66 Hip injury

66.1 Rehabilitation with an injured lower limb

After any serious lower limb injury, your aim will be to regain walking *without* a limp. There are 3 stages to do this, usually initially with crutches:
(1) a non-weight bearing stage in where the foot is kept off the ground, (2) a stage of partial weight bearing,
(3) a stage of full weight bearing with no aid, except perhaps from a stick.

HELP WITH WALKING

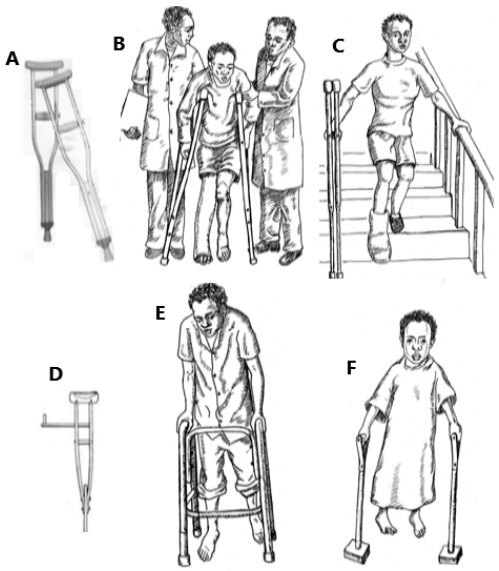

Fig. 66-1 HELP IN WALKING. A, crutches with well-padded shoulder supports. B, being taught to walk. C, coming down stairs. D, a crutch with an arm support. E, a walking frame. F, 'plonkers' for a child.

When an injured patient learns to walk normally, he uses all the muscles, and stabilizes the injured limb. If he limps, some of the muscles remain unused, with the result that he may limp permanently, and quite unnecessarily. So try to interest your ward staff in the way their patients walk, and turn them into active physiotherapists. The time indicated for no, partial or full weight bearing depends mostly on the kind of injury.

CRUTCHES FOR AN INJURED LEG
A plentiful supply of crutches is essential. Ask the hospital carpenter to make well-padded axillary crutches with rubber tips, adjustable for height, and also for the position of the hand grips, which should be c. ⅓ the way down the crutches. Fit crutches carefully so that the crutches are just short of the axilla on standing. When the hands are on the hand grips, the elbows should be slightly flexed. *A crutch which is slightly too short is better than one which is too long*. Weight bearing should be not only on the axilla but also on the forearm. Walking is easier if the good leg is slightly longer than the injured one; so use a shoe with a thicker sole.

CAUTION!
(1) Some weight bearing must occur on the hand rests, *not the axillae*, or a crutch paralysis may develop. Any nerve of the brachial plexus, particularly the radial, may be injured. This takes c.6 months to recover.
(2) A comfortable crutch will do much to reduce the burden of disability. Stand behind the patient and explain how to hold the crutches close to the side slightly in front of the feet, and to look straight ahead. Explain how to take the weight on the hands, to lean forwards, so that the weight is over the crutches, and then to transfer the weight to one crutch before moving the other.

NON-WEIGHT BEARING
Ask the patient to hop on the normal leg while steadying the trunk with the crutches.

PARTIAL WEIGHT BEARING
Ideally, you should use bathroom scales to measure how much weight is being put on the injured leg. Encourage as much weight bearing as possible without causing pain.

(a) Try first, '3-point walking': get the patient to bring the crutches & the injured leg forward together, taking some weight on each.

(b) Then try '4-point walking': get the patient to advance the right crutch followed by the left leg, and then the left crutch followed by the right leg. This is slow at first, but is much more like normal walking.

STICKS FOR LEARNING TO WALK

Two sticks are better than one, and less likely to cause a limp. Use the 4-point gait described above. For children, flat pieces of wood on the bottom of two sticks ('plonkers', 66-1F) will make them easier to use.

WALKING IN A CAST
If a patient is in a cast, explain how, if possible, to start walking normally erect and looking ahead, right from the start. Teach how to lift the heel, to transfer the weight to the forefoot, to bend the knee, to move the leg forward, to put the forefoot on the ground, to lower the heel, and to move the body forward.

Then practice repeating these movements with both legs until walking normally.

Once the cast has been removed, teach how to walk without a limp, using crutches at first to minimize the pain. Teach how to balance on both feet. Start by holding with both hands on to the foot of the bed, then teach how to balance on one foot. *This is the most important part of the training*. Stand in front and put both the patient's hands on your shoulders. Ask him to hold tight and lift the injured leg first, then the good one. To start with, he may be unable to balance the body over the injured leg, but he will soon learn to do so by abducting the hip on the injured side.

As soon as he can balance on one leg, ask him to bend the opposite knee to a right angle. This makes balancing more difficult.

Next, make him lift first one leg then the other, while standing in the same place. When he can do this, ask him to take short 'baby' steps, putting the good foot down 10 cm in front of the bad one, and then the bad foot the same distance in front of the good foot. Like this, he learns to put equal weight on both legs to avoid a limp.

