SURGERY
of the Head and Neck
THYROID AND LARYNGEAL PROCEDURES

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THYROID AND PARATHYROID ANATOMY

The thyroid gland is encased in the pre-tracheal fascia right above the trachea. The thyroid isthmus, which is the bridge between the lobes, usually straddles the first or second tracheal cartilage. A third lobe, called the pyramidal lobe due to its shape, may extend toward the head from the isthmus (Figure 1). This is important to remember when performing a tracheotomy, as the thyroid isthmus may either have to be bluntly elevated or transected.

The arterial supply to the thyroid gland comes from the superior thyroid artery, which is a branch of the external carotid, and the inferior thyroid artery, which is a branch of the subclavian artery (Figure 2). The points at which these arteries enter the thyroid gland are called the "poles" of the thyroid and are important anatomic landmarks. When performing a thyroidectomy, to preserve vocal cord function, the recurrent laryngeal nerve must be identified and protected. This nerve travels in the tracheoesophageal groove up from the chest and enters the larynx through the thyroid cartilage. Care is also taken to identify and preserve the parathyroid glands.

The parathyroid glands are typically four in number, but can vary from two to nine, and approximate the size and shape of a grain of rice. The parathyroid glands are most often found posterior to each pole of the thyroid gland; however, they can be difficult to locate because they can be found anywhere from the hyoid bone to the mediastinum. These glands are usually mustard yellow to caramel in color. They can be located within the thyroid capsule or even within the thyroid itself.

The recurrent laryngeal nerve is almost always medial to the parathyroid glands. The blood supply to the parathyroid glands is the inferior thyroid artery, but in some cases, the superior thyroid artery may also supply the glands. Because of the indefinite nature of parathyroid anatomy, a parathyroidectomy can be a very difficult surgery.

Thyroidectomy

Thyroid surgery dates back over 100 years. Removal of all or part of the thyroid became possible after the advent of general anesthesia and the development of hemostatic techniques. Theodor Kocher was the first surgeon to describe thyroidectomy in 1873. (See History of Surgery on page 32 of this issue.) He wrote that it was important to avoid a total thyroidectomy, if possible, to prevent cretinism or myxedema. Kocher had successfully performed 900 cases by 1895, with a mortality rate of just over 1%.

Most thyroid tumors or nodules are benign and present as adenomas or thyroiditis. Cancer of the thyroid is uncommon, making up only about 1% of all cancers (8,000 to 9,000 cases each year in the United States). Women tend to have a higher rate of thyroid disease and that chance increases with age. Symptoms of thyroid disease include difficulty swallowing, stridor, or hoarseness. Patients usually present with some kind of mass, which is not tender and moves with swallowing. Children who present with a thyroid mass most often have a malignant tumor, especially if there is a family history of cancer. Exposure to radiation of the head and neck in early life increases the risk of associated thyroid cancer. Hoarseness may be a sign of a malignancy but also may occur due to a large thyroid adenoma pressing on the glottis.

Indications for thyroidectomy include:
- A child presenting with a mass,
- A mass after a history of radiation therapy as a child,
- Mass with elevated calcitonin level,
- A mass in a patient over 40,
- A mass with vocal cord paralysis,
- Positive lymph nodes in the neck.

A total thyroidectomy is performed if the mass is malignant. After a total thyroidectomy, the patient must take thyroid replacement hormone for the rest of his or her life. The surgeon will then decide whether or not to do a neck dissection, depending on the type of tumor and whether any nodes are present.

Before surgery, most surgeons may try to use fine needle aspiration to obtain tissue for biopsy to determine the diagnosis. Fine needle aspiration is relatively safe, cost effective and about 95% accurate, but may not be able to differentiate between an adenoma and a carcinoma. Patients with no evidence of malignancy from the fine needle aspiration may undergo thyroid suppression treatment. If the size of the mass doesn't decrease with suppression, then the patient must have surgery.

Instruments needed for a thyroidectomy include a thyroid or neck set. The set should contain a pair of Green retractors, which are used to retract the strap muscles and were originally designed for thyroidectomy. Additionally, a Gelpi, a Weitlaner, or a Mahorner thyroid retractor may be needed.

