Dilemma in diagnosing thyroid adenoma – A case report

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ABSTRACT

A thyroid adenoma is a benign tumour of the thyroid gland. Almost all thyroid adenomas are follicular adenomas. In the clinical management of such patients, the extent of surgery depends on whether it is truly a follicular adenoma or a follicular carcinoma. In case of follicular adenomas where Fine Needle Aspiration (FNA) findings are inconclusive, nuclear medicine techniques play an important role in the pre operative work up. Here we present a case of follicular adenoma highlighting the role of nuclear medicine techniques in the pre operative workup along with the diagnostic dilemmas that can occur.

INTRODUCTION

A thyroid adenoma is a benign tumour of the thyroid gland. Almost all thyroid adenomas are follicular adenomas (1). Follicular adenomas are usually encapsulated tumour with evidence of follicular cell differentiation. The only histological features which reliably distinguish a follicular carcinoma from a follicular adenoma are the presence of vascular or capsular invasion. Nuclear medicine techniques play an important role in the diagnosis and management of thyroid nodules. Here we present a case of follicular adenoma highlighting the role of nuclear medicine techniques in the pre operative workup along with the diagnostic dilemmas that can occur.

CASE REPORT

A 29 year old male presented with a visible swelling on the left side of the neck and pain during deglutition. The patient was referred to National Institute of Nuclear Medicine and Allied Sciences for evaluation of the thyroid gland. The thyroid function test revealed normal thyroid

hormone levels. Ultrasonogram with 7.5 MHz probe was done which revealed a hypoechoic, solid nodule measuring 3.1 x 1.8 cm in the lower pole of the left lobe of thyroid. The nodule had a peripheral halo which on colour Doppler application showed increased vascularity in the periphery with no abnormal intranodular vascularity (Figure 1).

Figure 1: Ultrasonogram of thyroid showing hypoechoic nodule in the left lobe of thyroid with peripheral vascularity on colour Doppler application

Tc-99m pertechnetate thyroid scan revealed enlarged thyroid gland with a partially cold nodule in the lower pole of left lobe of thyroid (Figure 2).

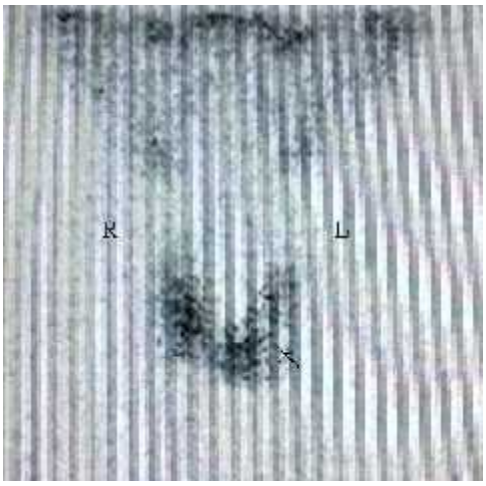

Figure 2: Tc-99m pertechnetate scan showing a partially cold nodular goiter in the lower pole of left lobe of thyroid.

Fine needle aspiration cytology (FNAC) of the nodule showed follicular lesion, however follicular adenoma could not be ruled out. The pathologist suggested a biopsy. Keeping in mind the probability of malignant nodule a Tc-99m methoxyisobutylisonitrile (Sestamibi) scan with 20 mCi Tc-99m Sestamibi was done. The early image at 10 minutes showed increased tracer uptake in the lower pole of left lobe of thyroid corresponding to the nodule. Delayed image at two hours showed retention of tracer in the nodule with poor washout resulting in a positive MIBI scan (Figure 3).