TURN YOUR WARD STAFF INTO PHYSIOTHERAPISTS

66.2 Overview of hip & femoral neck injury

HIP DISLOCATION AND FEMORAL NECK FRACTURES are not easy to distinguish without a radiograph. These are the injuries of the hip & femur you may encounter (66-2).

(a) Dislocations are usually posterior (66-2A), and occasionally anterior (66-2B), or central through the fractured acetabulum (66-2C).

(b) Femoral neck fractures are of 2 kinds: (a) the common unstable (66-2D), where the fracture line gores right across the bone (complete), or only partially across (incomplete), and (b) the rarer stable impacted valgus fracture (66-2E). Fractures here unite badly, because the blood supply to the proximal femoral fragment is damaged.

Conservative treatment is usually unsatisfactory, and so most of these fractures need internal fixation, if possible.

Intertrochanteric fractures (66-2F) occur between the two trochanters. Fractures here unite well, so that conservative treatment is usually satisfactory.

INJURIES TO THE HIP & FEMORAL NECK

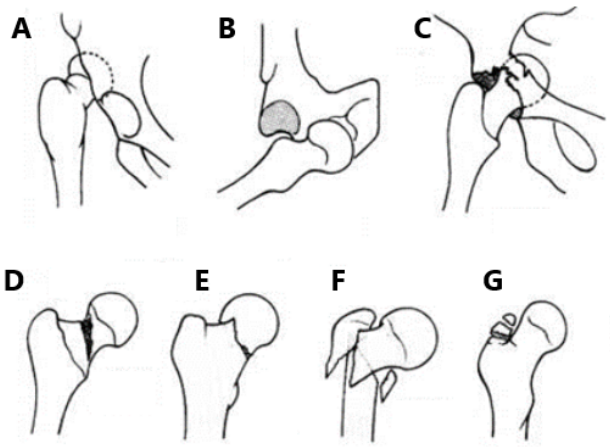

Fig. 66-2 INJURIES TO THE HIP AND FEMORAL NECK A posterior, B, anterior, C, central dislocations of the hip. D, unstable & E, impacted valgus femoral neck fractures. F, an inter-trochanteric fracture. G, fracture of part of the trochanter with an intact shaft.

Fractures of the greater trochanter are rare and not serious. A patient falls on the hip and breaks off the greater trochanter without breaking the neck of the femur (66-2G). Start walking on crutches until free from pain. *No other treatment is necessary*.

IF THE FEMUR IS FRACTURED, MAKE SURE THE HIP IS NOT DISLOCATED BY ALSO EXAMINING THE HIP

EXAMINATION
Remove all the clothes down to underwear. Observe the patient walking if possible. Is there a limp? If walking is possible, a serious leg injury is unlikely, but there may be an impacted femoral neck fracture.

Observe the patient standing on one leg. When a normal person does this, the pelvis tilts so that the opposite hip lifts up.

If it dips down, the hip mechanism of the weight-bearing leg is abnormal. The gait may be abnormal in a similar way (Trendelenburg sign and gait).

CHECK THE ATTITUDE OF THE HIP
When a normal patient lies supine, the legs rotate externally a little.

If the leg is abnormally externally rotated after an injury, there is probably a femoral neck fracture. If it is rotated 90°, the fracture is probably low in the neck, but if it is rotated only 45°, it is likely to be high in the neck, where it is partly retained by the capsule.

If the hip is flexed, adducted, and internally rotated after a violent injury, this is a posterior dislocation (66-2A).

If the hip is flexed, abducted and externally rotated, this is an anterior dislocation (66-2B).

CHECK THE HIP MOVEMENTS
Lie the patient flat with the pelvis level. With your hands on the thigh, gently rock the leg from side to side. Compare both sides.
Any painful limitation of movement indicates muscle spasm & possible fracture or dislocation.

N.B. With the patient prone, bend the knee, grasp the foot, and rotate the leg from side to side.

(a) Flexion. Put one hand palm upwards under the lumbar spine. With your other hand flex the normal hip. This will flatten the normal lumbar curve, and force the spine against the couch. If the other hip is able to extend normally, it will remain flat on the couch as you do this, but will flex otherwise.

(b) Rotation in flexion. While the hip and knee are flexed to 90°, rotate the hip externally and internally, and compare its range with the opposite side. Any 'crunchy feeling' in this or any other movement is a sign that the hip joint is abnormal.

(c) Abduction. Flex the normal knee and hook it over the edge of the couch. This will lock the pelvis and prevent it tilting. Now, keeping the other knee straight, grasp the ankle and then abduct the leg as far as it will go. Put one hand on the opposite anterior superior iliac spine to detect if the pelvis rotates.

(d) Adduction. Still steadying the pelvis, bring one thigh as far as possible over the other. It should be able to cross at its middle $^1/_3$.

