

## Giant enostosis of spine with increased uptake on planar and SPECT views of bone scan

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### ABSTRACT

An enostosis or bone island is a benign bony lesion that is almost diagnosed based on clinical and radiologic defining characteristics. One of the known diagnostic procedures in the evaluation of enostosis is bone scintigraphy. Generally, we don't expect to see increased uptake by enostosis in the bone scan. Herein we present a 52-year-old lady who was suffering from chronic low back pain that was referred for  $^{99m}\text{Tc}$ -MDP bone scanning. A bony lesion in a thoracic vertebral body had been discovered on CT and MRI and conventional imaging characteristics were compatible with enostosis, but skeletal scintigraphy showed increased uptake both on planar and SPECT images.

**Key words:** Enostosis; Skeletal scintigraphy; SPECT

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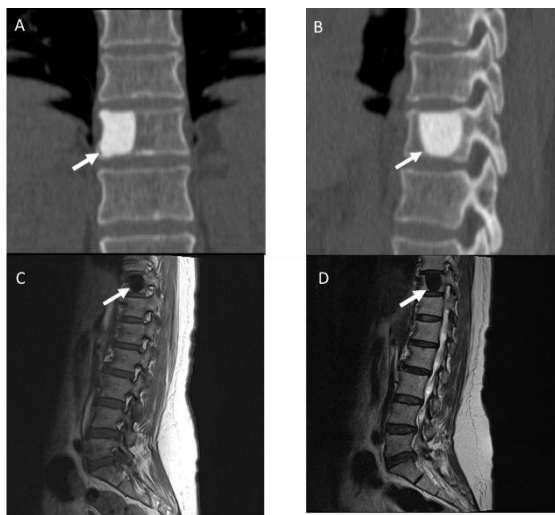
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## INTRODUCTION

An enostosis or bone island which is benign and presumed to be a developmental error represents as a small, ovoid or round focus of compact and mature bone within the sponge [1-7]. It is often asymptomatic and discovered incidentally on radiography performed for other purposes [1, 4-7]. Common locations are pelvis, ribs and long bones but spine may be involved less commonly [1-3, 5, 6].

## CASE PRESENTATION

A 52-year-old lady who was suffering from chronic low back pain was referred to our Nuclear Medicine Department for  $^{99m}\text{Tc}$ -MDP bone scanning. CT scan and MRI were also performed from thoracolumbar spine. Coronal and sagittal views of CT scan and sagittal views of MRI are shown on Figure 1.



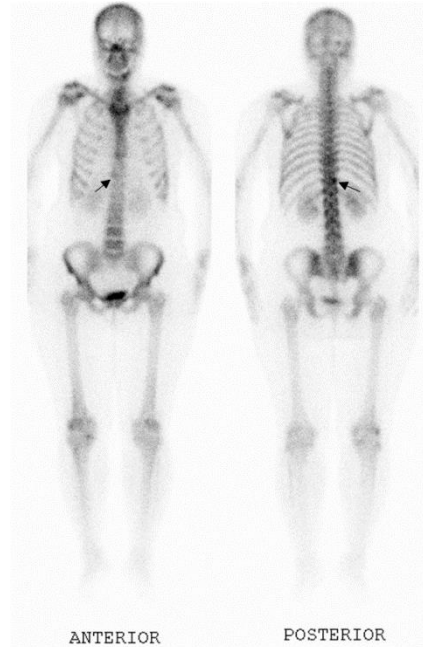
**Fig 1.** CT scan and MRI of thoracolumbar spine A, B: on coronal and sagittal views of CT scan there was a sclerotic lesion in the T11 vertebral body. C, D: Sagittal views of MRI from thoracolumbar spine revealed a single well-circumscribed hyposignal lesion in the body of T11 on both T1- and T2-weighted sequences. Both CT scan and MRI characteristics of the lesion were compatible with an enostosis.

For bone scanning following injection of 740 MBq (20 mCi) of  $^{99m}\text{Tc}$ -MDP whole body bone scan was performed with a dual head gamma camera, low energy high-resolution collimator and  $140 \text{ KeV} \pm 10\%$  photopeak window. SPECT images were performed from thoracolumbar spine with 64 projections over  $360^\circ$ , 25 s/step,  $64 \times 64$  matrix and noncircular orbit. Whole body bone scan and SPECT views are shown on Figure 2 and Figure 3.

