Delineation of Intervertebral Disc Space Infection

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Data courtesy of University of Erlangen, Erlangen, Germany

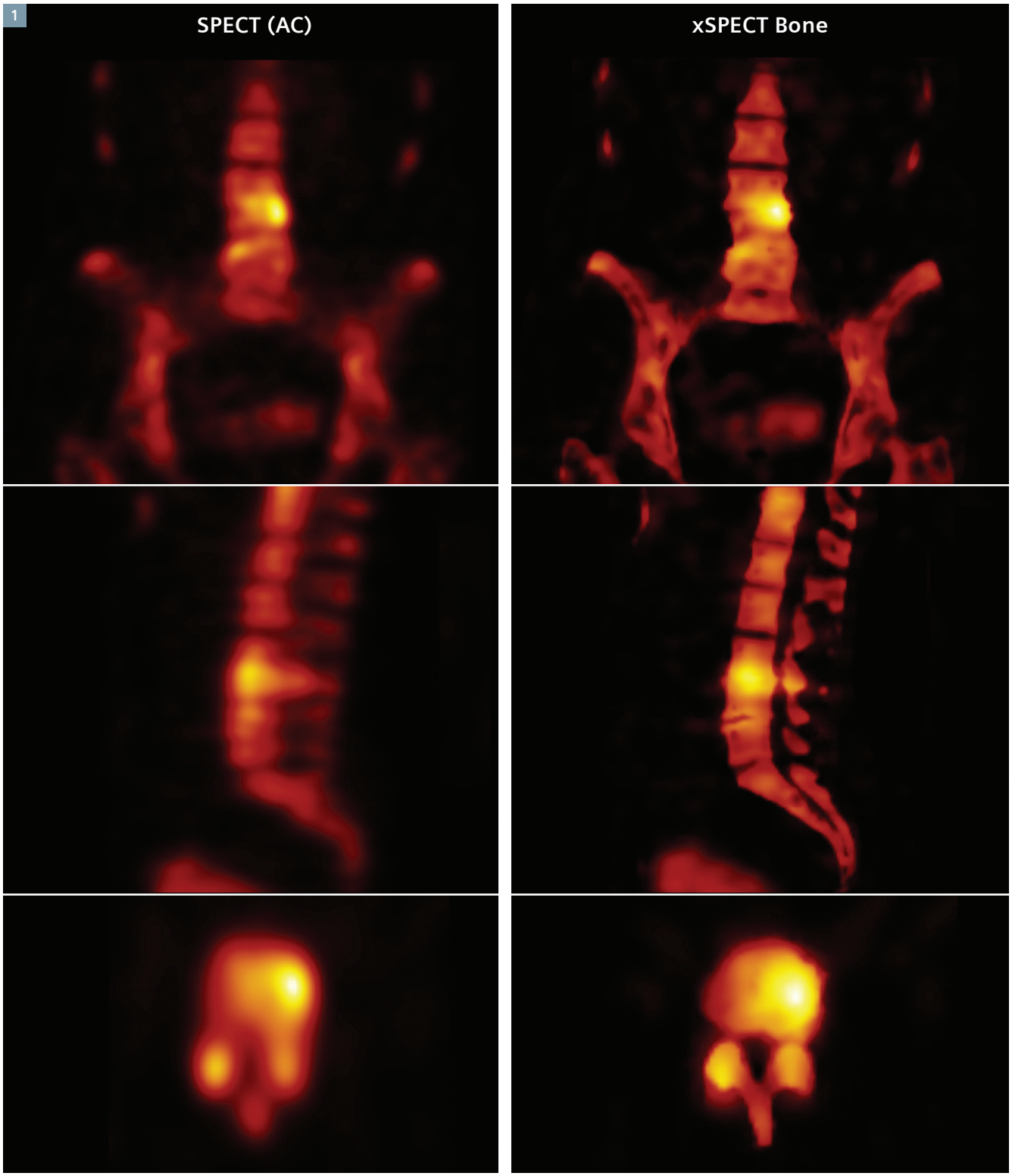
History

A 54-year-old female patient presented with severe back pain along with fever. An X-ray of the spine was inconclusive. Patient was referred for a ^{99m}Tc MDP bone scan to evaluate for spinal pathology. The image was acquired three hours after administration of 20 mCi of ^{99m}Tc MDP. Conventional 3D iterative and xSPECT Bone* images were reconstructed and compared, along with fusion of CT and SPECT.

