Diagnosis and immediate care of fractured neck of femur

Martyn Parker

DIAGNOSIS

The classical presentation of a patient with a hip fracture is an elderly person (female in about 80% of cases) who had tripped while walking and fallen. The symptoms are of pain in the hip and inability to walk. Clinical examination usually reveals a shortened and externally rotated limb for which all attempts at hip movement are painful. The diagnosis is readily confirmed by X-ray. Unfortunately, for about 14% of patients, the diagnosis is delayed (Pathak and Parker, 1996). The reasons for this are:

- Patient or carers did not seek medical help – 6%
- Patients seen by doctor but no X-ray requested – 5%
- X-rays showed fracture but misinterpreted – 1%
- X-rays of poor quality such that fracture missed – 1%
- Fracture not visible on X-rays even with hindsight – 1%.

If the patient is confused or has dementia, this can contribute to a delay in diagnosis. For approximately 5% of cases, there may be no history of trauma (Pathak and Parker, 1996). Such fractures are more likely to be pathological or occur with osteoporosis. Another pitfall is where the fracture is undisplaced (Parker, 1992).

In this situation, the limb will be neither shortened or externally rotated, and hip movements, although painful, may be possible. The patient may even be able to walk, albeit with pain and requiring an aid or assistance. The X-ray changes of an undisplaced fracture can be minimal or even completely absent. The incidence of a hip fracture with a completely normal X-ray is about 1% of all hip fractures.

Figure 1 gives an algorithm for the diagnosis of a hip fracture. Within *Figure 1*, the third X-ray is suggested as the initial X-ray taken for a suspected hip fracture is a pelvic view which includes the iliac crests and both hips. Consequently, the hip is in the corner of the X-ray. To make matters worse, the film is often taken with the hip in external rotation (the position of comfort for a patient with a hip fracture). This external rotation may result in the greater trochanter being posterior to the femoral neck and obscuring an intracapsular fracture. Taking a third view in 10° of internal rotation brings the femoral neck parallel to the X-ray film and gives clarity of this region (*Figure 2*). Beside the unnecessary pain caused by missing a fracture, an undisplaced fracture may displace if left untreated. The treatment and prognosis for an undisplaced fracture is better than that for a displaced fracture, particularly if the fracture is intracapsular.

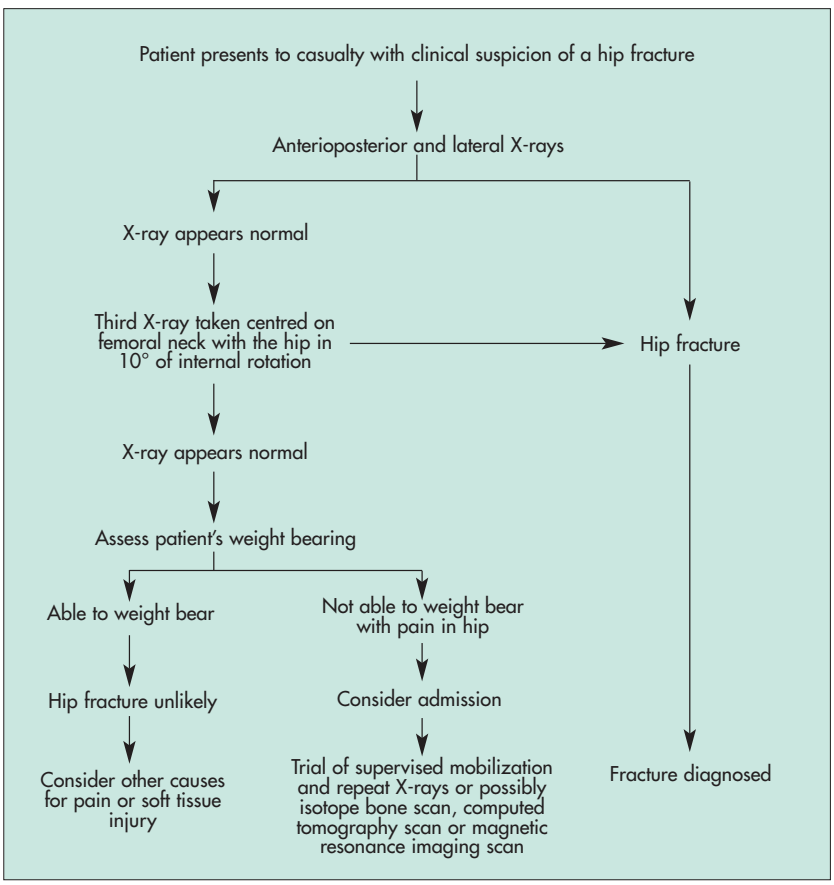
PATIENT ASSESSMENT

Having diagnosed a hip fracture, a brief medical assessment is required in the casualty department. The points to consider are:

- What was the cause of the fall?
- Were any other injuries sustained in the fall?
- Are there any other medical conditions requiring immediate treatment?

Most falls leading to a hip fracture are the result of a simple trip, but occa-

Figure 1. Suggested algorithm for the diagnosis of suspected hip fracture.



