

# Excision of thyroglossal duct cyst: the Sistrunk procedure

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Before 1893, the removal of a thyroglossal cyst included simple incision and drainage. The recurrence rate after this procedure was ~50%. In 1893, Schlange<sup>1</sup> proposed the excision of the cyst along with the central portion of the hyoid bone. This resulted in a drop in the recurrence rate to 20%. However, in 1920, Walter Sistrunk took this operation one step further and recommended not only taking the central portion of the hyoid bone but also carving out a core or tissue one eighth of an inch in radius from the hyoid bone to the foramen cecum.<sup>2</sup> He felt there was no point in identifying the suprahyoid portion of the duct, which it is usually hard to do because the duct may be so small and friable that it breaks off easily and thus it is difficult to remove by itself. Today, the Sistrunk procedure is the standard operation to remove thyroglossal cyst, with reported recurrence rates between 0% and 8%.<sup>3,4</sup>

## Diagnostic evaluation

A thyroglossal cyst usually presents as a midline neck mass that is not painful unless it is infected (Figure 1). A key to its diagnosis, which can be observed during physical examination, is the elevation of the mass with swallowing or protrusion of the tongue. Sixty percent to 80% of thyroglossal duct cysts are located below the level of the hyoid bone.<sup>3</sup> The differential diagnosis includes dermoid and lingual thyroid. No general consensus is found in the literature on the extent of the diagnostic evaluation of a patient with a suspected thyroglossal duct cyst. Some clinicians feel that it is important to rule out the possibility that this midline mass may be the patient's only source of thyroid hormone. To that end, an ultrasound of the neck is a simple and inexpensive test to look for the

presence of the thyroid gland in its normal location and to confirm the cystic nature of the mass.<sup>5</sup> Computed tomography or magnetic resonance imaging also may be useful but are not routinely indicated. Some clinicians feel that a thyroid-stimulating hormone level must be obtained before surgery and, if the level is high, the thyroid should be scanned. If, on the other hand, the level is normal, then proceed with surgery.<sup>6</sup>

## Surgical technique

A horizontal incision about 2 inches long at or just below the level of the hyoid bone is made in the midline of the neck (Figure 2). The incision is carried down through the subcutaneous tissue and platysma muscle.

Once the skin and platysma are elevated, the cyst can be found lying beneath the raphe connecting the sternohyoid muscles (Figure 3).