CHECK THE GREATER TROCHANTERS
Standing over the patient, place your thumbs on the anterior superior iliac spines, and your middle fingers on the trochanters.
Compare both sides, and feel if the trochanter on the affected side is displaced upwards (posterior dislocation), or downwards (fractured femoral neck of femur, or anterior dislocation).

If the greater trochanter has moved medially this is a central hip dislocation.

N.B. The dislocated femoral head is only palpable in the perineum or groin in a very thin patient.

CHECK THE POINT OF MAXIMUM TENDERNESS

If this is anterior, suspect a femoral neck fracture
If this is lateral, suspect a greater trochanteric injury

CHECK FOR LEG SHORTENING
This may be obvious, with the patient supine (66-3A), or with both hips and knees flexed (66-3B-D). The measurement of true shortening is useful in many hip and leg conditions. Place the uninjured leg in exactly the same position as the injured side.

TEST THE SCIATIC NERVE
Check if foot dorsiflexion is possible.

RADIOGRAPHS
Always get radiographs of the hip if there is pain on weight-bearing after a fall. Get an AP film with the hip in as much internal rotation as possible, even if you have to hold the leg in this position yourself. *Don't take it in external rotation* which is the natural position of a resting injured hip.

Also get a horizontal lateral view (to see if the head of the femur has been displaced posteriorly), with the X-ray tube in the groin and the plate pressed in well above the iliac crest.

If the films are difficult to interpret, compare both sides.

CAUTION! You can easily miss a fracture of the neck, especially if it is subcapital (close to the head). In doubt, look carefully all around the cortex for small breaks in continuity, a step, or an angular deformity.

THE MAJOR FEATURES OF SOME COMMON INJURIES

(a) An unstable femoral neck fracture.
Severe pain and inability to walk or lift the foot off the bed. The leg is externally rotated with ≥1cm shortening.

(b) A stable impacted valgus femoral neck fracture. Little pain, ability to lift the foot off the bed and maybe walk. The leg is not rotated nor shortened.

(c) An intertrochanteric fracture.
Severe pain and inability to walk or lift the foot off the bed. The leg Is externally rotated with shortening. Maximum tenderness is over the greater trochanter.

MEASURING LEG SHORTENING

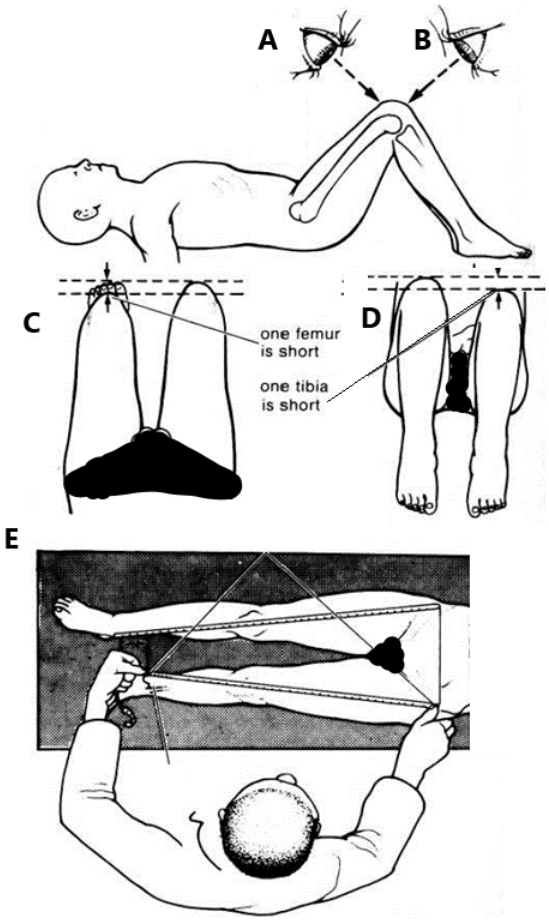

Fig. 66-3 MEASURING SHORTENING. A,B, with the patient's hips and knees flexed, look along the line of the tibia & femur. C,D, looking from above & below, check the position of the kneecap. E, measure from anterior superior iliac spine to medial malleolus.

Measure the distance between the inferior edge of the anterior superior iliac spine, and the tip of the medial malleolus (66-3E).

(d) Posterior hip dislocation.
The hip is flexed, adducted, and internally rotated, and the leg is shortened.

(e) Anterior hip dislocation.
The hip is flexed, abducted, and externally rotated, and the leg is shortened.

(f) Central hip dislocation.
The trochanter is displaced medially. There is no shortening.

66.3 Posterior hip dislocation

Posterior dislocation of the hip often occurs in a head-on car collision, where the knee hits the dashboard and the impact drives the femoral head at first behind, & then out of the acetabulum.
Typically, the hip is adducted & internally rotated. Soon, it rides up onto the dorsum of the ilium.

