document all the sites affected may prejudice those with unusual lesions.

Although plain radiographs remain the chief diagnostic method, this case demonstrates the value of other techniques, in that a radioisotope bone scan detected a definite abnormality despite equivocal plain radiographs. Scintigraphy is a sensitive method for detecting early bone necrosis (Gregg and Walder 1980), and may have a role in the surveillance of divers (Macleod et al. 1982). The development of pain near a known bone

lesion should lead to a search for evidence of structural failure of bone; tomography and arthrography may be helpful.

REFERENCES

- Gregg PJ, Walder DW. Scintigraphy versus radiography in the early diagnosis of experimental bone necrosis: with special reference to caisson disease of bone. *J Bone Joint Surg* 1980;62-B:214-21.
- Gregg PJ, Walder DN. Caisson disease of bone. *Clin Orthop* 1986;210:43-54.
- Macleod MA, McEwan AJB, Pearson RR, Houston AS. Functional imaging in the early diagnosis of dysbaric osteonecrosis. *Br J Radiol* 1982;55:497-500.

BONE SCANNING FOR HIP FRACTURE IN PATIENTS WITH OSTEOARTHRITIS: BRIEF REPORT

E. N. COLHOUN, S. R. JOHNSON, J. A. FAIRCLOUGH

Orthopaedic surgeons are frequently faced with the difficult problem of an elderly patient who presents with hip pain and inability to bear weight, but whose radiograph shows no fracture. We have demonstrated elsewhere that radio-isotope bone scanning can reveal the presence of a fracture at an early stage (Fairclough et al. 1987), but from that study we excluded patients with ipsilateral osteoarthritis. This was because we thought that the increased uptake due to the osteoarthritis would mask that of the fracture. We have therefore studied, in two different ways, the relationship between osteoarthritis and fractures.

Incidence of osteoarthritis in fractured hips. First, we reviewed retrospectively the radiographs of 200 patients with subcapital fractures and found that only 2% had ipsilateral osteoarthritis, while a control series of 200 without fracture, matched for age and sex, had a 24% incidence. By contrast, of 200 patients with intertrochanteric fractures 26% had osteoarthritis; a very similar incidence to the 29% we found in 200 similarly matched controls.

Scanning for fracture in osteoarthritic hips. Secondly, we conducted a prospective study of early bone scanning in 26 patients, each with a painful hip, inability to bear weight, no radiographic evidence of a hip fracture, but with osteoarthritis in the painful hip. There were 15 men and 11 women; their ages ranged from 60 to 81 years (mean 71.7). Fourteen of the 26 patients had mild osteoarthritis, in seven it was moderate and in five severe.

In all these 26 cases the isotope uptake was

increased in the hip region. This increase extended to the femoral neck where the osteoarthritis was moderate or severe, but was largely confined to the region of the acetabulum and the femoral head in those with early disease. In three of the 26 patients (12%), the bone scan also revealed an intertrochanteric fracture which subsequently became obvious on radiographs. There was one fracture in association with each of the three grades of severity of the osteoarthritis.

Discussion. Osteoarthritis causes increased isotope uptake in the acetabulum, the femoral head and the femoral neck; its intensity reflects the severity of the disease. Our concern that occult fractures would be masked by this increase was reduced considerably when our retrospective study confirmed the widely held view that, in association with osteoarthritic hips, intertrochanteric fractures are much more common than subcapital fractures. None of the 26 patients in our prospective study had a subcapital fracture, but on rare occasions these are associated with early osteoarthritis. Fortunately, in such early cases, the small amount of isotope uptake resulting from the early degeneration is unlikely to mask the band of increased activity which indicates an occult subcapital fracture.

In the much more common intertrochanteric fracture, scanning readily establishes the diagnosis even in the presence of osteoarthritis. In all three of our patients with this combination, the band of increased activity marking the fracture was clearly separated from the increased activity in the hip joint region.

We conclude that even in the presence of ipsilateral osteoarthritis, radio-isotope bone scanning provides an accurate means of detecting or excluding an occult proximal femoral fracture.

REFERENCE

- Fairclough JA, Colhoun EN, Johnston D, Williams LA. The elderly painful hip: prediction of the patients at risk of developing a fracture of the femoral neck using isotope bone scanning. *J Bone Joint Surg [Br]* 1987;69-B:251-3.

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