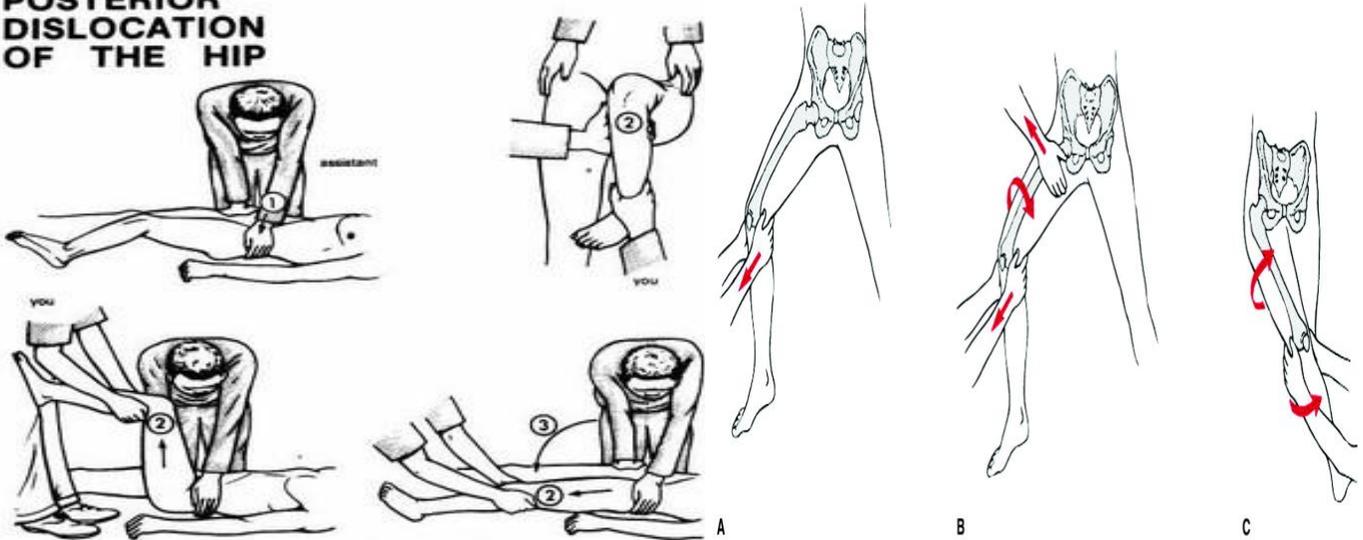


Treatment: It is the only Orthopaedic emergency & the dislocation should be reduced as early as possible under GA by one of these maneuvers:

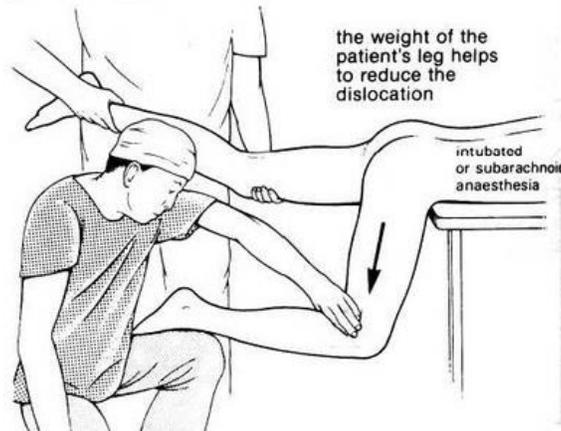
1. Allis method: An assistant steadies the pelvis, the surgeon flexes the patient hip & knee to 90 & pulls the thigh vertically upwards with alternating internal & external rotation until we heard clunk of the reduction.
2. Bigelow method: Traction in 90 flexion (hip& knee) + adduction + internal rotation then extension + abduction & external rotation.

3. Stimson method: the patient is prone on the table edge with the hip & knee 90 then alternating external & internal rotation.
 After reduction apply traction (skin or skeletal) & maintain it for 2wks, movement & exercises are begun as soon as pain allow at the end of 2wk the patient start partial weight bearing with crutches

POSTERIOR DISLOCATION OF THE HIP



POSTERIOR DISLOCATION OF THE HIP (alternative method)



Complications:

1. Sciatic nerve injury: - occur in 10 -20% usually recover & often takes months & in the meantime the limb must be protected from injury & the ankle splinted to overcome foot – drop.
2. Avascular necrosis: - after early reduction the risk is 10% but if the reduction more them a few hours the risk rises to more than 40%.
3. Myositis ossificans: - prevented by avoid forced movement & in severe injuries the period of rest & non-weight bearing may need to be prolonged.
4. OA: - due to
 - (a) Cartilage damage at the time of fracture.
 - (b) The presence of retained fragments in the joint.
 - (c) Avascular necrosis of the femoral head.
5. Fracture of post wall of the acetabulum: - *Thompson & Epstein* classification
 - Type I: dislocation + no more than minor chip fracture
 - Type II: dislocation + large single fragment of the posterior wall.