Supplies needed for thyroidectomy include several packages of X-ray detectable 4″ x 4″ sponges and Kitner dissectors or peanuts. The surgeon will likely use a headlight and often, the assistant will as well.

The patient is placed in the supine position on the operating table with his or her neck extended. Surgeons usually prefer extreme extension of the neck, which allows for good visualization of the field. A shoulder roll may be used for this purpose. The patient is shaved, if necessary, and then prepped from the chin to the upper chest and bilaterally as far as possible. Routine thyroid or neck drapes are used.

Whenever possible, the surgeon will use a skin crease over the thyroid to make the incision. If no skin crease is visible, the incision will be 1 cm above the clavicle and to each edge of the sternocleidomastoid muscles. Often after the skin is incised, several anterior superficial veins will have to be ligated. A superior flap is dissected above the thyroid and an inferior flap is developed inferiorly to allow placement of the surgeon's preferred retractor.

The strap muscles are divided in the midline and undermined for placement of the Green retractors. Both lobes of the thyroid are identified and palpated. The trachea is also identified. The isthmus of the thyroid is better exposed and

clamped, usually with heavy Mixter clamps, then divided. A heavy silk stick tie (eg 2-0) is used to tie off each end of the isthmus.
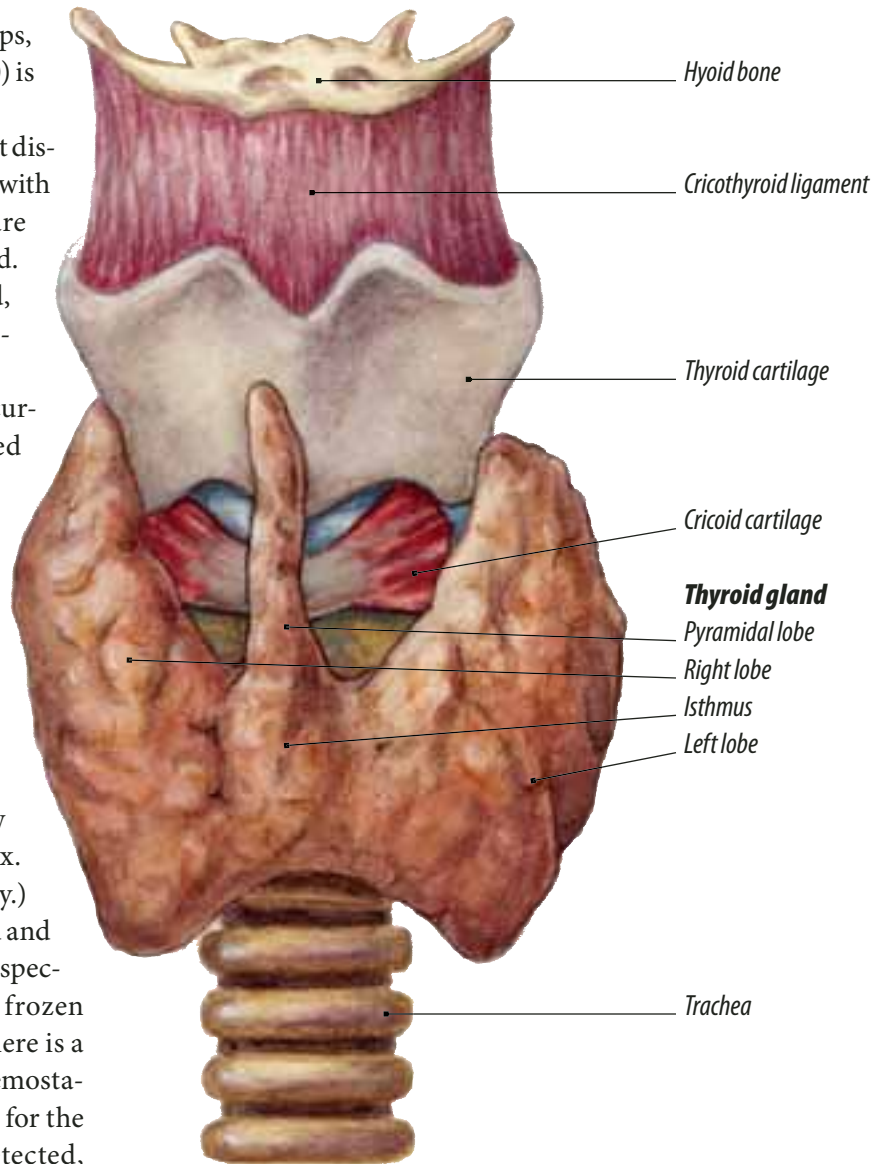
The thyroid is exposed laterally by blunt dissection of the strap muscles off of the lobe with a Kitner dissector. If any parathyroids are visible, they are dissected off of the thyroid. If a piece of tissue looks like a parathyroid, some surgeons may send it to the pathologist for a frozen section for identification.

