

Definition

Hoarseness is an abnormal voice characteristic in which the voice has a coarse, breathy quality. Usually it is benign and self-limited, but it may be an early indication of vocal cord carcinoma.

Technique

When presented with a patient with hoarseness, the examiner should determine the duration of hoarseness and the circumstances associated with its onset. One of the most common causes is some traumatic use of the voice such as yelling or shouting at a football game or chronic overuse of the voice as in the case of a professional singer. Smoking history should also be obtained, since it is a traumatic factor as well as a risk factor for the development of malignancies of the aerodigestive tract. An upper respiratory infection with coryza, fever, or cough is another common cause that should be considered. Has the patient had thyroid surgery or other neck surgery in which the vagus or recurrent laryngeal nerve may have been injured? Is there any history of reflux esophagitis or symptoms that might suggest the hoarseness is related to bathing the posterior portion of the larynx in acidic gastric fluids—an under-recognized but common condition? The examiner should inquire about pain or difficulty in swallowing, not only because of proximity of the larynx to the hypopharynx and the esophagus, but because these areas share a common neurologic supply.

Basic Science

The larynx is the guardian of the airway. As such, its function is to provide a passage for air to enter the tracheo-bronchial tree, to prevent the passage of food, saliva, and other swallowed substances from entering the airway, and to provide a sound source for phonation. The true vocal cords are actually muscles stretched across the top of the trachea and arranged in a V configuration. The major motor nerve supply to the vocal cords is the recurrent laryngeal nerve, which is a branch of the vagus. On both sides, the nerves pass out of the jugular foramen in the base of the

skull, down through the neck into the upper chest as the vagus nerve, and then ascend back into the neck in the groove between the esophagus and the trachea as the recurrent laryngeal nerves. In this location they are very vulnerable to injury during thyroid surgery. On inspiration, the angle between the cords widens as the cords abduct, and the angle decreases as the cords adduct during phonation and swallowing. Sound is created by vibration of the free edge of the cords, which occurs as expired air is forced through adducted cords.

Repeated forceful vocal cord adduction with high-velocity expiratory airflow, which occurs with shouting, can be very injurious to the vocal cords. Hoarseness may develop because of generalized swelling or by producing a small intramucosal hematoma at the point of maximum amplitude of vibration on the free edge of the cord. This hematoma can become organized and go on to form a small nodule, the so-called singer's nodule. Anything that interferes with the vibration of the free edge of the cord or that produces incomplete closure of the glottis can cause hoarseness. This includes benign vocal cord lesions such as polyps or papillomas, malignant lesions such as carcinoma, or neurologic dysfunction or injury of the vagus or, more specifically, the recurrent laryngeal nerve.

Clinical Significance

Most hoarseness results from benign causes such as acute laryngitis and is transient and self-limited. The clinical importance of hoarseness is that it may be an early sign of a vocal cord carcinoma, a potentially curable lesion. Any patient with hoarseness of greater than 2 weeks' duration should be examined via indirect laryngoscopy by mirror or by direct fiberoptic examination, both of which are office procedures. If a vocal cord lesion is found, then the patient may require direct laryngoscopy and biopsy.

References

- Paparella M, Shumrick D, eds. *Otolaryngology: head and neck*. Philadelphia: W.B. Saunders, 1980;3:2447–2527.
Saunders WH. The larynx. *Ciba Clin Symp* 1964;16:67–99.