CASE REPORT

FUNCTIONING THYROID NODULE WITH HYPOTHYROIDISM IN HASHIMOTO'S THYROIDITIS

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ABSTRACT

Hashimoto's thyroiditis (HT) is an autoimmune thyroid disorder, in which the immune system turns against the body's own tissues. The resulting inflammation from Hashimoto's thyroiditis often leads to an underactive thyroid gland. It is characterized by a great variability in thyroid scan appearance. We report an unusual finding of hot nodule in a patient of hypothyroidism.

Key words: Hashimoto's thyroiditis, Hypothyroidism, Hot nodule

Introduction

Hashimoto's thyroiditis is one of the most common human autoimmune diseases responsible for considerable morbidity in women. It is an organ specific T-cell mediated disease that affects the thyroid. It affects upto 2% of the general population and is more common in the older women and ten times more frequent in women than in the men. A significant proportion of the patients have asymptomatic chronic autoimmune thyroiditis and 8% of the women and 3% of the men have sub clinical hypothyroidism. Sub-clinical hypothyroidism is characterized by an increase in serum thyrotrophic (TSH) while serum levels of thyroxine (T4) and triidothyronine (T3) remain normal.[1] Technetium-99m-Pertechnetate thyroid scan in Hashimoto's thyroiditis is characterized by a great variability. We report here a case of hot nodule on Pertechnetate thyroid scan in such a case of hypothyroidism.

Case History

A 45 years female patient was presented with hypothyroid since 6 months. She was receiving 50µg L-Thyroxine and was maintaining TSH level at 4.6 uUI/ml. She developed right sided thyroid nodule 2 months back. Her medical history was unremarkable, without previous thyroid surgery or irradiation, iodine excess, painful goiter or post-partum period. Serum level of TSH was 18.67 uUI/ml (normal range;0.3-5.0) with off-Thyroxine and FT4 was 4.3 pmol/l (normal range 11.5 - 23.0 pmol/l). Anti-microsomal antibodies (M-Ab) were measured by the tanned red cell hemagglutination technique and were negative. The patient underwent thyroid scan for a palpable thyroid nodule, with Tc-99m sodium pertechnetate thyroid scan. Thyroid scan was performed with off L-thyroxin therapy. Thyroid scan was acquired with 74 MBq of Tc-99m per technetate i.v. Thyroid scan was carried out with a digital gamma camera with a Low Energy High Resolution (LEHR) collimator, after 20 minutes of the injection with the patient in the supine position. Two anterior views for 5 minutes were carried out, one with marker and the other without marker (Fig. 1).

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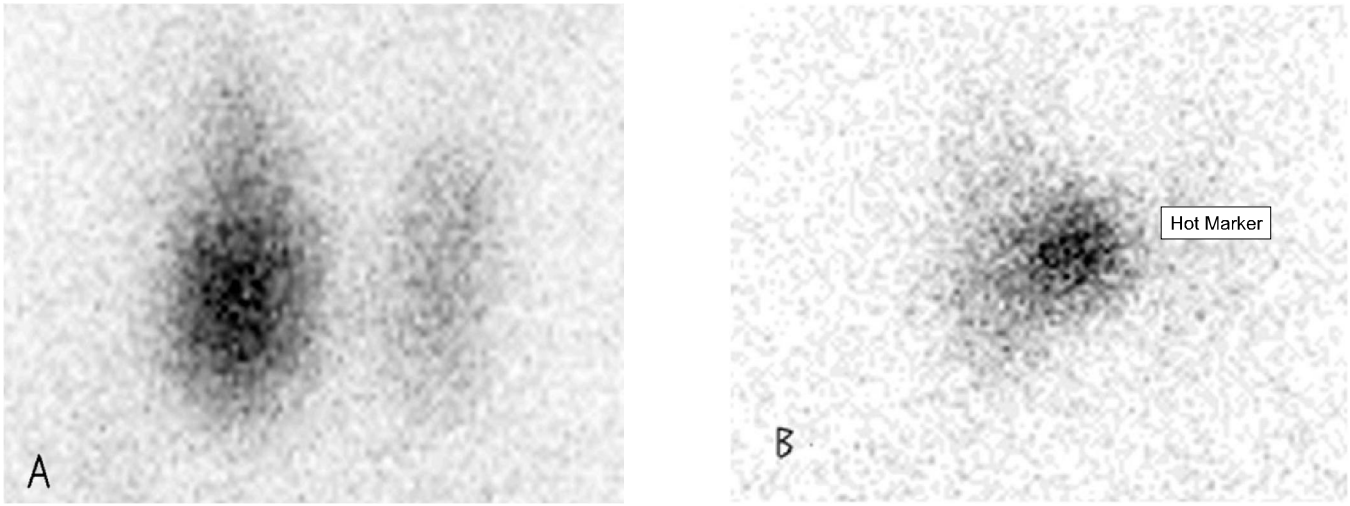