There are usually also other serious injuries, especially a fracture of the femoral shaft, or posterior cruciate ligament rupture in the knee, so that the dislocated hip is often missed.

N.B. Hip dislocation is relatively frequent after hip replacement and more so with revision arthroplasties. They can occur repeatedly if there is poor alignment or size discrepancy. They can be either posterior or anterior, but are usually relatively easy to reduce.
Patients should avoid internal rotation of the flexed hip, and bending too far forward.

HIP DISLOCATION REDUCTION (GRADE 1.3)
Resuscitate the patient if there are other serious injuries. However, don't delay long before reducing the hip, because it will become more difficult, and risks avascular necrosis of the femoral head.

Look for other fractures, especially a fracture of the posterior rim of the acetabulum. Check the function of the sciatic nerve before and after reduction (48.1), and examine the dorsalis pedis pulse.

Ketamine with diazepam is usually enough, if you use the method described.

REDUCING POSTERIOR HIP DISLOCATION

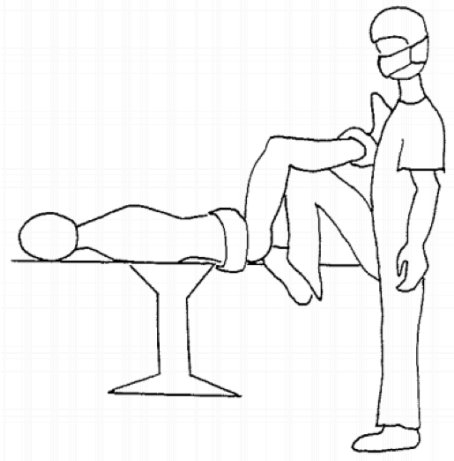

Fig. 66-4 REDUCING A POSTERIOR DISLOCATION OF THE HIP *After Bergman N, Reduction of posterior dislocation of the hip. Trop Doctor 1994; 24:134-5 with kind permission.*

'CAPTAIN MORGAN' REDUCTION
Place the dislocated hip close to the edge of the operating table. Tighten a broad leather belt tightly across both anterior superior iliac spines under the table. If possible, use a 2nd belt tightened over the inguinal ligament on the ipsilateral side. Lower the operating table so that you can comfortably put your forefoot on its edge, just distal to the dislocated hip. Flex the hip & knee to 90º. Keeping your forefoot in place, put your knee in the patient's popliteal fossa as snugly as possible. Grasp the ankle with one hand (66-4).
Now plantarflex your foot so that your knee pushes up against the patient's knee. Depress the foot with your hand and so reduce the dislocation.

While the patient is still anaesthetized, examine the knee for rupture of the posterior cruciate ligament (68.6).

TEST FOR STABILITY
While the patient is still anaesthetized, flex the hip to 90° and check to see if the femoral head easily slips out of the acetabulum posteriorly, or if it stays in place. If it slips out easily, suspect a fracture of the posterior rim of the acetabulum (66.5).

POSTOPERATIVE CARE
If the dislocation is stable and pain-free, there is no need for traction, so start active movements in bed, and after 10days get the patient up on crutches with partial weight bearing.

If reduction is unstable, and the femoral head slips out of the acetabulum, get a radiograph. If this shows a large chip broken off the rim of the acetabulum, try extension traction with a distal femoral or tibial pin. If this controls the reduction, continue to apply it for at least 6wks.

If this fails to control the unstable hip, it is probably because the posterior rim of the acetabulum has been shattered. Assemble '90-90 traction' (70-10), using skeletal traction with a tibial pin, as for an acetabular fracture (66.5). Get an AP and a lateral radiograph to make sure the reduction is satisfactory, while in traction. After you have held the hip like this for 6wks, there will be enough scar tissue in the posterior acetabulum to hold it. Provided the range of movement in the hip and the ability to control it increase each day, allow him to move it as he wishes. Explain that late complications may occur, and follow up for 2yrs.

DIFFICULTIES WITH DISLOCATED HIPS
If the hip is particularly painful immediately after reduction, consider aspirating it (7.17).

If dorsiflexion of the foot is impossible, and sensation on its dorsum is absent, there is a sciatic nerve palsy. This usually recovers. A fragment from the rim of the acetabulum may have impaled the sciatic nerve. Refer if possible so that the hip can be explored and the fragment fixed.

If the foot is cold, blue, and swollen, the femoral artery or vein has thrombosed, so reduce the dislocation urgently, and start anticoagulants.

If the foot is swollen, raise the leg. if the artery is thrombosed, keep the leg cool. Refer urgently for vascular surgery. If this is to be effective the operation must be done within 2h.

If there is a hip dislocation & a femoral head fracture, there may be a loose fragment inside the joint. Try to refer him as above.

If there is a hip dislocation & a femoral shaft fracture, reduce the dislocation using an external fixator (66-9).

If a posterior hip dislocation has been missed, try to reduce it by closed methods up to 2wks after the injury. If you fail, try to refer him. Older dislocations are usually impossible to reduce by closed methods.

