



## THYROID SURGERY

### Extension of the thyroid into the upper chest

#### BACKGROUND

The thyroid gland is typically located in the lower third of the neck in front of the trachea (wind pipe) and above the breast bone. In some patients, the thyroid gland or masses within the gland can grow large and extend into the upper chest into a space known as the mediastinum. This is known as a substernal thyroid. If the thyroid extends into this space and needs to be removed surgically, in most cases this can be accomplished through an incision in the neck. In much fewer cases, the chest needs to be surgically opened (by a sternotomy) as well which is a more extensive and invasive operation. The two studies reviewed look at which patients are more likely to have extension of their thyroid into the chest, how this impacts surgical outcome, and how to predict who may need a procedure that requires opening the chest.

#### THE FULL ARTICLE TITLES

Moten AS et al. Demographics, disparities, and outcomes in substernal goiters in the United States. *Am J Surg*. January 6, 2016 [Epub ahead of print].

Nankee L et al. Substernal goiter: when is a sternotomy required? *J Surg Res* 2015;199:121-5. Epub April 18, 2015.

#### SUMMARY OF THE STUDIES

The first study (Moten, et al.) looked at a large database of patients who underwent either a complete or one-sided substernal thyroidectomy between 2000 and 2010. They were compared with patients who underwent complete or one-sided thyroidectomy that did not have a portion of the thyroid in the chest. The group was comprised of 110,889 patients who received thyroid surgery during the study period. Of these patients, 5525 required substernal thyroidectomy. The patients who required thyroid tissue to be removed from their chest were more likely to be older, African-American, have hypertension, diabetes, or obesity. These patients typically needed to stay in the hospital longer and were more likely to require emergency surgery. Patients that required substernal thyroidectomy had increased odds of several postoperative complications: hemorrhage/hematoma, respiratory failure, pulmonary

embolism/deep venous thrombosis, hypoparathyroidism, hypocalcemia, collapsed lung, bloodstream infections, accidental puncture or laceration, and death.

The second study (Nankee, et al.) looked at 220 patients at the University of Wisconsin Medical Center who underwent total thyroidectomy for large or substernal goiters. The dates of the study were between 1995 and 2013. The patients with the substernal goiter were significantly older, by about a decade, than the patients with enlarged thyroids limited to the neck. Of the 127 patients who had a substernal goiter, 7 ultimately required a sternotomy. The sternotomy was anticipated in 6 of the 7 cases, with only 1 intraoperative decision to proceed with sternotomy. All patients who underwent sternotomy had previously undergone a CT scan and appeared to have more significant symptoms, such as chest pressure or voice symptoms. The addition of the sternotomy to the surgical procedure added an average of 2 hours to the surgery and a significant increase in blood loss. Patients who underwent sternotomy also had a longer length of stay. The group analyzed CT characteristics and found that at least 70% of the thyroid gland was below the sternal notch in all 7 patients who underwent sternotomy and all had extension to or below the aortic arch.

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

Extension of the thyroid gland into the upper chest is uncommon but can lead to more severe symptoms, make surgery more complicated and prolong recovery. Most surgeries can be completed through a neck incision but in some cases a sternotomy is required to remove the thyroid tissue from the upper chest. CT scans can be helpful in identifying which patients will require sternotomy.

— Ronald B. Kuppersmith, MD, FACS

#### ATA THYROID BROCHURE LINKS

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

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

**THYROID SURGERY**, continued**DEFINITIONS**

**Goiter:** a thyroid gland that is enlarged for any reason is called a goiter. A goiter can be seen when the thyroid is overactive, underactive or functioning normally. If there are nodules in the goiter it is called a nodular goiter; if there is more than one nodule it is called a multinodular goiter.

**Thyroid nodule:** an abnormal growth of thyroid cells that forms a lump within the thyroid. While most thyroid nodules are non-cancerous (Benign), ~5% are cancerous.

**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.

**Hypoparathyroidism:** low calcium levels due to decreased secretion of parathyroid hormone (PTH) from the parathyroid glands next to the thyroid. This can occur as a result of damage to the glands during thyroid surgery and usually resolves. This may also occur as a result of autoimmune destruction of the glands, in which case it is usually permanent.

## Thyroid Awareness Monthly Campaigns

The ATA will be highlighting a distinct thyroid disorder each month and a portion of the sales for Bravelets™ will be donated to the ATA. The month of April is **Hashimoto's Disease Awareness Month** and a bracelet is available through the [ATA Marketplace](#) to support thyroid cancer awareness and education related to thyroid disease.

