Laryngeal Conditions

Anatomy

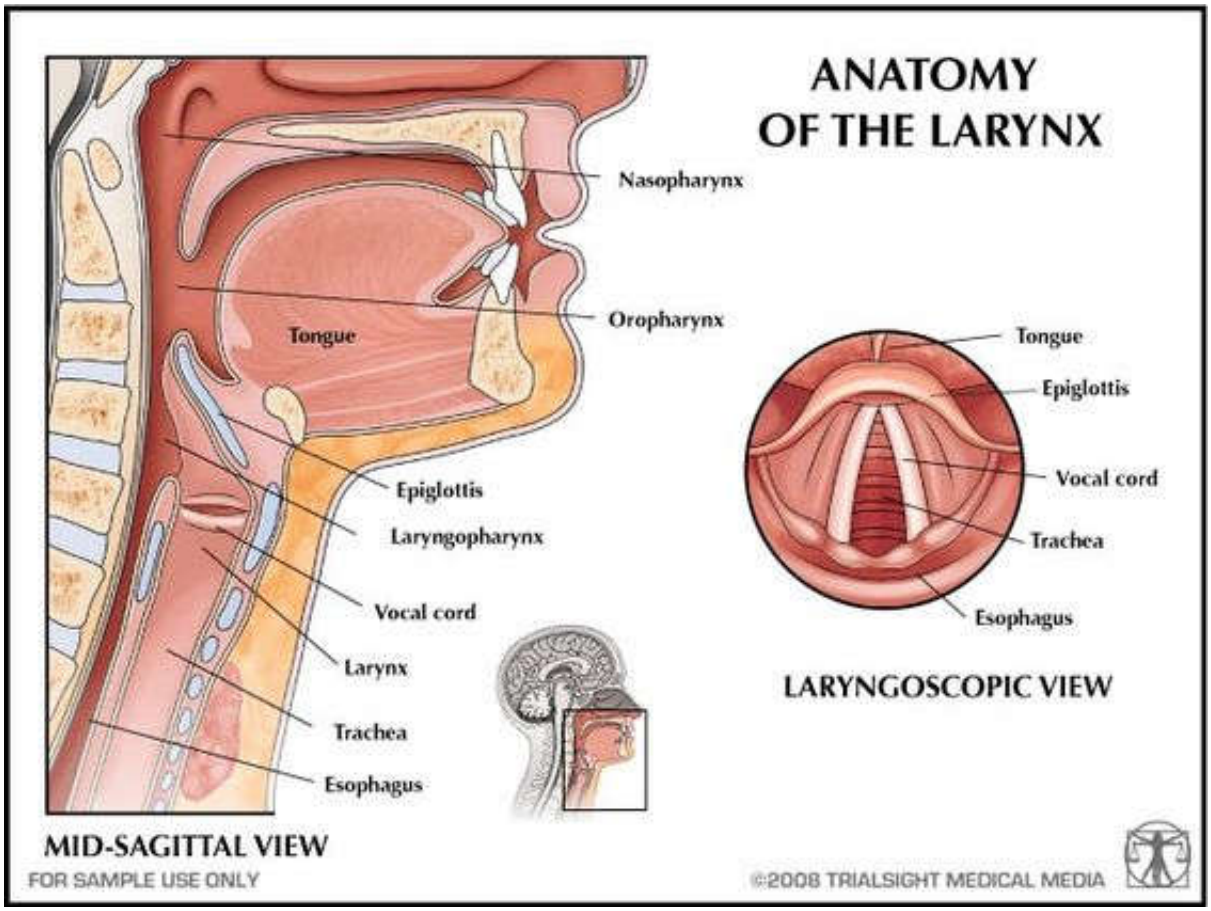

Figure 1: The larynx
Image Source: dnbhelp.wordpress.com

The larynx or voice box is the anatomical structure that allows the production of voice and plays an important role in airflow to and from the lungs.

The vocal cords (vibratory 'strings' that touch during voice production) are only one of many areas of the larynx that can be affected by disease.

The upper part (above the vocal cords) is called the supraglottis and the lower part is called the subglottis. The area that contain the vocal cords themselves, is called the glottis. Disease of the larynx can affect any of these parts of the larynx.

Laryngeal conditions

Any person that experiences a change in voice that persists for more than three weeks, need to be seen by an ENT specialist. Not only is it important to make sure the cause is not cancer, but also to recognize other conditions early.

Hoarseness is a term to describe a change in voice hallmarked by a coarse quality and sometimes difficulty in producing a sound (greater effort is necessary to speak).

Acute laryngitis is an infective condition of the larynx most often caused by viral organisms, and less often by bacteria. Rarely, laryngitis can be caused by fungal organisms, tuberculosis or syphilis.

