Marine-Lenhart Harboring Papillary Thyroid Cancer

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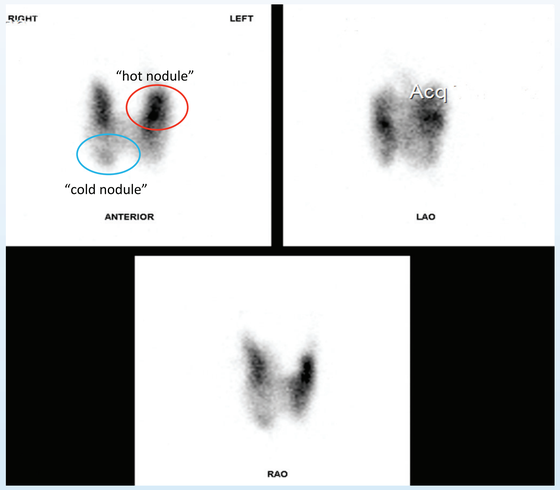
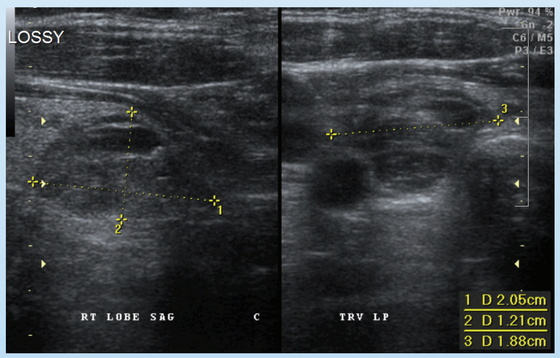
Thyroid Scan

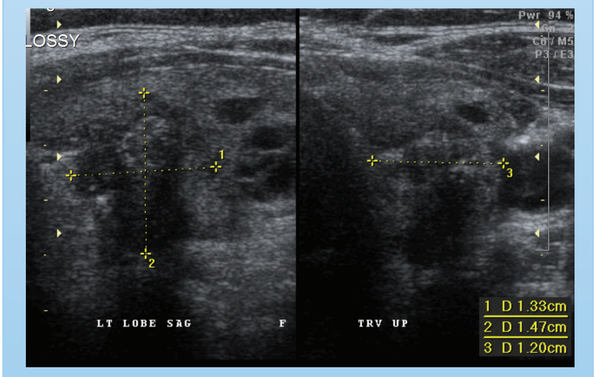


US Right lower pole "cold"nodule



Benign appearing cyst with septations containing mixed solid, cystic, and colloid components

US Left upper pole "hot" nodule



Ill-defined hypoechoic nodule with coarse and microcalcifications

Introduction

Graves' disease with functioning nodules is referred to as Marine-Lenhart Syndrome. Only 2.7% of the patients with Graves'disease have concomitant functioning nodules.[1] Thyroid scintigraphy often definitively confirms the diagnosis. However, in addition to a hyperfunctioning (i.e. "hot") nodule, the thyroid scan may reveal isofunctioning (i.e. "warm"), and or a nonfuntioning (i.e. "cold") nodule as compared to the normal surrounding thyroid. Since hyperfuntioning nodules rarely harbor malignancy, if one is found that corresponds to the nodule in question, no cytologic evaluation is usually necessary.[2] Conversely, the majority of all nonfunctioning nodules may be benign or less frequently malignant, thus requiring cytopathologic evaluation.[2] We report a patient with Marine-Lenhart syndrome with the dilemma of a "hot "nodule found on thyroid scintigraphy which had "suspicious" ultrasonographic features prompting thyroidectomy after cytological diagnosis of papillary thyroid cancer (PTC). In this case, the utilization of neck ultrasonography provided significant risk stratifying data to support appropriate management.

