



THYROID CANCER

A negative FDG-PET scan excludes the diagnosis of cancer in thyroid nodules >15 mm diameter

BACKGROUND

Thyroid nodules are very common and raise the possibility of thyroid cancer. Fine needle aspiration biopsy is the best test to determine whether a thyroid nodule is cancerous outside of surgery. However, in 10-15% of biopsies, the cytology is unable to provide a definite answer, meaning that 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) scanning, which is commonly used in the evaluation of cancer, has been studied by multiple authors with regard to its role in thyroid nodules. The authors of this study looked at existing studies to determine if FDG-PET scanning would be helpful in determining if patients with an indeterminate biopsy result have thyroid cancer.

THE FULL ARTICLE TITLE:

Vriens D et al. The role of [(18) F]-2-fluoro-2-deoxy-d-glucose-positron emission tomography in thyroid nodules with indeterminate fine-needle aspiration biopsy: Systematic review and meta-analysis of the literature. *Cancer*. March 22, 2011. [Epub ahead of print]. doi: 10.1002/cncr.26085.

SUMMARY OF THE STUDY

The authors searched the medical literature and found 6 studies comprising 225 patients that examined the role of FDG-PET scanning in thyroid nodules. The FDG-PET scan was positive in 63% of cases, but only 48% of these had a cancer, meaning that majority of the patients with a positive FDG-PET did not have thyroid cancer. When the authors limited the evaluation to thyroid nodules >15 mm, all of the cancers had a positive FDG-PET scan, but still the majority of patients with a positive test result did

not have thyroid cancer. Thus, while a positive FDG-PET scan did not diagnose cancer, a negative FDG-PET ruled out cancer in the nodule.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study showed that a negative FDG-PET scan in patients with thyroid nodules >15 mm with indeterminate thyroid biopsy results excludes the diagnosis of thyroid cancer. 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 scanning in patients with a thyroid nodule greater than 15 mm with an indeterminate biopsy to rule out thyroid cancer and potentially avoid surgery for the purpose of making a diagnosis.

Also, as FDG-PET scan is commonly performed in patients with other types of cancer, finding a thyroid lesion that is positive is not diagnostic of thyroid cancer. Nonetheless, there is at least a 48% percent chance that such a thyroid lesion could be cancerous. It is important for a patient who has a thyroid mass identified by FDG-PET scan to be properly evaluated like any other nodule.

— Ronald Kuppersmith, MD

ATA THYROID BROCHURE LINKS

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

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

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THYROID CANCER, 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): a nuclear medicine imaging test that uses a small amount of radiolabeled glucose to identify cancer. Since cancer cells are more active

than normal cells, the cancer cells take up more of the radiolabeled glucose and show up on the FDG-PET scan. FDG-PET scans are frequently combined with CT scans to accurately identify where the cancer is located. Its role in thyroid cancer is still being studied.

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.