



THYROID NODULES

Factors predicting thyroid surgery in patients with indeterminate thyroid nodules with a ‘benign’ molecular test result

BACKGROUND

Thyroid nodules are commonly found on imaging tests such as ultrasound and CT scans of the neck. Fine needle aspiration biopsy of thyroid nodules may be recommended based on the level of suspicion of cancer as a result of their appearance. However, sometimes, fine needle aspiration biopsies are inconclusive (i.e. indeterminate) and this may prompt molecular testing of the nodule in seeking additional information on the potential risk of cancer in the nodule. Some examples of molecular tests used for indeterminate thyroid nodules are the Afirma™ gene sequencing classifier and a previously developed Afirma™ gene expression classifier. The clinical implication of a ‘benign’ result of molecular testing would be that a nodule may be less likely to be a cancer and that thyroid surgery may potentially be avoided.

In this study, the authors examined how often patients with an indeterminate thyroid nodule biopsy result and a ‘benign’ result on an Afirma™ molecular test underwent thyroid surgery. The main analysis examined risk factors predicting the time from the biopsy to thyroid surgery.

THE FULL ARTICLE TITLE

Endo M et al 2020 Features of cytologically indeterminate molecularly benign nodules treated with surgery. *J Clin Endocrinol Metab* 105:dga506. PMID: 32772084.

SUMMARY OF THE STUDY

The authors reviewed the medical records of patients from Ohio State University Medical Center who had one or more thyroid nodules with an indeterminate biopsy result and who underwent an Afirma™ molecular test between

February of 2011 and December of 2018. The authors included in the study only the patients with a ‘benign’ result on molecular testing.

The authors examined data from 270 patients (including results of 289 nodules). During the study, 37 patients (13.7% of the 270) underwent thyroid surgery. These 37 patients had 38 nodules that were studied. For the 37 patients who underwent surgery, the range of time from biopsy to surgery was 0.4 to 45.7 months. Of the 37 patients who had surgery, 13.5% (5/37) of patients were found to have thyroid cancer.

In a statistical analysis adjusting for multiple possible features, the risk factors that were significantly related to ultimately having surgery included: presence of another nodule that had a ‘suspicious’ for cancer result on the molecular test, having compressive symptoms (in the neck), nodule size 3cm or larger and age younger than 40 years.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The main conclusion is that risk factors for thyroid surgery in patients who have an indeterminate thyroid biopsy with a ‘benign’ result on a molecular test include: presence of another nodule with a ‘suspicious’ molecular test result, compressive symptoms, larger nodule size, and younger age. These findings suggest that in spite of a ‘benign’ molecular test result, other factors may be important to patients and physicians in deciding whether to proceed with surgery for an indeterminate thyroid nodule.

— Anna Sawka, MD, PhD, FRCPC

ATA THYROID BROCHURE LINKS

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





THYROID NODULES, continued

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 results in the need for surgery to remove the nodule.

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™.

Thyroidectomy: surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a total thyroidectomy. When less is removed, such as in removal of a lobe, it is termed a partial thyroidectomy.