Case Report

A 60-year-old female presented for evaluation of hyperthyroidism discovered by routine blood work. She was asymptomatic and denied any thyroid-related symptoms of tremors, palpitations, weight loss, heat intolerance, and hyperdefecation. However, she did exhibit mild anxiety and "jumpiness" and her ophthalmological exam exhibited features of early Graves' eye disease with conjunctival injection and periorbital edema. Her labs confirmed mild hyperthyroidism with an undetectable TSH of <0.01, free T4 2.01 (normal 0.82-1.77 ng/dL), free T3 6.8 (normal 2.0-4.4 pg/mL), TPO antibody 9 (normal 0-34 IU/mL), and TSI 352% (normal 0-139%) indicative of Graves' hyperthyroidism. She denied a history of head and neck radiation and family history of thyroid disease. Subsequent radionuclide I-123 labeled scan demonstrated a 24-hour thyroid uptake value of 35.8% (normal range 10-35%). Scintigraphic images revealed a mildly enlarged heterogenous thyroid with a cold nodule in the right lower pole and a hot nodule in the left upper pole. Given the associated risk of cold nodules harboring a malignant lesion, an ultrasound guided fine needle aspiration biopsy of the cold nodule was pursued. Ultrasonography revealed a heterogeneous thyroid with bilateral nodules. Within the right lobe, the largest nodule was 2.1 x 1.4 x 1.8 cm and was described as cystic with septations containing mixed solid, cystic, and colloid components, with benign sonographic features correlating with the cold nodule on the nuclear scan. The left lobe demonstrated a highly suspicious 1.3 x 1.3 x 1.2 cm upper pole nodule described as solid, irregular in contour with coarse calcifications correlating with the hot nodule on the nuclear scan. Subsequently, fine needle aspiration biopsies of these two nodules were done. The cytology of the right lower pole "cold" nodule consisted of follicular, hurthle cells, macrophages, and abundant colloid consistent with benign follicular nodule. Cytologic features of the left upper pole "hot" nodule was consistent with PTC and molecular analysis revealed BRAF V600E mutation. She was started on Methimazole 10 mg daily in preparation for total thyroidectomy. After achieving a euthyroid state, she underwent an uneventful total thyroidectomy. The left thyroid lobe demonstrated a 0.9 x 0.9 x 0.7 cm partially encapsulated papillary thyroid carcinoma with perineural invasion, microscopic extrathyroidal extension, but without capsular, lymphatic, or vascular invasion corresponding to the "hot" nodule on scan. The right thyroid lobe demonstrated incidental multifocal micropapillary thyroid carcinomata of 0.3 cm and 0.2 cm. There was a benign right lobe 2 cm adenomatoid nodule corresponding to the "cold" nodule on nuclear scan. The Final AJCC-TMN classification was pT3N0Mx.

Discussion

Graves' disease may harbor an increased incidence of thyroid carcinomas.[3] Thyroid imaging modalities have evolved over the last several decades to assist clinicians with the diagnosis of thyroid disease. Thyroid scintigraphy assesses thyroid functionality by characterizing the anatomical distribution and intensity of radioactive tracer uptake. Neck ultrasonography provides descriptive morphologic features which may greatly contribute to risk stratification of thyroid malignancy. Current literature suggests that hyperfuntioning nodules rarely harbor malignancy and therefore no cytologic evaluation is necessary. However, in patients with coexistent thyroid nodules and Graves' disease, thyroid ultrasonography may shed light on characteristics suggestive of thyroid malignancy, thus allowing for proper therapeutic intervention as in our case where thyroid ultrasonography pinpointed the final pathology of PTC.

References

1. Charkes ND, 1972. Graves' disease with functioning nodules (Marine-Lenhart syndrome). J Nucl Med 13:885–892.
2. Cooper SC, Doherty GM, Haugen BR, Kloos RT, Lee SL, Mandel SJ, Mazzaferri EL, Mclever B, Pacini F, Schlumberger M, Sherman SI, Steward DL, Tuttle RM 2009. Revised America Thyroid Association Management Guidelines for Patients with Thyroid Nodules and Differentiated Thyroid Cancer. Thyroid 19: 1167-1214.
3. Carnell E, Valente W, 1998. Thyroid Nodules in Graves' Disease: Classification, Characterization, and Response to Treatment. Thyroid 8:8, 647-653.

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