Type III: dislocation + post wall comminuted fracture.

Type IV: dislocation + acetabular floor fracture

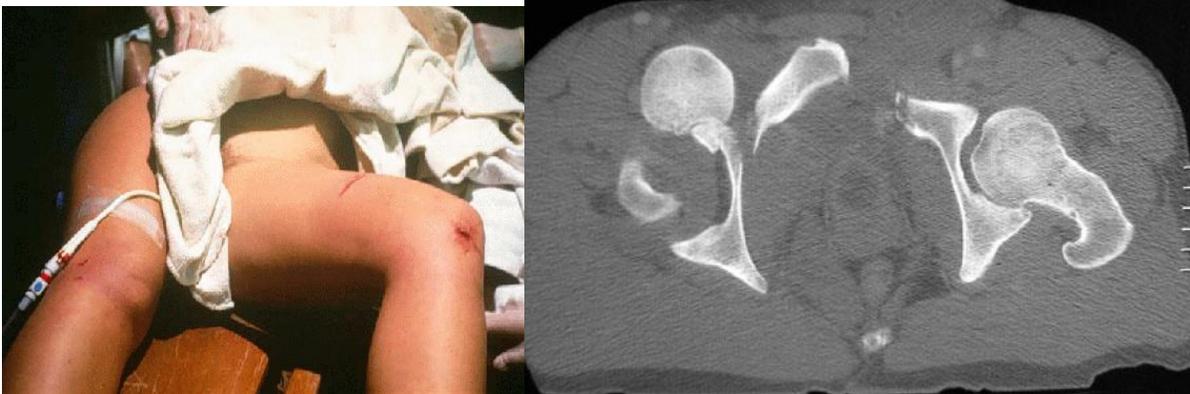
Type V: dislocation + fracture femoral head.

6. Unreduced dislocation: - > 2 wk dislocation need open reduction.

Anterior Hip Dislocation

This is rare compared with post. Dislocation the leg lies in externally rotated, abducted & slightly flexed seen from the side there is ant bulge in head in the groin.

X-ray: AP & Lat. is easily diagnostic. In AP There is a broken Shenton's line (which also present in post dislocation)



Treatment: the maneuvers employed almost identical to those of posterior dislocation except that while the flexed thigh is being pulled upwards, it should be adducted; an assistant then helps by applying lateral traction to the thigh .The subsequent treatment is similar to the post dislocation.

Central Hip Dislocation

A fall on the side or a blow over the greater trochanter may force the femoral head medially through the floor of the acetabulum. Although this is called central fracture/dislocation it is really a complex fracture of the acetabulum.

Clinical features:

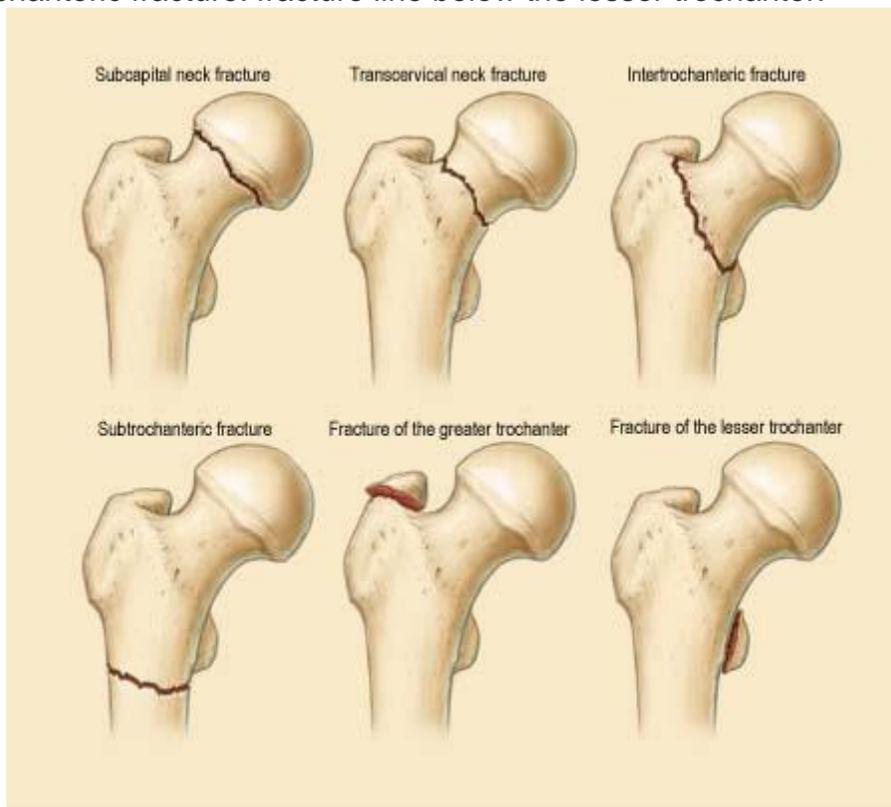
- (1) Short leg (femoral head inward & upward).
- (2) Normal position neither abduction nor adduction).
- (3) Examine pelvis & abdomen because fracture of the floor of acetabulum may injure the pelvis organ & vessels.

