



THYROID CANCER

Cancer volume doubling time in the active surveillance of papillary thyroid carcinomas

BACKGROUND

Thyroid cancer is the fastest rising cancer in the United States and papillary thyroid cancer is the most common type of thyroid cancer. This is due, in part, to an increase of identifying small thyroid cancers on imaging tests done for other reasons. It is clear that many of these small cancers grow at very slow rates and never spread beyond the thyroid. Because of this, the traditional treatment thyroid surgery, possibly followed by radioactive iodine therapy, may not be indicated for these low risk, less aggressive, small thyroid cancers. At present, the American Thyroid Association recommends following these small low risk cancers with ultrasound and clinical exam rather than surgery, which is known as active surveillance. During active surveillance the patient is monitored closely and referred for thyroid surgery if there is evidence of cancer progression on follow-up tests.

It is important to identify early the patients with small cancers who are likely to progress rapidly and refer them for thyroid surgery as compared to patients with stable disease for a long time who do not require any intervention. The goal of this study was to evaluate how fast papillary thyroid cancers grow by measuring the cancer volume doubling time and to find clinical and ultrasound features that predict a rapid cancer growth.

THE FULL ARTICLE TITLE

Oh HS et al 2019 Tumor volume doubling time in active surveillance of papillary thyroid carcinoma. *Thyroid* 29:642–649. PMID 30864894.

SUMMARY OF THE STUDY

The study included 273 patients diagnosed with papillary thyroid cancer and followed using active surveillance for more than a year after diagnosis at a medical center in Korea between 2002 and 2016. Patients with an aggressive type of papillary thyroid cancer, cancer invasion outside the thyroid into other neck structures and spread to local lymph nodes and outside of the neck were excluded from the study. Patients had a physical exam and neck

ultrasound performed every 6-12 months to measure the cancer volume and document the ultrasound appearance of the thyroid cancer. Thyroid surgery was recommended when the cancer size was greater than 1 cm or increased by 3 mm, the cancer volume increased by 50% from baseline, new local or distant metastases were detected or the cancer was growing towards other neck structures.

The average patient age at diagnosis was 51 years and 76% were women. The average initial maximal cancer diameter on ultrasound was 5.8 mm, while the average tumor volume was 62 mm³. Patients were classified into two groups based on the cancer volume doubling time: 1) a stable group with a cancer volume doubling time 5 years or longer, which included the majority (72%) of patients and 2) a rapid growing group with a cancer volume doubling time of less than 5 years (28% of patients). The maximum period of follow-up was 6 years for the rapid-growing group and 16 years for the stable group.

Most patients with a significant cancer growth were in the rapid growing group. There was a progressive and sustained cancer growth noted in this group, while there was minimal or no cancer growth in the stable group. Younger age of less than 50 years and the presence of macrocalcifications on neck ultrasound were associated with a faster cancer growth and cancer volume doubling time of less than 5 years. Gender, initial cancer size or other ultrasound features of the cancer were not associated with the tumor growth.

A total of 19% of patients, 60% being in the rapid growing group, stopped active surveillance and underwent thyroid surgery after an average time of 29 months of surveillance. At the time of thyroid surgery, almost 45% of patients had tumor extension outside the thyroid, one third had lymph node metastases in the neck and no patients had distant metastases. There were no significant differences in any of these parameters between the rapid-growing and stable groups. Two patients in the rapid-growing group and none in the stable group had lymph node metastases in the lateral neck.





THYROID CANCER, continued

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

Cancer volume doubling time is a good indicator of the cancer growth rate and progression in patients with papillary thyroid cancer monitored by ultrasound during active surveillance. Indeed 2/3rds of patients have a relatively benign course with a cancer volume doubling time longer than 5 years. A younger age and cancer volume doubling time, macrocalcifications noted on

ultrasound were associated with a faster growth and a shorter cancer volume doubling time. Cancer volume doubling time may be helpful to predict which cancers progress fast requiring early surgical referral and which cancers are stable for a long time. However, cancer volume doubling time may not predict other unfavorable prognostic factors, such as cancer extension outside the thyroid and lymph node metastases.

—Alina Gavrila, MD, MMSC

ATA THYROID BROCHURE LINKS

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

Thyroid Surgery: <https://www.thyroid.org/thyroid-surgery/>

ABBREVIATIONS & DEFINITIONS

Active surveillance (AS): a treatment plan that involves closely watching a patient with low risk cancer without starting any treatment unless the condition is getting worse.

Papillary thyroid cancer (PTC): the most common type of thyroid cancer. There are 4 variants of papillary thyroid cancer: classic, follicular, tall-cell and noninvasive follicular thyroid neoplasm with papillary-like nuclear features (NIFTP).

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.

Thyroid Ultrasound (US): 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.

Macrocalcifications: Large flecks of calcium that can be seen either inside a thyroid nodule or in the periphery (so called egg-shell/rim calcifications), usually seen as large bright spots on ultrasonography.

Lymph node: bean-shaped organ that plays a role in removing what the body considers harmful, such as infections and cancer cells.

Cancer metastasis: spread of the cancer from the initial organ where it developed to other organs, such as the lungs and bone.

