

DETECTION OF A PARATHYROID ADENOMA BY ^{99m}Tc – MIBI SCINTIGRAPHY WITH NEGATIVE ULTRASOUND IMAGING: A CASE REPORT

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Keywords : Parathyroid adenoma, ^{99m}Tc -MIBI scintigraphy, Negative ultrasound.

INTRODUCTION

The ^{99m}Tc -MIBI parathyroid scintigraphy is a functional imaging technique used for exploring hyperparathyroidism.

Primary hyperparathyroidism is a common endocrine disorder characterized by autonomous overproduction of parathyroid hormone (PTH) by one or more parathyroid gland(s).

PURPOSE

Highlighting the importance of parathyroid scintigraphy in investigating abnormal parathyroid tissue.

PATIENT AND METHOD

We report the case of a 54-year-old female patient with no specific medical history, referred for the evaluation of confirmed primary hyperparathyroidism, as indicated by a high PTH level of 650.7 pg/ml. Cervical ultrasound revealed the presence of thyroid nodules classified as EU-TIRADS 4-3 and 2, with no presence of parathyroid adenoma.

The examination was performed using a gamma camera, employing the dual-tracer subtraction technique with ^{99m}Tc (1mCi) / Sestamibi - ^{99m}Tc (18 mCi). It involved the acquisition of an anterior cervical thyroid image, followed by the acquisition of two separate sets of early and late anterior cervical and mediastinal images. This was then complemented by a single-photon emission computed tomography/computed tomography (SPECT/CT) scan centered on the neck and the chest.

RESULTS

The scintigraphic examination revealed a thyroid gland in its normal position with roughly symmetrical uptake and irregular contours, particularly at the lower pole of the right thyroid lobe (Figure 1). In the early cervical image, there is heterogeneous tracer uptake, with a noticeable area of moderate uptake extending beyond the lower pole of the right thyroid lobe (Figure 2). This focal area corresponds, on the fusion SPECT/CT images, to a rounded parathyroid nodule measuring 1.5 x 1.4 cm (Figure 3). The examination did not reveal any mediastinal ectopic focus (figure 4).

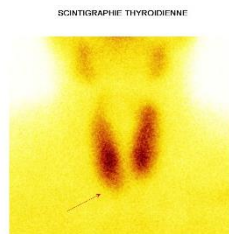


Figure 1: Thyroid image with ^{99m}Tc .

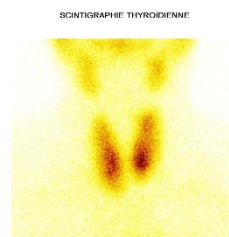


Figure 2: Early cervical image with MIBI- ^{99m}Tc .

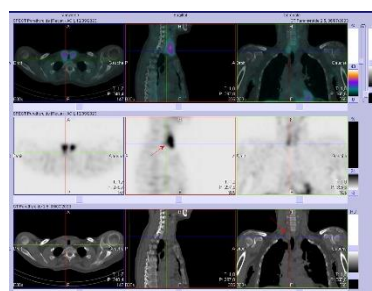


Figure 3: Fusion slices of SPECT/CT showing the parathyroid nodule.

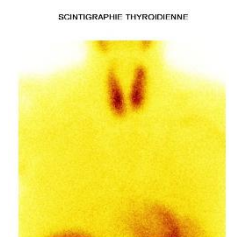


Figure 4: Early mediastinal image with MIBI- ^{99m}Tc .

DISCUSSION

The introduction of ^{99m}Tc -MIBI scintigraphy in the exploration of hyperparathyroidism represents one of the most effective clinical applications of nuclear medicine.

Several studies have been able to confirm its great utility in the diagnosis and management of parathyroid overactivity, particularly in cases involving single or multiple adenomas, diffuse hyperplasia, and ectopic localizations.

Compared to ultrasound and CT scans, which have sensitivities ranging from 34% to 78% and 46% to 87%, respectively, ^{99m}Tc -MIBI scintigraphy proves to be more sensitive (80-95%).

In the case of our patient, the ^{99m}Tc -MIBI subtraction scintigraphy unveiled a parathyroid lesion that had gone unnoticed during the cervical ultrasound examination.

CONCLUSION

Parathyroid scintigraphy is a crucial diagnostic procedure, offering a notably enhanced sensitivity in pinpointing abnormal parathyroid tissue when compared to other structural imaging modalities, notably cervical ultrasound.

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