

IMAGING GAMUT

Paget's disease as an incidental finding in a patient with breast cancer

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Background A 65-year-old postmenopausal female with breast cancer and brain secondaries was referred for bone scintigraphy to rule out bone metastases.

Procedure Whole-body bone scan was performed 3 hours after intravenous administration of 814 MBq ^{99m}Tc hydroxy methylene diphosphonate (HDP).

Findings The whole-body HDP bone scan images revealed intense increased tracer uptake in the condylar region of right femur with extension to lower two-thirds of the shaft (Figure 1). There was normal uptake seen in the remainder of the skeleton. Plain radiographs revealed an extensive sclerotic lesion in the right femur, corresponding to the area of increased uptake seen on bone scan (Figure 2). Biochemical tests revealed a high serum alkaline phosphatase with normal serum calcium and phosphorous levels.

Conclusion The scan findings were not suggestive of bone metastasis but were in keeping with localised primary bone pathology, with the appearances suggestive of Paget's

disease. The scintigraphic findings and the radiographic appearance were consistent with monostotic Paget's disease. The scan appearances in Paget's disease are usually characteristic, and since uptake of the tracer depends upon skeletal metabolic activity, it reflects the severity of Paget's disease. A bone biopsy was subsequently performed, which confirmed Paget's disease.

Comments Paget's disease (PD) may be associated with other diseases, such as malignancies especially carcinoma. In this situation, it often poses a diagnostic dilemma to the clinician since the firm diagnosis of Paget's disease in patients with cancer, and the assurance that there is no metastasis, may save them from further unnecessary examination and aggressive therapy [1, 2].

Paget's disease is a chronic metabolically active bone disease, characterized by a disturbance in bone modelling and remodelling due to an increase in osteoblastic and osteoclastic activity. Paget's disease is mostly polyostotic but may be monostotic in 20% of cases [3]. Frequent site of involvement include the skull (25-65%), spine (30-75%), pelvis (30-75%), and proximal long bone (25-30%) [4]. Paget's disease of bone is usually asymptomatic. In most cases it is detected accidentally through radiological findings or by increase in serum alkaline phosphatase [5]. Radiographs show widening of bone, thickening of the cortex, osteolytic areas and osteosclerosis [6].

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Figure 1 (Left) ^{99m}Tc -HDP whole-body images showing intense increased tracer uptake in the condylar region of right femur and the lower two-thirds of the femoral shaft

Figure 2 (Right) Plain x-ray shows the widening of bone, thickening of the cortex, osteolytic and patchy sclerotic lesions in the lower two-thirds of the right femur

Because of high bone turnover, bone-seeking isotopes are very sensitive and are the investigation of choice in diagnosing Paget's disease. It is valuable in defining the number, extent, and overall metabolic activity of each bone involved and determining their potential for developing complications. Scintigrams are more sensitive than conventional radiography, revealing up to 30% more bone lesions [7]. Breast cancer and coexisting incidental Paget's disease can occur and need careful evaluation.

Characteristic findings on bone scan differentiate PD from bone metastases and avoid unnecessary examinations and aggressive therapy. PD has evenly distributed cortical uptake, whereas metastatic disease will typically lead to increased uptake within the medullary canal. In some cases a pinhole image will help to make this distinction.

The prevalence of the disease is high in Europe and countries such as the US, Australia, New

Zealand, etc., which are populated by European immigrants; however, it is rare in Asia and the Middle East [8]. This case is hence of interest since during the work-up of breast cancer, abnormal uptake on a bone scan is usually considered to be metastatic. Non-malignant causes can occur and must be recognized as such to spare the patient aggressive treatment and procedures.

References

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