
Tc-99m MDP Accumulation in Lymph Node Metastases of Recurrent Thyroid Cancer

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Abstract

99 mTc-MDP bone scintigraphy was performed in a 65-year-old female who had recurrent thyroid cancer. Intense radionuclide accumulations to the neck and upper mediastinal lymph node metastases were demonstrated. X-ray CT revealed heavy calcification of cervical lymph node metastases that correlated with 99 mTc-MDP uptakes.

Introduction

Extra osseous uptakes of bone scan agents have been described in a wide spectrum of disorders. Soft tissue uptake of 99 mTc-MDP is seen in both benign and malignant neoplastic lesions¹⁾²⁾. Calcified metastases from colon cancer³⁾, ovarian cancer⁴⁾ and osteogenic sarcoma⁵⁾ may show significant uptakes of bone scan agents. In ovarian cancer, the presence of psammoma bodies was thought to be one of the important factors causing uptake of 99 mTc-MDP⁶⁾. Although primary thyroid cancer with psammoma bodies demonstrated an intense uptake of bone scan agents⁶⁾, this has not been reported with regard to metastatic lymph nodes. The authors describe a case of recurrent thyroid cancer with high uptake of 99 mTc-MDP in metastatic lymph nodes.

Case Report

A 65-year-old female detected a left anterior neck mass. Seven years ago, she had received

surgery for papillary thyroid cancer (a right lobectomy and a right neck lymph nodes dissection). Pathological findings were a papillary adenocarcinoma of the thyroid and no lymph nodes metastases. On physical examination, hard masses of thyroid, left cervical and supraclavicular lymph nodes were observed. She was referred to our hospital for further examination. Neck radiographs (anterior and lateral views) showed tracheal deviation and significant calcifications in the left cervical and supraclavicular regions (Fig. 1 A, B). Noncontrasted CT images revealed a low density mass in the thyroid with calcification and multiple lymph nodes with heavy calcification (Fig. 2 A, B, and C). 99 mTc pertechnetate imaging showed residual thyroid tissue of the left lobe (Fig. 3). Tl 201 scintigraphy was performed 20 minutes after 111 MBq of 201 TlCl intravenous injection (i.v.) and there were extra-thyroid radionuclide accumulations in the left lower neck (Fig. 4). To evaluate bone metastasis, bone scintigraphy was done 3 hours after 99 m Tc-MDP 740 MBq i.v. Left anterior oblique image of a bone scintigram demonstrated intense radionuclide accumulations in the left cervical and supraclavicular regions (Fig. 5). These findings were correlated with those of a 201 Tl scan and CT images.

Discussion

Calcified metastases from colon cancer, ovar-

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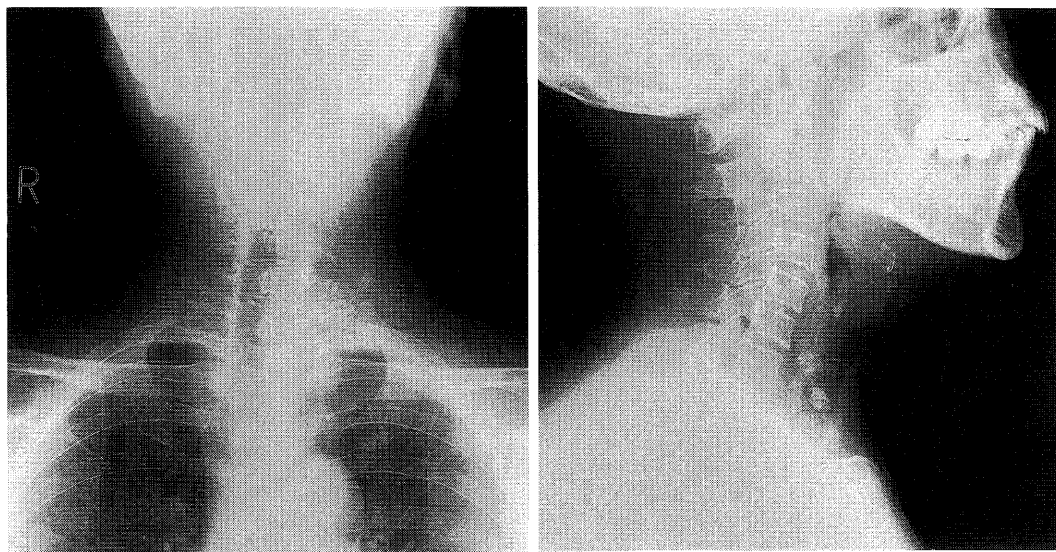


Fig. 1A, B Anterior and lateral radiographs of the neck show coarse calcifications in the left neck and tracheal deviation to the right.



