

## Tc-99m Pentavalent DMSA Scintigraphy in Myelofibrosis Detection

John T. Koutsikos, MD,\* Antigone Velidaki, MD,† and Theodoros Athanasoulis, MD\*

**Abstract:** In a 62-year-old man with medullary carcinoma of the thyroid, a postoperative Tc-99m dimercaptosuccinic acid [(V) DMSA] study was requested. In the Tc-99m (V) DMSA scan, no abnormalities, indicating local recurrence or metastatic disease, were observed. However, there was increased uptake in the spleen and liver and significantly diffusely increased uptake in the bone marrow. The patient also had a history of myelofibrosis and these findings appear to have been the result of this pathology.

**Key Words:** Tc-99m (V) DMSA, myelofibrosis, bone marrow uptake

(*Clin Nucl Med* 2006;31: 806–807)

### REFERENCES

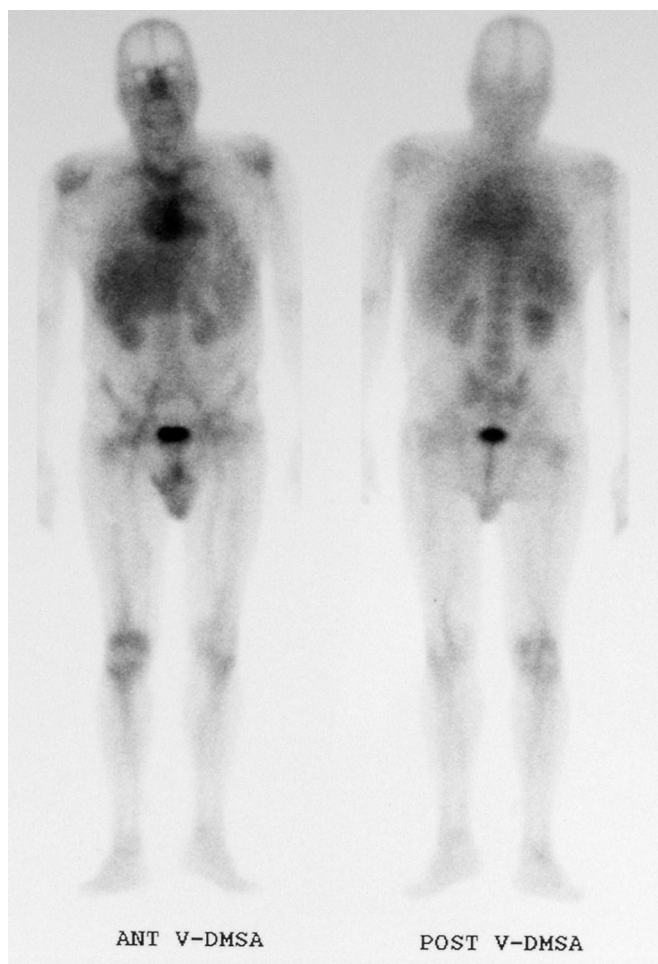
1. Clarke SEM. Medullary thyroid cancer. In: Ell PJ, Gambhir SS, eds. *Nuclear Medicine in Clinical Diagnosis and Treatment*, 3rd ed, vol 1. Edinburgh: Churchill Livingstone; 2004:165–174.
2. Athanasoulis T, Koutsikos J, Mouloupoulos LA, et al. Reverse of the differential uptake intensity of Tc-99m MIBI and Tc-99m V-DMSA by multiple myeloma lesions in response to therapy. *Clin Nucl Med*. 2003;28:631–635.
3. Barosi G, Hoffman R. Idiopathic myelofibrosis. *Semin Hematol*. 2005; 42:248–258.
4. Dingli D, Mesa RA, Tefferi A. Myelofibrosis with myeloid metaplasia: new developments in pathogenesis and treatment. *Intern Med*. 2004;43: 540–547.
5. Rain JD, Najean Y. Bone marrow scintigraphy in myelofibrosis. *Nouv Rev Fr Hematol*. 1993;35:101–102.
6. Coates GG, Eisenberg B, Dail DH. Tc-99m sulfur colloid demonstration of diffuse pulmonary interstitial extramedullary hematopoiesis in a patient with myelofibrosis. A case report and review of the literature. *Clin Nucl Med*. 1994;19:1079–1084.
7. Gruning T, Franke WG. Bone marrow scan using Tc-99m-labeled antigranulocyte antibody to evaluate hematopoiesis in osteomyelofibrosis. *Clin Nucl Med*. 2000;25:222–223.
8. Huic D, Ivancevic V, Aurer I, et al. Bone marrow immunoscintigraphy in hematological patients with pancytopenia: preliminary results. *Nucl Med Commun*. 2002;23:757–763.
9. Burrell SC, Fischman AJ. Myelofibrosis on F-18 FDG PET imaging. *Clin Nucl Med*. 2005;30:674.
10. Schirmmeister H, Bommer M, Buck A, et al. The bone scan in osteomyeloclerosis. *J Bone Miner Res*. 2001;16:2361.
11. Oyen WJ, Raemaekers JM, Corstens FH. Acute myelofibrosis mimicking multiple bone metastases on Tc-99m MDP bone imaging. *Clin Nucl Med*. 1998;23:1–2.

Received for publication May 14, 2006; revision accepted September 9, 2006.

From \*Department of Nuclear Medicine, Alexandra University Hospital, Athens, Greece; and the †General Army Hospital of Athens, Athens, Greece.

Reprints: John T. Koutsikos, MD, Alexandra University Hospital, Department of Nuclear Medicine, 44-48 Martinegou Str., Athens, Greece 11524. E-mail: jtkoutsik@yahoo.gr.

Copyright © 2006 by Lippincott Williams & Wilkins  
ISSN: 0363-9762/06/3112-0806



**FIGURE 1.** Tc-99m (V) DMSA is a readily available isotope, which developed a recognized role in patients with medullary thyroid carcinoma.<sup>1</sup> A Tc-99m (V) DMSA scan was performed on a 62-year-old man with medullary carcinoma of the thyroid to evaluate the possibility of local recurrence and/or metastatic disease.

The study did not reveal any abnormal lesion indicating metastatic spread. However, increased uptake of the radiopharmaceutical in the liver and spleen was observed. Apart from the normal sites of tracer uptake (vascular blood pool, kidneys, urinary bladder, scrotum, base of penis), unexpected uptake was also detected in the pelvis, vertebrae, ribs, shoulders, and knee joints. This uptake pattern was considered as nearly pathognomonic for active bone marrow as a result of the patient's myelofibrosis with a pathway similar to Tc-99m (V) DMSA accumulation in inflammatory processes.<sup>2</sup>

Idiopathic myelofibrosis is a chronic myeloproliferative disorder that is clinically characterized by anemia, progressive splenomegaly, bone marrow fibrosis, and extramedullary hematopoiesis.<sup>3</sup> It is typically presenting with uniformly fibrotic bone marrow, whereas many patients develop osteosclerosis and angiogenesis.<sup>4</sup> Bone marrow scintigraphy, using Tc-99m sulfur colloid and In-111 chloride,<sup>5,6</sup> and immunoscintigraphy with Tc-99m-labeled antigranulocyte antibodies<sup>7,8</sup> are highly sensitive tests for the detection of bone marrow abnormalities and considered to be important tools for the evaluation of myelofibrosis.

Similar findings have been reported previously with F-18 FDG PET imaging<sup>9</sup> as a result of increased metabolism, F-18 sodium fluoride PET scans<sup>10</sup> and bone scans<sup>11</sup> as a result of osteosclerosis.