CASE REPORT

Lesser trochanter fracture: the presenting feature of a more sinister pathology

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SUMMARY

We report the rare case of a 75-year-old man who was hospitalised following referral by his general practitioner with a 4-day history of worsening groin pain. Initial radiographs demonstrated an isolated avulsion fracture of the lesser trochanter. There were associated bony changes indicating pathological bone disease, likely secondary to bony metastasis. Further investigation revealed a renal mass almost certainly consistent with a renal cell carcinoma. This case emphasises the importance of having a high index of suspicion for neoplastic pathology when low impact injuries result in fractures.

BACKGROUND

Avulsion fractures of the lesser trochanter constitute a rare clinical entity. In isolation, such an occurrence should raise suspicion of an underlying sinister pathological process affecting the bone. A neoplastic process should be considered, with appropriate assessment and investigations.

CASE PRESENTATION

A 75-year-old man presented to the emergency department, following referral by his general practitioner, with a 4-day history of left groin pain following a fall at home. The fall occurred as the patient tried to sit down and was described as very low impact. Other than mild bruising over the left flank and buttock, the patient sustained no other apparent injuries, and did not report loss of consciousness. He had significant hip pain but was nonetheless able to weight-bear and mobilise following the fall (albeit with considerable difficulty). Medical history included long-standing lower back pain. He had also suffered from recurrent syncopal episodes for which several outpatient investigations were ongoing. He was a current smoker with a 45 pack-year history. Other than this he reported no major comorbidities and enjoyed generally good health with independence in all activities of daily living.

At presentation, the patient was haemodynamically stable and afebrile. There were no clinical signs or symptoms to suggest an underlying infective process. Clinical examination revealed no obvious deformity, rotation or leg length discrepancy. Even though he was comfortable at rest, he was tender anteriorly over the groin. Resisted flexion movement of the ipsilateral hip produced significant pain. Cardiorespiratory and abdominal examinations were unremarkable. Importantly, he had no palpable masses or lymphadenopathy and rectal

examination revealed an enlarged but smooth prostate.

INVESTIGATIONS

Initial plain radiographs of pelvis and the left hip revealed the fracture (see figures 1 and 2). Further workup subsequently consisted of CT imaging to assess the extent of, and to further characterise, the fracture (figures 3 and 4). In view of the strong and early suspicion of a malignant process, the patient underwent CT of the abdomen and pelvis (CT AP) to search for a primary source (figure 5). This revealed a large left-sided renal mass almost certainly consistent with a renal cell carcinoma. He also had chest radiograph and serum prostate specific antigen which were within normal limits.

DIFFERENTIAL DIAGNOSIS

There are many causes of acute hip/groin pain following a minor trauma. Fractures to the bony structures around the hip should obviously be ruled out in the first instance. Such fractures may involve the pubic rami, acetabulum, neck of femur, intertrochanteric area or, in this case, the lesser trochanter. Osteoporotic and vertebral fractures should be considered (especially in female patients or those otherwise known to be at risk). Such entities as osteomyelitis, septic arthritis, neurological and radicular processes can also provoke hip pain. Simple musculoskeletal exacerbation of osteoarthritis or groin sprain is often diagnosed and treated, after these other more sinister causes have been reasonably excluded.

TREATMENT

Initial management was non-operative and focused on analgesia, bed rest and immobilisation of the

Figure 1 Anteroposterior pelvic radiograph showing a displaced left-sided lesser trochanteric avulsion fracture.

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Figure 2 Lateral hip radiograph showing displacement of lesser trochanter.

limb while investigations proceeded. Ultimate surgical management consisted of prophylactic intramedullary nail fixation in view of the risk of impending shaft of femur fracture (in line with the Harington's criteria) (figure 6).

OUTCOME AND FOLLOW-UP

After the initial prophylactic femur fixation, the patient underwent staging and assessment for suitability of further treatment. Immunotherapy and surgical resection were options that were considered by the medical oncology and urological surgical specialities. However, a course of palliative chemotherapy and associated treatment was deemed to represent the best option for this patient.

The patient's disease was stable and he was discharged with regular input from the community palliative care team at the time of publication.

DISCUSSION

The lesser trochanter is a pyramidal process that projects medially from the shaft of the femur and receives insertion of the iliopsoas muscle. Isolated fracture or detachment of the lesser trochanter is an infrequent occurrence and is most commonly seen secondary to avulsion in adolescent athletes.^{1 2} The majority of cases involving lesser trochanter fracture are usually complex fractures of the femoral neck and the greater trochanter. Owing to its anatomical location, isolated fracture of the lesser trochanter secondary to direct trauma is rare. It is protected anteriorly and posteriorly by large muscular masses,

Figure 3 CT axial section showing displaced fracture of lesser trochanter.

Figure 4 CT three-dimensional reconstruction showing displaced fracture of left lesser trochanter.

superiorly by the head and the neck of the femur, laterally by the femur itself, and medially by the Ischiopubic ramus and ilio-pubic eminence. Sudden traction by the iliopsoas muscle on the femoral tendinous insertion as a result of trauma is thought to be the most common mechanism by which these fractures occur.²

There are 36 cases of pathological lesser trochanter fractures reported in the literature. Bertin *et al* described the first cases in a series in 1984. Malignancies associated with lesser trochanter fractures, islet cell pancreatic carcinoma, follicular adenocarcinoma of the thyroid, prostate carcinoma and adenocarcinoma of unknown origin. They concluded that in light of these findings, a thorough search for occult metastatic malignant disease should be made whenever this fracture occurs in an adult.³ Subsequent reviews of the literature indicate metastatic aetiology to be the

Figure 5 CT coronal section showing a primary renal tumour with associated bony metastases and likely pathological fracture of the left lesser trochanter.

Figure 6 Postoperative radiograph showing intramedullary nail.

most frequent cause of pathological lesser trochanter fractures, at 70% of cases. The most frequent primary cancers occurring in the femur and responsible for avulsion fractures of the lesser trochanter were myeloma, chondrosarcoma and Ewing's sarcoma.^{4 5} Further cases have since emerged where lesser trochanter avulsion fracture has been the presenting feature of a sinister underlying pathology. In light of these findings, low impact fractures ideally warrant further investigation to rule out metastatic bone disease.⁵⁻⁷

Learning points

- ▶ Pathological fractures are a well described presenting feature of metastatic neoplastic processes.
- ▶ Physicians should consider the need for radiographic imaging to rule out fractures, even in those with a history of low impact injury.
- ▶ Lesser trochanter fractures constitute an unusual fracture pattern and should raise suspicion of an underlying malignancy.
- ▶ Low impact fractures warrant further investigation to rule out metastatic bone disease.

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