



THYROID NODULES

A negative FDG-PET scan excludes the diagnosis of cancer in thyroid nodules with non-diagnostic cytology

BACKGROUND

Thyroid nodules are very common and raise the possibility of thyroid cancer. Fine needle aspiration biopsy (FNAB) is the best test to determine whether a thyroid nodule is cancerous outside of surgery. In some cases, the FNAB is described as “non-diagnostic” by the pathologist, meaning that they are unable to provide information about the nodule, usually because there was not enough material obtained during the biopsy. These patients may need to undergo repeat biopsy or surgery to determine if the nodule is actually cancerous. ¹⁸F-2-fluoro-2-deoxy-d-glucose-positron emission tomography (FDG-PET), which is commonly used in the evaluation of cancer, has been studied with regard to its role in thyroid nodules. The authors of this study looked at existing studies to determine if FDG-PET would be helpful in determining if patients with a non-diagnostic FNAB have thyroid cancer.

THE FULL ARTICLE TITLE:

Giovanella L. et al. ¹⁸FDG-positron emission tomography/computed tomography (PET/CT) scanning in thyroid nodules with nondiagnostic cytology. *Clin Endocrinol* 2011;74:644-8.

SUMMARY OF THE STUDY

The authors looked at 151 patients that had non-diagnostic results on FNAB. The FNAB was repeated in these patients and 88 of the 151 patients had a non-diagnostic second biopsy. All of these patients underwent an FDG-PET scan followed by surgery to remove the lobe of the thyroid that contained the nodule. All 29 patients with cancer had a positive FDG-PET scan. Of the 59 patients with a benign nodule, 35 patients had a negative FDG-PET scan and the other 24 had a positive FDG-PET scan. This means that if surgery was based solely on the FDG-PET scan, then 40%

of patients with non-diagnostic results on FNAB would not have needed surgery.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study showed that a negative FDG-PET scan in patients with non-diagnostic FNAB results rules out the diagnosis of thyroid cancer. Conversely, while a positive FDG-PET scan was found in all thyroid cancers, over half of the positive scans were produced by benign thyroid nodules. This study is similar to the article in the July issue of *Clinical Thyroidology for Patients*, which looked at the role of FDG-PET scanning of patients with FNAB findings that are indeterminate. (http://thyroid.org/patients/ct/volume4/issue6/ct_patients_v46_3_4.html)

As the cost of FDG-PET scans is currently high, this test is unlikely to be routinely performed as part of the work-up of thyroid nodules. But as the cost comes down, there may be a role in for FDG-PET in patients with thyroid nodules with a non-diagnostic and indeterminate FNAB to rule out thyroid cancer and potentially avoid surgery in a large number of patients.

— Ronald Koppersmith, MD

ATA THYROID BROCHURE LINKS

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

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

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

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THYROID NODULES, continued

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.

¹⁸F-2-Fluoro-2-Deoxy-d-Glucose-Positron Emission Tomography (FDG-PET): is a scan that is commonly performed to determine whether metastatic cancer is present or after treatment to determine the resolution of certain cancers. Its' role in thyroid cancer is still being studied.

Non-Diagnostic Thyroid Biopsy: this happens when there are not enough thyroid cells or atypical cells obtained during the biopsy to provide a diagnosis. This occurs in 5-10% of biopsies. This often results in the need to repeat the biopsy.

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.