Treatment: if the fracture with minimal displacement so do longitudinal traction by 10kg but if the displacement is too much & the femoral head in the pelvis so in addition to the longitudinal traction do lateral skeletal traction through the greater trochanter.

Fractures of the Femur

Fractures of proximal femur are divided in to:

1. Intracapsular fracture (fracture neck of femur) high incidence of complication e.g. Avascular necrosis & nonunion.
2. Extra-capsular fracture (peritrochanteric): less incidence of complication & further divided in to:
 - (a) Intertrochanteric fracture: fracture line pass between the two trochanters.
 - (b) Subtrochanteric fracture: fracture line below the lesser trochanter.



Femoral Neck fracture:

It is most commonly occurring in old patient especially postmenopausal women with severe osteoporosis where it is regarded as a pathological fracture. Other risk factors include bone – losing or bone – weakening disorders such as osteomalacia, D.M., stroke, alcoholism & chronic illnesses by contrast patient with increased bone mass (e.g. Negros, pt. with OA) have less incidence.

Mechanism of injury:

- Direct injury: e.g. direct trauma to the trochanteric region after a FFH or RTA.
- Indirect injury: especially in elderly with severe osteoporosis less force is required perhaps no more than catching a toe in the carpet & twisting the hip in to external rotation.
- Stress fracture.

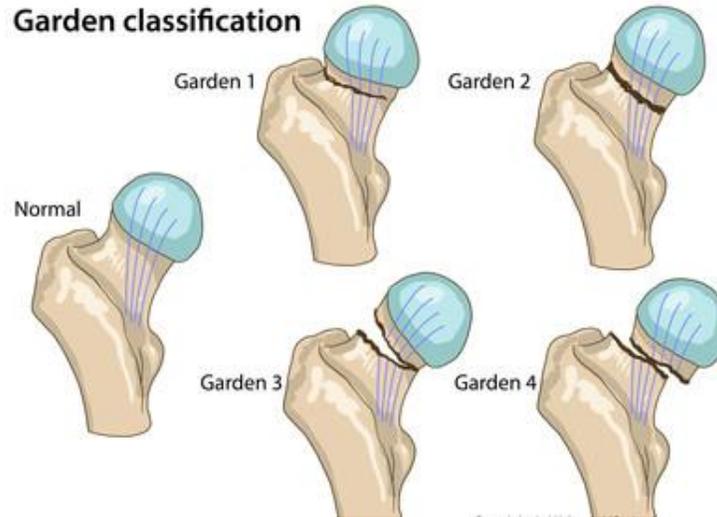
Clinical Features: elderly pt. with history of a fall, Followed by pain in the hip with inability to stand or walk. Local signs if the fracture is displaced the limb is short & externally rotated; the pt. is unable to lift the affected limb & put it over the other.

X-ray & Classification: include AP & L views by AP can fracture classified into:(Gardens' classification).

- G1-----Incomplete impacted fracture: only the lateral cortex fractures the neck in valgus.

- GII-----Complete fracture but undisplaced: both cortices fracture but no displacement.
- GIII-----Complete fracture with partial displacement & the neck in varus.
- GIV-----Complete fracture with complete displacement.

Generally GI&II are undisplaced fracture with good prognosis while GIII & IV are displaced fracture with poor prognosis.



Differential Diagnosis: cases in which a femoral neck fracture may be missed are:

- (1) *Stress fracture:* The elderly patient with unexplained pain in the hip should be considered to have stress fracture until proved otherwise. In difficult case may need bone scan.
- (2) *Undisplaced impacted fracture:* may be difficult to diagnose on X-ray & need MRI or CT scan.
- (3) *Painless fracture:* may occur in bedridden or very elderly patient even patient with impacted fracture.
- (4) *Pathological fracture:* may occur in multiple myeloma or a secondary bone deposits.
- (5) *Multiple fractures:* the patient with femoral shaft fracture may also have a hip dislocation, which easily missed unless the pelvis is X-rayed.