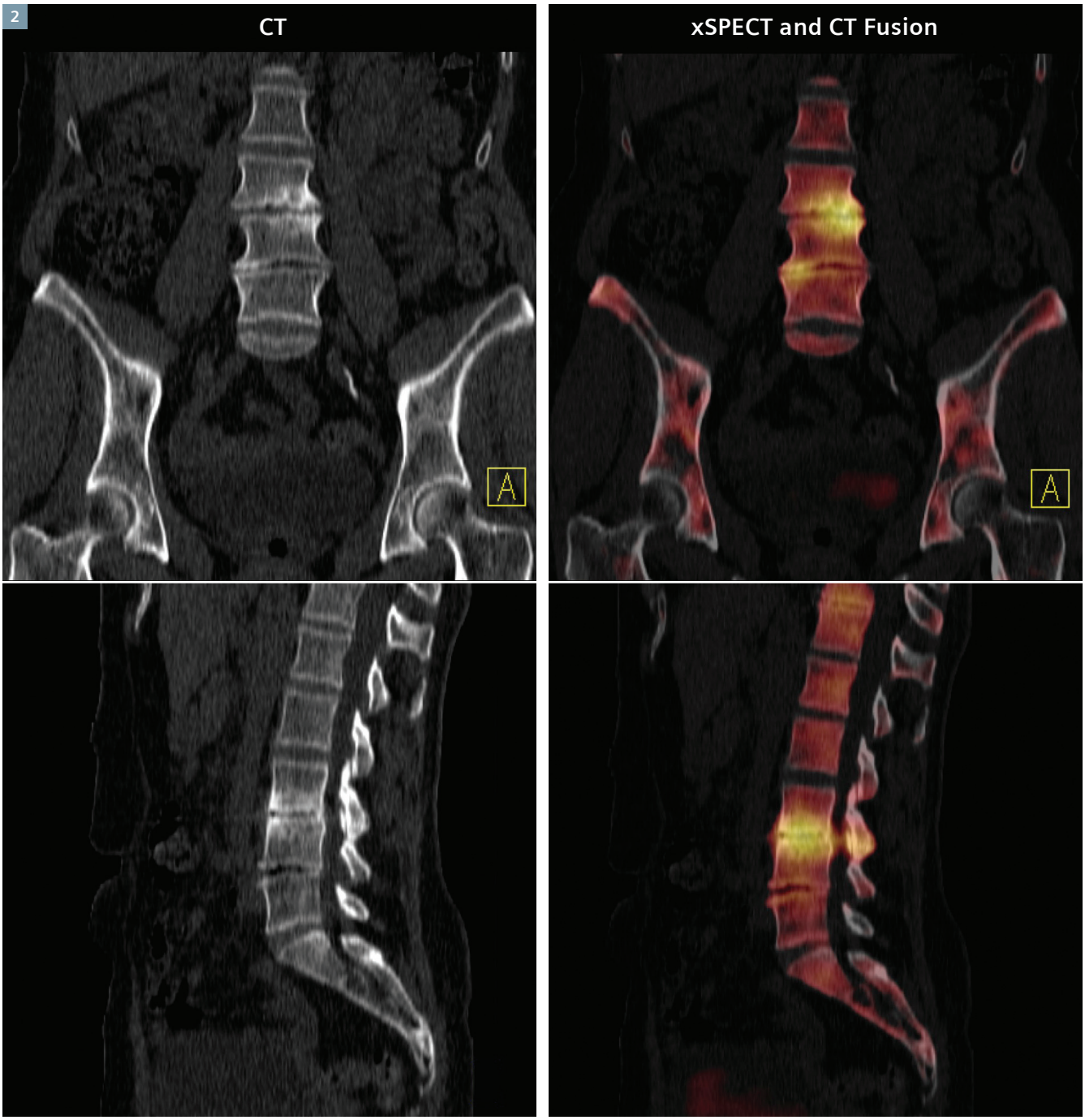
Diagnosis

SPECT shows increased uptake of the tracer in the L3-L4 lumbar vertebral end plates and intervertebral disc. xSPECT Bone shows sharp delineation of the individual vertebrae with clear definition of the focal area of increased uptake within the L3-L4 intervertebral disc and adjacent vertebral end plates. xSPECT* clearly defines the location of the uptake and delineates the sharp vertebral end plate margins, thereby demonstrating the narrowing of the L3-L4 intervertebral disc space as well as the tracer uptake within the disc. Other lumbar vertebrae show normal shape with normal intervertebral disc spaces without abnormal focal uptake.

Low-dose CT shows narrowing of L3-L4 intervertebral disc space with severe erosion of the adjacent vertebral end plates along with mild sclerosis. xSPECT and CT fused data shows increased uptake within the narrowed intervertebral disc space along with uptake limited to the zone of sclerosis adjacent to the vertebral end plate erosion. The other intervertebral disc spaces appeared normal without abnormally increased uptake or end plate changes on CT. Minor degenerative changes were visualized in the lateral aspect of L4-L5 vertebral end plates.



1 Comparison of SPECT (AC) and xSPECT Bone* reconstruction demonstrating increased uptake within the L3-L4 intervertebral disc.



2 Low-dose CT and fusion of xSPECT* and CT shows narrowing of L3-L4 disc space with severe end plate erosion and mild sclerosis.

Comments

The clinical presentation of the patient, along with the SPECT (AC) findings of narrowing of disc space, end plate erosion and severely increased bone metabolism within the disc space and in the adjacent vertebral end plates without major involvement of other intervertebral disc spaces, was suggestive of an intervertebral disc space infection. The intensity of end plate tracer uptake was clearly higher than the degree of sclerosis, which is also supportive of the diagnosis of active disc space inflammation. Subsequent to the diagnosis of intervertebral disc space infection, the patient was treated with intensive antibiotic therapy.

Examination Protocol

Scanner	Symbia™ with xSPECT Bone
Scan dose	20 mCi ^{99m}Tc MDP
Scan delay	3 hours post injection
Parameters	32 frames, 20 sec/frame
CT	140 kV, 50 eff mAs, 3mm slice thickness

Value of xSPECT Modality

Compared to standard SPECT AC reconstruction, the xSPECT Bone* images clearly delineated in the intervertebral disc spaces and uptake patterns and helped interpret the degree and extent of intervertebral disc inflammation and the correlation of uptake intensity to degree of erosion and sclerosis. This level of delineation with xSPECT Bone supported the diagnostic confidence of the interpretation of the study as a case of intervertebral disc space inflammation. Based on this diagnosis supported by xSPECT Bone, subsequent therapy decisions involving antibiotic administration were made.

* xSPECT and xSPECT Bone 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.