SMALL THYROID BED MASSES FOUND AFTER **INITIAL TREATMENT OF DIFFERENTIATED** THYROID CANCER HAVE A BENIGN OUTCOME

Rondeau G, Fish S, Hann LE, Fagin JA, Tuttle RM. Ultrasonographically detected small thyroid bed nodules identified after total thyroidectomy for differentiated thyroid cancer seldom show clinically significant structural progression. Thyroid 2011;21:845-53.

SUMMARY • • • • • •

BACKGROUND

High-resolution ultrasound neck surveys have become an accepted routine method of detecting recurrence of differentiated thyroid cancer after the initial treatment of thyroidectomy with or without radioactive iodine ablation (1). Masses in the thyroid bed include metastatic nodes and tumor recurrence, but they also may be a result of postoperative fibrosis or suture granulomas (2). Although the revised ATA guidelines for thyroid cancer allow for observation without biopsy of small suspicious cervical nodes found on sonography, there are no recommendations for nodules in the thyroid bed. Masses in the thyroid bed may be benign or malignant. The management of malignant masses in the thyroid bed presents a dilemma because invasion may result in recurrent laryngeal-nerve damage or tracheal invasion and surgical removal may also result in morbidity from recurrent nerve dysfunction or hypoparathyroidism. This study was designed to determine the likelihood, magnitude, and rate of growth of small masses found in the thyroid bed (level VI) after initial therapy.

METHODS AND RESULTS

This is a retrospective review of 1531 patients with differentiated thyroid cancer who had two or more cervical sonographic studies between August 1998 and June 2009. Thyroid-bed nodules were present in 521 (34%) of the patients, but only 191 had masses <11 mm and had at least two additional follow-up exams. The patients all had a total thyroidectomy for a differentiated thyroid cancer with central-neck dissection, and 84% subsequently received radioactive iodine (RAI) remnant ablation (median activity, 146 mCi) and were followed for a mean of 7 years (median, 5 years). Patients had at least one small thyroid-bed nodule (range, 1 to 6) and 35% of these patients had at least one new additional thyroid-bed nodule (range, 1 to 9) on a follow-up exam. The median size of the thyroid-bed nodules was 5 mm (range, 2 to 11). Suspicious sonographic features (microcalcifications, hypoechogenicity or increased peripheral or intranodular vascularity) were seen in 63% of the patients. RAI uptake in the thyroid bed occurred in 23% of the patients and fluorodeoxyglucose uptake in 24%. Patients were excluded if the thyroid-bed mass was >11 mm or if they did not have enough follow-up exams. Patients receiving additional RAI therapies or who had other abnormal nodes in the central or lateral compartments were included. Only 17 of the 191 (9%) of the patients had an increase in size (≥ 3 mm in the largest dimension) of the thyroid-bed nodule during a mean follow-up of 7 years and a median follow up of 5 years. The 3-mm cutoff was selected because it was thought that this is the minimal size change that can be reproducibly determined by high-resolution ultrasound (3, 4). Only 3 of these 17 patients had a fine-needle aspiration biopsy, and all masses were confirmed as papillary thyroid carcinoma. The remaining 14 patients continued to be followed without biopsy or treatment with either radioactive iodine or surgery. Most thyroid-bed nodules showed only minor growth over several years, often showing a waxing and waning growth pattern. The median rate of growth of the nodules that grew was 1.3 mm per year (range, 0.4 to 3.7). Only 1 patient had significant growth from 9 mm on the first exam to 16 mm 40 months later and then 27 mm approximately 48 months later. There were no specific clinical or sonographic features that reliably determined which nodules were likely to grow. Negative predictive values (NPVs) with an absence of suspicious features on ultrasound (NPV, 0.97), absence of abnormal cervical nodes (NPV, 0.94), and absence of rising serum thyroglobulin (NPV, 0.93) provide reassurance that a mass is unlikely to grow.

Clinical

CONCLUSION

This study demonstrates the benign behavior of thyroid-bed masses found after the initial therapy continued on next page



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(thyroidectomy, level VI dissection, and RAI ablation). Small thyroid-bed nodules were found in 34% of patients after initial therapy and only 9% increased in size over a median follow-up period of 5 years.

The risk of locoregional recurrence of papillary thyroid carcinoma in the cervical lymph nodes of the thyroid bed ranges from 15% to 25% (5). Careful structural evaluation by high-resolution ultrasound with measurement of basal or thyrotropin-stimulated thyroglobulin has the highest sensitivity for detecting thyroid cancer recurrence. According to the revised ATA thyroid cancer guidelines, cervical ultrasound to evaluate the neck should be performed 6 to 12 months after initial surgery then periodically thereafter depending on the risk for recurrence (3). This article demonstrates that small nodules in the thyroid bed were detected in 34% of their patients who had aggressive initial therapy including total thyroidectomy, central-neck dissection, and RAI remnant ablation in 84%. This study did not indicate whether the patients without RAI ablation had a higher risk of a mass in the thyroid bed consistent with a normal thyroid remnant. Thus, without biopsy it is not known what fraction of these masses represent normal remnant, nodal metastases, or invasive residual disease. The authors did not report any complications such as tracheal or recurrent nerve invasion during the follow-up period. The benign

behavior confirms that the growth of persistent/ recurrent thyroid carcinoma is indolent. This article will change my practice, as my surgical experts worry that thyroid-bed masses after thyroidectomy, centralneck dissection, and RAI ablation represent a more aggressive, invasive residual tumor that places the patient at risk for recurrent nerve damage or tracheal invasion and should be removed. In fact, this study suggests that the presence of small masses in the thyroid bed, whether thyroid remnant or metastatic disease, grow slowly, with no evidence of invasive behavior. These patients with thyroid-bed masses can be under watchful waiting rather than be exposed to the risks of additional RAI therapy or difficult reoperation with a higher risk of hypoparathyroidism and recurrent laryngeal-nerve damage. The absence of suspicious sonographic features, abnormal cervical nodes, and rising thyroglobulin levels strongly predicts a quiescent behavior of the mass. This watchful observation with serial ultrasound evaluation is consistent with the revised ATA guideline recommendations regarding the observation without biopsy of small abnormal cervical lymph nodes in patients with differentiated thyroid carcinoma (3).

- Stephanie L. Lee, MD, PhD

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