

Evaluating the Role of Pretherapy Scans in Post-Thyroidectomy Thyroid Cancer Management: Predictive Value, Management Impact, and Efficacy

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Background:

Thyroid cancer management typically involves radioiodine ablation (RAI) therapy post-thyroidectomy to eliminate residual thyroid tissue and cancerous cells. Pretherapy imaging and dose selection are contentious subjects. This study evaluates the comparative effectiveness of different imaging modalities and doses.

Methods:

This retrospective IRB approved study included 98 thyroid cancer cases of patients who underwent ablation therapy from January 2022 onwards. Data was collected through the electronic health record system. Imaging studies were evaluated by 2 separate readers. 39 cases were excluded for imaging congruency due to the absence of SPECT/CT. Cure rate analysis excluded 15 cases due to missing post-ablation Tg levels. The data was stratified into N1b (metastasis to cervical lymph nodes) and non-N1b cancer.

Results

Results indicate that pretherapy planar and SPECT/CT imaging findings were congruent in the non-detection of extrathyroidal disease. Both I-123 and I-131 isotopes demonstrated high congruence with post-planar scans, with I-123 showing 85.48% congruency and I-131 showing 82.86% congruency.

Cure rates varied only minimally by RAI dosage with the highest cure rates observed in the 33-56 mCi range (92.31%) and the lowest in the 110+ mCi range (81.82%). In N1b cases, the highest cure rate was 100% in the 33-56 mCi range, while non-N1b cases showed the highest cure rate of 94.12% in the 56-110 mCi range.

Conclusions:

No advantage was found using SPECT/CT or I-123 for detecting extra-thyroidal diseases. Higher treatment doses beyond 110 mCi do not yield better outcomes.

Scientific/Clinical/Policy Impact and Implications:

The study's findings underscore important considerations regarding cost-effectiveness of imaging and appropriate dose section in thyroid cancer ablation management.