The larynx and hypopharynx are constituent parts of the upper aerodigestive tract, intimately linked together with their connective tissue elements and different epithelia. The anatomy and histology of both organs are very complex and details are available in various standard textbooks and specialised papers [103, 158, 238, 321, 322]. Only essential data will be given here.

The larynx is a hollow tube that communicates cranially with the hypopharynx. Its upper limits are the free edge of the epiglottis and the two aryepiglottic folds. The lower laryngeal part continues caudally with the trachea, and its inferior limit is the lower edge of the cricoid cartilage. The anterior border consists of the lingual surface of the epiglottis, thyrohyoid membrane, thyroid cartilage and the anterior arch of the cricoid cartilage. Posteriorly, the cricoid cartilage and area of the arytenoids limit the larynx.

The larynx is divided into supraglottic, glottic and subglottic regions, which have particular significance for the biological behaviour and staging of tumours. The supraglottic region extends from the tip of the epiglottis down to the superior edge of the true vocal cord and includes the epiglottis, aryepiglottic folds, arytenoids, the false vocal cords and ventricles. The glottis includes the vocal cords with anterior and posterior commissures. The subglottis extends below the true vocal cords to the lower border of the cricoid cartilage.

Our own experience suggests that marked variations in the distribution of different types of laryngeal epithelia related to age seem to be the rule [177]. The lingual and, variably, laryngeal side of the epiglottis and the true vocal cords are covered by the non-keratinising stratified squamous cell epithelium, the rest of the larynx is lined with the respiratory epithelium. The seromucinous glands are abundant in all compartments of the larynx except in the vocal cords, where they are essentially missing on their free edges and are sparse in the rest of the cords.

It is important to draw attention to some particularities in the laryngeal structure that considerably influence the spread of malignant tumours. The elastic cartilage of the epiglottis with numerous fenestrations for vessels, nerves and glands provides a “locus minoris resistentiae” for the progress of malignant growth from the laryngeal to the lingual side or vice versa. In the anterior commissure, where the true vocal cords meet in the anterior midline, a band of fibrous tissue (protrusions of the two vocal ligaments) with lymphatic and blood vessels is attached to the thyroid cartilage. There is no perichondrium at this point, which certainly facilitates the ingrowth of malignant tumours in the thyroid cartilage. The network of capillaries is poorly developed in Reinke’s space of the vocal cords and lymphatics are lacking. These specificities contribute to the development of various exudative lesions of the vocal cords and delayed metastases of glottic cancers.

Embryologically, the supraglottic part of the larynx arises from the third and the fourth branchial arches, while the glottic and subglottic portions are derived from the sixth arch. The first appearance of the respiratory tract occurs at approximately 21 days during embryogenesis as an evagination or a vertical groove of the cephalic portion of the foregut. This evagination is the precursor of the epiglottis, the earliest portion of the larynx. Its outlines appear at the 6-mm foetal stage by 30 days. The respiratory groove begins to close and with the formation of the arytenoids, the closure becomes complete [103]. The covering epithelium of the groove appears in the 3–5 mm embryo as three lines of polyhedral embryonic cells of endodermal origin. In a 30-mm foetus, by 60–70 days, the thickness of the embryonic stratified squamous epithelium increases, and the vocal cords begin to differentiate. The ciliated epithelium occurs in a 40-mm foetus on the epiglottis and laryngeal vestibule. A sharp distinction between the two epithelia appears after the foetus reaches a length of 95 mm. The larynx of a newborn is covered in the ciliated epithelium, except on the true vocal cords. In addition to this location, the stratified squamous epithelium is also present on the interarytenoid area and on the tip of the epiglottis [158].

The hypopharynx is the caudal part of the pharynx with the wide part superiority, extending from the tip of the epiglottis to the inferior level of the cricoid cartilage, where it becomes narrow and continuously proceeds to the oesophagus. The hypopharynx is divided into three compartments: left and right pyriform sinuses, postcricoidal region, and posterior pharyngeal walls. The pyriform sinuses are medially limited by the aryepiglottic folds and laterally by the thyroid cartilage. The postcricoid area is the posterior side of the cricoid cartilage. The posterior wall is situated in front of the cervical spine. The entire hypopharynx is covered in the stratified squamous cell epithelium.

Embryologically, the pharyngeal gut or pharynx extends from the buccopharyngeal membrane to the tracheobronchial diverticulum. The hypopharynx is almost entirely of endodermal origin. In the 8th through to the 10th gestation week the pharynx, as well as the hypopharynx, is rather small and after the 10th week of gestation, remarkable growth occurs in this region [204, 252].