Treatment: Initial treatment consists of pain-relieving measures & simple splint age of the limb (by traction). The definitive treatment is the operative treatment because displaced fracture will not unite without internal fixation & in any case old people should be got up & active without delay if pulmonary complications & bed sores are to be prevented. Impacted fracture can left to unite but there is risk that may become displaced even with lying in bed so fixation is safer. *Only one indication for non-operative is impacted fracture and the patient walk on it more than 2wk.*

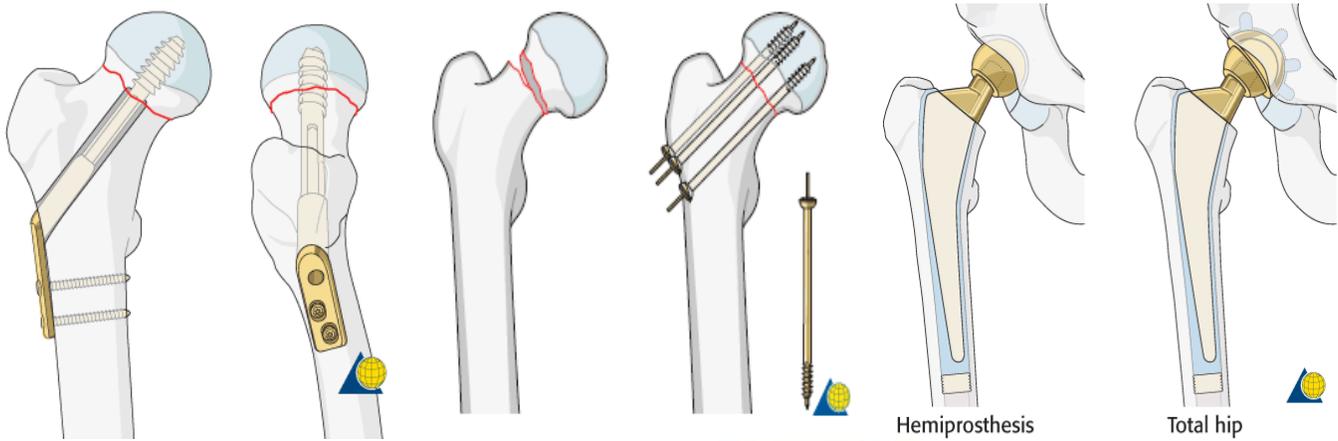
1. *Internal fixation:* aims,
 - A. Accurate reduction.
 - B. Secure fixation.
 - C. Early activity.

This done by closed reduction + internal fixation by 2-3 annulated screws or Dynamic Hip Screw (DHS) if closed reduction failed we do open reduction.

2. *Prosthetic Replacement:* it is either partial or total hip replacement Indications of Partial Hip Replacement (e.g. Austin Moore prosthesis).
 - The very old more than 60yr very frail.
 - Failure of closed reduction.
 - Pathological fracture.

Indication of Total Hip Replacement (THR):

- If treatment delayed for some weeks & acetabular damage is suspected.
- Pt. with metastatic dis. or Paget's dis.
- In case at complication e.g. ((A.N& nonunion)).



Thompson
(has neck, no holes,
need cement)

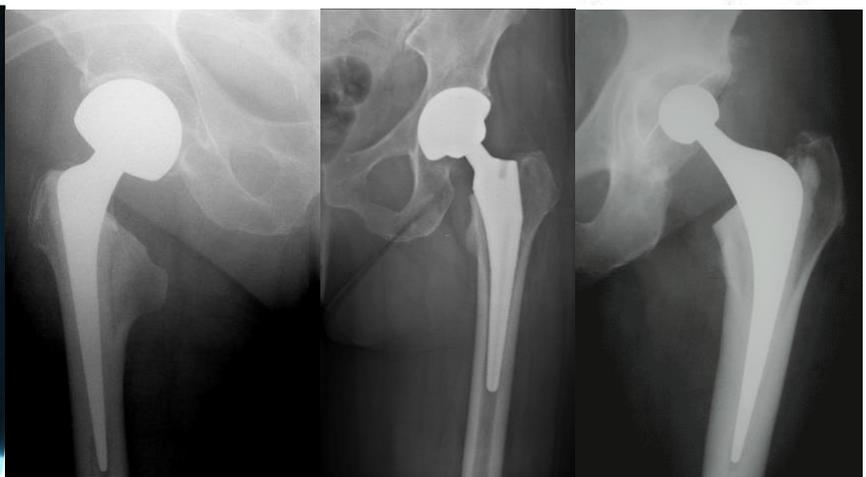
Austin Moore (has less of
everything)
(has 2 holes, no neck, no
need cement)



BIPOLAR HEMIPROSTHESIS



Total Hip Replacement (THR)



Postoperatively: from the first day the pt. should sit up in bed or in a chair & taught breathing exercises & encouraged to help & being walking with crutches or a walking aids.

Complications:

- **General complications:** there is high incidence of general complication (e.g. bed sore, Thromboembolism, pneumonia). Because the patient usually elderly & often frail patient with some systemic & debilitating disorder.
- **Local complication:**
 1. *Avascular necrosis (AN):* occurs in 30% of displaced fracture & in 10% of undisplaced fracture & it is due to damage of blood supply to the head of the femur because when the fracture is displaced the nutrient artery (medullary vs.) are severed, the Retinacular vs. from the capsule are torn & the remaining blood supply via the ligamentum teres may be insufficient to prevent is ischemia of the femoral head.
Treatment of AN: >45yr.-----THR.
<45yr.-----Realignment osteotomy or Arthrodesis.