If the hip becomes progressively more painful some months or years after a dislocation, it is probably due to avascular necrosis of the femoral head and consequent osteoarthritis. You will see an increased bone density of the femoral head on a radiograph. This may be visible at 6wks but usually much later. Try to arrange an arthroplasty.

REDUCE DISLOCATED HIPS IMMEDIATELY

66.4 Anterior hip dislocation

In this rare injury the patient falls from a height and displaces the head of the femur in front of the acetabulum. Typically the hip lies flexed, abducted & externally rotated.

STIMSON'S REDUCTION (GRADE 1.5)
Intubate the patient and lie him prone. Strap the pelvis to the table with a broad belt across the anterior superior iliac spines (66.3).

Hold the leg and bend the hip and the knee to 90°. Get an assistant to hold the foot. If the weight of the patient's own leg does not achieve reduction, gently insert your heel into the patient's popliteal fossa, and exert downward pressure. You may need some internal rotation at the hip by turning the foot to achieve reduction.

POST-OPERATIVE CARE
Keep the patient in bed until he has regained control of the hip. Then allow him up and let him bear weight. Monitor for avascular necrosis of the femoral head, as with a posterior dislocation.

66.5. Acetabular fracture

The outlook for a patient with an acetabular fracture depends mostly on whether or not the femoral head has destroyed the upper part of the acetabulum. This is the part which bears the weight, and if enough of it remains unbroken, the outlook is good. Otherwise severe degenerative arthritis is likely to follow.

Posterior rim acetabular fracture is one of the results of a car accident in which the patient's knee hits the dashboard. The head of the femur is driven backwards, and breaks off a piece of the rim of the acetabulum. At the same time, the hip may dislocate posteriorly, and the sciatic nerve may be injured. Provided the hip has not been dislocated, the attitude of the leg is normal, and there is no shortening. These fractures are often missed and their late effects are underestimated.

Acetabular floor fracture is the result of the patient falling from a height onto the greater trochanter and forcing the femoral head against the acetabular floor. Or, it may occur through direct injury in a car crash.

The head may remain in its socket (66-5A), or it may dislocate centrally through the broken floor of the acetabulum into the pelvis, so that he has a central dislocation of the hip (66-5B).

Movement of the leg or lifting the foot off the bed is impossible. If the foot is in its normal position, it shows that the hip is in its normal attitude. Unless displacement is gross, the leg is not shortened. Although the radiograph is characteristic, fractures of an acetabular floor are often overlooked. Traction combined with gentle movements gives surprisingly good results. *Don't treat in a Thomas splint.*

ACETABULAR FLOOR FRACTURE

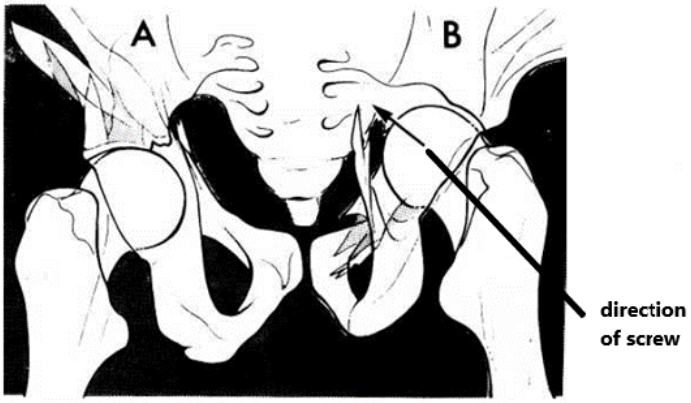

Fig. 66-5 ACETABULAR FLOOR FRACTURE. A, the femoral head is in its normal place. B, it is dislocated it centrally into the pelvis (B). Place the fixation screw in the direction shown.

POSTERIOR RIM FRACTURE
Check if this is associated with an unstable hip dislocation (66.3). If not, and the hip is stable, maintain bedrest for 1wk, and then allow partial weight bearing.

If the femoral head will not stay in the acetabulum, try to refer immediately to have the posterior lip of the acetabulum screwed back. The longer you delay the more difficult this will become. If you cannot refer, introduce '90-90 traction' for 6wks (67-3).

If a fragment of bone is trapped inside the joint, it must be removed at open operation, so try to refer for this.

ACETABULAR FLOOR FRACTURE WITHOUT CENTRAL DISLOCATION
Encourage active hip movement and then allow partial weight bearing on crutches as soon as pain allows.

ACETABULAR FLOOR FRACTURE WITH CENTRAL DISLOCATION (GRADE 3.4)
This is a severe injury and the patient is likely to need a blood transfusion. Under GA correct lateral rotation of the leg, by bringing the patella to face anteriorly. Flex the hip a little and feel for the greater trochanter. Insert a Schanz screw (or any strong long threaded pin) through the femoral neck into the femoral head under fluoroscopy if possible. Otherwise, make a small lateral incision well distal of the greater trochanter. Insert the screw in the anterior portion of the femur owing to the shape of the trochanter)

CAUTION! Don't put the pin too far medially or you may injure the sciatic nerve!

