



THYROID CANCER

PET scans are superior to radioactive iodine whole-body scanning in localizing recurrent or persistent thyroid carcinoma

BACKGROUND

The majority of patients with thyroid cancer do well after their initial treatment and are cured. However, many will have a recurrence of their cancer, usually discovered as an increase in the level of serum thyroglobulin or thyroglobulin antibody or an abnormal lymph node on neck ultrasound during a routine follow up. Frequently, an increase thyroglobulin is associated with a negative neck ultrasound, so the question is, where is the cancer? One option is to simply re-treat with radioactive iodine, using the post-treatment whole body scan (WBS) to localize and treat the disease. More recently, positron emission tomography/computed tomography (PET/CT) scanning has proven valuable in identifying cancer that has spread outside of the neck. This study compares the sensitivity of post-treatment WBS to 18-fluorodeoxyglucose PET/CT (FDG PET/CT) in localizing persistent or recurrent thyroid cancer.

THE FULL ARTICLE TITLE

Leboulleux et al. Postradioiodine treatment whole-body scan in the era of 18-fluorodeoxyglucose positron emission tomography for differentiated thyroid carcinoma with elevated serum thyroglobulin levels. *Thyroid*. 22:8:832-838.

SUMMARY OF THE STUDY

A total of 34 patients with recurrent thyroid cancer were referred for empiric radioactive iodine therapy and also underwent FDG PET/CT scanning. A total of 23 of these patients had persistently elevated thyroglobulin levels, 10 had elevated thyroglobulin levels observed during follow-up after having had initially low thyro-

globulin levels and 1 had the appearance of thyroglobulin antibodies during follow-up. Post-treatment WBS and FDG PET/CT were analyzed by independent readers. A total of 75 lesions were found in 23 patients: 30 in the neck, 28 in the lungs, 11 in the mediastinum and 6 in bone. FDG PET/CT revealed the lesions in 22 patients, 5 of whom also had abnormal post-treatment WBS. Only one patient had an abnormal post-treatment WBS with a normal FDG PET/CT. Based on these data, the authors conclude that FDG PET/CT, rather than post-treatment WBS, is the preferred method to localize disease in patients with thyroid cancer suspected of having recurrent or persistent disease based on thyroglobulin levels or positive thyroglobulin antibodies.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The greater success of FDG PET/CT in localizing persistent or recurrent thyroid cancer compared to post-treatment WBS favors the use of FDG PET/CT to localize disease in patients suspected of having persistent or recurrent cancer. This is an important tool to help in the diagnosis of metastatic cancer in the patient with an increasing thyroglobulin level and no evidence of disease on neck ultrasound.

— Frank Crantz, MD

ATA THYROID BROCHURE LINKS

Cancer of the Thyroid: <http://www.thyroid.org/cancer-of-the-thyroid-gland/>

Radioactive Iodine: <http://www.thyroid.org/radioactive-iodine/>

ABBREVIATIONS & DEFINITIONS

Thyroglobulin: a protein made only by thyroid cells, both normal and cancerous. When all normal thyroid tissue is destroyed after radioactive iodine therapy in patients with thyroid cancer, thyroglobulin can be used as a thyroid cancer marker in patients who do not have thyroglobulin antibodies.

Thyroid ultrasound: a common imaging test used to evaluate the structure of the thyroid gland. Ultrasound uses soundwaves to create a picture of the structure of the thyroid gland and accurately identify and characterize nodules within the thyroid. Ultrasound is also frequently used to guide the needle into a nodule during a thyroid nodule biopsy.

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THYROID CANCER, continued

Positron-emission-tomography (PET) scans: 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 PET scan. PET scans are frequently combined with CT scans to accurately identify where the cancer is located.

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.

Radioactive iodine (RAI): this plays a valuable role in diagnosing and treating thyroid problems since it is taken up only by the thyroid gland. I-131 is the destructive form used to destroy thyroid tissue in the treatment of thyroid cancer and with an overactive thyroid. I-123 is the non-destructive form that does not damage the thyroid and is used in scans to take pictures of the thyroid (Thyroid Scan) or to take pictures of the whole body to look for thyroid cancer (Whole Body Scan).

Post-radioactive iodine whole body scan (post-RAI WBS): the scan done after radioactive iodine treatment that identifies what was treated and if there is any evidence of metastatic thyroid cancer.