



THYROID CANCER

Cancer rates in children with indeterminate thyroid nodules

BACKGROUND

Thyroid nodules are uncommon in children; however, the risk of cancer in a thyroid nodule is higher when compared to adults. As in adults, thyroid biopsy and cytology are used to evaluate thyroid nodules. Approximately 35% of thyroid nodules in children are reported as indeterminate by biopsy. Indeterminate thyroid nodules include classification groups: 1) atypia of undetermined significance/follicular lesion of undetermined significance (AUS/FLUS); 2) follicular neoplasm/suspicious for a follicular neoplasm (FN/SFN); and 3) suspicious for a malignancy (SM). In children, cancer rates have been reported to be 28% in nodules with AUS/FLUS cytology, 58% in FN/SFN, and 100% in SM. In contrast, recent data in adults suggest cancer rates of 6 to 18% for AUS/FLUS, 10 to 40% for FN/SFN, and 45 to 60% for SM.

The current American Thyroid Association guidelines recommend removal of the entire thyroid gland (thyroidectomy) or removal of one lobe of the thyroid (lobectomy) in children with indeterminate thyroid nodules. The objective of this study is to evaluate the cancer rate for indeterminate thyroid nodules in pediatrics.

THE FULL ARTICLE TITLE

Wang H et al Incidence and malignancy rates of indeterminate pediatric thyroid nodules. *Cancer Cytopathology*. Epub 2019 Feb 15. PMID: 30768868.

SUMMARY OF THE STUDY

This study analyzed 302 thyroid biopsies in patients less than or equal to 21 years of age at the time of the

biopsy. A total of 41 nodules (14%) were reported as indeterminate and 104 nodules were surgically removed. Cancer rates were determined for different classifications of thyroid nodules. Cancer was reported in 3 of the 15 (20%) of the AUS/FLUS nodules, 2 of the 8 (25%) with FN/SFN, and 5 of the 5 (100%) diagnosed as SM.

The authors also reviewed 6 previously published studies on thyroid biopsies in children and found similar results. When adding this study to the 6 others, the data showed an average rate of indeterminate thyroid nodules of 20%. The rate of cancer was different for the various types of indeterminate nodules. Thus, the rates of indeterminate nodules in pediatrics and rates of cancer for indeterminate nodules may be lower than previously reported.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This largest study to date of thyroid nodules in children suggests that the rate of cancer is lower than previously reported for indeterminate thyroid nodules in children and more specific management may be needed compared to the current recommendations of up-front surgery for these nodules. This study did not include evaluation of molecular markers in the indeterminate nodules, as is common practice in adults with indeterminate nodules. Thus, adding molecular marker analysis to a study such as this would be helpful to guide management of these nodules.

—Priya Mahajan, MD

ATA THYROID BROCHURE LINKS

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

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

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





THYROID CANCER, 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 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.

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.

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 or lobectomy.

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™.