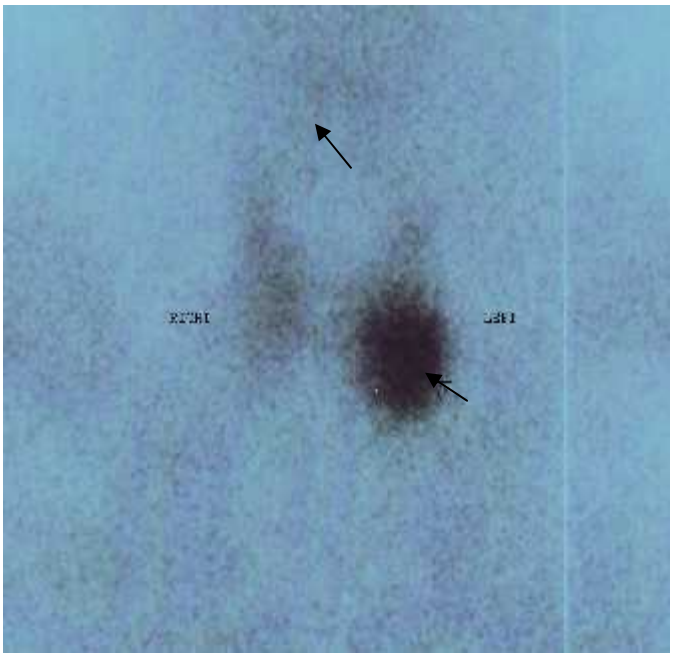

Figure 3: Delayed image at 2 hours showing retention of tracer in the nodule with poor Washouts resulting in a positive MIBI scan

As the MIBI scan was positive, serum parathormone and calcium was done, both of which were within normal limits excluding the probability of parathyroid adenoma. Eventually the patient underwent surgical excision of the nodule along with lobectomy and isthmusectomy. Histopathology of the resected nodule revealed a benign follicular adenoma.

DISCUSSION

Thyroid nodules are relatively common with an overall prevalence of 4-7% (2). It is important to evaluate a solitary nodule for differentiation between hyperplasia and neoplasm. Non functional nodules are mostly benign whereas 5% to 15% are malignant (3). The histologic criteria used to distinguish benign from malignant neoplasm can be subtle especially in case of follicular neoplasm (4). The differential diagnosis of a thyroid nodule with a FNA biopsy consistent with follicular neoplasm is a follicular adenoma, adenomatous hyperplasia, follicular carcinoma, follicular variant of papillary carcinoma (5). A FNA biopsy specimen consistent with follicular neoplasm has a 15-30% risk of malignancy (6) . In this case the FNAC report was inconclusive.

High-resolution ultrasonography plays an important role in the work up of thyroid nodules, however it has low specificity (7). On ultrasonography, adenomas appear as solid masses, which can be hyperechoic, isoechoic or hypoechoic (8). The usual finding of a peripheral hypoechoic halo represents the fibrous capsule and blood vessels, which can be delineated by application of, colour Doppler. In this case ultrasonography findings were in favour of a benign nodule.

In case of a solitary cold thyroid nodule in Tc-99m pertechnetate scan further evaluation of the nodule is required as the incidence of malignancy in solitary cold nodule ranges from 9% to 26% (9). There is a difference in the extent of surgery in terms of the probability of malignancy in the nodule. Thyroid lobectomy and isthmusectomy is the definite treatment for patients with a benign follicular adenoma and patients with minimally invasive follicular cancer whereas total thyroidectomy is necessary for invasive follicular carcinoma (5). Frozen section examination is not that helpful in intraoperative decision-making as it rarely distinguishes a follicular adenoma from a follicular carcinoma, which has been proven by various clinical trials (10). In such cases where FNA is insufficient there is a need for MIBI scintigraphy for the pre operative work up. In previous studies (11,12) it has been suggested that MIBI is not specific for thyroid malignancy. However high Tc-99m MIBI uptake increases the probability of diagnosis of malignant lesions, while decreased uptake excludes it (13). Malignant cells in particular maintain a more negative

mitochondria trans membrane potential, which in turn encourages increased MIBI accumulation because of their increased metabolic need (14). Benign lesions demonstrated various uptake behavior resulting in 23% of benign nodules being MIBI positive (11,12).

In this case the partially cold nodule in Tc-99m pertechnetate scan showed intense uptake in both early and delayed phases of MIBI scan. At the end, the ultrasonographic findings suggested a benign nodule while the Tc-99m pertechnetate and MIBI scan were more in favour of malignancy with an inconclusive FNA report resulting in a diagnostic dilemma.

CONCLUSION

This case illustrates the potential complexity, which may occur in the diagnosis of a thyroid adenoma. Nuclear medicine techniques play an important role in pre operative work up of such cases specially where FNA is inconclusive but may also end up in diagnostic dilemma.

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