Injuries of the pelvis

Types of injury

(1) isolated fractures with an intact pelvic ring;

(2) fractures with a broken ring – these may be stable or unstable;

(3) fractures of the acetabulum

(4) sacrococcygeal fractures.

ISOLATED FRACTURES

Avulsion fractures A piece of bone is pulled off by violent muscle contraction; All are essentially muscle injuries, needing only rest for a few days and reassurance.

Direct fractures A direct blow to the pelvis, usually after a fall from a height, may fracture the ischium or the iliac blade. Bed rest until pain subsides is usually all that is needed.

Stress fractures Fractures of the pubic rami are fairly common (and often quite painless) in severely osteoporotic or osteomalacic patients.

FRACTURES OF THE PELVIC RING

Mechanisms of injury

Anteroposterior compression The pubic rami are fractured and externally rotated so-called ‘open book’ injury. Lateral compression Anteriorly the pubic rami on one or both sides are fractured, and posteriorly there is a severe sacroiliac strain or a fracture of the sacrum or ilium

Vertical shear fracturing the pubic rami and disrupting the sacroiliac region on the same side.

Combination injuries In severe pelvic injuries there may be a combination of the above.

Management

EARLY MANAGEMENT Six questions must be asked and the answers acted upon as they emerge:

- Is there a clear airway?
- Are the lungs adequately ventilated?
- Is the patient losing blood?
- Is there an intra-abdominal injury?
- Is there a bladder or urethral injury?
- Is the pelvic fracture stable or unstable?

TREATMENT OF THE FRACTURE

For patients with very severe injuries, early external fixation is one of the most effective ways of reducing haemorrhage and counteracting shock

Isolated fractures and minimally displaced fractures
These injuries need only bed rest, possibly combined with lower limb traction. Within 4–6 weeks the patient is usually comfortable and may then be allowed up using crutches.

Open-book injuries gap less than 2 cm there are no displaced or posterior disruptions treated satisfactorily by bed rest; a posterior sling or a pelvic binder helps to ‘close the book’. The most efficient way by external fixation with pins in both iliac blades connected by an anterior bar; ‘closing the book’

Complications

Thromboembolism deep vein thrombosis or pulmonary embolism

Sciatic nerve injury nerve is injured it is usually a neuropraxia and one can afford to wait several weeks for signs of recovery.

Urogenital problems Urethral injuries sometimes result in stricture, incontinence or impotence

Persistent sacroiliac pain due to partial or complete sacroiliac joint disruption arthrodesis of the sacroiliac joint is needed.

FRACTURES OF THE ACETABULUM

Fractures of the acetabulum occur when the head of the femur is driven into the pelvis.

Treatment

EMERGENCY TREATMENT

The first priority is to counteract shock and reduce a dislocation. Skeletal traction is then applied to the distal femur (10 kg will suffice) and during the next3–4 days the patient's general condition is brought under control. Occasionally, additional lateral traction through the greater trochanter is needed for central hip dislocations. Definitive treatment of the fracture is delayed until the patient is fit and operation facilities are optimal.

Complications

Iliofemoral venous thrombosis
Sciatic nerve injury
Hereterotopic bone formation
Avascular necrosis
Loss of joint movement and secondary osteoarthritis

INJURIES TO THE SACRUM AND COCCYX

A blow from behind, or a fall onto the ‘tail’ may fracture the sacrum or coccyx, or sprain the joint between them. Women seem to be affected more commonly than men.

X-rays may show
(1) a transverse fracture of the sacrum

(2) a fractured coccyx

(3) a normal appearance if the injury was merely a sprained sacrococcygeal joint.

Treatment

If the fracture is displaced The lower fragment may be pushed backwards by a finger in the rectum. use a rubber ring cushion when sitting. Excision in sever cases.

DISLOCATION OF THE HIP

POSTERIOR DISLOCATION

This is a posterior dislocation, usually occurring in a road accident often a piece of bone at the back of the acetabulum is sheared off, making it a fracture-dislocation.

