Interest of double phase technetium 99m-sestamibi scintigraphy in the exploration of multiple parathyroid adenomas

I Ghfir, N Ben Rais

Citation

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Abstract

Technetium99m-sestamibi (^{99m}Tc-sestamibi) scintigraphy using double phase technique is useful to detect and localize parathyroid adenomas by separating thyroid and parathyroid tissue. We report the case of 52 year old male patient with left kidney lithiasis and diffuse osteoaticular pain. Biological exam finds hypercalcemia with high level of parathormone. Double phase ^{99m}Tc-sestamibi scintigraphy allowed three hearths of high uptake corresponding to multiple parathyroid adenomas whereas ultrasonography and computed tomography showed only one hearth of adenoma.
This case suggests that double phase ^{99m}Tc-sestamibi scintigraphy is very useful and more efficient as a functional exploration in the assessment of primary hyperparathyroidy, particulary to confirm the multiple character of parathyroid adenoma and also to improve the success of surgery.

INTRODUCTION

Multiple parathyroid adenomas are rare cause of hyperparathyroidism. ^{99m} Tc-Sestamibi scan intervenes as a mean of functional imagery allowing the exploration to confirm the multiple character of parathyroid adenoma. We report the case of a patient presenting hyperparathyroidism at which ^{99m} Tc-Sestamibi allowed the description of 3 parathyroid adenomas.

CASE REPORT

A 52 year old men patient with an episode of left renal colic associated to osteoarticular pains accentuated by effort. Ultrasonography showed a renal lithiasis which was treated by extracorporel shock wave therapy.

Radiography of the two hands highlights an under-periost resorption in the level of the 2nd phalanges. His total calcium serum was found elevated at 160 mg/l. Other results showed serum phosphate of 18 mg/l and alkaline phosphate of 610 UI/L.

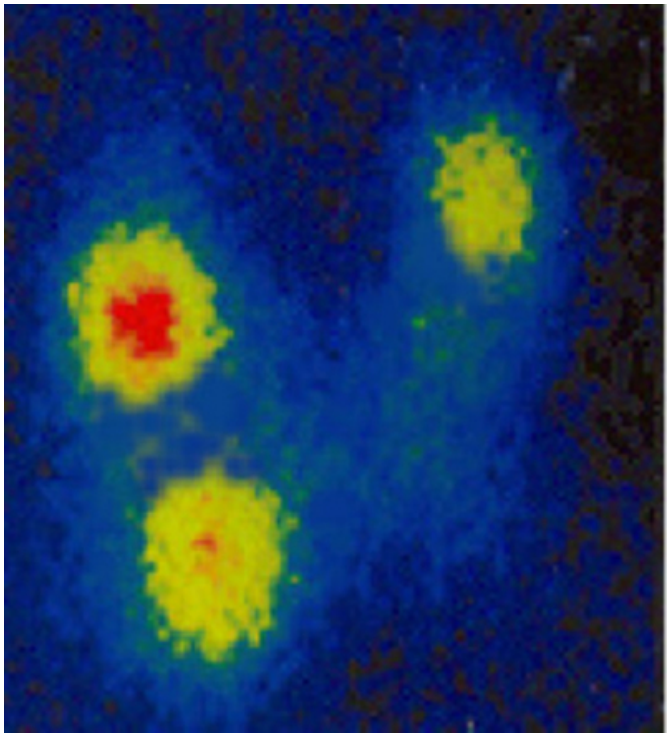
The diagnosis of primary hyperparathyroidism was confirmed by elevated serum parathyroid hormone level of 450 ng/ml.

Ultrasound was successful in localizing one adenoma in the right upper glande.

Parathyroid scintigraphy was performed 20 minutes and 2 hours after injection of 740 MBq of ^{99m} Tc-sestamibi. The second hour scan localized the same adenoma revealed in echography and showed another focal uptake in the lower right gland and the higher left gland (figure1).

Figure 1

Figure 1: Parathyroid scintigraphy using Tc-sestamibi (2 hour after injection of radiotracer) showing 3 hearths of high uptake in the level of the right superior and inferior lobe and the left upper lobe.



Surgical resection of the multiple adenomas was carried out. Pathologic examination of the surgical specimen revealed parathyroid adenoma tissue. Evolution was marked by a clear clinical improvement and a normalisation of the parathormone rate.

DISCUSSION

85% to 90% of primary hyperparathyroidism are due to unique parathyroid adenoma. Exceptionally the hyperparathyroidism can be due to multiple adenomas (double in 5% of case, triple in 3% of cases). That is why preoperative localization remains very helpful. it increases surgical reliability and reduces operating time [1]. ^{99m} Tc-Sestamibi scintigraphy is highly accurate in detecting parathyroid adenomas (sensitivity and specificity of about 95%). A combination of this scintigraphy and computed tomography, magnetic resonance imaging or ultrasonography can detect and localize nearly 98% of adenomas [2].

The majority of cases occur after 45 years age with a female prevalence (2 women for one men).

Ultrasonography and MRI have a predictive value from 40% to 80%. The result are better with double phase ^{99m} Tc-sestamibi scintigraphy with predictive value 90% to 100% and permit to detect multiple or mediastinal adenomas [3].

References

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Author Information

I. Ghfir
Department of Nuclear Medicine

N. Ben Rais
Department of Nuclear Medicine