Incremental diagnostic value of SPET/CT in precise localization of extraskeletal uptake of bone-seeking agents in multiple myeloma

To the Editor: The extra-skeletal uptake of bone-seeking radiopharmaceuticals is often an unexpected finding [1-2]. It has been stated that bone scans show a great sensitivity in detecting soft-tissue calcifications or metastatic calcinosis [1-6]. A 54 years old woman was admitted for surgical fixation of right clavicular fracture with no underlying osteopathy on the plain films. Preoperative investigations showed an erythrocyte sedimentation rate (ESR) of 59mm, calcium 3.30mmol/L, phosphate 2.7mmol/L, and creatinine 9.15mg/dL with significant renal insufficiency (GFR<20mL/min). Large amounts of kappa-light chains in both serum and urine raised suspicion for multiple myeloma. Bone marrow aspirate indicating 50% plasma-cell infiltration confirmed the diagnosis. As a whole body survey, $^{99m}$technetium-methylene-diphosphonate ($^{99m}$Tc-MDP) scan was performed, which showed increased radiotracer uptake in the medial right clavicle, the left sixth and eight ribs (posteriorly), scoliotic vertebrae and more interestingly, soft tissue radiotracer activity in left upper abdominal quadrant, mimicking the anatomic picture of left kidney or stomach (Fig. 1).

Figure 1. $^{99m}$Tc-MDP bone scan showed soft tissue radiotracer activity in left upper abdominal quadrant.

The differentiation was not easily possible, as ultrasonographic findings reported distorted and enlarged configuration of the left renal pelvicalyceal system. In fact, regarding the severe degree of the patient's renal function impairment and the renal ultrasonic appearance of markedly echogenic and thickened cortices, it was not possible to definitely conclude that the radiotracer activity in the left upper abdominal quadrant should be attributed to gastric activity. However, using SPET/CT, diagnosis of metastatic gastric calcification was made (Fig. 2).

As an alternative approach, differentiating renal from gastric morphologies, as presented by the ultrasound and MDP-scan findings, could be achieved based on a simple renal cortical $^{99m}$Tc-DMSA scintigraphy, with a lower radiation dose. However, such an approach could not be performed on the same day and two days imaging was its main disadvantage.

Although our case does not add a particularly innovative approach to the already published cases, it emphasizes again on the fact that SPET/CT improves the diagnostic confidence of bone scan and reduces equivocal reports. In such cases, definition of anatomical localization of extraskeletal uptakes is much easier by SPET/CT due to better depiction of underlying anatomic details [7].

On the other hand, gastric uptake in bone scintigraphy of multiple myeloma due to metastatic calcification has been infrequently reported [2, 8-10]. Although it has been stated that bone scintigraphy suffers from low sensitivity for the diagnosis of multiple myeloma, due to the minimal osteoblastic activity and hypovascularity of the lesions [11], our case showed multiple foci of increased osteoblastic activity involving the spine and ribs.

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Bibliography


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