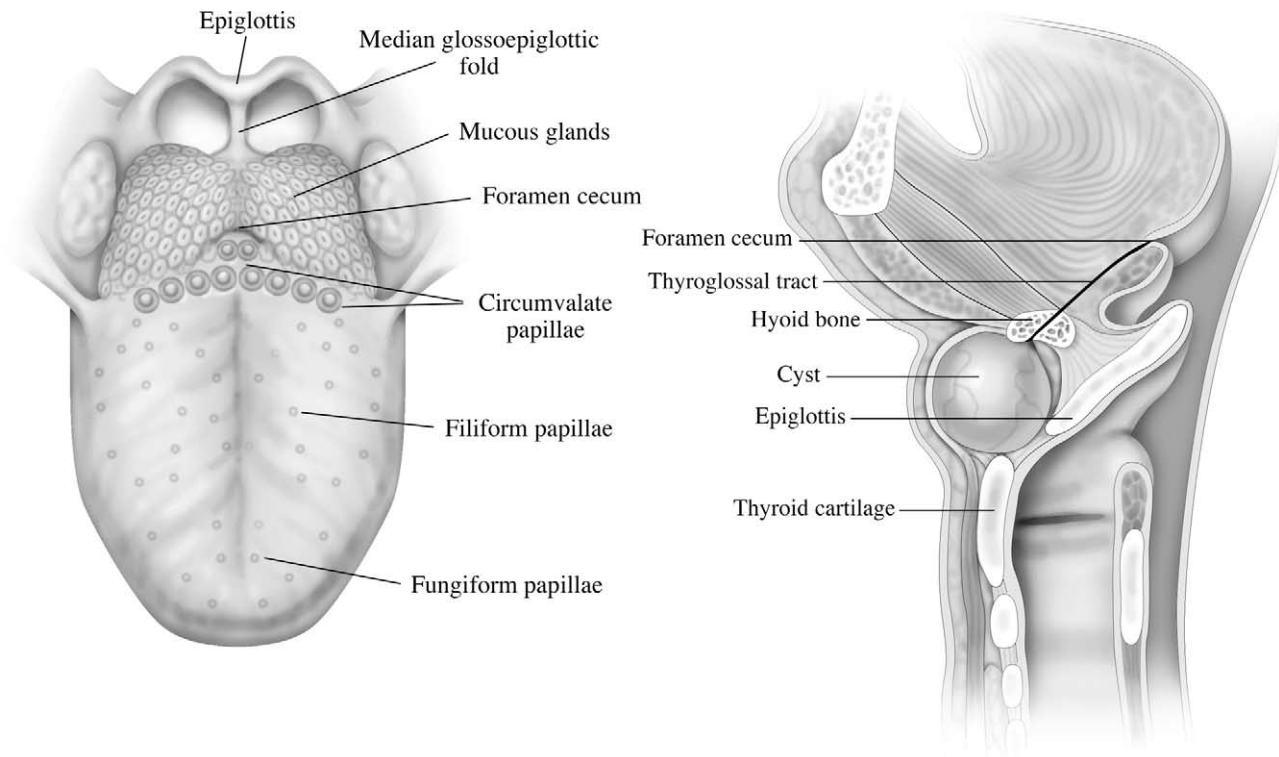
The strap muscles are retracted laterally, and the cyst is dissected free of the thyroid cartilage and surrounding tissue until it is pedicled superiorly to the hyoid bone (Figure 4).

The muscles and soft tissue are then dissected off the central segment of the hyoid bone, about 1.5 to 2 cm in length. Dissecting superiorly or inferiorly to the hyoid bone should be avoided because of the risk of transecting the duct. The hyoid bone is then cut on each side of midline (Figure 5).

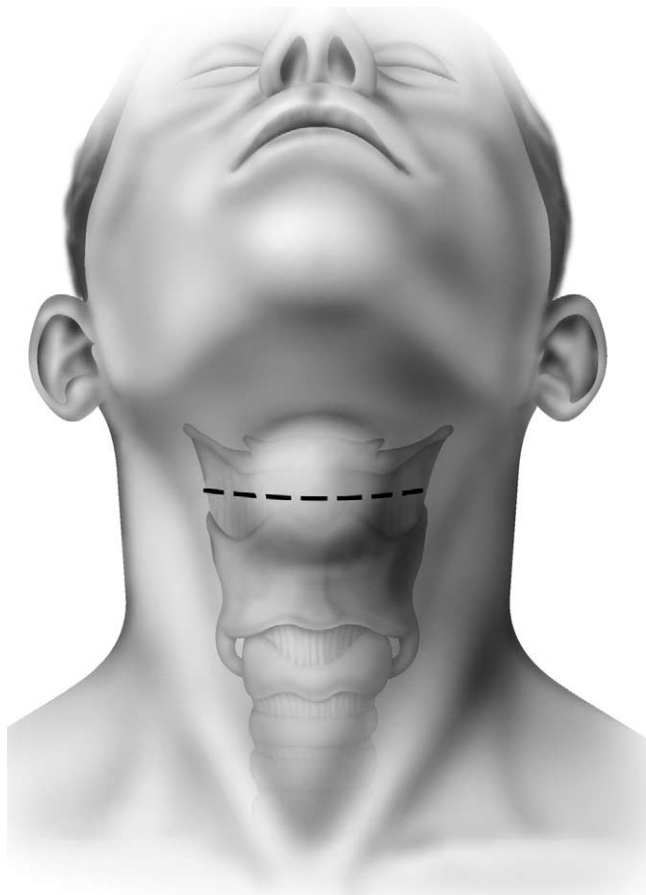
Without isolating the duct, tissue one eighth of an inch in radius is cored out through the tissues up to and including the foramen cecum (Figure 6). The foramen cecum can be reached by drawing a line backward and upward from the hyoid at a 45° angle through the intersection of the horizontal and perpendicular lines at the center of the hyoid. Placing a retractor through the mouth and into the vallecula to pull the tongue base down into the wound may help with this part of the procedure. Placing a large needle from the hyoid into the foramen cecum may also aid in dissecting out the core.

