ELASTOGRAPHY IS NOT CLINICALLY USEFUL FOR DIAGNOSIS OF MALIGNANCY IN CYTOLOGICALLY INDETERMINATE THYROID NODULES

Lippolis PV, Tognini S, Materazzi G, Polini A, Mancini R, Ambrosini CE, Dardano A, Basolo F, Seccia M, Miccoli P, Monzani F. **Is elastography actually useful in the presurgical selection of thyroid nodules with indeterminate cytology?** J Clin Endocrinol Metab 2011;96:E1826-30. Epub August, 24, 2011.

SUMMARY • • • • • •

BACKGROUND

When fine-needle aspiration biopsy of thyroid nodules is performed, approximately one fourth fall into the indeterminate classification. Some authorities recommend surgical removal of all indeterminate nodules, although only about 10% to 30% are malignant. Real-time elastography (RTE) has been proposed to improve the diagnosis of thyroid cancer before surgery. Thyroid cancers have a harder consistency than benign thyroid nodules; RTE is a technique that uses ultrasonography to provide an estimation of tissue stiffness by measuring the degree of elasticity under the application of external light force. The goal of the current study was determine the efficacy of RTE, as compared with conventional ultrasonography (US), for differentiating malignant from benign thyroid lesions in patients being operated on for nodules with indeterminate cytology.

METHODS

The study included 102 patients (69 women) with indeterminate cytology who had conventional US and RTE performed by a skilled operator in the same session.

Elasticity was scored from 1 (elastic) to 4 (stiff). The median nodule diameter was 2.2 cm (range, 0.7 to 10).

RESULTS

All patients underwent surgery; 36 had a pathologic diagnosis of cancer (32 follicular variant of papillary thyroid cancer, 2 classic papillary, and 2 follicular carcinoma). The remaining 66 nodules were benign, with a final pathology of follicular adenoma in 64 and hyperplastic nodule in 2. The only ultrasound feature that was significantly associated with the diagnosis of cancer was microcalcification, and this was found in 56%. Thyroid cancer was detected in 50% of the nodules that scored 1 to 2 on RTE (good elasticity) and in 34% that scored 3 to 4 (stiff). Of the 36 patients with malignant nodules, 32 had RTE scores of 3 to 4. Although the sensitivity was 89%, the positive predictive value was 50%.

CONCLUSIONS

The current study did not confirm the utility of RTE for the differential diagnosis of malignancy or benignity in thyroid nodules with indeterminate cytology.

ANALYSIS AND COMMENTARY • • • • •

Investigators from Pisa, Italy, had previously reported that RTE was useful for making a diagnosis of malignancy in indeterminate nodules with a positive predictive value of 77% and a negative predictive value of 99% (1). The cause of the lack of confirmation of this result in the current study is unclear. The person performing RTE in this study was very experienced. Nevertheless, there is a considerable element of subjectivity in this method. To overcome the subjectivity,

software has been developed for quantitative analysis of stiffness. One technique, called "shear wave elastography," may be more useful because it eliminates the operator-dependence of the procedure (2, reviewed in the January 2011 issue of *Clinical Thyroidology*). It is likely that the true utility of shear wave elastography for discrimination between benign and malignant nodules in the indeterminate category will require additional studies for validation.

— Jerome M. Hershman, MD

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