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The larynx: applied basic science and examination

Anatomy of the larynx

The larynx or voice-box is part of the upper respiratory tract. It is lined with ciliated columnar epithelium except over the vocal folds or 'cords' which are covered with squamous epithelium. It is made of a series of cartilages, the main ones being the epiglottis, the cricoid cartilage (a complete ring just above the trachea) and the thyroid cartilage, which you can palpate as the 'Adam's Apple' externally in the neck. Various membranes, muscles and ligaments complete the structure of the larynx (Figs 25.1 and 25.2).

Physiology of the larynx

Air passes through the vocal folds, which vibrate like the reed of a musical instrument in expiration to produce voice (phonation). The other functions of the larynx are as a conduit for air entry into the respiratory tract and to close off the air-passages during swallowing to protect the lungs.

Symptoms and signs of laryngeal disease

Lesions on or around the vocal cords cause **hoarseness**.

Failure of the laryngeal inlet to close on swallowing causes **aspiration**; the patient will cough and splutter on swallowing – food 'going down the wrong way'.

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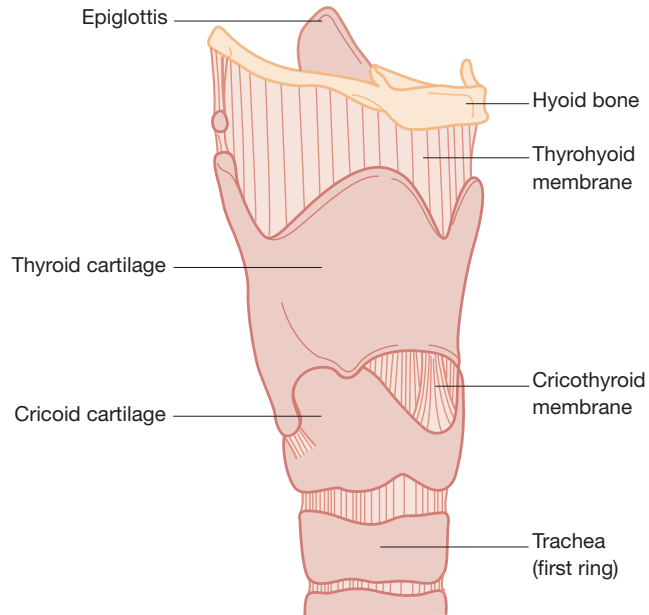


Figure 25.1 The main cartilages and membranes of the larynx.

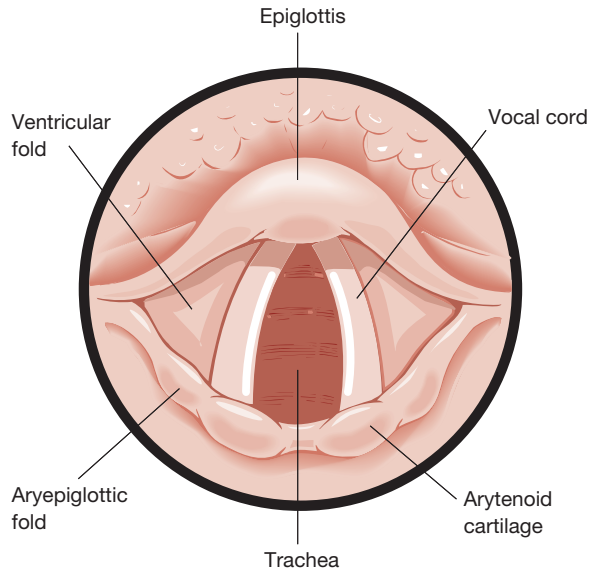


Figure 25.2 The structures seen on indirect laryngoscopy.

The most dangerous laryngeal pathology is narrowing of the airway. This causes reduced air entry and turbulent flow so that the patient makes a high-pitched noise when breathing (**stridor**). Increasing difficulty causes a rise in respiratory rate (tachypnoea), and the patient will struggle to breathe and become distressed as he uses the accessory muscles of respiration to maintain airflow. In severe cases there may be cyanosis, cessation of air entry (apnoea) and death.

Examination of the larynx

You can get some idea of how the larynx is working by listening to the patient's **voice** (is he hoarse?) and observing his breathing (is there stridor?). Palpate the neck as well and feel for the prominence of the laryngeal cartilages. '**Crepitus**' or a sensation of 'crackling' under your fingers when you gently move the larynx is normal.

