



## THYROID NODULES

# Core needle biopsy does not prevent the need for thyroid surgery in indeterminate thyroid nodules

### BACKGROUND

Thyroid nodules are very common, occurring in up to 50% of the population. The concern with thyroid nodules is whether they are cancerous, which is the case in 5-7% of nodules. Ultrasound is the common first step when a nodule is found on physical exam or identified by other imaging tests such as CT or MRI scans. Although ultrasound can identify thyroid nodule characteristics suggestive of thyroid cancer, most thyroid nodules are less clear. The most accurate way to determine if a thyroid cancer is present is to perform a fine needle aspiration biopsy, a minor procedure in which a fine needle is inserted into a thyroid nodule and cells from the nodule are removed through the needle. A pathologist, a doctor specializing in disease diagnosis through tissue sample analysis, then reviews these cells.

In up to 25% of biopsies, a diagnosis cannot be determined by looking at the cells alone. This is known as an indeterminate biopsy result. There are 3 categories for indeterminate nodules: 1) atypia of unknown significance or follicular lesion of unknown significance (AUS/FLUS), 2) follicular or hurtle cell lesion and 3) suspicious for papillary cancer. The likelihood for cancer is the lowest in the AUS/FLUS category. The use of molecular markers has greatly helped in the diagnosis of indeterminate nodules, as a negative result is consistent with a benign nodule. However, these tests are expensive and may not be available everywhere. Prior to the development of molecular markers, the recommendation was to repeat a biopsy and, if still indeterminate, proceed with surgery to remove the lobe containing the nodule. Some studies suggest repeating a biopsy with a core needle, which is a larger needle that will remove more cells for analysis than the usual fine needle, may be helpful in evaluating indeterminate nodules. The purpose of this study was to compare the accuracy of fine needle vs core needle biopsies for the diagnosis of thyroid cancer in the evaluation of the AUS/FLUS category of indeterminate nodules.

### THE FULL ARTICLE TITLE

Yoon JH et al 2019 Ultrasonography-guided core needle biopsy did not reduce diagnostic lobectomy for thyroid nodules diagnosed as atypia of undetermined significance/follicular lesion of undetermined significance. Ultrasound Q. Epub 2019 Feb 4. PMID: 30724862.

### SUMMARY OF THE STUDY

In this study, the authors evaluated every indeterminate biopsy result that fell into the ACUS/FLUS category from their institution that over a two-year period (2013-2015). They ultimately identified 149 ACUS/FLUS cases for which repeat biopsy was performed, either using fine needle (86 cases) or core needle (63 cases). In comparing the biopsy groups, the authors found the following: 1) The core needle technique was more likely to provide an adequate sample for analysis (98.4% vs. 88.4%), 2) A similar numbers of ACUS/FLUS cases were found to be benign for each group (55.6% core needle vs 50% fine needle), 3) 3.5% of repeat biopsies were identified as cancerous for the fine needle group as compared to 11.1% of the core needle group, 4) of the thyroid surgeries performed for each group, 73% in the fine needle group were confirmed cancers as compared to 65% of core needle cases and 5) core needle biopsies had a higher rate of minor complications as compared to fine needle biopsies (6.3% vs 0%).

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Although this study is quite small, with relatively few patients ultimately undergoing surgery in each group, the authors found that core needle biopsy was somewhat better at identifying thyroid cancer in patients having had a previous ACUS/FLUS biopsy. However, because a significant number of biopsies in each group still showed indeterminate findings (not clearly cancerous or benign), the need for thyroid surgery was not reduced in the core needle group. In fact, the surgery rate for this group





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was somewhat higher as compared to the fine needle group. In addition, the risk of complications from a core needle biopsy was significantly higher than in the fine needle biopsies, which is why the latter is the standard

biopsy technique for thyroid nodules. Overall, this study therefore does not support use of core needle biopsies in the evaluation of thyroid nodules.

— Jason D. Prescott, MD PhD

### 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/>

Thyroid Surgery: <https://www.thyroid.org/thyroid-surgery/>

### 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 fine needle aspiration biopsy (FNAB):** 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.

**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 surgery is recommended to remove the nodule.

**Lobectomy:** surgery to remove one lobe of the thyroid.

**Molecular markers:** genes and microRNAs that are expressed in benign or cancerous cells. Molecular markers can be used in thyroid biopsy specimens to either to diagnose cancer or to determine that the nodule is benign. The two most common molecular marker tests are the Afirma™ Gene Expression Classifier and Thyroseq™

