

IMAGING GAMUT

Diagnosis of isolated fibular fracture on SPECT-CT

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Key words: *Fibular fracture, SPECT-CT*

Background A 60-year-old lady with a history of breast cancer and suspected metastatic involvement of the skeleton was referred for a whole-body bone scan with or without a SPECT-CT.

Procedure Bone scan was performed 3 hours after an intravenous injection of ^{99m}Tc -MDP (750 MBq) using a dual-headed gamma camera fitted with high-resolution collimators. SPECT scan was acquired using 128 (20 sec) projections over 360 degrees with a matrix size of 128 x 128. Images were reconstructed using filtered back-projection and iterative reconstruction. Transverse slices were generated and images displayed in transverse, coronal and sagittal views.

Findings The whole-body bone scan showed increased uptake of tracer in the left leg below the knee joint. Initial suspicion was that of a possible metastasis in the left upper tibia. There was no history of pain or trauma to suggest any fractures. While a solitary metastasis at that site would be unusual, such lesions do occur and in the presence of a solitary focal lesion other imaging modalities

or biopsies are often required to differentiate a malignant process from a benign one. On SPECT-CT scan the focal area of increased uptake was localised to the left fibula fracture.

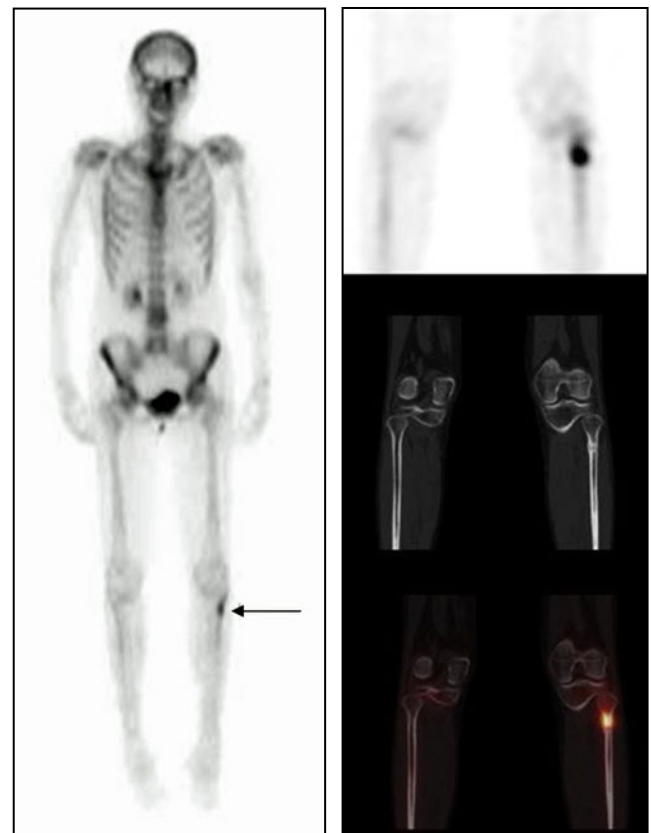


Figure 1 Whole-body bone scan (left) showing a discrete focus of increased uptake below the left knee laterally (arrow). SPECT-CT images (right) showing focal increased activity to correspond to a fibular fracture

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Conclusions The SPECT-CT was diagnostic of a fibular fracture and the patient was treated accordingly.

Comment Radionuclide bone scan has been utilised for the detection of bone metastases for more than three decades. Appendicular bone metastases are usually found in cases of general spread of the disease and frequent sites are in the femur and humerus [1]. An isolated metastasis in the fibula is rare but has been described in a case report [2].

An isolated fracture of the proximal fibula without associated tibial or ankle injury or resulting from direct violence is unusual [3]. Fibular shaft fracture often presents after a direct blow to the lateral leg and patients will usually complain of pain and swelling. In the absence of a direct blow, a torsional injury to the ankle should be suspected. However, in our case the patient could not provide any history of injury or trauma to the left leg. Most of the fibular fractures are accompanied with tibial fractures [4]. Fractures of fibular and tibial shafts are the most common fractures of a long bone [5]. A solitary active bone lesion seen on a bone scan is nonspecific and often subject to misinterpretation [6, 7]. In this case, the CT component of the study was essentially diagnostic in the identification of a fracture.

This case highlights the importance of hybrid imaging (SPECT-CT) in unusual presentations where the bone scan may not clearly differentiate between benign versus malignant disease and indeed where exactly the lesion is localized.

References

1. Kransow AZ, Helleman RS, Timins ME, et al. Diagnostic bone scanning in Oncology. *Semin Nucl Med*, 1997; 27:107-141.
2. Solitary fibular metastasis from lung cancer mimicking stress fracture Chien-Chin, Ya-Wang Chuan, Chia-Yang Lin and Ying-Fong Huang *Clinical Nuclear Medicine*, 2006 May, 31(5):269-271.
3. Isolated proximal fibula fracture in Marfan syndrome, Reich I, Merkel G, Gebert L *Chirurg*. 1993 Nov; 64(11):975-7.
4. Orthopaedia - Fibula shaft fractures: Orthopaedia - Collaborative Orthopaedic Knowledgebase. Created Jan 27, 2008 by James Stuart Melvin
5. Leach RE Fractures of tibia and fibula. In fractures of adults, edited by C.A.Rockwood.Jr, and D.P.Green.Ed 2, vol2, pp1593-1663, Philadelphia, J.B Lippincott 1984.
6. Salem SS, Heiba S, Santiago J, et al. Unusual presentation of solitary bone metastasis from breast carcinoma mimicking acute osteomyelitis of the left midtibial shaft. *Clin Nuclear Med*. 2000; 25:480-481.
7. Rajan P, Warner A, Quick CR. Fibular metastasis from renal cell carcinoma masquerading as deep vein thrombosis. *BJU Int*.1999; 84; 735-736.