IMAGING CORNER

Incidental Bone Scintigraphic Detection of Asymptomatic Paget's Disease of the Skull During Evaluation of Sternal Osteomyelitis

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Abstract

Paget's disease is a chronic metabolic disease with multifactorial etiology. Tc99m MDP Three-phase- Bone-scintigraphy is of particular importance in assessing ongoing acute osteoblastic activity. Hyperaemia and osteoblastic activity are evaluated which are important underlying mechanisms of Paget's pathophysiology. We describe a case of incidental detection Paget's disease of skull in a patient who underwent bone scan for suspected osteomyelitis in sternum.

Keywords: Bone scan, Paget's disease, skull

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Case Discussion

A 70 years old patient was referred for three phase bone scintigraphy. Patient had history of coronary artery bypass grafting with sternal sinus formation 4 months post procedure. He underwent sternal sinus exploration and debridement following antibiotic treatment. As the sinus discharge persisted, three-phase-bone-scan was requested to rule out any osseous infective etiology involving sternum. There was history of frequent episodes of epistaxis.

Bone scintigraphy in our case showed no significant uptake on initial blood flow and pool images of thorax. Delayed whole body skeletal and SPECT-CT images of thorax demonstrated a focal area with increased uptake involving the lower sternum with underlying bone density changes; suggestive of ongoing bone infection which was likely attenuated by chronic antibiotic use (Figure 1) Interestingly, heterogeneously increased uptake was noted in the skull. SPECT-CT of skull revealed widened diploic spaces and reduced bone density, characteristic of Paget's disease (Figure 2).

Paget's disease also known as osteitis deformans has a bimodal distribution and multifactorial etiology.[1] Symptoms vary depending on the region involved. When the skull is involved, excessive growth can cause entrapment of cranial nerves,

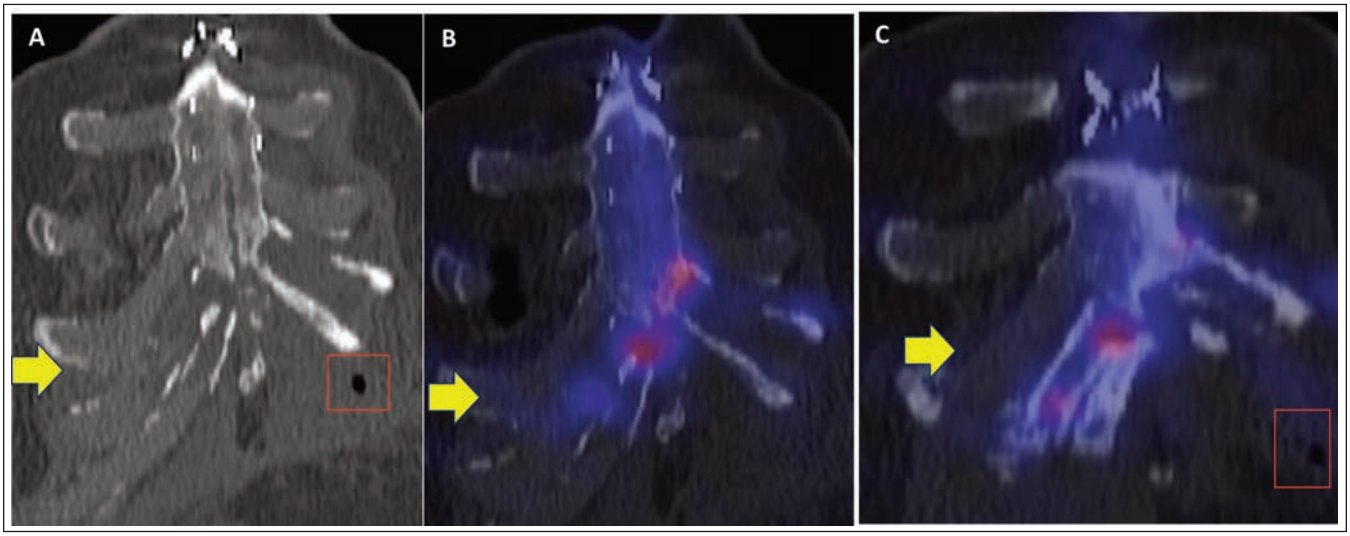

Figure-1: Coronal SPECT-CT images of thorax demonstrated increased uptake in lower sternum with underlying bone density changes (B,C). Adjacent to it, there were foci of tracer uptake pattern involving bilateral 5th and 6th costal cartilages and xiphisternum. (Yellow arrows A,B,C). Soft tissue thickening in left anterior lower chest, overlying 7th costochondral region with small air loculations (Red boxes A, C) and cutaneous break; suggestive of infective bone pathology involving the lower end of sternal body and xiphisternum.

platybasia and hearing loss.[2,3] Diagnosis is based on elevated serum alkaline phosphate levels, nuclear medicine imaging, and conventional CT and MRI scans.

