

**THYROID CANCER****BRAF-positive thyroid cancer differs from RAS-positive thyroid cancer****BACKGROUND**

Thyroid cancer is the fastest rising cancer in women and papillary thyroid cancer is the most common type of thyroid cancer. Many thyroid cancers are associated with mutations in one or more cancer-associated genes. It is unclear whether mutations in these genes cause the cancer or are just associated with the cancer cells. Two cancer-associated genes important in thyroid cancer are BRAF and RAS. Newer studies show that BRAF mutations may be a marker for a more aggressive type of thyroid cancer while RAS mutations appear to be a marker for the more classical type of thyroid cancer. This study tries to combine a group of features, namely patient demographics, thyroid cancer pathology, and ultrasound characteristics of the cancer to determine if there are true differences between cancers that have a BRAF mutations and those that have a RAS mutation.

**THE FULL ARTICLE TITLE**

Kakarmath S et al Clinical, sonographic, and pathological characteristics of RAS-positive versus BRAF-positive thyroid carcinoma. *J Clin Endocrinol Metab* 2016;101:4938-44. Epub September 30, 2016.

**SUMMARY OF THE STUDY**

The authors identified 101 thyroid cancers from a single institution that had either a BRAF or RAS mutation that was tested for after the cancer was removed. They had a radiologist review the pre-operative ultrasound for all the patients and added patient demographic information to compare the two mutation groups.

The majority of cancers (72%) had a BRAF mutation and the rest (28%) had a RAS mutation. Cancers containing the BRAF mutation tended to be smaller, but more likely to have concerning ultrasound features such as hypoechoogenicity (darkness) and irregular margins, more likely to have a pre-operative biopsy diagnosis of cancer and were more likely to demonstrate aggressive features such as positive lymph nodes and spread outside of the nodule.

**WHAT ARE THE IMPLICATIONS OF THIS STUDY?**

This data can help clinicians evaluate patients with biopsy proven or suspected thyroid cancer. This may include operative planning (ie, how much surgery to do), prognosis (how likely is your thyroid cancer to come back) and monitoring (how often and for how long to follow for cancer recurrence) recommendations.

— Melanie Goldfarb, ND

**ATA THYROID BROCHURE LINKS**

Fine Needle Aspiration Biopsy of Thyroid Nodules:

<http://www.thyroid.org/fna-thyroid-nodules/>

Thyroid Cancer (Papillary and Follicular):

<http://www.thyroid.org/thyroid-cancer/>

Thyroid Nodules: <http://www.thyroid.org/thyroid-nodules/>

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

**ABBREVIATIONS & DEFINITIONS**

**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.

**Thyroid fine needle aspiration biopsy (FNAB):** a simple procedure that is done in the doctor's office to determine if a thyroid nodule is benign (non-cancerous) or cancer. The doctor uses a very thin needle to withdraw cells from the thyroid nodule. Patients usually return home or to work after the biopsy without any ill effects.



## THYROID CANCER, continued

**Papillary thyroid cancer:** 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).

**Cancer-associated genes:** these are genes that are normally expressed in cells. Cancer cells frequently have mutations in these genes. It is unclear whether mutations in these genes cause the cancer or are just

associated with the cancer cells. The cancer-associated genes important in thyroid cancer are BRAF, RET/PTC and RAS.

**Mutation:** A permanent change in one of the genes.

**BRAF gene:** this is gene that codes for a protein that is involved in a signaling pathway and is important for cell growth. Mutations in the BRAF gene in adults appear to cause cancer.