Insert another pin in the upper tibia, and apply 7-10kg longitudinal traction. Put a stirrup on the vertical pin and apply 15kg for 15mins. If this pulls the femoral head out, it will usually stay out. Then, remove the vertical pin and continue skeletal traction in extension with 5-10Kg applied to the tibial pin (67-3).

N.B. You might need to flex & abduct the thigh forcibly, or adduct it using your foot as a fulcrum.

Get radiographs to check reduction. Exert countertraction by raising the foot of the bed 25cm. This will make the patient more comfortable, but will not, by itself, reduce the dislocation.

Put a sling under the thigh and pass the cord from this over a pulley allow exercise of the hip. Maintain traction for at least 6wks. Encourage exercise as much as possible. Then allow gradually increasing weight bearing with crutches (66-1A).
Remove the crutches as soon as standing normally is possible on the injured leg.

If reduction is still unsatisfactory, try to refer him for open reduction.

66.6 Femoral neck fracture

These are difficult fractures. The nearer they are to the femoral head, the less likely they are to unite (except in the case of a stable impacted valgus fracture), and the more likely the head is to undergo avascular necrosis.

The blood supply of the head of the femur is precarious, little callus is formed, and early rigid internal fixation provides the only hope of union.

Surprisingly, these fractures are often missed. For the purposes of management in a district hospital, there are 3 kinds:
(1) An incomplete unstable fracture (66-6A)
(2) A complete, unstable fracture (66-6B).
(3) A stable impacted valgus fracture (66-6C).

UNSTABLE FEMORAL NECK FRACTURE
Most fractures of the femoral neck are unstable and complete. The patient is either a young adult who has sustained a severe injury, or an old person who has fallen and injured the hip. Standing or lifting the foot off the bed, or moving the hip gives great pain. The leg is externally rotated so that the foot points laterally, and the leg is shortened c.1cm.

3 TYPES OF FEMORAL NECK FRACTURES

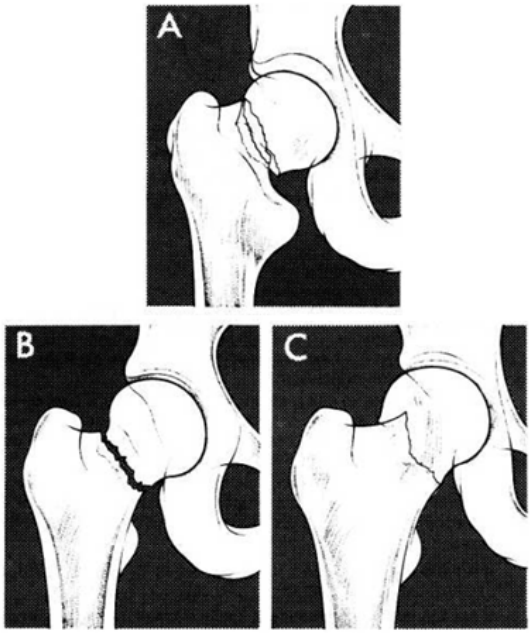

Fig. 66-6 TYPES OF FEMORAL NECK. A, the rare incomplete unstable fracture. Note that the fracture line has not gone completely through the neck. B, the common complete unstable fracture (66-2D). C, the uncommon impacted valgus fracture (66-2E). *Kindly contributed by John Stewart.*

There is less shortening than with intertrochanteric fractures. Sometimes, the injury may seem to be trivial. Occasionally, there is pain in the knee, rather than in the hip, so *any patient who cannot walk after a fall must have the hip X-rayed*, with the leg held in maximal internal rotation in order to get the best view of the femoral neck of the femur. External rotation makes the neck look foreshortened.

N.B. If you allow walking, you can easily convert an incomplete fracture into a complete one.

Try to refer all patients with incomplete fractures for internal fixation or for the fitting of a prosthesis. Transport him with the legs bandaged gently together with cotton wool between them.

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UNSTABLE FEMORAL NECK FRACTURE

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If referral is an impossibility, mobilize the patient as best you can. A false joint will develop, and the final result will resemble that after a Girdlestone's operation (7.19), except that it may be somewhat less satisfactory. There will probably be a limp and permanent need for crutches, or at the very least a walking stick, but the patient may do surprisingly well.

There is no indication for excising the head of the femur immediately, and traction is useless.

N.B. Don't use a hip spica in an old person; because immobility will certainly lead slowly but surely to fatal complications.

If there is an incomplete unstable fracture, it may become complete at any moment. As there is no way of testing for clinical union, apply Perkins traction or extension traction for at least 12wks, but without the vigorous exercises necessary for fractures of the femoral shaft.

