



## THYROID CANCER

### Thyroid cancer diagnosed by fine needle aspiration biopsy is associated with younger age, male gender and solitary nodules

#### WHAT IS THE STUDY ABOUT?

Thyroid nodules are very common and can be found in up to 50% of the population. The possibility that a nodule contains a thyroid cancer is 5-8%. Most thyroid cancers are discovered by fine needle aspiration biopsy (FNAB) of thyroid nodules. While FNAB is a very accurate test, there are occasional cancers that are missed with the initial biopsy cytology reading. Further, FNAB cannot diagnose follicular or hurtle cell cancer; it can only state that the results are indeterminate or non-diagnostic. Up to 20-25% of FNABs are reported as being indeterminate or non-diagnostic. When these nodules are removed, only 15-20% are cancerous and the rest are noncancerous follicular or hurtle cell adenomas. This means that many patients are operated on for non-cancerous thyroid nodules. A lot of research has been done in trying to do a better job in diagnosing all thyroid cancers with FNAB. This study sought to evaluate potential risk factors for prediction of thyroid cancer in thyroid FNAB samples.

#### THE FULL ARTICLE TITLE:

Rago et al. Male sex, single nodularity, and young age are associated with the risk of finding a papillary thyroid cancer on fine-needle aspiration cytology in a large series of patients with nodular thyroid disease. *European J. Endocrinology*. 2010; 162: 763-770.

#### WHAT WAS THE AIM OF THE STUDY?

The aim of the study was to determine clinical risk factors associated with thyroid cancer, specifically papillary thyroid cancer.

#### WHO WAS STUDIED?

A total of 34,266 patients who underwent FNAB of one or more thyroid nodules in the Department of Endocrinology at the University of Pisa, Italy between 1997 and 2004 were studied.

#### HOW WAS THE STUDY DONE?

The records of the patients were examined and clinical, radiologic, and laboratory data were analyzed. Thyroid function tests, as well as pathology of the FNAB, were

determined and correlations were made with clinical characteristics. Potential clinical risk factors predictive of papillary thyroid cancer on FNAB were determined.

#### WHAT WERE THE RESULTS OF THE STUDY?

A total of 47,775 nodules in 34,266 subjects were assessed by FNAB. Most of the nodules (74.7%) were benign. A smaller number of nodules were determined to be indeterminate (5.7%) or nondiagnostic (17.1%). Approximately two percent (2.4%) of the nodules were suspicious or consistent with papillary thyroid cancer. All nodules indicative of cancer on FNAB were confirmed on surgical pathology to be cancer, as were >98% of nodules suspicious for cancer on FNAB.

Several clinical characteristics were found to be associated with the diagnosis of papillary thyroid cancer. These clinical features included male gender, presence of a single nodule and age, with papillary thyroid cancer being more common in younger subjects. Further, patients with papillary thyroid cancer had a higher TSH than those with benign thyroid nodules.

#### HOW DOES THIS COMPARE WITH OTHER STUDIES?

This study is one of the largest series of patients with thyroid nodules in the literature and the results are consistent with previous studies. As with prior studies, this study confirms the overall excellent diagnostic accuracy of the FNAB for assessment of thyroid nodules. The rates of indeterminate or nondiagnostic FNAB results of approximately 20% are also consistent with the published literature on this topic. This study also confirms risk factors thought to be associated with increased risk of thyroid cancer.

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

This study suggests that male gender, younger age and solitary nodules are more likely to be associated with thyroid cancer. These investigators have developed an

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## THYROID CANCER, continued

algorithm for predicting the risk of papillary thyroid cancer in a thyroid nodule when the FNAB does not definitively confirm the diagnosis. This study contributes importantly to our understanding of nodular thyroid disease and prediction of risk for thyroid cancer.

— Whitney Woodmansee, MD

## ATA THYROID BROCHURE LINKS

Thyroid Nodules: [http://thyroid.org/patients/patient\\_brochures/nodules.html](http://thyroid.org/patients/patient_brochures/nodules.html)

Thyroid cancer: [http://thyroid.org/patients/patient\\_brochures/cancer\\_of\\_thyroid.html](http://thyroid.org/patients/patient_brochures/cancer_of_thyroid.html)

## ABBREVIATIONS & DEFINITIONS

**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 usually when the diagnosis is a follicular or hurtle cell lesion. Follicular and hurtle cells are normal cells found in the thyroid. Current analysis of thyroid biopsy results

cannot differentiate between follicular or hurtle cell cancer from noncancerous adenomas. This occurs in 15-20% of biopsies and often results in the need for surgery to remove the nodule.

**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.

**TSH: thyroid stimulating hormone** — produced by the pituitary gland that regulates thyroid function; also the best screening test to determine if the thyroid is functioning normally.