The carotid artery is identified. The recurrent laryngeal nerve is usually identified before any major vessels are ligated. The nerve is commonly found in the triangle between the carotid, trachea, and the inferior pole of the thyroid. After the nerve is identified, any dissection to be made over the nerve should be blunt, using the scissors or a clamp. Once the thyroid is dissected off of the nerve, the inferior pole vessels are identified and ligated. This allows the surgeon to follow the nerve up to where it enters the larynx. Then the dissection is continued superiorly.)

The superior pole vessels are identified and ligated, and the specimen is excised. The specimen is sent directly to pathology for a frozen section, in most cases to determine if there is a malignancy. The surgeon will achieve hemostasis and irrigate the wound while waiting for the pathology report. If a malignancy is detected, the opposite lobe will be inspected in the same manner. If no malignancy is found, the wound is closed. Some surgeons prefer to place a drain in the wound, usually a 7 mm flat Jackson-Pratt. Dressing is optional.

Tech tip: Some surgeons will close the incision and break before hearing the pathology report. It is important to leave the patient draped until the report comes back and the surgeon says the patient can wake up.

Complications of thyroidectomy include hematoma, recurrent laryngeal nerve injury resulting in vocal cord paralysis, hypoparathyroidism, and respiratory obstruction. If bilateral recurrent laryngeal nerve injury occurs, respiratory distress is noted postoperatively and can

Hyoid bone

Cricothyroid ligament

Thyroid cartilage

Cricoid cartilage

Thyroid gland
Pyramidal lobe
Right lobe
Isthmus
Left lobe

Trachea

FIGURE 1

Thyroid

anatomy.

occur from minutes to hours after extubation. The patient may have to be reintubated or have an emergency tracheotomy.

Hypoparathyroidism occurs in 1%-5% of the patients, because the parathyroids have been removed, as they are difficult to distinguish from the surrounding tissue. If the patient has a total thyroidectomy, they experience hypothyroidism. They are given synthetic thyroid hormone treatment for life and often radioactive iodine treatment to treat the cancer.

Parathyroidectomy

Parathyroidectomy is performed for patients experiencing hyperparathyroidism, usually due

to tumor. These patients present with hypercalcemia, high-normal or elevated fasting-serum parathyroid hormone levels, or calciuria in excess of 150 mg every 24 hours. Often there is a palpable mass or a mass seen on a CT scan. There should be no contraindications for general surgery for these patients. Instruments and supplies needed for parathyroidectomy are the same as for thyroidectomy, but the surgical team members should be prepared for numerous frozen sections for identification.

The patient is positioned, prepped and draped in the same manner as for a thyroidectomy. The incision is also the same as a thyroidectomy. The surgeon palpates for a mass through the strap muscles. If a mass cannot be palpated, the surgeon chooses a side to explore. The strap muscles and the thyroid lobe are dissected away. The middle thyroid vein may have to be ligated as part of the exploration and to take the thyroid out of the field. The thyroid is dissected away by finger dissection, from superior to inferior, under the gland.

