EMERGENCY CASEBOOKS

Diagnosis of femoral shaft fracture in pregnancy by ultrasound

N A Watson, G M Ferrier

A 29 year old woman, known to be eight weeks pregnant, presented to the accident and emergency department having twisted and fallen onto her left leg while playing netball. The limb was painful and she was unable to weight bear. On examination there was no deformity or swelling but the entire leg was painful and the patient was unable to locate an area of maximal tenderness. There was no neurovascular deficit or systemic disturbance. Initially, because of the relatively trivial nature of the trauma, soft tissue injury was suspected. The patient's symptoms, however, were disproportionately severe and a pelvic radiograph was requested to rule out bony injury of the hip. The radiographer was reluctant to irradiate an early pregnancy particularly as the index of suspicion of serious injury was low. A portable ultrasound scan was requested with the intention of excluding soft tissue haematoma or an effusion at the hip joint. Ultrasound examination of the hip joint was normal. However, on wider examination of the leg, an area of focal tenderness over the anterior aspect of the mid-thigh (not apparent from the patient's presenting symptoms or evident on initial examination) was found. The femoral shaft was visualised and a discrete discontinuity in the cortex was seen (fig 1). Slight displacement of the femoral shaft below this was also noted. There was no evidence of significant haematoma overlying the upper femoral shaft, in keeping with the lack of soft tissue swelling clinically. The diagnosis of femoral shaft fracture with distal angulation was made on the basis of the ultrasound examination. A limited radiography examination, with appropriate pelvic shielding, confirmed the diagnosis (fig 2) and excluded associated injury at the hip. There was no evidence of underlying bony pathology at the fracture site, which radiographically appeared normal. There was no history to suggest a stress fracture. The fracture was treated initially on a Thomas splint and was subsequently fixed surgically with an intramedullary nail. During surgery there was full shielding of the fetus and a minimum of fluoroscopic screening was used. The fracture subsequently united uneventfully and the patient went on to deliver a healthy baby at full term.

Ultrasound is a useful investigation in cases of trauma but its use is usually limited to abdominal injury. Our case illustrates the

Figure 1 Ultrasound image: longitudinal view of the left mid-femoral shaft showing the fracture (normal cortex, solid arrowheads; cortical discontinuity of fracture, open arrowhead).

Figure 2 Plain radiograph of left mid-femur confirming ultrasound diagnosis of fracture. Note the underlying bone appears normal.

potential use of ultrasound in acute musculoskeletal trauma where radiography is relatively contraindicated. Ultrasound has been used to infer the presence of a fracture by assessment of neighbouring soft tissue structures such as the presence of haematoma or the displacement of the radial artery in scaphoid fracture.¹ Direct visualisation of fractures, however, has been largely confined to paediatric trauma.²

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Our patient had no evidence of any underlying bony abnormality predisposing to fracture and the radiological appearances of the healing fracture were also entirely normal. Pregnancy can be associated with a generalised decreased bone density usually causing back pain and possibly vertebral compression fractures but this is uncommon.³ The “transient osteoporosis of the hip in pregnancy” is also rare but can lead to pathological femoral neck fractures but this is usually late in the third trimester.⁴ Stress fractures are also found but usually involve the pubis in late pregnancy, often related to childbirth.⁵ Our patient had no evidence to suggest any such predisposing factors.

The diagnosis of a femoral shaft fracture with ultrasound in our patient was fortuitous for several reasons. Firstly a femoral shaft fracture in a young adult usually requires significant trauma and the index of suspicion for

such an injury in our patient was low. Secondly the patient was pregnant so ultrasound was used to establish the diagnosis and subsequent x ray irradiation of the fetus was minimised. Thirdly, the patient could not localise an area of focal tenderness and the pelvic radiograph initially requested to exclude a hip injury would have missed the femoral shaft fracture, unnecessarily irradiated the fetus, and incorrectly reassured the casualty staff.

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- 2 Gleeson AP, Stuart MJ, Wilson B, *et al.* Ultrasound assessment and conservative management of inversion injuries of the ankle in children. *J Bone Joint Surg Br* 1996;78:484–7.
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- 4 Junk S, Ostrwski M, Kokoszczyński L. Transient osteoporosis of the hip in pregnancy complicated by femoral neck fracture. *Acta Orthop Scand* 1996;67:69–70.
- 5 Maron JJM. Stress fractures in pregnancy. *Am J Obstet Gynecol* 1988;158:1274–7.

Plain abdominal radiography in the diagnosis of the “body packer”

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Plain abdominal radiography remains an important tool in the management of cases of suspected drug smuggling by internal body concealment (“body packing”).

A 29 year old man presented to the accident and emergency department after allegedly taking an oral overdose of the drug ecstasy, while he was in police custody. He also stated that he was transporting two sealed containers in his rectum, each containing approximately 70 ecstasy tablets.

A plain abdominal radiograph demonstrated two well circumscribed foreign bodies lying within the pelvis (fig 1). Other investigations were normal. The patient was subsequently managed conservatively after the natural expulsion of the two foreign bodies.

Where the internal concealment of drugs is suspected, their existence and location must be accurately determined. Plain abdominal radiography is an important and effective method of diagnosis. The transporting materials are usually sealed condoms or similar materials. Air can leak into these packs and create a characteristic gas halo or ring shadow, easily detectable by radiography.¹ Radiography may detect over 80% of such concealed packages,² but the use of wrapped or aluminium foil packs are more likely to lead to a false positive result.³ The dense nature of the container used for concealment in this case (the “Kinder egg”) made it easily detectable. Although ultrasound may be a valuable

Figure 1 Radiograph showing two foreign bodies.

diagnostic tool in these cases, radiography may be superior in the differentiation of ingested packages.⁴ Additional investigations, such as urinary drug screening or bowel contrast studies, should be used where the diagnosis is equivocal.³

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- 3 Gherardi R, Marc B, Alberti X, *et al.* A cocaine body packer with normal abdominal plain radiographs. Value of drug detection in urine and contrast study of the bowel. *Am J Forensic Med Pathol* 1990;11:154–7.
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