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**Figure 1** Origination and descent of thyroglossal duct cyst.

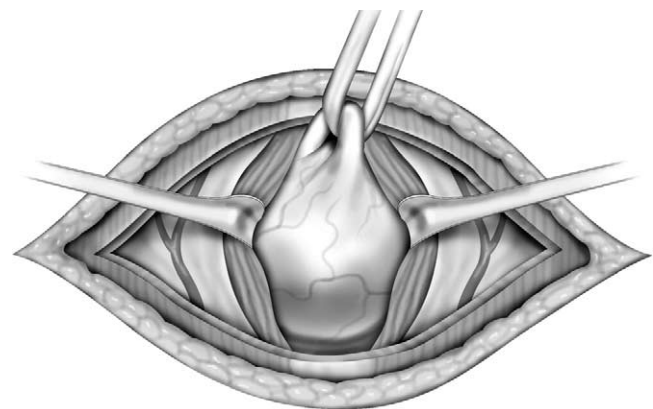


**Figure 2** Skin incision is made midline overlying cyst and thyroid cartilage.

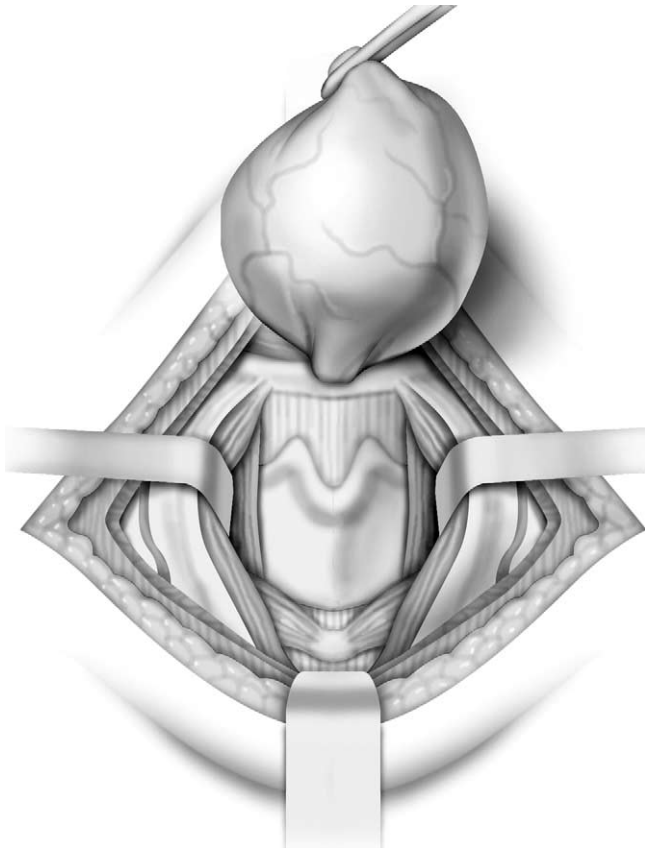
Once the specimen is removed, the wound is irrigated, and the opening into the pharynx at the foramen cecum is closed with 2-3 absorbable sutures (Figure 7). The strap muscles are approximated, a Penrose drain is placed in the wound, and the subcutaneous tissues and the skin are closed (Figure 8).