Inspecting the larynx requires some skill and practice. **Fibre-optic laryngoscopy** is increasingly available and fibre-optic instruments are now of extremely high quality. The instrument is passed through the nose into the pharynx. It is then manoeuvred past the epiglottis until the interior of the larynx is seen (Fig. 25.3). This allows inspection of the cords during phonation and also enables a photographic record to be made. To assess mobility of the cords ask the patient to say 'EE', causing adduction (movement of the cords towards the midline) or to take a deep breath, which causes abduction (movement of the cords away from the midline). The patient can even see her own larynx on a television monitor.

For **indirect laryngoscopy** ask the patient to protrude her tongue, which is held gently between the examiner's middle finger and thumb (Figs 25.4 and 25.5). A warmed laryngeal mirror is introduced gently but firmly against the soft palate in the midline. By tilting the laryngeal mirror, the various structures shown in Fig. 25.2 can be seen.

For more detailed examination and particularly if a biopsy is needed direct laryngoscopy under general anaesthesia is required (Figs 25.6 and 25.7).



Figure 25.3 Flexible laryngoscopy.

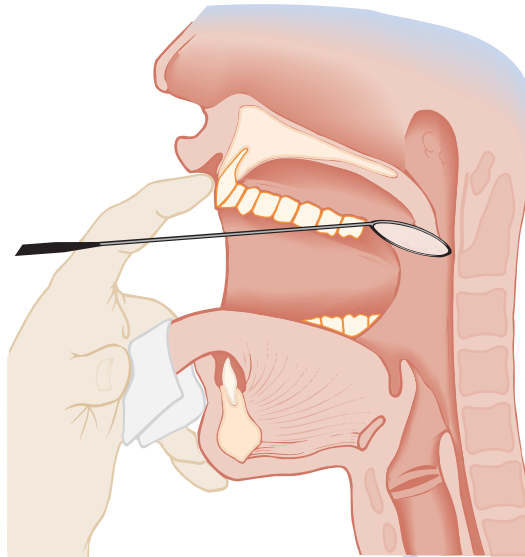


Figure 25.4 The position of the mirror on indirect laryngoscopy.



Figure 25.5 The technique of indirect laryngoscopy.

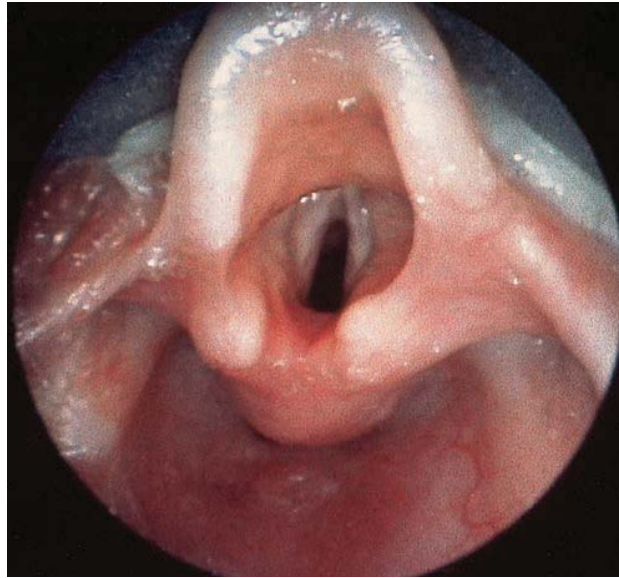


Figure 25.6 The normal larynx as seen by direct laryngoscopy in a child.

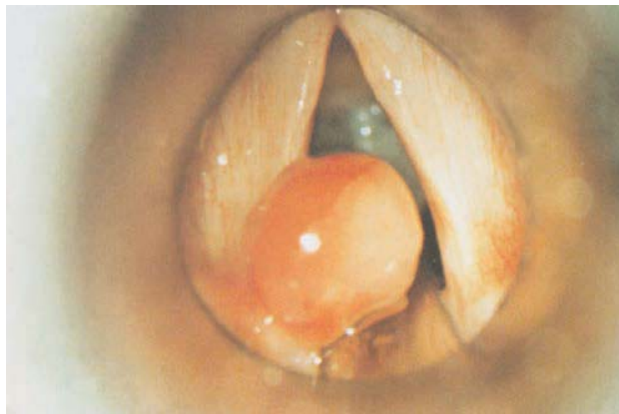


Figure 25.7 The appearance of the larynx as seen by direct laryngoscopy. Note the large polyp on the left vocal cord.



CLINICAL PRACTICE POINT

- The main symptoms and signs of laryngeal disease are hoarseness, stridor and aspiration. All are potentially serious but be especially vigilant if there is any worry about airway obstruction, which can progress very quickly.



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