



## THYROID NODULES

### Shear wave elastography will differentiate benign from cancerous thyroid nodules

#### BACKGROUND

Thyroid nodules represent a common endocrine condition, being found in up to 50% of individuals on ultrasound. Most thyroid nodules are small and only 5-10% of thyroid nodules are cancerous. It is important to differentiate benign from cancerous thyroid nodules, and to avoid unnecessary surgery. Ultrasound-guided thyroid biopsy is currently the best choice to evaluate thyroid nodules. Thyroid biopsies can be easily and safely performed in the office. However, this procedure does result in local discomfort (usually minor) and it is costly, given the large number of procedures performed on a daily basis. Several studies have evaluated whether shear wave elastography, a non-invasive ultrasound method that measures tissue stiffness, can be used to differentiate between benign and cancerous thyroid nodules and avoid unnecessary thyroid biopsies. This study is a meta-analysis of studies using shear wave elastography (SWE) to differentiate benign from cancerous thyroid nodules.

#### THE FULL ARTICLE TITLE

Zhang B et al. Shear wave elastography for differentiation of benign and malignant thyroid nodules: a meta-analysis. *J Ultrasound Med* 2013;32:2163-9.

#### SUMMARY OF THE STUDY

An extensive medical literature search for studies published between September 2009 and September 2012 found five studies which met the criteria to be included in this meta-analysis. The meta-analysis included a total of 469 subjects with 698 nodules. Based on the biopsy and/or surgical pathology results, 568 nodules were

benign, while 130 nodules were cancerous. Three studies included patients who underwent thyroid surgery and had a final pathologic diagnosis. In two studies, those patients with suspicious or malignant biopsy results underwent thyroid surgery. SWE had a pooled sensitivity of 84% and specificity of 90% with a diagnostic accuracy of 92% to differentiate benign from cancerous thyroid nodules. There was a wide range for the cutoff values, therefore, a threshold recommendation between benign and cancerous thyroid nodules could not be provided from this study. However, 3% of nodules that SWE classified as benign were misdiagnosed nodules representing papillary cancers..

#### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

SWE is a non-invasive ultrasound method that can be used to complement conventional ultrasound to differentiate benign from cancerous thyroid nodules and avoid the more invasive and costly biopsy in a large number of patients. Further large studies to determine the threshold and efficacy of this method between benign and cancerous thyroid nodules are needed.

— Alina Gavriła, MD, MMSC

#### ATA THYROID BROCHURE LINKS

Thyroid Nodules: <http://www.thyroid.org/what-are-thyroid-nodules>

Thyroid Cancer: <http://www.thyroid.org/cancer-of-the-thyroid-gland>

Thyroid Surgery: <http://thyroid.org/patients/patient-brochures/surgery.html>

#### ABBREVIATIONS & DEFINITIONS

**Meta-analysis:** a study that combines and analyzes the data from several other studies addressing the same research hypothesis.

**Thyroid nodule:** an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (benign), ~5% are cancerous (malignant).

**Thyroid ultrasound:** a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses sound waves to create a picture of the structure of the thyroid gland and accurately identify and characterize nodules within the thyroid. Ultrasound is also frequently used to guide the needle into a nodule during a thyroid nodule biopsy.



## THYROID NODULES, continued

**Shear wave elastography:** an ultrasound technique used to measure the stiffness of a thyroid nodule. Cancerous nodules are stiffer than benign nodules.

**Thyroid fine needle aspiration biopsy (FNA):** a simple procedure that is done in the doctor's office to determine if a thyroid nodule is benign (non-

cancerous) or cancer. The doctor uses a very thin needle to withdraw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.

**Papillary thyroid cancer:** the most common type of thyroid cancer.

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