

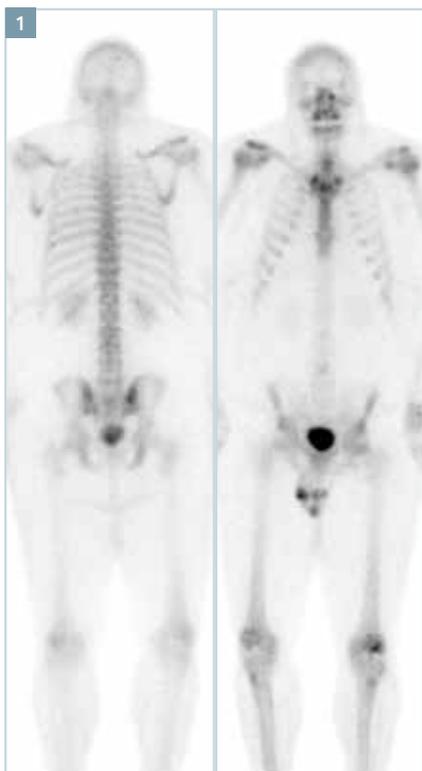
Case Study

Detection of Skeletal Metastases with xSPECT Bone

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History

A 50-year-old man presented with untreated prostate cancer and progressively increasing PSA (PSA increasing from 11 to 233 within 4 years). A ^{99m}Tc MDP bone scan was performed to evaluate for skeletal metastases.



1 ^{99m}Tc MDP planar bone study.

Evaluation

The planar study demonstrated increased uptake in the right sacroiliac joint, which appeared to be related to degenerative changes, but given the patient's PSA levels, was considered suspicious. Mild degenerative disease in the bilateral acromioclavicular joints, sternoclavicular joints, patellofemoral joints, tibial tuberosities as well as lumbar vertebrae were also visualized. No other well-defined focal area of increased uptake suggestive of skeletal metastases was seen.

In view of the suspicious nature of the sacroiliac joint uptake, a dedicated xSPECT* (full integration of SPECT and CT) acquisition of the pelvis was performed with integrated thin-slice CT.

Comparison images of standard Flash 3D reconstruction of bone SPECT and xSPECT Bone* images at a slice through the sacroiliac joint show a small focal hypermetabolic area on the dorsal aspect of the ilium adjacent to the right sacroiliac joint. When compared to SPECT with attenuation correction (AC), the xSPECT Bone images show sharp definition of the hypermetabolic lesion with clear distinction of the lesion location from the adjacent sacroiliac joint margin. With SPECT (AC), the lesion appears larger and ill-defined, and no distinction of the lesion location from the sacroiliac joint is possible.

CT (Figure 4) demonstrates a small focal area of sclerosis in the ilium adjacent to but distinct from the right sacroiliac joint space, which corresponds exactly to the focal hot area seen on the corresponding slices on xSPECT Bone. xSPECT also sharply defines the right sacroiliac joint margin thereby clearly differentiating the focal hot iliac bone lesion from the sacroiliac joint. The sharp definition of the focal bone lesion when compared to the minor sclerosis seen in the corresponding CT slices illustrates enhanced lesion margin resolution achieved by xSPECT.