## DISCUSSION

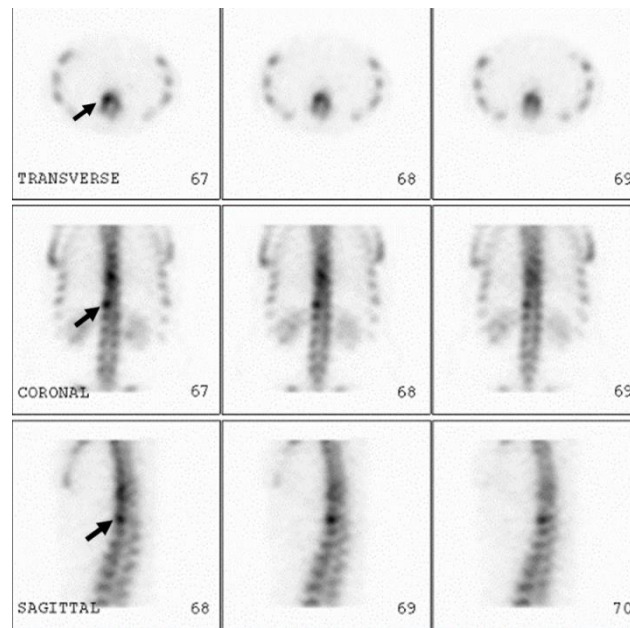
The enostoses are almost diagnosed based on clinical and radiologic defining characteristics [1]. It

represents as a consistent, homogenously sclerotic focal lesion within the cancellous bone on plain radiography, low-attenuating focus with speculated edges on CT scan and low signal focus on T1- and T2-weighted MRI sequences [1-5, 8].



**Fig 2.**  $^{99m}\text{Tc}$ -Methylene diphosphate whole-body bone scan in the anterior (left) and posterior (right) views showed a focus of increased uptake in T11. The rest of the skeleton was normal.

Bone scintigraphy can also be performed to differentiate enostosis from more aggressive and significant lesions [1-4, 9]. Although most of the time enostoses present as cold lesions on bone scan, there have been several reports of increased uptake by these lesions on planar or SPECT images, which are consistent with some degrees of skeletal remodeling and osteoblastic activity or may be due to size and location of the lesion, as well as sensitivity of the radiopharmaceutical agent [1-5, 7, 9, 10]. Herein we present an incidentally discovered enostosis in which conventional imaging characteristics were compatible with enostosis demonstrating increased uptake both on planar and SPECT images of the bone scan. High sensitivity of skeletal scintigraphy especially with SPECT images in discovering even minimal degrees of metabolic activity in bone islands, relying on bone scan distinguish cases of enostoses with tracer activity from aggressive bony lesions has become challenged to differentiate from more serious lesions [1, 3-5]. Then, in the case of a hot lesion on bone scan close follow-up and morphologic features on conventional imaging should be taken into consideration and histologic examination may become necessary especially if there is a significant increase in the size of the lesion [1, 3, 4].



**Fig 3.** SPECT images (transverse-top row, coronal-middle row, sagittal-lower row), showed focal increased activity in the T11 vertebral body corresponding to the lesion on CT scan and MRI.

#### REFERENCES

- Greenspan A. Bone island (enostosis): current concept--a review. *Skeletal Radiol.* 1995 Feb;24(2):111-5.
- Broderick TW, Resnick D, Goergen TG, Alazraki N. Enostosis of the spine. *Spine.* 1978 Jun;3(2):167-70.
- Araki S, Otani T, Watanabe K, Yamaji T. Positive bone scan in a bone island. A histologically verified case in os capitatum. *Acta Orthop Scand.* 1989 Jun;60(3):369-70.
- Greenspan A, Steiner G, Knutzon R. Bone island (enostosis): clinical significance and radiologic and pathologic correlations. *Skeletal Radiol.* 1991;20(2):85-90.
- Achong DM. Increased uptake in a vertebral bone island seen only on SPECT. *Clin Nucl Med.* 2007 Aug;32(8):620-3.
- Ikeuchi M, Komatsu M, Tani T. Giant bone island of femur with femoral head necrosis: a case report. *Arch Orthop Trauma Surg.* 2010 Apr;130(4):447-50.
- Park HS, Kim JR, Lee SY, Jang KY. Symptomatic giant (10-cm) bone island of the tibia. *Skeletal Radiol.* 2005 Jun;34(6):347-50.
- Greenspan A, Stadalnik RC. Bone island: scintigraphic findings and their clinical application. *Can Assoc Radiol J.* 1995 Oct;46(5):368-79.
- Go RT, El-Khoury GY, Wehbe MA. Radionuclide bone image in growing and stable bone island. *Skeletal Radiol.* 1980 Feb;5(1):15-8.
- Hall FM, Goldberg RP, Davies JA, Fainsinger MH. Scintigraphic assessment of bone islands. *Radiology.* 1980 Jun;135(3):737-42.