

## 뼈 스캔상 우연히 발견된 그레이브스 갑상선기능항진증에서 갑상선의 섭취증가

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### Incidental Visualization of Thyroid Gland on Bone Scan Caused by Graves' Hyperthyroidism

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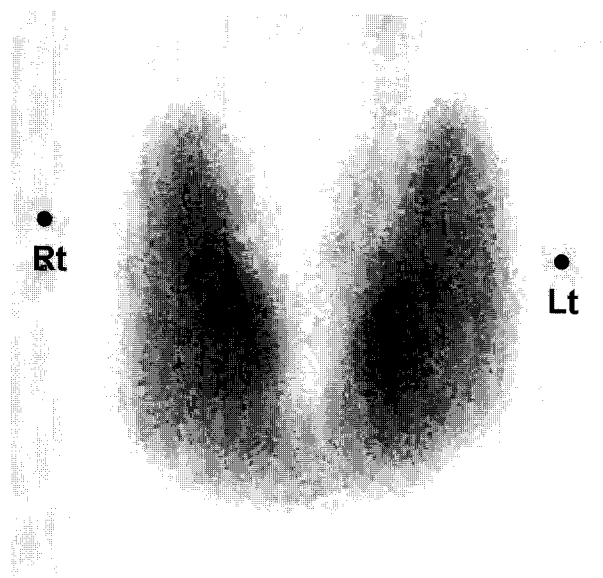
A 45-year-old man presented with fatigue and weight loss underwent a Tc-99m MDP bone scan because of increased serum alkaline phosphatase. Delayed images at 4 hours demonstrated diffuse increased activity throughout both lobes of the thyroid in the absence of activity of the stomach and salivary glands. Thyroid laboratory indices and a Tc-99m pertechnetate thyroid scan suggested Graves' hyperthyroidism. (Nucl Med Mol Imaging 2009;43(2):154-155)

**Key Words:** Tc-99m MDP, bone scan, Graves' disease, hyperthyroidism



**Figure 1.** A 45-year-old man presented with a several month history of fatigue and weight loss (10 kg/4 months). The patient underwent a Tc-99m MDP bone scan because of increased serum alkaline phosphatase (386 IU/L). Delayed images at 4 hours demonstrated diffuse increased activity throughout both lobes of the thyroid (arrows) without stomach or salivary gland activity. There is also increased uptake in the right side of the lower lumbar spine correlating to the degenerative changes seen on plain films. His thyroid was found to be enlarged. A thyroid workup was then performed. Serum free T4 (134.5 pmol/L), TSI (155.5 U/L), and anti-TM (>100 U/ml) were elevated. Serum TSH (0.02 mIU/L) was decreased. He was diagnosed of Graves' hyperthyroidism. Visualization of the thyroid gland on bone scans is usually attributed to the presence of free Tc-99m pertechnetate.<sup>1,2)</sup> Free Tc-99m pertechnetate can be taken up and excreted by the thyroid gland, salivary glands, and gastric mucosa. Uptake of free pertechnetate by the thyroid can be excluded due to the absence of gastric and salivary activity in this case. Uncommon causes of Tc-99m MDP thyroid uptake are non-toxic goiter,<sup>3,4)</sup> amyloid goiter,<sup>5)</sup> hyperthyroidism,<sup>6,7)</sup> and metastatic calcifications.<sup>8)</sup> Although mechanisms of thyroid visualization by Tc-99m MDP in hyperthyroidism are uncertain, it has been postulated that uptake of radioactive metabolites of Tc-99m PYP may occur in a hypermetabolic state.<sup>9)</sup>

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**Figure 2.** A thyroid scan using Tc-99m pertechnetate revealed diffuse goiter of both lobes of the thyroid with diffusely increased uptake (20 minute thyroid uptake=76.5%), consistent with Graves' disease. The distance from the right side marker to the opposite side is 10 cm.

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