IMAGING CORNER

Hyperostosis Frontalis Simulating Metastatic Deposits: Unmasked on SPECT-CT

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Abstract

Skeletal scintigraphy has a pivotal role in detecting a number of bone pathologies, but it has its own limitations because of 2D image acquisition. Hybrid imaging acts as a savior in these cases where it is difficult to distinguish between benign and malignant lesions just on the basis of planar images. We present one such case of known breast carcinoma with abnormal increased radiotracer uptake in the skull which was difficult to characterize as benign lesion such as hyperostosis frontalis or metastatic osseous lesion. The importance of describing this case is to have a thorough understanding of hyperostosis patterns and to not confuse it with metastatic deposits in patients with known malignancies.

Keywords: Hyperostosis Frontalis, SPECT-CT, bone scan

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Discussion

A 69-year-old female, diagnosed case of breast carcinoma, presented to us for staging bone scan. Bone scintigraphy was acquired 3 hours after injecting technetium-99m methylene diphosphonate (Tc99m-MDP). Planar images revealed suspicious looking abnormal increased tracer uptake in skull, giving an impression of metastatic deposits (Figure 1, A). So, we proceeded with single photon emission computed tomography (SPECT- CT) of skull to better delineate this lesion (Figure 1 B-C). SPECT only images (Figure 1 B) showed symmetrical tracer activity in both frontal bones with underlying bony thickening on fused SPECT-CT images (Figure 1 C). These findings were typical for hyperostosis frontalis with characteristic radiological appearances. Metastatic lesions can present as symmetrical or asymmetrical tracer uptake on

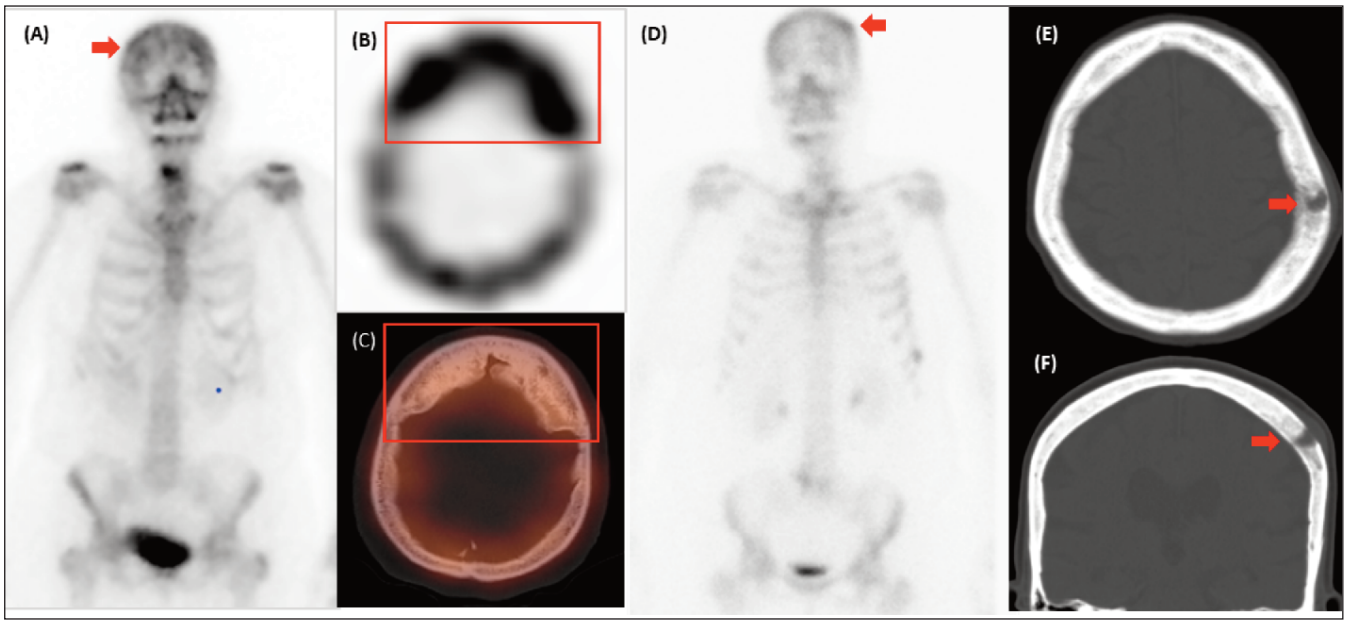

Figure: Planar bone scintigraphy images (A) showed heterogeneous radiotracer uptake in the anterior skull (red arrow). Axial SPECT only images (B) showed symmetrical increased tracer uptake in both frontal bones (red box). Axial fused SPECT-CT images (C) showed underlying irregular thickening of internal surface of frontal bones without any destructive or sclerotic osseous lesion ruling out metastatic osseous lesion (red box). Planar bone scan images (D) of another 58 year old female with known breast carcinoma showed asymmetrically increased tracer uptake in the left frontal bone (red arrow) correlating with lytic lesion on axial (E) and coronal (F) CT images (red arrows).

bone scans. Bone scan of one of our other 58 year old breast carcinoma patient showed increased tracer uptake in the left parietal bone (Figure 1, D) correlating with lytic lesion on CT images (Figure 1, E-F) suggestive of metastatic lesion.

SPECT-CT not only provides anatomical details of the lesions but also gives information regarding the functional status of these lesions. A spectrum of benign lesions with variable appearances are seen routinely on bone scans such as linear tracer uptake in the sutures of skull and diffuse uptake in skull in metabolic diseases such as hyperparathyroidism and Paget's disease.[1] Hyperostosis usually involves frontal bones with preponderance for females, but cases have been reported where involvement of occipital and parietal bones have been documented.[2-4] It can develop independently or on background of other pathologies such as androgen imbalance and acromegaly.[5] As it can closely mimic sinister bony pathology, routine use of hybrid nuclear scans can differentiate between normal variants, metabolic and metastatic pathologies.

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