



THYROID CANCER

Successful chemotherapy is possible for seemingly inoperable anaplastic thyroid cancer

BACKGROUND

While the vast majority of thyroid cancers are slow growing and have an excellent prognosis, anaplastic thyroid cancer, which makes up <1% of all thyroid cancer, is one of the most aggressive of all cancers, with a survival averaging ~6 months after diagnosis. Surgery, radiation and single drug chemotherapy is all ineffective in most cases. The aim of this study is to study if combination chemotherapy will make previously inoperable anaplastic thyroid cancers safe to remove with surgery.

THE FULL ARTICLE TITLE

Wang JR et al 2019 Complete surgical resection following neoadjuvant dabrafenib plus trametinib in BRAF^{V600E}-mutated anaplastic thyroid carcinoma. *Thyroid* 29:1036–1043. PMID: 31319771.

SUMMARY OF THE STUDY

In this study from the MD Anderson Cancer Center in Texas, 6 patients with anaplastic thyroid cancer that had the BRAF^{V600E} mutation were evaluated. Prior to receiving combination tyrosine kinase inhibitor therapy with dabrafenib and trametinib, 4 patients had some

form of standard chemotherapy and 2 received another tyrosine kinase inhibitor called pembrolizumab. Of the 6 patients that had surgery after this treatment, 4 patients had the entire primary cancer removed and the other 2 patients only had microscopic pieces of cancer left after the surgery. After the surgery, 5 of 6 patients received standard chemotherapy and radiation to the surgical area. Of the 6 patients, 4 patients had no evidence of cancer at the last check, some over 2 years after surgery. The 2 other patients did pass away from anaplastic cancer; however, there was no re-growth of cancer in the area where surgery occurred.

WHAT ARE THE IMPLICATIONS OF THIS STUDY?

In selected patients with anaplastic thyroid cancer with the BRAF^{V600E} mutation, treatment with dabrafenib and trametinib may increase the chance of having a successful surgery of the primary tumor. This is important to patients because it gives hope for an improved outcome for a cancer that generally has a terrible prognosis and a high death rate.

— Joshua Klopper, MD

ATA THYROID BROCHURE LINKS

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

ABBREVIATIONS & DEFINITIONS

Anaplastic thyroid cancer: a very rare but very aggressive type of thyroid cancer. In contrast to all other types of thyroid cancer, most patients with anaplastic thyroid cancer die of their cancer and do so within a few years.

Mutation: A permanent change in one of the genes.

Genes: a molecular unit of heredity of a living organism. Living beings depend on genes, as they code for all

proteins and RNA chains that have functions in a cell. Genes hold the information to build and maintain an organism's cells and pass genetic traits to offspring.

Thyroidectomy: surgery to remove the entire thyroid gland. When the entire thyroid is removed it is termed a *total thyroidectomy*. When less is removed, such as in removal of a lobe, it is termed a *partial thyroidectomy*.





THYROID CANCER, continued

Tyrosine kinases: proteins that are overactive in many of the pathways that cause cells to be cancerous. Inhibiting these proteins with drugs known as **tyrosine kinase inhibitors** are effective chemotherapy drugs for cancers, including advanced thyroid cancer

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*

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.

