



THYROID NODULES

A review of the diagnostic accuracy of thyroid fine needle aspiration biopsy

BACKGROUND

Thyroid nodules are very common and often need to be evaluated for cancer. While most thyroid nodules are non-cancerous, ~5% are cancerous. Fine needle aspiration biopsy is the best test for diagnosing cancer outside of surgery. Although most of the time the thyroid biopsy provides an accurate diagnosis, sometimes the results can be inconclusive. Also, rarely a biopsy result may be incorrect and be read as cancerous when no cancer is present or read as benign when a cancer actually is present. This study examined the accuracy of the thyroid fine needle aspiration biopsy in diagnosing thyroid cancer. The authors compared the biopsy results with the pathology results after the surgical removal of thyroid nodules in their own patients and in other published studies. They also examined how often local pathologists and experts who also reviewed the specimens agreed on the diagnosis for the surgical specimens.

THE FULL ARTICLE TITLE

Wang CC et al. A large multicenter correlation study of thyroid nodule cytopathology and histopathology. *Thyroid* 2011;21:243-51.

SUMMARY OF THE STUDY

Four cytologic categories were used to report the biopsy results: benign, malignant (cancerous), indeterminate and non-diagnostic. The study included 753 biopsies: 80% were categorized as benign, 7% as malignant, 8% as indeterminate and 5% as non-diagnostic. Among the 112 thyroid nodules that were surgically removed, the following were diagnosed with cancer: 11% of the nodules with benign cytology on FNAB, 98% of the nodules with malignant cytology, 34% of the nodules with indeterminate cytology and none of the nodules with non-diagnostic cytology.

Similar results were obtained in the review of 11 other studies including a total of 17,059 patients who underwent thyroid biopsy. Among the 8,937 patients who

proceeded with thyroid surgery based on the biopsy result, the cancer rate was 12% in the benign category, 97% in the malignant, 25-62% in the indeterminate and 12% in the non-diagnostic category.

Two expert pathologists reviewed the surgical specimens from 221 resected thyroid nodules in addition to the local pathologist to determine whether the specimens were benign or malignant. In 8-11% disagreement was noted between the diagnoses reported by experts compared to local pathologists when diagnosing the thyroid nodules as being benign or malignant.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Non-diagnostic and indeterminate thyroid biopsy results remain a challenge when evaluating patients with thyroid nodules. For example, most of the patients with biopsies in the indeterminate cytology results will undergo surgery for a definitive diagnosis, however, two thirds of these thyroid nodules are benign. Approximately 25% of the patients with biopsies that are indeterminate decide not to undergo thyroid surgery and thyroid cancer can be missed in this situation. Therefore, we need to further improve the biopsy diagnostic accuracy. Current research is looking into several areas to improve the diagnostic accuracy of biopsies. However, it is important to remember that the thyroid biopsy remains the best test to determine which patients will benefit the most from thyroid surgery.

— Alina Gavrila, MD

ATA THYROID BROCHURE LINKS

Thyroid Nodules: http://thyroid.org/patients/patient_brochures/nodules.html

Thyroid Cancer: http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html

Thyroid Surgery: http://thyroid.org/patients/patient_brochures/surgery.html

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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 (malignant).

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 malignant (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/Insufficient thyroid biopsy: this happens when not enough cells are obtained during the biopsy to provide a diagnosis and often results in the need to repeat the biopsy. This occurs in 5-10% of biopsies.

Indeterminate thyroid biopsy: this happens usually 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 and have a definitive diagnosis.