



THYROID CANCER

Is I-124 PET/CT useful in identifying thyroid cancer that may take up radioactive iodine?

BACKGROUND

In patients who have had surgery (total thyroidectomy) for thyroid cancer, diagnostic whole body radioactive iodine (I-123 or I-131) scans are used to look for residual normal thyroid tissue or recurrent thyroid cancer that may be treated with radioactive iodine therapy. However, sometimes thyroid cancer lesions may be missed on traditional diagnostic radioactive iodine scans. In this study, a systematic review of the literature and pooled analysis of published data was performed, to determine how effective I-124 PET/CT is in identifying thyroid cancer lesions that may be able to be treated with radioactive iodine, as confirmed by a post-therapy scan (after radioactive iodine treatment).

THE FULL ARTICLE TITLE

Santhanam P et al. Utility of I-124 PET/CT in identifying radioiodine avid lesions in differentiated thyroid cancer: a systematic review and meta-analysis. *Clin Endocrinol (Oxf)* 2017 May;86:645-51. Epub February 28, 2017.

SUMMARY OF THE STUDY

The authors did an electronic search of MEDLINE/PUBMED and EMBASE databases for relevant articles on the use of “I-124” and “differentiated thyroid cancer”, and then reviewed 118 published reports. The authors included 8 studies that met their criteria for the review. In these studies, I-124 PET/CT scans were performed prior to radioactive iodine treatment and the results were compared to the post-therapy scans. The authors included data from a total of 141 patients and 415

thyroid cancer lesions. The authors reported that there was significant variability among included studies with respect to variables such as radioactive iodine treatment dose activity and diagnostic scanning techniques. The authors combined the data from the reviewed studies and reported that the following pooled diagnostic accuracy data for I-124 PET/CT in detection of thyroid cancer lesions. The results show that the sensitivity 94.2% and specificity 49.0% (34.8-63.4%)

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

The authors concluded that I-124 PET/CT is a sensitive technique to identify thyroid cancer lesions that may be able to respond to treatment by radioactive iodine. Further research confirming these findings is needed, ideally including larger numbers of patients and standardized techniques across studies. Moreover, more research is needed to determine whether the use of I-124 PET/CT to guide radioactive iodine treatment decisions may improve long-term patient outcomes. These findings may be important to patients as they demonstrate emerging evidence on the diagnostic accuracy of I-124/PET-CT scanning.

— Anna M. Sawka, MD

ATA THYROID BROCHURE LINKS

Thyroid Cancer (Papillary and Follicular): <https://www.thyroid.org/thyroid-cancer/>

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

ABBREVIATIONS & DEFINITIONS

Thyroidectomy: surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a total thyroidectomy. When less is removed, such as in removal of a lobe, it is termed a partial thyroidectomy.

Diagnostic Whole Body Scans: these radioactive iodine scans are performed under TSH stimulation, either after thyroid hormone withdrawal or after injections of recombinant human TSH (Thyrogen), and usually include measuring serum thyroglobulin levels.





THYROID CANCER, continued

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.

Test sensitivity: the proportion of patients with a certain disease in whom the test used to diagnose that disease is positive.

Test specificity: the proportion of patients without a certain disease in whom the test used to diagnose that disease is negative

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.

