# THYROID NODULE MACROCALCIFICATION DOES NOT MEAN THE NODULE IS BENIGN

Lu Z, Mu Y, Zhu H, Luo Y, Kong Q, Dou J, Lu J. Clinical value of using ultrasound to assess calcification patterns in thyroid nodules. World J Surg 2011;35:122-7.

#### SUMMARY • • • • • • • • • • • • • • •

#### **BACKGROUND**

The most recent ATA guidelines for the evaluation of thyroid nodules and cancer emphasize the use of thyroid ultrasound to guide the clinician to which nodule requires biopsy to exclude malignancy. Microcalcifications are frequently cited as being highly specific for thyroid malignancy, especially for papillary thyroid carcinoma. However, the risk for malignancy of macrocalcifications is not widely known. The purpose of this study was to determine the clinical usefulness of calcification patterns of thyroid nodules detected on sonography in predicting malignancy.

### **METHODS**

Ultrasonography was used to examine 2122 nodules in 1498 Chinese patients within 1 month before thyroidectomy. Calcification patterns including macrocalcifications, microcalcifications, rim calcifications, and isolated calcifications were correlated with histologic diagnosis.

### **RESULTS**

A total of 12.2% of thyroid nodules with a mean (±SD) diameter of 2.3±1.5 cm were found to be malignant. Papillary thyroid carcinoma was found in 85.3% of all malignancies. Calcification of any pattern was found in 49.6% (128 of 258) of malignant and 15.7% (292 of 1864) of benign nodules. Microcalcifications

were found in 33.7% (87 of 258) of malignant nodules and 6.4% (120 of 1864) of benign nodules; 95% of the thyroid malignancies associated with microcalcifications were papillary carcinomas, but 94% of the macrocalcifications were also associated with papillary carcinomas. The sensitivities of calcifications (all forms) and microcalcifications for predicting malignancy were 49.6% and 33.7%, respectively, with corresponding specificities of 84.3% and 93.6%.

#### **CONCLUSIONS**

Calcifications in this study were found by ultrasonography in 15.7% of benign and 49.6% of malignant nodules. Although microcalcification is specific (93.6%) for malignancy in this study, the presence of other patterns of calcification (macrocalcifications, rim calcifications, undefined calcification) was found in malignant nodules. It was previously considered that macrocalcifications were usually benign and did not need evaluation or surgery. This and several other reports suggest that all calcifications raise concern for thyroid malignancy. Macrocalcifications in this study were found in 37% of benign nodules and 27% of malignant nodules. Peripheral or eggshell calcification was thought to suggest slow growth or lack of growth of a nodule, but several studies have demonstrated that disruption or thickening of the calcification was suggestive of malignancy.

### COMMENTARY • • • • • •

Calcifications can be found in both benign and malignant nodules. The most common thyroid cancer is papillary thyroid carcinoma and the most specific sonographic characteristic of this tumor is microcalcifications. But this article illustrates the expanding literature that macrocalcifications are also associated with malignancy, primarily papillary thyroid carcinoma (1-5). Macrocalcifications should not exclude a nodule from further investigation. This

was acknowledged by the latest ATA guidelines, with the recommendation that all nodular calcification should be assessed for malignancy.

In my practice, I continue to perform thyroid ultrasonography to help determine the target of biopsy but do not consider that macrocalcifications indicate that a nodule is benign and does not require biopsy.

— Stephanie L. Lee, MD, PhD

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### References

- 1. Cooper DS, Doherty GM, Haugen BR, et al. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. Thyroid 2009;19:1167-214.
- 2. Kim BM, Kim MJ, Kim EK, et al. Sonographic differentiation of thyroid nodules with eggshell calcifications. J Ultrasound Med 2008;27:1425-30.
- 3. Seiberling KA, Dutra JC, Grant T, et al. Role of intrathyroidal calcifications detected on ultrasound as a marker of malignancy. Laryngoscope 2004;114:1753-7.

- 4. Yoon DY, Lee JW, Chang SK, et al. Peripheral calcification in thyroid nodules: ultrasonographic features and prediction of malignancy. J Ultrasound Med 2007;26:1349-55.
- 5. Frates MC, Benson CB, Doubilet PM, et al Prevalence and distribution of carcinoma in patients with solitary and multiple thyroid nodules on sonography. J Clin Endocrinol Metab 2006;91:3411-17.