The carotid artery, recurrent laryngeal nerve, and the inferior thyroid artery are identified and protected. The inferior thyroid artery is often used as a landmark for the superior parathyroids. The superior parathyroid glands usually lie above the junction with the nerve, and the inferior glands lie below.
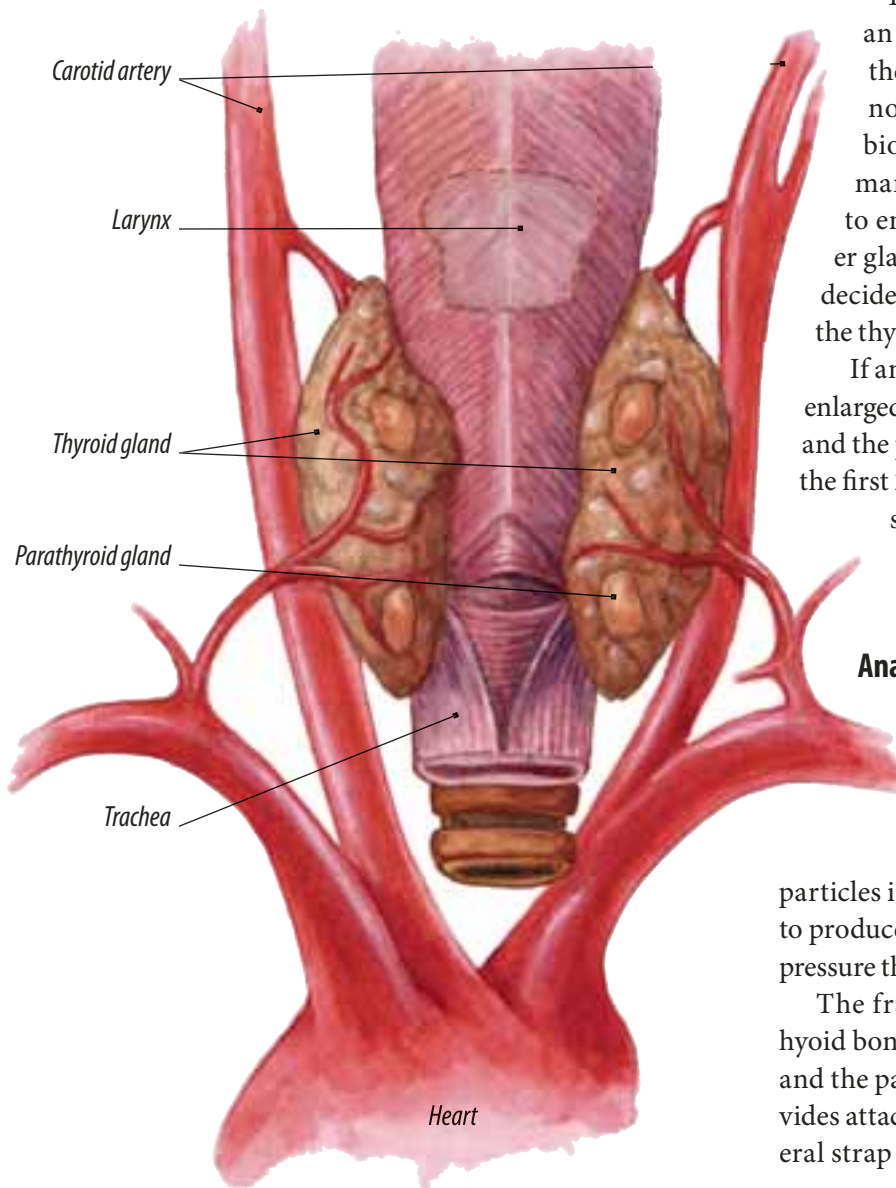
The enlarged gland is identified and an effort is made to find other glands on the same side to make sure that they are normal. Once found, these glands are biopsied, usually with a hemoclip (as a marker). They are sent to the pathologist to ensure that they are normal. If another gland cannot be found, the surgeon may decide to explore the neck and even take out the thyroid gland to find it.

If another gland still cannot be found, the enlarged gland is taken out, the wound is closed, and the patient is watched postoperatively. For the first 24 hours, a parathyroidectomy patient should have the head of their bed elevated to 30 degrees to minimize bleeding in the operative site.

Anatomy of the larynx

The larynx separates the trachea from the upper aerodigestive tract. Its primary function is phonation, but it is also a regulator for respiration and prevents aspiration of food particles into the lungs. The larynx is necessary to produce an effective cough or create negative pressure through a Valsalva maneuver.