**Complications**

Major complications include recurrence, abscess or hematoma requiring surgical drainage, entry into the airway, the need for tracheotomy, nerve paralysis, hypothyroidism, and death. Reports of these major complications

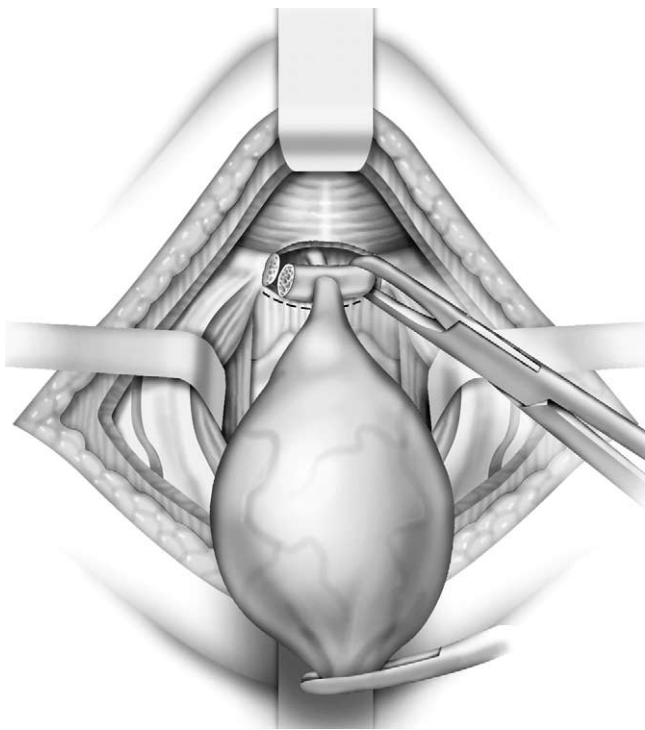


**Figure 3** After splitting strap muscles down the middle, the cyst can be grabbed and lifted up as it is dissected free from the surrounding tissues.

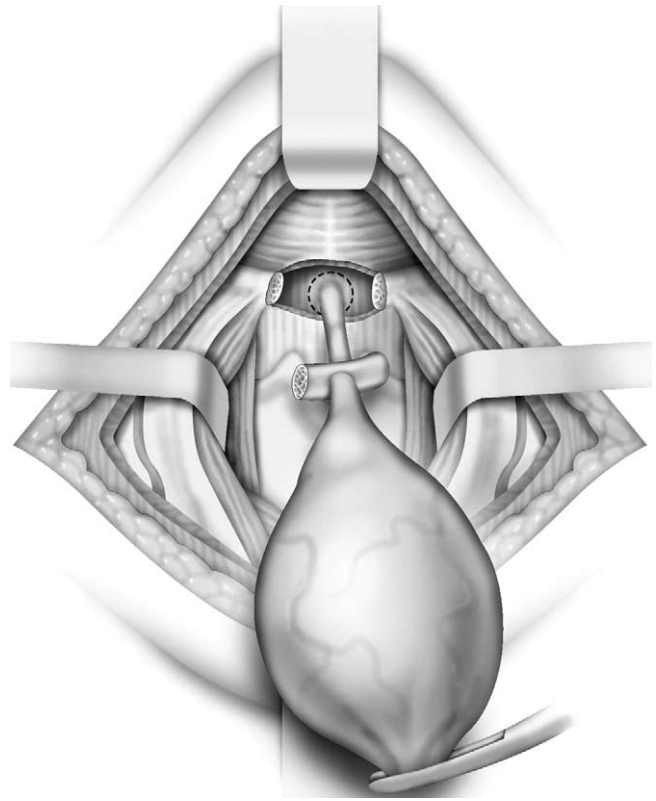


**Figure 4** Once freed up inferiorly, the cyst can be seen pedicled to the hyoid bone superiorly. Also notice the close relationship between the cyst and the underlying airway.

are rare.<sup>7</sup> By identifying the thyroid notch and the thyrohyoid membrane intraoperatively, one can decrease the likelihood of entering the airway. The hypoglossal nerve can be injured if one divides the hyoid too laterally or

