

# Serum Tg Before Radioiodine Ablation Is an Effective Predictor of Recurrence in High Risk Differentiated Thyroid Cancer Patients

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Piccardo A, Arecco F, Puntoni M, Foppiani L, Cabria M, Corvisieri S, Arlandini A, Altrinetti V, Bandelloni R, Orlandi F. Focus on high-risk DTC patients: high postoperative serum thyroglobulin level is a strong predictor of disease persistence and is associated to progression-free survival and overall survival. Clin Nucl Med 2013;38:18-24. doi: 10.1097/RLU.0b013e318266d4d8.

## SUMMARY ●●●●●●●●●●●●●●●●●●●●

### Background

Patients with differentiated thyroid cancer (DTC) classified as high risk by staging systems are more likely to have recurrent disease after their initial therapy, but the factors that stratify risk have not been quantified. The staging systems, such as TNM or MACIS, were developed to predict the risk of death rather than the recurrence of disease. The current study evaluates the positive predictive value (PPV) of serum thyroglobulin at the time of ablation (ablation Tg) for predicting recurrent or persistent thyroid cancer.

### Methods

Of 1894 patients with DTC treated from 1992 to 2010, a total of 243 were classified as high risk. Treatment included total thyroidectomy, remnant ablation with 100 mCi <sup>131</sup>I, and L-T<sub>4</sub> suppression therapy. Study exclusions were distant metastases at time of diagnosis, unknown lymph-node status (Nx), and positive Tg antibodies. Ablation Tg was measured before RAI ablation when serum TSH was >30 mU/L 4 to 6 weeks after surgery without replacement thyroid hormone therapy.

Patients were divided into four groups based on outcome: (A) complete remission after initial therapy (n = 149); (B) persistent disease after initial therapy and complete remission after further adequate treatment (surgery and/or <sup>131</sup>I administration) (n = 64); (C) persistent disease after initial therapy and progression

or stable disease after further adequate treatment (surgery and/or <sup>131</sup>I administration) (n = 19); and (D) persistent disease after initial therapy and fatal progression of disease after further adequate treatment (surgery and/or <sup>131</sup>I and/or radiotherapy (n = 11).

### Results

Median follow-up was 4 to 5 years (55 months) in the four groups. Ablation Tg increased significantly from group A to group D. Ablation Tg of 50 ng/ml or greater gave the highest PPV for recurrence, 0.97, of any clinical parameter, including tumor size, grade, lymph-node status, and MACIS score. The multivariate logistic model showed that only three parameters (ablation Tg, tumor dimension, and nodal status) were independently and significantly associated with disease persistence. Ablation Tg levels were the most important predictive and prognostic factor in terms of risk estimates, especially when comparing patients who had ablation Tg levels of 50 ng/ml or higher with patients in the lowest-level category (ablation Tg, <2 ng/ml). A total of 58 of 60 patients with ablation Tg of 50 ng/ml or greater had persistent disease; in contrast 126 of 136 patients who had ablation Tg <10 ng/ml had complete remission after initial therapy. The prognostic value of ablation Tg was also confirmed in Kaplan–Meier survival curves.

### Conclusions

Ablation Tg levels of 50 ng/ml or greater are a valuable initial predictor of disease persistence or recurrence in patients at high risk for DTC.

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### ANALYSIS AND COMMENTARY ● ● ● ● ●

The current study provides a valuable, easily measured indicator of disease recurrence in high-risk subjects, namely the serum Tg at the time of ablation when it is stimulated by TSH. Although the authors measured ablation Tg 4 to 6 weeks after surgery (without substitution therapy), which gives a more sustained elevation of serum TSH levels than recombinant TSH, the likelihood is that ablation Tg after recombinant TSH will be similarly useful.

The study confirmed that ablation Tg <10 ng/ml has a high negative predictive value (93%) for disease

recurrence in high-risk patients, as this group had reported previously for low-risk patients (1).

The study has some limitations, including the retrospective nature of the evaluation and the relatively short follow-up of 4 to 5 years for DTC. However, in the high-risk patients, this may be sufficient for evaluating recurrence.

This study will alter my practice by adding the measurement of ablation Tg to my routine management of patients with DTC in order to predict disease recurrence.

### Reference

1. Piccardo A, Arecco F, Morbelli S, et al. Low thyroglobulin concentrations after thyroidectomy increase the prognostic value of undetectable thyroglobulin levels on levo-thyroxine suppressive treatment in low-risk differentiated thyroid cancer. *J Endocrinol Invest* 2010;33:83-7. Epub July 28, 2009.



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