The framework of the larynx includes the hyoid bone, thyroid cartilage, cricoid cartilage, and the paired arytenoids. The hyoid bone provides attachment of the epiglottis, as well as several strap muscles, such as the sternohyoid and

FIGURE 2

Arterial supply to the thyroid gland.

Carotid artery

Larynx

Thyroid gland

Parathyroid gland

Trachea

Heart

thyrohyoid. The thyroid cartilage has the anterior attachments of the vocal folds and articulates posteriorly with the cricoid cartilage. The cricoid cartilage is a complete ring and articulates with both the thyroid cartilage and the arytenoids. The arytenoids glide along the posterior cricoid and attach to the posterior ends of the vocal folds. With the strap muscles, the framework of the larynx aids in swallowing and respiration.

There are several divisions of the larynx. The glottis is the area within the larynx that contains the true vocal cords. The supraglottis is the area above the true vocal cords containing the epiglottis, the aryepiglottic folds extending from the lateral epiglottis to the arytenoids, the false vocal cords, and the ventricles (ie the area between the false vocal cords and the true vocal cords). The subglottis is the area below the true vocal cords extending to the inferior border of the cricoid cartilage. The trachea extends below the cricoid cartilage and serves as the passageway for air to the lungs.

The larynx and the pharynx are closely associated to just above the superior border of the cricoid cartilage. This is an important landmark for surgeons when performing laryngectomies, as it is important to keep the esophagus intact.

Laryngeal procedures

Most major surgeries involving the larynx and its associated structures are performed to excise cancer. Direct laryngoscopy or a CT scan often diagnoses the cancer. Laryngeal cancer is responsible for about 1.2% of all new cancers and about .73% of cancer deaths. A majority of the patients who present with this type of cancer are over the age of 60. The overall five-year survival rate for patients with laryngeal cancers is 67%. The risk factors for laryngeal cancers are tobacco usage (especially cigarettes), exposure to second-hand smoke, alcohol, occupational exposure, and radiation. Occupational exposures include asbestos workers, nickel workers, farmers, wood workers, painters who use lead paint, and machinists.

Squamous cell carcinoma (SCCA) represents 85%-90% of all cases of laryngeal cancer. The first symptom is a voice change, usually hoarseness, that doesn't go away. If unchecked, the cancer can cause airway obstruction. Some patients feel a fullness or discomfort in their throat. Often, in advanced stages of the disease, the patient will experience weight loss. Laryngeal cancer is more common in middle-aged males.

For smaller tumors, radiation therapy can often be the only treatment and offers a good chance of a cure. The patients should have a CT scan and MRI to detect the size of the tumor, the spread into surrounding tissue, and whether there is nodal disease in the neck. These patients must also be checked to see if there is any GI or respiratory cancers or spread of cancer. In addition, the patients must be thoroughly informed about the surgery, as their lifestyles can be dramatically changed. If the entire larynx is removed, the patient will have to learn to speak using esophageal speech. All patients will have a tracheotomy—some temporary and some permanent.

Instruments needed for laryngeal surgeries should include a neck dissection set. Some bone cutting instruments might be needed and should be available. If only performing a partial laryngectomy, a microsagittal saw will be used to cut through the cartilage. When doing partial laryngectomies, there may be frozen sections on the margins. Make sure that they are clear before closing the larynx. Several frozen sections may be processed. Lahey clamps are often used to grasp the hyoid bone and should be included on the surgical set up.

The supplies needed for laryngeal surgeries are the same as for neck dissections. Extra items include a saw blade for the microsagittal saw, tracheotomy tubes, and some kind of irrigation set up (eg a syringe with an Angiocat) to keep the field cool and clear of debris when using the saw. The size of the tubes is surgeon preference, but a rule of thumb is usually a 6 trach tube for women and an 8 for men. At least two of each size of tracheotomy tube should be in the room. The tube should be cuffed and nonfenestrated. This tube allows for healing of the larynx and trachea and also prevents blood from the wound getting into the lungs. Several days postoperatively, the patient will either be fitted with a cuf-

fless, fenestrated tube to allow them to speak or have the tube removed entirely. This depends on the patient's ability to cough, as that helps prevent aspiration.