Clinical features
the leg is short and lies adducted, internally rotated and slightly flexed.

X-ray
In the anteroposterior film the femoral head is seen out of its socket and above the acetabulum.

Treatment
The dislocation must be reduced as soon as possible under general anaesthesia. In the vast majority of cases this is performed closed, but if this is not achieved after two or three attempts an open reduction is required.

Complications

EARLY
Sciatic nerve injury damaged in10–20 per cent of cases but it usually recovers.

Vascular injury Occasionally the superior gluteal artery is torn and bleeding may be profuse.

Associated fractured femoral shaft

LATE

Avascular necrosis Ischaemia is due to interruption of femoral head blood supply when the hip is dislocated. X-ray features such as increased density of the femoral head may not be seen for at least 6 weeks, and sometimes very much later (up to 2 years), depending on the rate of bone repair.

Myositis ossificans This is an uncommon complication, probably related to the severity of the injury.

Unreduced dislocation After a few weeks an untreated dislocation can seldom be reduced by closed manipulation and open reduction is needed.

Osteoarthritis Secondary osteoarthritis is not uncommon and is due to

(1) cartilage damage at the time of the dislocation
(2) the presence of retained fragments in the joint
(3) ischaemic necrosis of the femoral head.
In young patients treatment presents a difficult problem.

ANTERIOR DISLOCATION

Anterior dislocation is rare compared with posterior. occur when a weight falls onto the back The femoral head lie superiorly(type I - *pubic*) or inferiorly (type II - *obturator*).

Clinical features
The leg lies externally rotated, abducted and slightly flexed. It is not short, because the attachment of rectus femoris prevents the head from displacing upwards.

X-ray
In the anteroposterior view the dislocation is usually obvious, but occasionally the head is almost directly in front of its normal position; any doubt is resolved by a lateral film.

complications
Avascular necrosis occurs in less than 10 per cent of cases.

CENTRAL 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 dislocation', it is really a fracture of the acetabulum

FRACTURES OF THE FEMORAL NECK

The femoral neck is the commonest site of fractures in the elderly disorders such as osteomalacia, diabetes, stroke, alcoholism and chronic debilitating disease. In addition, old people often have weak muscles and poor balance resulting in an increased tendency to fall.

Garden classification

Stage I is an incomplete impacted fracture, including the so-called abduction fracture in which the femoral head is tilted into valgus in relation to the neck.
Stage II is a complete but undisplaced fracture.
Stage III is a complete fracture with moderate displacement.
Stage IV is a severely displaced fracture.

X-ray

In ***Garden I fractures*** the femoral head is in its normal position or tilted into valgus and impacted on the femoral neck stump. The medial cortex may be intact. The femoral head stress trabeculae are normally aligned with the innominate trabeculae.

In ***Garden II fractures*** the femoral head is normally placed and the fracture line may be difficult to discern.

In ***Garden III fractures*** the anteroposterior x-ray shows that the femoral head is tilted out of position and the trabecular markings are not in line with those of the innominate bone; this is because the proximal fragment retains some contact with the neck stump and is pushed out of alignment.

In ***Garden IV fractures*** the femoral head trabeculae are normally aligned with those of the innominate bone; the reason is that the proximal fragment has lost contact with the femoral neck and lies in its normal position in the acetabular socket.

Treatment

Initial treatment consists of pain-relieving measures and simple splintage of the limb.

non-operative treatment of undisplaced(Garden Stages I and II)

Displaced fractures will not unite without internal fixation or Prosthetic replacement

in any case elderly people should be got up and kept active without delay if pulmonary complications and bed sores are to be prevented.

Complications

General complications deep vein thrombosis, pulmonary embolism, pneumonia and bed sores

Avascular necrosis

Non-union More than 30 per cent of all femoral neck fractures fail to unite

Osteoarthritis Avascular necrosis or femoral head collapse may lead, after several years, to secondary osteoarthritis of the hip.