Fig. 2A, B Noncontrasted CT images show a low density mass in the thyroid with calcification and multiple lymph nodes with heavy calcification.

ian cancer and osteogenic sarcoma may cause intense uptake of bone seeking agents³⁾⁻⁵⁾. Papillary adenocarcinomas of ovarian and thyroid cancer frequently calcify in primary and metastatic sites, and the presence of psammoma bodies are commonly observed. Although concentration of ^{99m}Tc-diphosphonate in primary thyroid cancer with psammomatous calcification has been

reported⁶⁾, it has not been reported with regard to cervical lymph node metastases.

In the present case, calcified lymph nodes were considered to be metastatic lesions resulting from the recurrent thyroid cancer. Accumulations of ^{99m}Tc-MDP were observed in the left cervical and supraclavicular regions and correlated with ²⁰¹Tl scan and X-ray CT images. Factors proposed

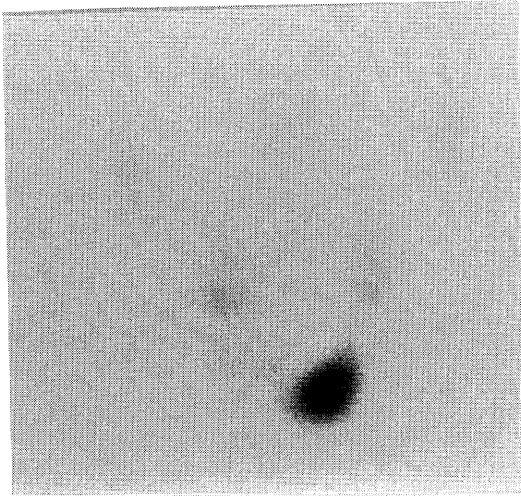


Fig. 3 Anterior neck image of thyroid scintigram obtained 20 minutes after 185 MBq ^{99m}Tc -pertechnetate intravenous injection showed the residual thyroid tissue of the left lobe.

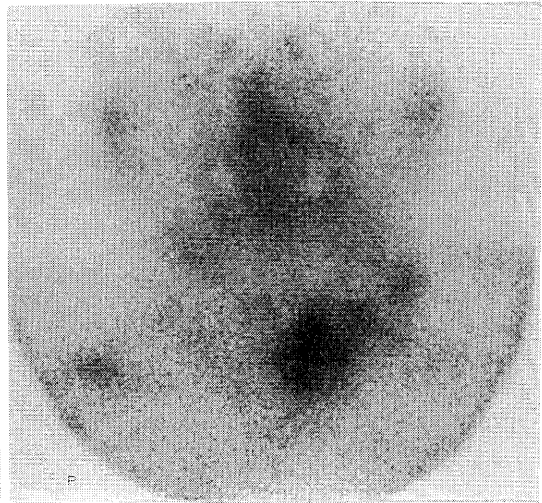


Fig. 4 Tl201 scintigram obtained 20 minutes after 111 MBq of $^{201}\text{TlCl}$ intravenous injection. Abnormal radiothallium accumulations are seen in the left lower neck.

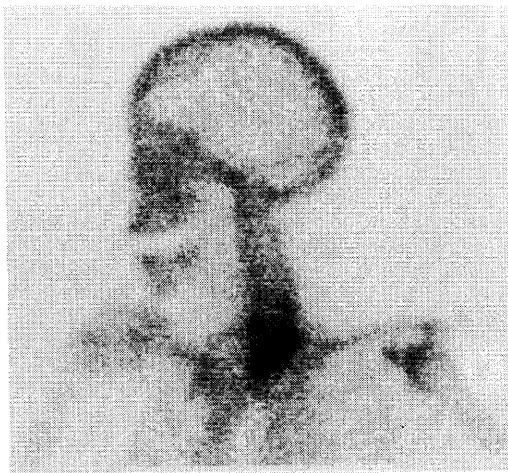


Fig. 5 Left anterior oblique image of a bone scintigram obtained 3 hours after 99 mTc-MDP 740 MBq intravenous injection demonstrates intense radionuclide accumulation in the left lower neck corresponding with calcified lesions.

as mechanisms of bone seeking agents in the soft tissue lesions include increased blood perfusion, necrosis, calcification and immature collagen³⁾. Several authors have described the accumulation of bone scan agents in ovarian and thyroid cancer

and have noted the presence of psammoma bodies⁴⁾⁶⁾⁷⁾. The precise mechanism of ^{99m}Tc -MDP uptake is not recognized, but the calcification process is thought to be one of the important factors. Papillary thyroid cancer frequently calcifies in both primary and metastatic lesions. The accumulation of ^{99m}Tc -MDP may be related to the calcification.

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