Figure 1: A 45 years-old woman with overt hypothyroidism. Thyroid scan with Tc-99m pertecnetate showed hot nodule on the right base **(A)**; the nodule was highlighted by a hot marker **(B)**

Ultrasound scanning was performed by USD F-770A color-Doppler system with a 7.5MHz linearscanner; data was collected that measured concerned thyroid glands and nodule, and echogenicity was compared with the sternomastoid muscle. The nodule was hypo echoic, having diameter of 20 mm. The remaining tissue was atrophic. Color Flow Doppler sonography showed absence of internal increase of vascularization even with low frequency impulsion repetition. Fine needle aspiration cytology was performed in and it revealed several lymphocytes were present.

Age (yr)	Thyroid Function Tests		Microsomal antibodies M-Ab	Thyroid scan	USG		Color Flow Doppler Sonography	FNAC
	FT4 (pmol/l)	TSH (mIU/l)			Nodule	Remaining Tissue		
45	4.3	18.67	Negative	Hot	Hypoechoic 18mm	Atrophic, Hypoechoic	Absence of nodular hypervascularization	Benign, presence of lymphocytes

Table 1: Characteristics of patients with hot nodule.

Discussion

We report herein a case of functioning nodule in context of Hashimoto's thyroiditis. Such observations are relatively rare in the medical literature, the functioning nodules being generally discovered during the etiological investigation of thyrotoxicosis.

Although M-Abs were negative in such a case but Hashimoto's thyroiditis remains the most probable etiology despite the negativity of M-Ab, according, essentially, to the ultrasonographic aspect with atrophic aspect and diffuse reduction in thyroid echogenicity, which constitutes a valid predictor of autoimmune thyroid disease. Furthermore, no particular findings on cases history, clinical exams and biological data indicate other possible cause of hypothyroidism.[2]

In HT, thyroid scan may be of particular value especially in the case of solitary or dominant thyroid mass with incomplete regression or suppressive therapy suggesting cancer or lymphoma.[3] These nodules are usually cold and correspond to severely diseased portions by the destructive and fibrotic process;[4] in some cases multiple areas of decreased uptake are noted and the scan feature is similar to that of multinodualr goiter.[5] Exceptionally thyroid scan reveals that the nodule is functional.[6-9]

According to the aspect of the surrounding tissue on thyroid scan and ultrasonographic, two forms were recognized i.e. early stage of HT and advanced des-

tructive process. In the first, surrounding tissue was plainly visualized; in this form follicular cell destruction and fibrosis are slight and left sufficiently normal thyroid tissue, inefficient hormone production is caused mainly by the abnormalities of iodine metabolism rather than and destructive process. In the second form, there was a severe diminished uptake of the remaining tissue, the functioning nodules being the solely areas of uptake. So, it appears that the association of HT with hot nodule may be observed either on the early stage of disease or at the advanced stage.[3,4]

The finding of the hot nodule in HT underlines the great variability of thyroid scan inthis pathology that is called the great mimic;[10] this aspect is surprising because of the destructive nature of the disease. The eventuality of the autonomous adenoma without sufficient hormone production to overcome hypothyroidism is implausible. In the reports of Mousavi[7] and Hoogenberg,[11] most nodules regressed in the patients followed upto the adequate thyroid hormone replacement. The most stringent argument against the autonomy is the pattern of nodules in color flow Doppler sonography, with the absence of intra-nodular vascularity; indeed a normal or low internal hypervascularization permits to exclude autonomous adenoma with very high predictive value.[12] This means that hot nodules noted on the Tc-99m pertecnetate scan did not indicate increase in the blood flow; as proposed by others, we think that chronic stimulation by TSH or other thyroid auto antibodies contribute to increase in the concentrating ability of the nodule as well as in its nodular growth.[7,13,14]

This case illuminates the pathogenic complexity of the HT. In case of nodularity, the possibility of HT should be considered.

Conflict of Interest: None

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