2 A planar spot view of posterior pelvis demonstrated increased uptake at the right sacroiliac joint area.

Comments

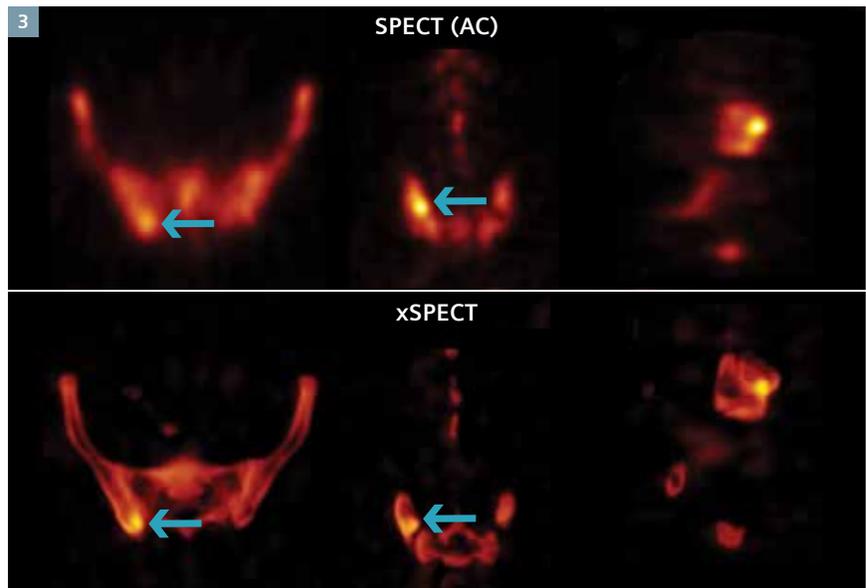
The focal sclerotic and hypermetabolic skeletal lesion adjacent but distinctly separate from the sacroiliac joint demonstrated by xSPECT and CT is clearly suggestive of bone metastasis. Focally increased uptake is seen with both SPECT (AC) and xSPECT, but interpretation of xSPECT is facilitated by the sharper delineation of the iliac bone and the lesion itself.

Examination Protocol

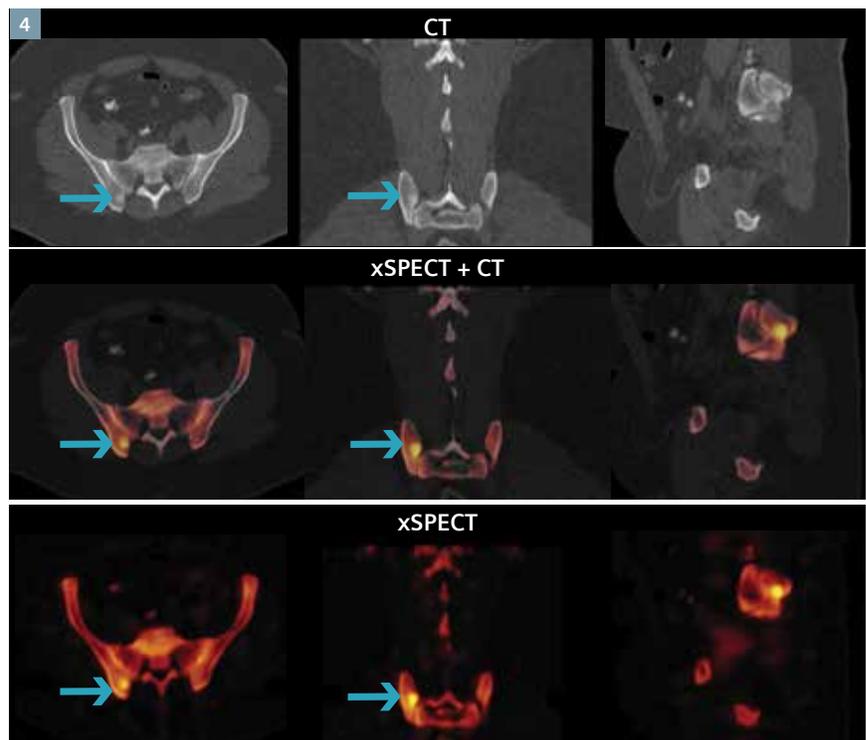
Scanner	Symbia with xSPECT
Scan dose	27 mCi ^{99m} Tc MDP
Scan delay	3 hours post injection
Parameters	64 frames 20 sec/frame
Acquisition	Planar whole-body bone scan with spot views xSPECT study of the pelvis performed following planar study
CT	130 kV, 70 eff mAs 3mm slice thickness

* Symbia Intevo and xSPECT are not commercially available in all countries. Due to regulatory reasons their future availability cannot be guaranteed. Please contact your local Siemens organization for further details.

The statements by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.



3 Comparison of SPECT (AC) and xSPECT reconstructed slices through the sacroiliac joint demonstrating a small hypermetabolic metastasis in the posterior right iliac bone.



4 CT (top row) fusion of CT and xSPECT Bone (middle row) and xSPECT Bone (bottom row) demonstrates sclerotic focal bone lesion in the posterior aspect of the right ileum adjacent to the right sacroiliac joint suggestive of a skeletal metastasis.