Supraglottic laryngectomy

SCCA makes up 95% of malignant supraglottic tumors. Supraglottic laryngectomy is highly effective for controlling localized disease and allows for near normal preservation of the voice and swallowing. All patients must sign the operative permit for a total laryngectomy, in the event that the margins of the tumor extend to the point where a supraglottic laryngectomy would be ineffective.

The decision to perform supraglottic laryngectomy depends on the size and location of the tumor. If it is a small, superficial tumor, the options for cure could be surgery or radiation therapy. If the tumor is more extensive, surgery is the only option. If the tumor involves the tongue base (which extends into the neck to the level of the hyoid bone) or hypopharynx, it is more likely to recur, and surgery with postoperative radiation therapy is performed. It is very important to check the margins in this surgery, as if there is a possibility of recurrence, then the best option is total laryngectomy.

The patient is positioned supine on the operating table with the neck extended, prepped and draped. A tracheotomy is performed right away or during the surgery. The surgical technologist should have a sterile endotracheal tube on the field to use as a temporary airway; a tracheotomy tube is placed at the end of the case.

An apron flap incision is made, and the flap is dissected upward and is sutured to keep the flap out of the way. The hyoid bone is skeletonized, which releases the strap muscles. The strap muscles are released downward to expose the thyroid cartilage. The perichondrium is elevated off the thyroid cartilage. The thyroid cartilage is cut with a microsagittal saw midway between the thyroid notch and its lower border. The saw cut is extended laterally to allow the surgeon to enter the hypopharynx and grasp the epiglottis. Mucosal incisions are made to incise the tumor

and still leave adequate margins. The tumor is sent to pathology for a frozen section to determine if the margins are free of tumor. Hemostasis is achieved.

If the margins are clear, the tongue base is sewn to the glottis in a way that the mucosa of the tongue base is not approximated to the glottis but set back slightly. This helps decrease aspiration, as there is no epiglottis. The mucosa is closed in the periform sinus to lateral aspects of the tongue base. If there is not adequate perichondrium for attachment, holes may be drilled in the thyroid cartilage. The patient's head must be flexed to achieve closure. This decreases the tension on the sutures. The strap muscles are sewn back to their normal positions. Reinforce the initial closure by approximating the suprahyoid strap muscles to the infrahyoid strap muscles. Jackson-Pratt drains are placed and the incision is closed. Once the incision is closed, the tracheotomy tube is placed. A nasogastric tube is placed before the patient wakes up.

Postoperatively, the patient is fed through a nasogastric tube, as vomiting may disrupt the closure. Aspiration is rare postoperatively, as the vocal cords are swollen. Once the swelling goes down, the chance for aspiration increases. Six to 10 days postoperatively, the cuff on the trach tube is deflated, and the presence of the gag reflex is verified. If present, a cuffless trach tube is placed. If the patient tolerates the cuffless trach tube overnight, the tube is taken out completely (ie decannulation).

Before the patient is discharged, they must learn to feed themselves. The first oral feeding occurs under supervision, and the patient is taught the supraglottic swallow. This entails the patient taking a breath, closing the glottis with a Valsalva maneuver, swallowing, and coughing before inspiration. Pureed food is tried initially, and the patient is discharged once taking an oral diet, which is usually 14 to 17 days postoperatively.

Hemilaryngectomy

Hemilaryngectomy is the removal of half the larynx. This procedure was first performed in the

1880s and was popularized in the United States in the 1970s. Hemilaryngectomy is a vertical laryngectomy where one vocal cord is removed and the other cord is left intact. The hyoid bone and cricoid cartilage are left intact as well. The excision includes taking an anterior portion of the contralateral cord. Hemilaryngectomy is done for vocal cord tumors, which aren't likely to be controlled by radiation therapy alone. If the tumor involves the cricoid cartilage, though, hemilaryngectomy is contraindicated.

The instruments and supplies needed for a hemilaryngectomy are the same as for a supraglottic laryngectomy. Some surgeons may perform a direct laryngoscopy to make sure that the tumor has not grown larger, crossed over to the other cord, and does not involve the cricoid cartilage. For this reason, the hemilaryngectomy patient must also give informed consent for a total laryngectomy.