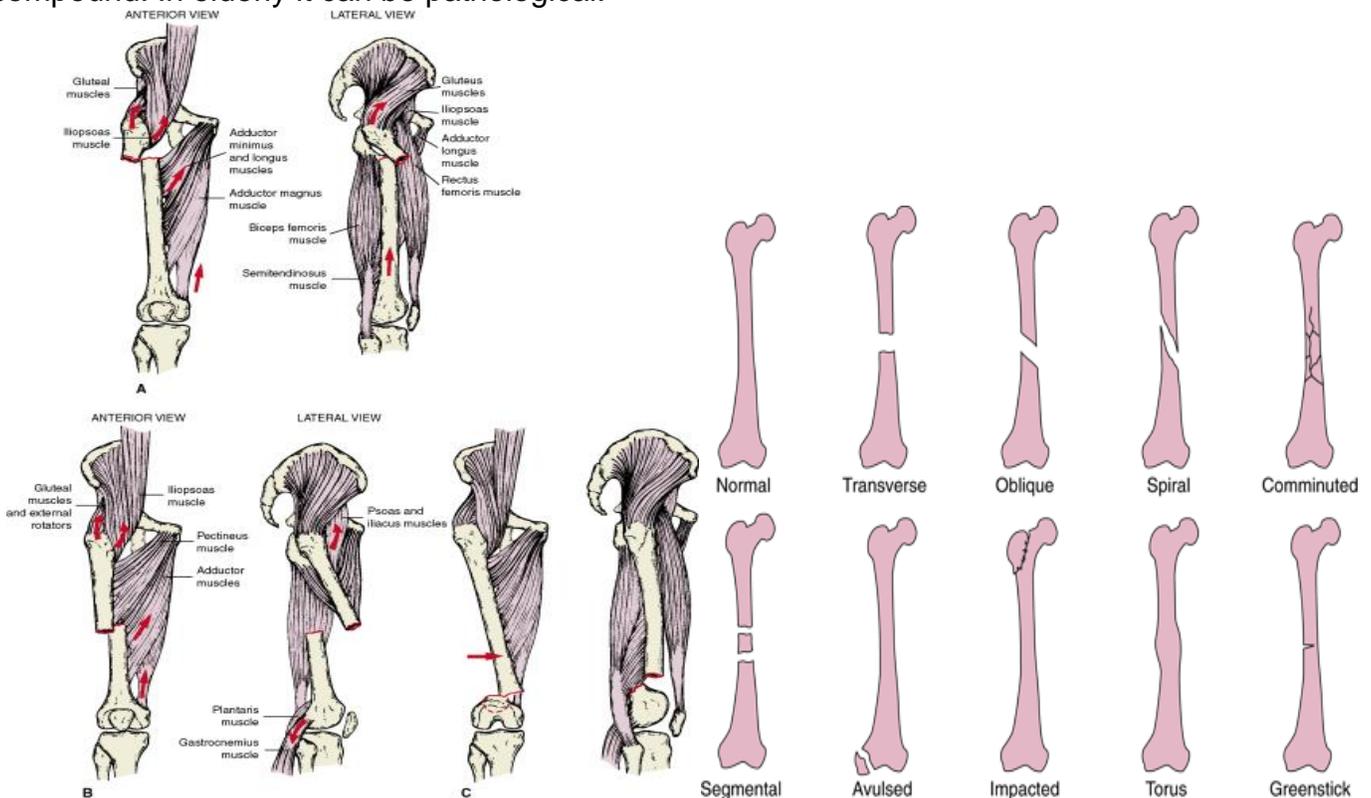


Femoral shaft fracture:

It is a common fracture of young adults, when it occurs in elderly it should be regarded as pathological until proved otherwise. This fracture needs great force of injury to occur. It is frequently displaced by many of the muscles, which surround the femur.

The fracture associated with severe bleeding sometimes without evident clinical swelling, if it's so severe it may lead to shock. The patient sometimes is a multiply injured.

The fracture can be spiral with twisting force, transverse or short oblique with angulatory force, or sometimes associated with butterfly fragment. In complex injury it may be comminuted or compound. In elderly it can be pathological.



Clinical features:

History of trauma, or the patient is multiply injured or in shock. The limb is swollen tender and sometimes short and deformed, there may be some rotation with functional loss.



X-Ray & Classification:

It is good to diagnose the fracture its site, type & displacement. It also helps to decide treatment.

