



## THYROID CANCER

# Early postoperative unstimulated thyroglobulin may help determine use of radioactive iodine in patients with papillary thyroid cancer

### BACKGROUND

Papillary thyroid cancer is the most common type of thyroid cancer. Standard management includes surgery followed by radioactive iodine therapy when indicated. Radioactive iodine therapy significantly improves outcomes in patients with either persistence of cancer or at intermediate or high risk of cancer recurrence after surgery. However, the use of radioactive iodine therapy has markedly decreased in recent years as studies have shown that it provides little benefit to patients that are at low risk of cancer recurrence after surgery. It has recently been suggested that levels of post-operative thyroglobulin may be useful in deciding who may require radioactive iodine therapy after surgery. Thyroglobulin is a hormone made by thyroid cells and can be used as a cancer marker after initial treatment to detect persistent or recurrent cancer. It can be measured as unstimulated (at baseline) or stimulated (when thyroid stimulating hormone (TSH) levels are high). This study aimed to evaluate whether levels of early post-operative unstimulated thyroglobulin (6 weeks after surgery) can be used to determine which patients with papillary thyroid cancer may need radioactive iodine therapy.

### THE FULL ARTICLE TITLE

McDow AD et al 2019 Utility of Early Postoperative Unstimulated Thyroglobulin in Influencing Decision Making in Patients with Papillary Thyroid Carcinoma. *Ann Surg Oncol* Jul 2. doi: 10.1245/s10434-019-07581-8. [Epub ahead of print]

### SUMMARY OF THE STUDY

This was a study of 134 patients treated with surgery for papillary thyroid cancer at a single institution between 2015 and 2017. Only patients with appropriately low TSH were included as per the American Thyroid Association guidelines. Unstimulated thyroglobulin levels were measured at approximately 6 weeks following surgery. A level of  $\leq 0.2$  ng/ml was used to define excellent response postoperatively. Neck ultrasounds were done 6 and 12 months after surgery to evaluate for evidence

of persistent or recurrent cancer. Persistent cancer was defined as an unstimulated thyroglobulin  $>0.2$  ng/ml, abnormal neck ultrasound, or persistent elevation of thyroglobulin antibodies at 6 months after initial therapy. Recurrent cancer was defined as evidence of cancer following previous achievement of an undetectable thyroglobulin level, negative thyroglobulin antibodies, and negative ultrasound.

The average patient age was 45 years-old and the majority of patients were female (74.6%) and white (92.5%). More than half of the patients (53.7%) received radioactive iodine therapy following surgery. Overall, 49.3% of patients had an excellent response to treatment with an unstimulated thyroglobulin level of  $\leq 0.2$  ng/ml, with 60% of them not receiving radioactive iodine therapy. Of these, 96.7% maintained an undetectable unstimulated thyroglobulin at 6 months and 94.1% at one year. All patients that received radioactive iodine therapy had an undetectable unstimulated thyroglobulin level both at 6- and 12-months following surgery.

Additionally, 69% of patients with an early postoperative unstimulated thyroglobulin higher than 0.2 ng/ml and up to 2.0 ng/ml achieved a goal of  $\leq 0.2$  ng/ml at 6 months if they received radioactive iodine therapy, compared to only 15.4% if they didn't receive radioactive iodine therapy. Only 30.8% of patients with an early postoperative unstimulated thyroglobulin  $>2.0$  ng/ml achieved a goal of  $\leq 0.2$  ng/ml at 6 months if they received radioactive iodine therapy, compared to only 25.0% if they didn't.

### WHAT ARE THE IMPLICATIONS OF THIS STUDY?

This study shows that early postoperative unstimulated thyroglobulin levels can be used to predict use of radioactive iodine therapy in patients with papillary thyroid cancer. Even though these findings are from a single institution, they are important for two main reasons: 1) this practice can help to decrease overtreatment with radioactive iodine therapy in patients who have





## THYROID CANCER, continued

low risk disease and 2) it can aid in identifying presence of persistent disease early in the treatment process. In the future, population-based studies can reinforce these results

and help with personalizing treatment in patients with papillary thyroid cancer.

— Maria Papaleontiou, MD

### ATA THYROID BROCHURE LINKS

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

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

### ABBREVIATIONS & DEFINITIONS

**Papillary thyroid cancer:** the most common type of thyroid cancer.

**Cancer recurrence:** this occurs when the cancer comes back after an initial treatment that was successful in destroying all detectable cancer at some point.

**TSH: thyroid stimulating hormone** — produced by the pituitary gland that regulates thyroid function; also, the best screening test to determine if the thyroid is functioning normally.

**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 that do not have thyroglobulin antibodies.

**Thyroglobulin antibodies:** these are antibodies that attack the thyroid instead of bacteria and viruses, they are a marker for autoimmune thyroid disease, which is the main underlying cause for hypothyroidism and hyperthyroidism in the United States.

**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.

**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.