The patient is prepped and draped the same as a supraglottic laryngectomy. The surgical procedure is much the same as a supraglottic laryngectomy, with a few key differences. The strap muscles are not taken off the hyoid, instead, they are dissected at the midline and retracted away. The perichondrium of the thyroid cartilage is opened at the midline and retracted away. The surgeon uses a sagittal saw to cut vertically through the thyroid cartilage. Some surgeons make a window in the cricothyroid membrane to look into the glottis and visualize their cuts. Once the window is made and the surgeon can visualize the field, the other cartilage cuts are made to remove the affected vocal cord and part of the opposite vocal cord.

Taking part of the opposite vocal cord ensures adequate tumor margins. The margins of the specimen will be checked, however, to make sure that the entire tumor is removed. The remaining vocal cord is reattached to the thyroid cartilage with a small absorbable suture. The epiglottis is sutured to the hyoid bone, and the perichondrium of the thyroid cartilage is closed. The surgeon will perform a tracheotomy sometime in the procedure and, after the wound is closed, the surgeon will place a cuffed, nonfenestrated

trach tube. Most surgeons place a drain in the wound and a nasogastric tube before the patient wakes up.

About five days postoperatively, the patient is tested for decannulation. A cuffless trach tube may be used if the patient cannot tolerate decannulation. Once decannulated, the nasogastric tube is removed, and the patient resumes oral feeding.

Staging of laryngeal tumors

T: the area the tumor takes up in the larynx
T_{IS} Carcinoma in situ
T_1 Tumor confined to vocal cords with normal mobility
T_2 Tumor extending to the supraglottis and/or subglottis with impaired vocal cord mobility
T_3 Tumor limited to the larynx with vocal cord fixation
T_4 Tumor invades through thyroid cartilage and/or extends to other tissue beyond the larynx

N: nodal metastasis
N_0 no lymph node metastasis
N_1 single node less than 3 cm
N_2 single node 3-6 cm or multiple nodes less than 6 cm
N_3 metastasis in node greater than 6 cm
N_x nodes cannot be assessed

M: metastasis outside of the neck
M_0 No distant metastasis (cancer has not spread to distant body structures)
M_1 Distant metastasis (cancer has spread to distant body structures)
M_x Distant metastasis cannot be assessed

Staging of laryngeal tumors
Stage I $T_1 N_0 M_0$
Stage II $T_2 N_0 M_0$
Stage III $T_3 N_0 M_0$
           $T_1/T_2/T_3 N_1 M_0$
Stage IV $T_4 N_0$ or $_1 M_0$
           Any T N_2 or $_3 M_0$
           Any T, Any N, M_1

Total laryngectomy

Total laryngectomy involves the removal of tissues from the hyoid bone to the cricoid cartilage. The base of the tongue, trachea, posterior pharyngeal wall, and cervical esophagus are preserved. Theodor Billroth performed the first total laryngectomy in 1881. There was a successful excision of the tumor, and the patient was rehabilitated with voice prosthesis.

Indications for total laryngectomy include malignant disease, radiation therapy failure, radiation necrosis of the larynx unresponsive to treatment, and severe irreversible aspiration (laryngectomy needed for separation of air and food passages). The patient must be a candidate for general anesthesia and be informed of the postoperative lifestyle change.

The patient will undergo a very thorough work-up before having a total laryngectomy. There must be a biopsied proof of malignancy. The patient will be screened for any airway and digestive tract tumors. The patient will have a CT scan to determine if there is any cartilage invasion of the tumor or metastasis in the neck nodes.

The instruments, equipment, and supplies needed for a total laryngectomy are about the same as for a supraglottic laryngectomy. The sagittal saw and the trach tubes are not needed. The entire cartilage framework is excised, leaving the trachea to be sewn to the skin as a permanent stoma. The sterile endotracheal tube will be used during the case to maintain the airway, as the original tube goes through the larynx and will be in the way. If the patient already has a tracheotomy present, then the anesthesiologist will place the endotracheal tube in the tracheotomy stoma, and the tube will be prepped as part of the field. Most surgeons prefer that the tube be sewn to the skin to prevent dislocation. This can be done before or after the prep according to the surgeon's wishes. Usually a 2-0 silk on a cutting needle is used.

