Diagnostic dilemma of degenerative joint disease, chronic avascular necrosis or metastasis in planar Tc-99m-methylene diphosphonate planar skeletal scintigraphy excluded by single positron emission computed tomography/computed tomography

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ABSTRACT

We present a 71-year-old male patient subjected to skeletal scintigraphy for metastasis work up of prostate cancer. Whole body planar images revealed a solitary focal tracer uptake in left femoral head mimicking as solitary metastatic focus. Single positron emission computed tomography/computed tomography images localized this increased tracer uptake to the subchondral cysts with minimal sclerosis in left femur head with no decrease in size of femur head and was reported as (degenerative joint disease).

Keywords: Avascular necrosis, degenerative joint disease, femur head, planar skeletal scintigraphy, single positron emission computed tomography/computed tomography

A 71-year-old patient of prostate carcinoma post (trans-urethral resection of the prostate) presented with pain in the left hip for the last 8 months. He had no history of any trauma and serum prostate specific antigen level was normal (3.0 ng/mL). Patient was referred for metastatic work-up and underwent skeletal scintigraphy after intravenous administration of 740 ^{99m}Tc-methylene diphosphonate. Planar skeletal scintigraphy anterior [Figure 1a] and posterior [Figure 1b] views showed an abnormal focal increased tracer uptake in left femur head apart from the lateral aspect of L4 and L5 vertebrae. Single positron emission computed tomography/computed tomography (SPECT/CT) pelvis was acquired which localized the increased tracer uptake in the lateral aspect of L4 and L5 vertebrae indicating disc degenerative changes [Figure 1c-e]. However, increased tracer uptake in the left femoral head localized to subchondral cystic (white arrow on SPCET/CT images in Figure 1c) and minimal sclerotic changes on CT images with no change in femur head size. A final impression of degenerative joint disease (DJD) was given instead of metastatic involvement of left femur head. However, possibilities of chronic AVN with joint degeneration also considered, but due to the same management of these two entities, further magnetic resonance image (MRI) was not prescribed.

Skeletal scintigraphy is most commonly used for detection of skeleton metastasis and any focal increased tracer uptake raise a suspicion of metastasis. Bone metastases are present in around 90% patients of prostate cancer.[1] Bone scan has a high sensitivity but lesser specificity because of false positivity in many benign pathologies and trauma.[2] Focal abnormal tracer uptake in bone scintigraphy should be critically evaluated because skeletal metastases are an independent prognostic marker in prostate carcinoma.[3-5]

Head of the femur is most common site for avascular necrosis (AVN) and most common cause of AVN is trauma. Nontraumatic AVN is usually bilateral and occurs in younger adults.[6,7] Due to small sized fat cells, mucoid fluid between in fat cells and loose reticulum in the femoral head, elderly persons are

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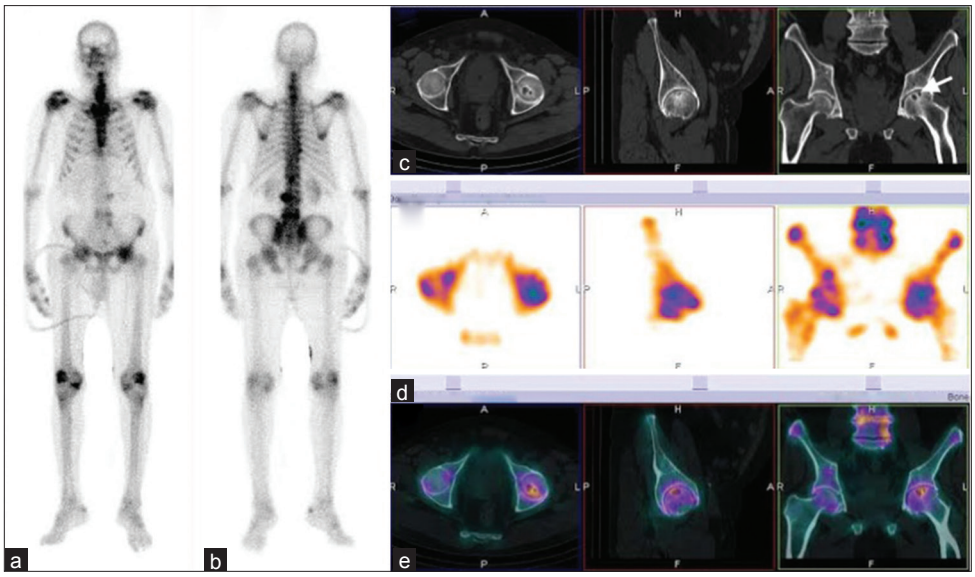

Figure 1: ^{99m}Tc-methylene diphosphonate planar skeletal scintigraphy anterior and (a) posterior (b) views showing an abnormal focal increased tracer uptake in left femur head and lateral aspect of L4 and L5 vertebrae. On single positron emission computed tomography/computed tomography (SPECT/CT), (c-e) the increased tracer uptake in the left femoral head localized to subchondral cystic (white arrow on SPCET/CT images) with minimal sclerotic but no change in the size femur head changes on CT images

at lesser risk to develop AVN.[8] DJD also reveals juxta-articular sclerosis, joint-space narrowing, and subchondral cyst. Absence of femoral head collapse differentiates DJD from AVN. In problematic cases, MRI may be helpful. However due to old age and similar management of these two conditions MRI may not be required.[9,10] The present case revealed that SPECT/CT can avoid unnecessary radiotherapy treatment and emphasizes the careful inspection of the image before arriving at the final conclusion.

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