Chronic laryngitis is when there is swelling and inflammation of the vocal cords over a long period of time. Voice problems are often caused by a combination of underlying conditions. Some of the risk factors for voice problems include smoking, excess alcohol consumption, gastro-oesophageal reflux disease, caffeine intake, loud or excessive voice use, professional voice use, airborne irritants, decreased humidity and poor water intake. Thyroid problems can sometimes be a cause.

Smoking itself can cause chronic hoarseness by causing swelling of the vocal cords (Reinke's edema). This condition is also called smoker's laryngitis. Due to the fact that smoking can cause cancer, all smoking patients that develop a hoarse voice must be seen and investigated by an ear, nose and throat specialist.

Vocal cord lesions can be cancerous and non-cancerous. The most common non-cancerous lesions include nodules, polyps, granulomas, ulcers and papillomas.

Nodules (also called 'singer's nodules') and **polyps** are mostly caused by injury to the vocal cords, especially due to voice overuse (speaking a lot and/or loudly, or professional voice use).

Granulomas and **ulcers** occur in close relations to the bony/cartilaginous structures of the voice box that are responsible for the movement of the vocal cords (arytenoids). The most common cause is intubation (use of a tube to maintain access to the lungs), which is used during surgery or when ventilating the lungs in an Intensive Care Unit.

Papillomas are wart-like growths that form on and around the vocal cords and is caused by a viral infection called Human Papilloma Virus. It is a very variable condition and can develop slowly, without many complications (more so in adults), but it can also be very aggressive and cause life-threatening airway obstruction (more so in children). Needless to say, urgent intervention is indicated. It includes securing the airway and surgical removal.

Scarring of the voice box area may cause hoarseness and difficulty breathing. Such conditions are usually caused by trauma to the larynx or intubation.

Chronic reflux of gastric content (stomach fluids) onto the laryngeal areas (gastroesophageal reflux disease, laryngopharyngeal reflux disease) is a common cause for hoarseness. The gastric fluid is acidic and contains enzymes (responsible for the breakdown of food), which can damage the soft tissue lining of this area.

Rarely, there are **non-cancerous tumors** that may arise from any of the tissues that form the voice box (soft-tissue lining, ligaments, bone, cartilage, muscle, etc.).

Laryngeal cancer is a malignant tumor that arises from anywhere in the voice box. The most common type is squamous cell carcinoma and the most common cause is smoking, however there are many other factors that can play a role. Sometimes cancer of other areas in the body may spread to the vocal cords, but it is a very rare occurrence.

Laryngeal nerve weakness or paralysis causes decreased mobility of a vocal cord. This impairs the proper closure of the vocal cords, which is necessary for the production of sound. It is caused by any condition that affects the laryngeal nerve or lesions that fixes the vocal cord.

Normal ageing of the voice may cause a deeper, coarser voice, which can become tremulous.

Any **neurological diseases or injuries** can also affect the function of the vocal cords. These include strokes, Parkinson's disease, motor neuron disease, myasthenia gravis or brain tumors.

Systemic medical conditions (those that affect the entire body) that can affect the voice box, include thyroid abnormalities, auto-immune diseases (for example rheumatoid arthritis), granulomatous conditions (sarcoidosis, Wegener's granulomatosis, etc.), bone diseases and cartilage diseases.

The **side-effects of certain medications** can cause hoarseness. If a particular medication causes dryness of the soft-tissue lining of the vocal cords and/or thickening of the mucous that lubricates the vocal cords, it can potentially cause voice changes.

There are a few **congenital disorders** (abnormalities that a person is born with) that can affect a patient's voice and/or cause problems with breathing.

Functional dysphonia (abnormal voice), is diagnosed when no medical or anatomical cause for the voice changes can be found. There are various types of functional dysphonia.

Difficulty breathing/shortness of breath can be caused by an obstruction at the level of the laryngeal structures (voice box). The possible causes include:

- **Infections** can cause swelling of the soft tissues of the laryngeal structures which impairs airflow to the lungs. Examples are epiglottitis, laryngitis, croup, diphtheria and abscess formation.
- **Allergic response or a condition called angioedema** (some forms are hereditary) can cause inflammation and swelling of the laryngeal structures, obstructing the airway.
- **Trauma** to the larynx can cause obstruction of the airway. It may occur with direct injury to the neck, airway burns, surgical trauma, assisted delivery, etc.
- **Tumors/masses** that involve the larynx can sometimes grow large enough to obstruct the airway. Tumors can be benign or cancerous and need urgent attention. Sometimes masses in the area surrounding the larynx can cause enough pressure on the airway structures to cause obstruction.
- **Vocal cord immobility (paralysis or paresis)** can sometimes cause obstruction of the airway, because it doesn't move 'out of way' during breathing. Immobility of the vocal cords can be caused by conditions that affect the laryngeal nerve, which is responsible for movement of the vocal cords (laryngeal nerve), dysfunction of the joints (that allow movement of the vocal cords) or benign or malignant lesions that infiltrate either the nerve, the joints or the vocal cords themselves. Children can also be born with paralysis or paresis of the vocal cords.