The patient is placed in the supine position with the neck extended. An apron flap incision is made, and the flap is dissected upward and sewn out of the way. If there is nodal metastasis or a chance for metastasis, bilateral level II, III, and IV neck dissections will be performed. An anterior compartment neck dissection is performed as part of the laryngectomy.

Once the neck dissections are finished, the strap muscles are divided at the level of the hyoid bone. The hyoid bone is grasped with an Allis or Lahey and held upward to aid in the dissection of the strap muscles. Care is taken to make sure that the 12th cranial nerve is visualized off the lateral horns of the hyoid bone and not cut as part of the dissection. The dissection is carried through until the pharynx is entered above the epiglottis. The laryngeal framework is carefully dissected away, leaving as much pharyngeal mucosa as possible for a clear margin. The constrictor muscles are dissected away from the lateral plates of the thyroid cartilage to allow the cartilage to be freed up but also to allow easier exposure to the pharynx. As much mucosa as possible is salvaged to allow for a clear passage for food after closing.

The esophagus is dissected away from the trachea. This is often accomplished by the surgeon placing a finger in the esophagus and dissecting with scissors between the esophagus and the cricoid cartilage. The lower strap muscles are divided, and the thyroid lobe on the side of the tumor is removed. Of course, there is no need to preserve the recurrent laryngeal nerve when removing the thyroid, so thyroidectomy is easily accomplished by dividing its vessels.

The surgeon may take one or two tracheal rings to ensure a clear margin. The cut in the trachea is usually an angled cut to accommodate a larger stoma. The surgeon may perform a tracheoesophageal (TE) puncture to allow for feeding postoperatively and placement of an esophageal speech device after healing. This depends on whether or not the patient has had radiation therapy. If the patient has had preoperative radiation, then a TE puncture is performed before closing the esophagus and pharynx, and a soft nasogastric tube (eg Levine tube) is placed through to the stomach. If a TE puncture is not performed, a nasogastric tube will be placed through the nose into the stomach.

The pharynx is usually closed with an absorbable suture (eg 3-0 Vicryl®) on a taper nee-

dle. The tracheal stoma is pulled up and stabilized by suturing it to the periosteum of the clavicle. Jackson-Pratt drains are placed, the skin is closed, and the tracheal stoma is sewn to the skin. There is no need for a trach tube because aspiration from food is no longer possible, as the airway is now separated from the esophagus.

Complications of total laryngectomy include drain failure, which can be a serious threat, hematoma, and infection. A pharyngocutaneous fistula is a complication, which presents about one to six weeks postoperatively. The fistula starts as a salivary leak into the subcutaneous space and progresses to form the fistula tract. Management of the pharyngocutaneous fistula includes packing and antibiotics. The patient is allowed nothing by mouth. For larger fistulas, which do not heal well, a muscle flap may be needed to close the fistula. Stomal stenosis may also occur, but can be repaired by a stomatoplasty. The pharynx may also become stenotic due to the surgery and may have to be dilated.

Total laryngopharyngectomy

Total laryngopharyngectomy is the removal of the larynx and the pharynx, along with all or part of the esophagus. To repair the defect, the stomach may be pulled up and sewn to the oropharynx (ie a gastric pull-up). Another way to repair the defect is to perform a jejunal free flap, where a length of jejunum with its blood supply is sewn into the neck. Either way, this is a major case requiring double set-ups for each procedure. Often, other specialists, such as general and/or plastic surgeons, work along with the otolaryngologist to perform this major surgery. This surgery is done for patients with cancer in their larynx, which has either grown into the pharynx and/or esophagus, or in both, requiring the removal of all structures involved. This surgical procedure will not be discussed.

Conclusion

Cancers of the head and neck can have devastating consequences for patients. Skill and knowledge of the surgical treatment of these diseases are key to quality patient care. Future articles in this series will cover other types of head and neck surgery, including oral surgery.

About the author

Mary Sutton, CST, CFA, is currently an instructor at Concorde Career Institute in Jacksonville, Florida, and was recently a speaker at AST's 36th Annual National Conference in Orlando. She has been active in the Florida State Assembly, the AST national Board of Directors, and continues to serve the profession on the LCC-ST Board of Directors.

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