STABLE IMPACTED VALGUS FEMORAL NECK FRACTURE

The fracture line runs across the proximal part of the femoral neck and the fragments are firmly impacted, with the head in valgus. This makes the fracture stable and is a useful point in recognizing this particular fracture.

The patient is usually an old person. Walking may be possible after the accident, and with a little encouragement can lifting the leg off the bed. There is no rotational deformity and no shortening.

Because the fracture line is mainly horizontal, there is little shearing stress across it, and a good chance that the head will not disimpact. Bearing a little weight on it is beneficial because it maintains the impaction. It is a useful rule that if a patient can walk into the hospital, the fracture is probably stable. If he is lucky it will remain so.

If there is any doubt about the stability of the impaction and you can refer the patient immediately for internal fixation, do so.

There is no case for the application of a hip spica.

CAUTION! Don't apply traction, because it will disimpact the fracture and make it unstable.

If walking is possible, let this continue, with partial weight bearing and crutches. The head is at its softest and most liable to displacement 10-14 days after the fracture. Supervise walking carefully for the first 2-3wks before discharge. Warn that care is needed not to trip or stumble.

If walking is not possible, advise bedrest, while doing vigorous *quadriceps* exercises, until the pain has subsided enough to allow mobilizing on crutches, with partial weight bearing while you carefully supervise walking for 3-4wks. As pain diminishes, allow progressively more weight-bearing on the injured leg.

DIFFICULTIES WITH IMPACTED FEMORAL NECK FRACTURES

If a patient has been walking satisfactorily on an impacted valgus fracture, and the leg suddenly becomes painful, prohibiting weight bearing, the fragments have probably disimpacted. Try to refer for internal fixation.

DISPLACING THE FEMORAL SHAFT FOR AN INTER-TROCHANTERIC FRACTURE

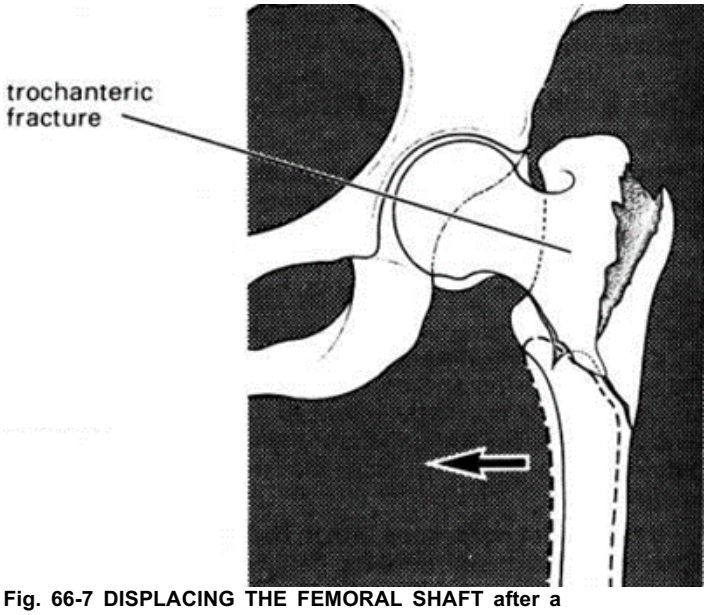


Fig. 66-7 DISPLACING THE FEMORAL SHAFT after a intertrochanteric fracture. By displacing the femoral shaft medially, it is better able to support the neck and head. *Kindly contributed by John Stewart.*

66.7 Inter-trochanteric femoral fracture

In these common fractures, the femur breaks between its 2 trochanters. The lesser trochanter sometimes separates as a 3rd fragment, or there may be multiple fragments. Muscular pull reduces the normal 145° *varus* angulation of the neck on the femoral shaft to 90°, and shortens the leg. Sometimes, there may be little displacement when viewed anteriorly, but considerable in a lateral view.

Although the patient is commonly an elderly person who trips and falls, a more severe injury can cause this fracture in a young person.

Typically, the elderly person cannot walk after a fall. She lies in bed unable to lift her leg, with her foot turned outwards, and her leg as much as 3cm shortened. The outer side of the thigh is painful, and moving the hip produces great pain. After a few days, bleeding from the fracture site spreads to cause a bruise in the posterior thigh.

Although internal fixation greatly shortens the time in bed and reduces morbidity, these fractures will usually unite with non-operative treatment. Use Perkins traction, because it allows the patient to sit up and exercise, and so reduces the incidence of pneumonia and bedsores.

The critical milestone (6-12wks) is the patient's ability to lift the leg off the bed. Most patients are partly weight bearing with two sticks or a walking frame by 12wks.

N.B. If a patient bears weight on the fractured femur too soon, it may angulate or refracture. This is much less likely to happen if you displace the lower fragment medially under the femoral head. This may occur spontaneously at the time of the injury, but if it does not, you can produce it.

If displacement is minimal, and the patient elderly, maintain bedrest for 3wks, then start partial weight bearing for another 2wks.