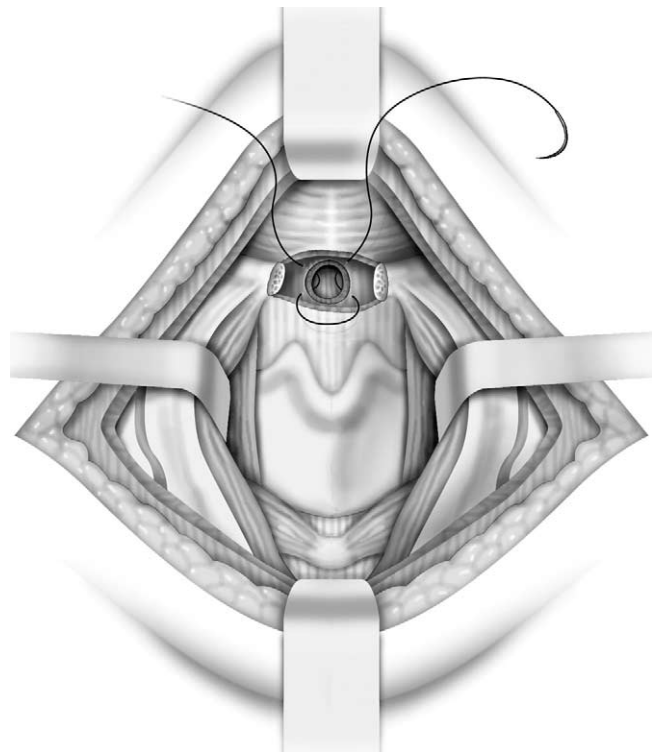


**Figure 5** The hyoid bone is then cut on each side of the midline.

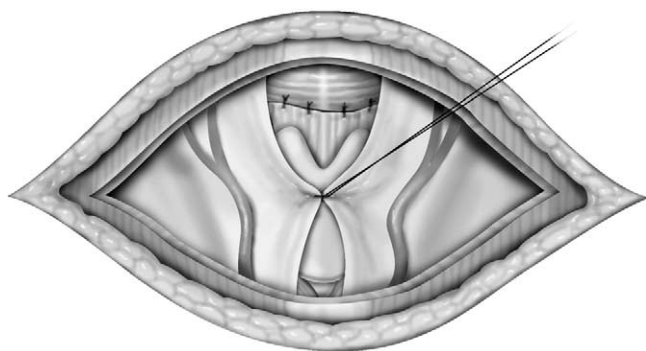


**Figure 6** The tract can be followed to the foramen cecum and excised.

dissects too aggressively in the superior direction. Dividing the hyoid medial to the lesser cornu and dissecting superiorly medial to the anterior digastric muscle can avoid this type of injury. Hypothyroidism can be avoided with the proper preoperative evaluation to determine the



**Figure 7** The opening at the foramen cecum is then closed.



**Figure 8** The strap muscles are reapproximated and the skin then closed.

presence of a normal thyroid. Although Maddalozza reported no major complications in his series of 35 patients undergoing a Sistrunk procedure, he did have a 29% occurrence of minor complications such as seroma, local

wound infection, and stitch abscess. All were treated with conservative management and resolved without any further sequela.<sup>7</sup>

## References

1. Schlange H: Uber die fistual colli congenita. *Arch Klin Chir* 46:390-392, 1893
2. Sistrunk WE: The surgical treatment of cysts of the thyroglossal tract. *Ann Surg* 71:121-126, 1920
3. Allard R: The thyroglossal cyst. *Head Neck Surg* 5:134-146, 1982
4. Pelausa M, Forte V: Sistrunk revisited: A 10-year review of revision thyroglossal duct surgery at Toronto's Hospital for Sick Children. *J Otolaryngol* 18:325-333, 1989
5. Gupta P, Maddalozzo J: Preoperative sonography in presumed thyroglossal duct cysts. *Arch Otolaryngol Head Neck Surg* 127:200-202, 2001
6. Radkowski D, Arnold J, Healy GB, et al: Thyroglossal duct remnants: Preoperative evaluation and management. *Arch Otolaryngol Head Neck Surg* 117:1378-1381, 1991
7. Maddalozzo J, Venkatesan TK, Gupta P: Complications associated with Sistrunk procedure. *Laryngoscope* 111:119-123, 2001