Bone scans can display markedly increased uptake in the region of abnormal bone in all three phases of Paget's disease and particularly in active lesions and can be used to monitor response to therapy.[4,5]

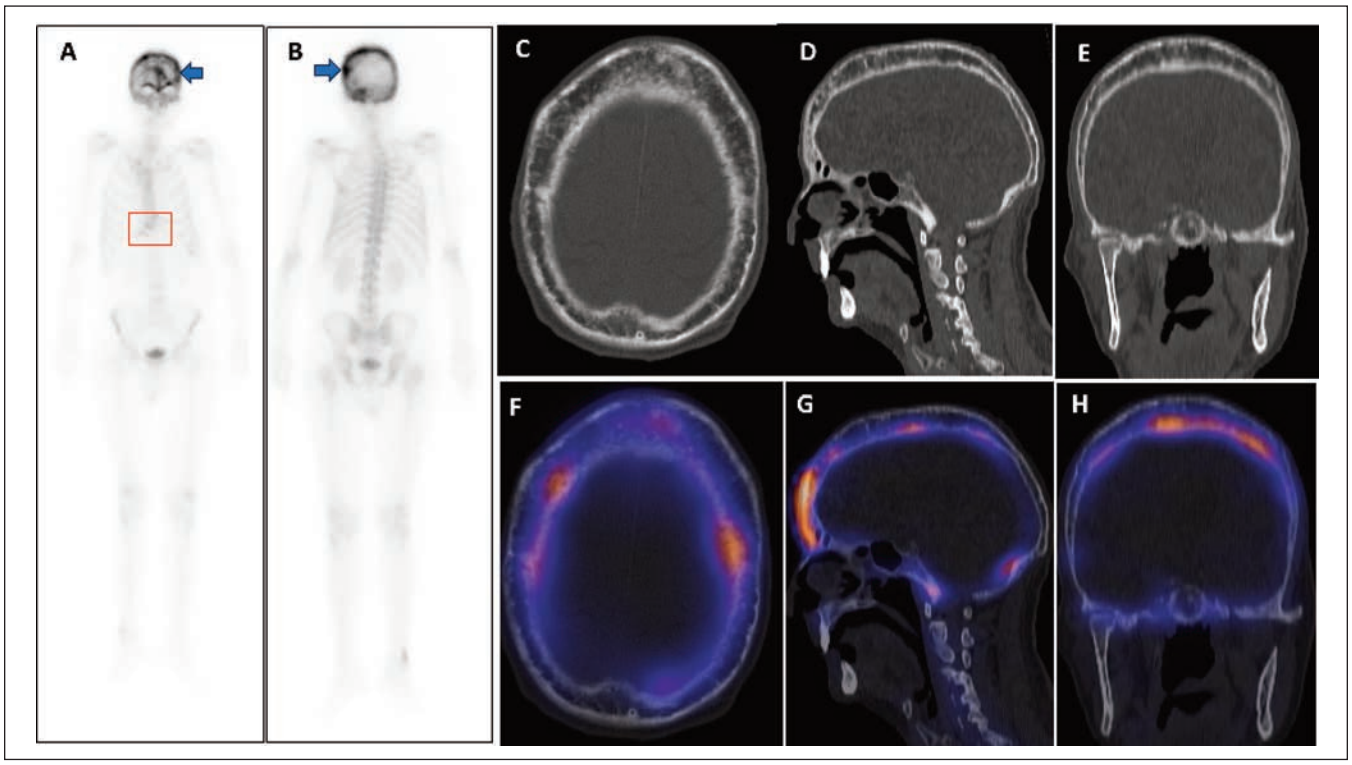

Figure-2: Anterior (A) and Posterior (B) planar images show heterogeneously increased uptake in skull shown by blue arrows. Uptake is also seen in sternal bone sinus highlighted by red box in A. Axial CT only (C) , sagittal CT only (D) and Coronal CT only slices (E) with corresponding SPECT-CT fusion axial (F) , Sagittal (G) and coronals (H) slices show tracer uptake in skull with widened diploic spaces and reduced bone density; characteristic of Paget's Disease of skull.

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