Winquist '1984' classification:

- **Type 0 - No comminution**
- **Type I - Insignificant butterfly fragment with transverse or short oblique fracture**
- **Type II - Large butterfly of less than 50% of the bony width, > 50% of cortex intact**
- **Type III - Larger butterfly leaving less than 50% of the cortex in contact**
- **Type IV - Segmental comminution**



Treatment:

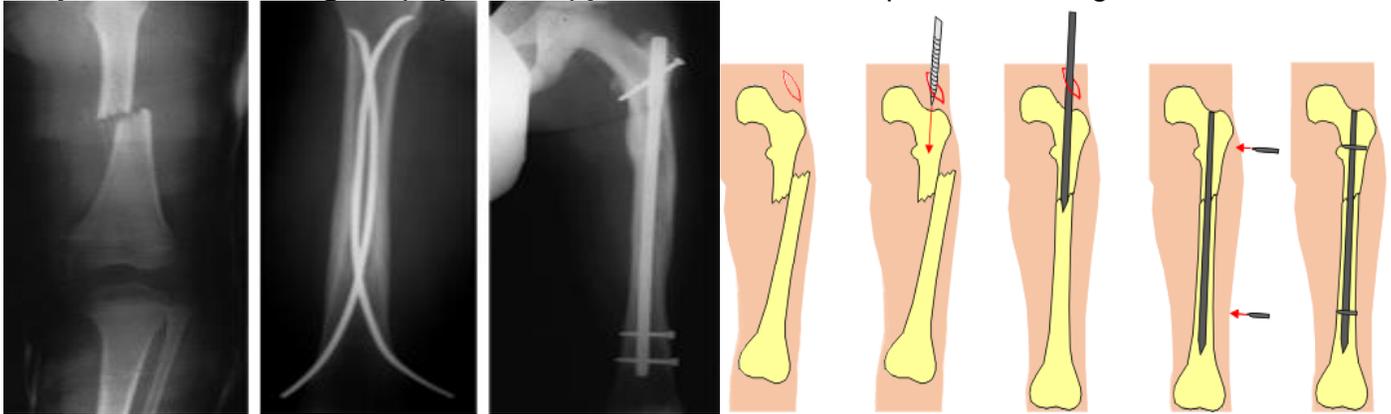
1. **Emergency measures:** Treatment of shock, care for other vital systems injury and urgent immobilization of the limb by a splint or even rapping the limb with the other.
2. **Conservative treatment:** Bed rest and skeletal traction for 4 – 6 weeks followed by pop or brace for other 4-6 weeks until healing, all associated with good follow up and physiotherapy with graduation of wt. bearing. Some degrees of mal-alignment are accepted in such treatment it's about 2cm of shortening or overlap, up to 10-15 degrees of medio-lateral or antero-posterior angulations but rotation is always forbidden.



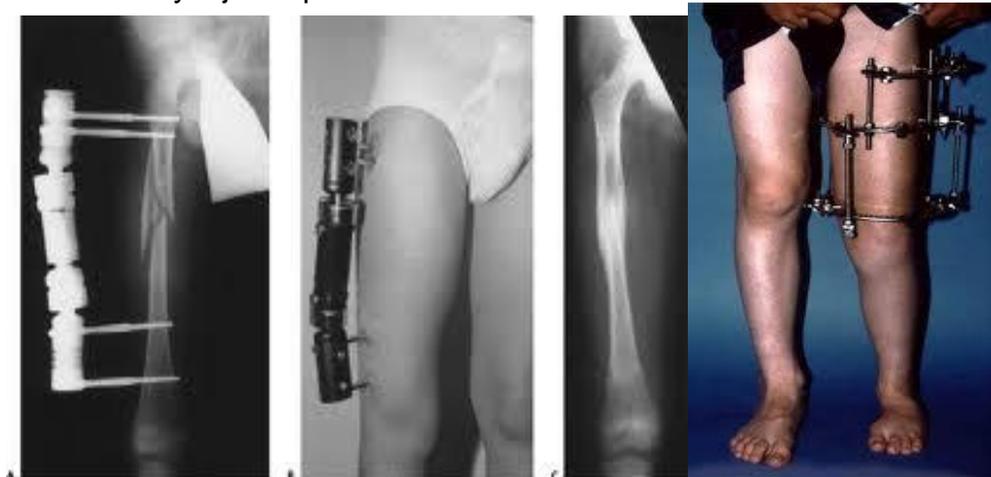
3. ORIF: Indications are:

- Transverse unstable fracture.
- Failed conservative treatment.
- Multiple fractures.
- Pathological fracture.
- Associated vascular injury.
- Contraindication for prolonged bed rest.

There are variable implants for internal fixation most widely used is the intramedullary nail, which can be reamed or unreamed, closed or open, locked or unlocked. Occasionally we use plate & screws that is not very much welcomed in the femur. Locked nails have the advantage of being useful in cases of segmental loss, severe comminution, cortical loss and highly unstable fracture those nails can be dynamized after a period to allow better healing. Internal fixation followed by early mobilization and good physiotherapy to maintain muscle power and range of motion.



