Interesting images

SPECT-CT imaging of poliostotic fibrous dysplasia

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A 25-year-old healthy woman with no special medical history, complained of persistent back pain after giving birth. Having direct X-ray film of lumbar vertebrae suspicious for metastases, she was referred to bone scintigraphy (BS), which revealed increased radiotracer uptake in several ribs and lumbosacral vertebrae (fig. 1a). Additional SPECT-CT images verified these findings and showed increased uptake in the lytic lesions with sclerotic rim but no soft tissue component (figs. 1 and 2). The lesions were atypical for metastasis, since they cause lytic lesions without a well defined sclerotic rim and often accompanying soft tissue component. Brown tumor is another condition causing lytic lesions, but this was excluded with normal parathyroid hormone and Ca levels1. Given the characteristic scintigraphic and CT appearance of the lesions together with clinical history, she was considered to have poliostotic fibrous dysplasia (FD) and biopsy from L4 vertebra confirmed the diagnosis (fig. 3).

FD is a developmental failure in the remodeling of primitive bone to mature lamellar bone. The lesions become symptomatic when they grow to compress nerve roots or lead to fatigue fractures. Female patients, like ours, may experience an increase

Figure 1. Whole body BS (a) revealed increased radiotracer uptakes in left 3rd and 4th ribs, the corpus of lumbar 3rd, 4th and 5th vertebrae and sacrum (black arrows). SPECT-CT fusion (b) and low dose CT images of SPECT-CT from ribs (c) revealed increased radiotracer uptake in the lytic bone lesions with sclerotic rim (white arrows).

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Figure 2. SPECT-CT fusion (2a and 2b) and low dose CT images of SPECT-CT (2c) from lumbosacral vertebrae confirmed increased radiotracer uptake in the lytic bone lesions with sclerotic rim and ground glass appearance without soft tissue component (2c) (white arrows).

Figure 3. Biopsy from L4 vertebra was reported to be compatible with fibrous dysplasia. Hematoxylin-eosin-stained microscopic image shows irregular bone trabeculae (black arrows) and surrounding dense fibrous stroma, H&E (X230).

in pain during pregnancy and during their menstrual cycle, because of the estrogen receptors present in FD. In FD, normal bone is replaced by a more radiolucent, grayish tissue called “ground-glass” pattern. The radiolucent region occasionally contains cystic component and characteristically is bounded by a distinct rim of reactive bone. Scintigraphically FD lesions show increased uptake due to high bone turnover. Although BS is sensitive for FD, it lacks specificity. The problem with the specificity is resolved with the use of SPECT-CT which helped to characterize the metabolic and anatomic features of the disease.

References