If the fracture is moderate but not comminuted, apply Perkins traction in abduction.

REDUCTION OF DISPLACED INTER-TROCHANTERIC FEMORAL FRACTURE (GRADE 2.1)
If the fracture is moderate and comminuted, (67-5B) displace the femoral shaft medially under the femoral head (66-6) and apply Perkins traction.

Under GA, lying the patient on the contralateral side, with an assistant abducting the leg a little, exert some traction. Put both your hands on the thigh just below the fracture site. With one good push using your full weight, move the lower fragment medially. You cannot push it too far or too hard!

Apply Perkins traction (67.4)
If, after 12wks, radiographs show that the distal fragment remains medially displaced, partial weight bearing in crutches can start immediately.
If you could not maintain medial displacement, or if the fragments have displaced into a *varus* position, allow very little weight-bearing, using only the heel and toe of the injured leg.

The fracture will have consolidated after 5-6 months of partial weight bearing. This is difficult to evaluate clinically, so check with a radiograph.

66.8 Girdlestone operation for ununited femoral neck

If an arthrodesis or a prosthesis is impractical, you can remove the femoral head so a pseudarhrosis forms (the Girdlestone procedure), either as the definitive operation, or as a temporary one before a prosthesis is fitted. This is not an easy operation, and is for more experienced operators only. Refer the patient if you can. Other indications are for sepsis (7.19).

INDICATIONS
Painful walking as the result of:
(1) An ununited femoral neck fracture.
(2) Osteoarthritis with a femoral neck which is too osteoporotic to allow a prosthesis to be fitted.
(3) Avascular necrosis following the insertion of a pin or plate in sickle cell disease.

METHOD (GRADE 3.5)
Make a posterolateral incision (66-8A), extending it upwards almost to the iliac crest and downwards in a vertical incision through skin and *fascia lata* to the bone on the outer surface of the femur (66-8B).
Use a periosteal elevator to detach the gluteal muscles from the femur so as to reflect an inferomedial flap of these muscles (66-8C) and expose the *obturator internus*, the 2 *gemelli*, & the upper fibres of *quadratus*. Divide these c.1cm from their insertion into the femur, and swing them medially where they will protect the sciatic nerve (66-8D).

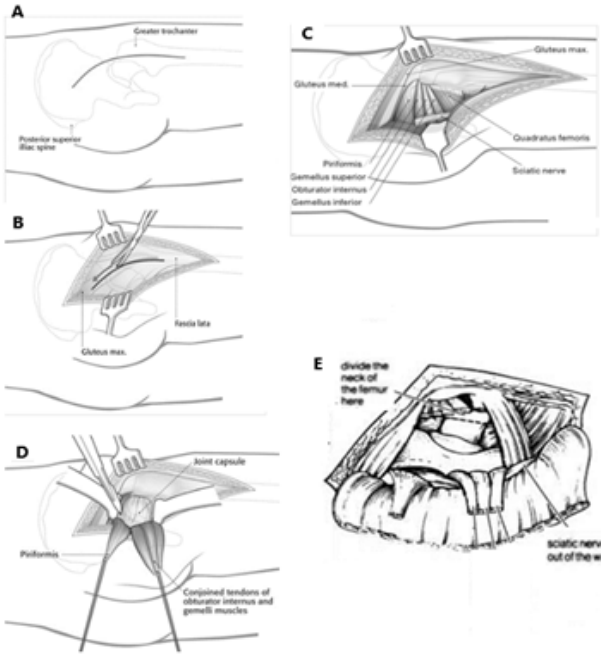
Approach the hip joint from behind. Open the capsule and check that it really is the hip joint by asking an assistant to move the patient's leg and seeing the head of the femur move too.

Dislocate the head of the femur from the acetabulum, by asking your assistant to adduct the leg and forcibly internally rotate it, while you divide the remaining fibres of the capsule and the *ligamentum teres*. If necessary, use a sharpened spoon to divide these.

Cut the neck of the femur flush with the shaft using an osteotome or Gigli saw (66-8E). Remove the head. If the neck is already fractured, trim it back with a rasp. Wash out the joint thoroughly to remove chips of bone.

Control bleeding. Close the wound without drainage, and apply skin traction as above.

If you have difficulty removing the head of the femur, try to get a Gigli saw under the neck of the femur. You may need help to do this. You can use an osteotome to insert the retractors, and remove the head and neck of the femur piece by piece. The lower border of its neck will be the hardest piece to cut.



GIRDLESTONE OPERATION

Fig. 66-8 GIRDLESTONE OPERATION FOR NON-INFECTIVE CONDITIONS. A, a long curved incision. B, divide the *fascia lata*. C, reflect the gluteal muscles. D, reflect *pyriformis, obturator internus,* & the *gemelli* to hide the sciatic nerve out of the way. E open the capsule of the hip joint & divide the femoral neck. *Kindly contributed by Peter Bewes.*