4. External fixation: Used for compound fracture after debridement or sometimes used as an urgent fixation for seriously injured patients.



Complications:

Early:

1. Shock.
2. Fat embolism.
3. DVT.
4. Vascular injury.
5. Infection.

Late:

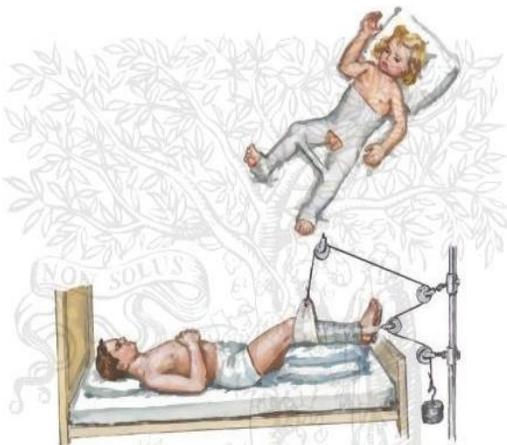
1. *Delayed union & Nonunion:* fracture femoral shaft should unite in 100 days +/- 20 days. If union is delayed a lot it may need bone graft & internal fixation.
2. *Malunion:* In adults up to two centimeters of shortening and 10 -15 degrees of angulation are only accepted, otherwise the fracture is said to be malunited and it needs surgical corrective osteotomy to avoid possible complications on the hip or knee.
3. *Joint stiffness:* Especially the knee & best avoided by using lower femoral traction instead of upper tibial traction with early mobilization and muscle exercises intensive physiotherapy, MUA or even soft tissue release or V/Y plasty of the quadriceps tendon treats it.

Femoral Shaft Fracture in Children:

It is quite common in older children by direct violence under the age of two years it can be part of child abuse.



Treatment: Almost always conservative and ORIF is only rarely indicated. Balanced traction of 1-2 weeks with frequent x-ray check, if the position is acceptable POP spica cast is done for the next 4-6 weeks until healing, followed by graduation of weight bearing and physiotherapy. Children under the age of **4 years** and less than 12 Kg in wt we use Gallows overhead traction for better nursing. In children and because of better intention of healing and remodeling abilities, greater degrees of malalignment are accepted (1-2cm. of shortening and overlap and up to 20 degree of angulation), but rotation is forbidden. Above **5 years** need fixation according to type of fracture, weight, age, skin condition...



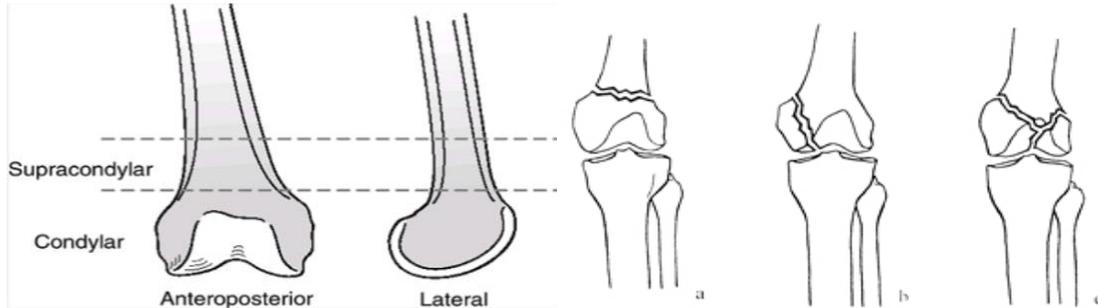
Complications:

1. Malunion in form of angulation or rotation.

2. Leg length discrepancy; there may be shortening which is usual but also there may be increased leg length because of active healing process with hyperemia and high growth hormone concentration.

Supracondylar Fracture of Femur:

The fracture occurs at a line just above the two condyles, sometimes intra-articular extension occurs giving rise T or Y shaped fracture. It is a fracture of young adults caused by direct violence, in elderly we must think of pathological fracture. It can be simple or comminuted if unstable the distal fragment can be displaced by the pull of gastrocnemius muscle and can endanger popliteal circulation.



