



## THYROID CANCER

### Rate of nodule growth on surveillance ultrasound predicts risk of cancer

#### BACKGROUND

Thyroid nodules are very common, occurring in up to 50% of individuals in the US. The vast majority of nodules (~95%) are non-cancerous (benign). Nodules are evaluated by ultrasound and, on the basis of nodule size and ultrasound characteristics, are selected for thyroid biopsy. Nodules that have benign biopsy results still need to be followed by ultrasound periodically (ultrasound surveillance) and nodules that significantly grow need to undergo a 2nd biopsy to ensure the initial biopsy did not miss a cancer. That being said, cancer is still rare in growing nodules that have had a prior benign biopsy. However, nodule growth alone is not very specific to identify a cancer as low-risk thyroid cancers may remain stable for several years. Indeed, some studies suggest that certain smaller nodules that are cancerous may not require surgery immediately and can also be followed by ultrasound. To help sort this out, the current study compared the rate of nodule growth between nodules with benign and cancerous cytology during ultrasound surveillance.

#### THE FULL ARTICLE TITLE

Angell TE et al. Differential growth rates of benign versus malignant thyroid nodules. *J Clin Endocrinol Metab.* October 12, 2017

#### SUMMARY OF THE STUDY

This study followed patients who underwent a thyroid nodule biopsy at Brigham and Women's Hospital during the period 1995–2014. Nodules  $\geq 1$  cm were included if repeat ultrasound examinations were performed at least 1 year apart for benign nodules and at least 6 months apart for cancerous nodules. Nodules were classified as benign on the basis of cytology results alone, while cancerous nodules were confirmed following surgical removal. Patients with cancerous nodules did not undergo immediate surgery for several possible reasons: (a) a delay between initial ultrasound and biopsy, (b) initial non-diagnostic or indeterminate cytology results that were

ultimately repeated with a cancerous result, and (c) other higher-priority medical conditions. Nodule growth was defined as  $>2$  mm/year or according to American Thyroid Association (ATA) criteria ( $>20\%$  increase in two nodule dimensions or  $>50\%$  increase in nodule volume). The main outcome was growth rate of the largest nodule dimension compared between benign and malignant nodules.

Of the 1363 benign nodules and 126 cancerous nodules included in the study, the average follow-up between ultrasound examinations was 21.8 months for benign nodules and 20.9 months for cancerous nodules. Patients with benign nodules, as compared with cancerous nodules, were older (52 vs. 49 years) and more likely to be female (90% vs. 84%), but there was no difference in average nodule size (1.7 cm).

Growth of  $>2$  mm/year was observed in 12% of benign nodules and 26% of cancerous nodules. When applying the ATA criteria for significant nodule growth, a  $>20\%$  increase in at least two dimensions was observed in 14% of benign nodules and 25% of cancerous nodules. Nodule growth  $>2$  mm/year was found to be an independent risk factor for cancer. Importantly, 88% of benign nodules and 74% of cancerous nodules either grew  $<2$  mm/year or did not grow at all.

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

This study shows that cancerous nodules are ~2-fold more likely to grow 2 or more mm/year than benign nodules. It is reasonable to continue with this growth criteria to identify whether a nodule with a prior benign biopsy would be biopsied a 2nd time. More importantly, most nodules, whether they are benign or cancerous, either are stable or grown  $<2$  mm/year. This is helpful in the long term management of thyroid nodules.

— Alan. P. Farwell, MD, FACE





## THYROID CANCER, continued

### ATA THYROID BROCHURE LINKS

Thyroid Nodules: <https://www.thyroid.org/thyroid-nodules/>

Fine Needle Aspiration Biopsy of Thyroid Nodules: <https://www.thyroid.org/fna-thyroid-nodules/>

Thyroid Cancer (Papillary and Follicular): <https://www.thyroid.org/thyroid-cancer/>

### ABBREVIATIONS & DEFINITIONS

**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.

**Thyroid Ultrasound:** a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves 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 biopsy:** 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.

**Non-diagnostic thyroid biopsy:** this happens when some atypical cells are found but not enough to provide a diagnosis. This occurs in 5-10% of biopsies. This often results in the need to repeat the biopsy.

**Indeterminate thyroid biopsy:** this happens a few atypical cells are seen but not enough to be abnormal (atypia of unknown significance (AUS) or follicular lesion of unknown significance (FLUS)) or when the diagnosis is a follicular or hurthle cell lesion. Follicular and hurthle cells are normal cells found in the thyroid. Current analysis of thyroid biopsy results cannot differentiate between follicular or hurthle cell cancer from noncancerous adenomas. This occurs in 15-20% of biopsies and often results in the need for surgery to remove the nodule.