Dr Martyn Parker is Orthopaedic Research Fellow in the Orthopaedic Department, Peterborough District Hospital, Peterborough PE3 6DA

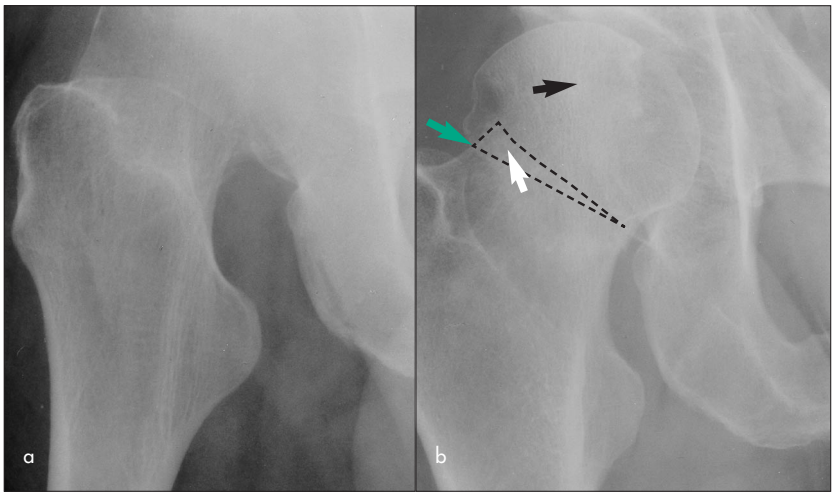


Figure 2. a. The initial film in external rotation fails to show the fracture. b. With internal rotation, the fracture is visible. This impacted intracapsular fracture is the commonest type of missed hip fracture. It has the characteristics of a triangle of denser bone at the site of impaction (white arrow), vertical trabeculae (black arrow) and loss of the smooth curve of the femoral neck laterally (green arrow). ---- = Fracture line.

sionally they may be related to an acute medical condition, such as myocardial infarction or cardiac arrhythmia. For most patients, an electrocardiogram (ECG) is required before surgery, and the casualty department is well placed to perform this on admission.

EARLY MANAGEMENT

The key features for the immediate management of a hip fracture are:

- Appropriate pain relief
- Correction of hypovolaemia with intravenous fluids
- Treatment of hypothermia if present
- Care of pressure areas
- Thromboembolic prophylaxis
- Information and reassurance.

The degree of pain experienced after a hip fracture can vary from moderate to severe. Analgesia needs to be tailored to the patient and could be codeine or opiates. Intravenous opiates should be used with caution in the elderly because of their unpredictable response. Non-steroidal analgesics may have adverse effects of bleeding and may cause renal impairment. A femoral nerve block may be used (Haddad and Williams, 1996; Parker et al, 2001).

Blood loss from a hip fracture may vary from a few millilitres for an undisplaced intracapsular fracture to over 1 litre for a comminuted subtrochanteric fracture. In addition to this, the patient may be dehydrated from a lack of oral intake following the fall. A saline intravenous infusion should be started in casualty with the drip rate tailored to correct for the estimated blood loss at the fracture site.

Other factors that need to be considered are the presence of hypothermia. Hip fracture patients are vulnerable to pressure sores and the hard surfaces of casualty trolleys have been criticized. To alleviate this, pressure-relieving mattresses should be used on the trolleys, and patients should not spend excessive times in casualty. A maximum time in casualty of 1 hour has been suggested (Scottish Intercollegiate Guidelines Network, 1997), but a more realistic time to aim for is under 2 hours. Traction for hip fractures is no longer considered appropriate (Anderson et al, 1993; Parker and Handoll, 1997).

In addition to the medical aspects of hip fracture, many patients fear that the diagnosis of a hip fracture implies either death or loss of independence. The patient needs to be informed of the likely treatment and outcome, which is generally surgery. Following a hospital stay of about 2–3 weeks, the majority of patients are able to return home, albeit being more dependent on walking aids and assistance.

Many casualty departments have fast-tracking policies to ensure that the items listed below are undertaken and the patient spends the minimum time within casualty. The key components of a fast-tracking policy are:

- Diagnosis established
- Patient assessed for other injuries and associated medical conditions
- Pain relief as appropriate
- Intravenous fluids
- Routine bloods taken (full blood count, urea and electrolytes, group and save)
- ECG taken
- Chest X-ray pre-surgery if clinically indicated
- Transfer to the orthopaedic ward without further delay. HM

KEY POINTS

- Most hip fractures are visible on an anterioposterior hip X-ray.
- The commonest missed hip fracture is an undisplaced intracapsular fracture.
- Missed fractures may subsequently displace.
- Initial management is analgesia and intravenous fluids.
- A fast-tracking policy in casualty should streamline the patient's progress.

Anderson GH, Harper WM, Connolly CD, Badham J, Goodrich N, Gregg PJ (1993) Preoperative skin traction for fractures of the proximal femur. A randomised prospective trial. *J Bone Joint Surg Br* **75**(5): 794–6

Haddad FS, Williams RL (1995) Femoral nerve block in extracapsular femoral neck fractures. *J Bone Joint Surg Br* **77**(6): 922–3

Pathak G, Parker MJ, Pryor G (1997) Delayed diagnosis of femoral neck fractures. *Injury* **28:** 299–301

Parker MJ (1992) Missed hip fractures. *Arch Emerg Med* **9:** 23–7

Parker MJ, Handoll HHG (1997) Pre-operative traction for fractures of the proximal femur (Cochrane Review). In: The Cochrane Library, Issue 1. Update Software, Oxford

Parker MJ, Griffiths R, Appadu BN (2001) Nerve blocks (subcostal, lateral cutaneous, femoral, triple, psoas) for hip fractures (Cochrane Review). In: The Cochrane Library, Issue 4. Update Software, Oxford

Scottish Intercollegiate Guidelines Network (1997) *Management of Elderly People with Fractured Hip*. No. 15. Royal College of Physicians, Edinburgh