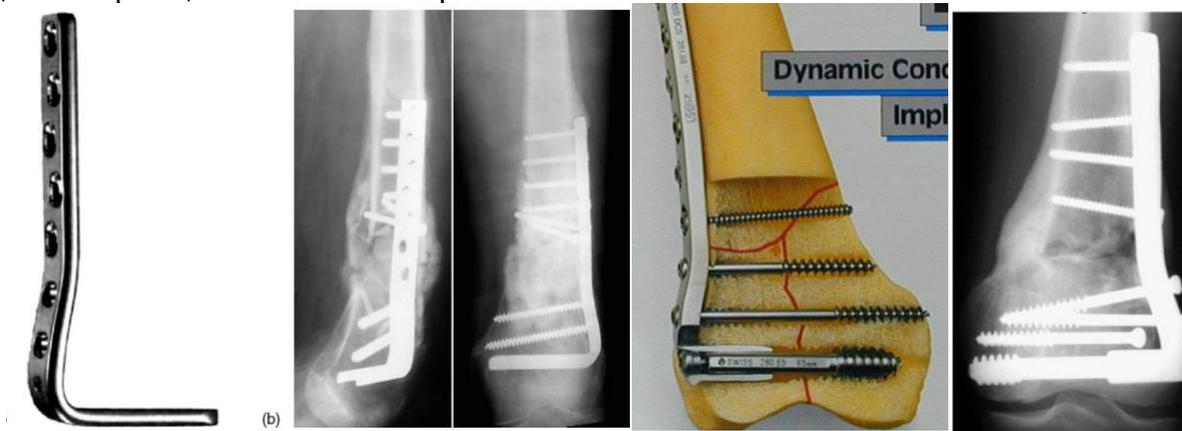
Clinical features: There is painful swollen knee with evident deformity and painful movement. Distal pulses must always be checked.

X-Ray: It shows the fracture its type and degree of displacement.



Treatment: In elderly people we should use ORIF, in younger adults conservative treatment by upper tibial skeletal traction with a knee flexion piece for 4-6 weeks followed by functional brace and partial wt. bearing on crutches, full wt. bearing never allowed until full consolidation.

In elderly and when indicated in young ORIF is done with the use of DCS (dynamic condylar screw), blade-plate, or even buttress plate.



Complications:

Early:

- Skin damage
- Vascular injury

Late:

- Knee stiffness
- Nonunion

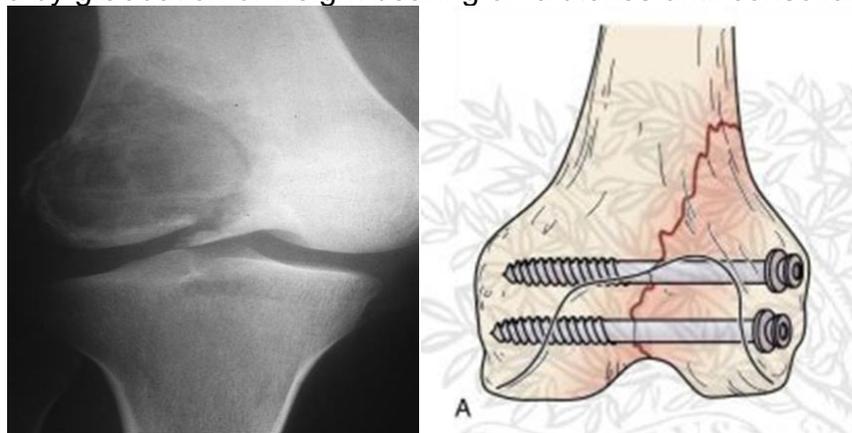
Condylar Fracture of Femur:

Fall from a height or direct injury can cause single condyle fracture or double T or Y shaped condylar fracture.

Clinical features: The knee is swollen with haemarthrosis and always check the distal neurovascular function.

X-ray: Easily show the fracture & its displacement.

Treatment: Conservative treatment by MUA and skeletal traction for 4-6 weeks with frequent x-ray checks followed by graduation of weight bearing on crutches until consolidation.

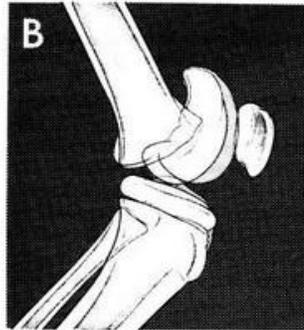
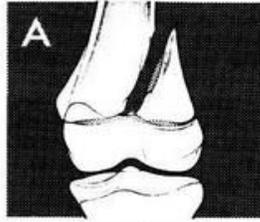


Fracture-Separation of Distal Femoral Epiphysis:

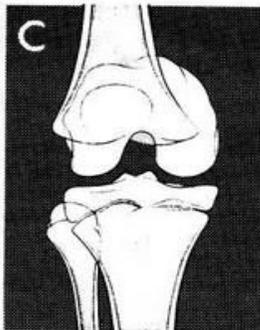
This childhood injury is equivalent to supracondylar fracture of adults. It is caused by lateral angulation force or hyperextension injury, it is usually Salter-Harris type two with some displacement. This injury is famous in causing epiphyseal arrest and growth disturbances with later angular deformity of the distal femur.

SEPARATION OF THE DISTAL FEMORAL EPIPHYSIS

Type II injury, fracture line passes out through shaft



Lateral view



AP view

Type I injury, separation occurs along the epiphyseal line

Treatment: MUA and POP with graduation of wt. bearing on crutches for 4-6 weeks. Sometimes, if unstable on check x-ray, MUA & percutaneous K wires done under x-ray guide.