



Figure 16-11 Diagrammatic comparison of a singer's nodule, a benign papilloma and an exophytic carcinoma of the larynx to highlight the difference in their clinical appearance.

in adults because of the larger size of the larynx and the stronger accessory muscles of respiration. *Croup* is the name given to laryngotracheobronchitis in children, in which the inflammatory narrowing of the airway produces the inspiratory stridor so frightening to parents. The most common form of laryngitis, encountered in heavy smokers, predisposes to squamous epithelial metaplasia and sometimes overt carcinoma.

Reactive Nodules (Vocal Cord Nodules and Polyps)

Reactive nodules, also called polyps, sometimes develop on the vocal cords, most often in heavy smokers or in individuals who impose great strain on their vocal cords (singer's nodules) (Fig. 16-11). By convention, singers' nodules are bilateral lesions and polyps are unilateral. Adults are most often affected. These nodules are smooth, rounded, sessile or pedunculated excrescences, generally only a few millimeters in the greatest dimension, located usually on the true vocal cords. They are typically covered by squamous epithelium that may become keratotic, hyperplastic, or even slightly dysplastic. The core of the nodule is a loose myxoid connective tissue that may be variably fibrotic or punctuated by numerous vascular channels. When nodules on opposing vocal cords impinge on each other, the mucosa may undergo ulceration. Because of their strategic location and accompanying inflammation, they characteristically change the character of the voice and often cause progressive hoarseness. They virtually never give rise to cancers.

Squamous Papilloma and Papillomatosis

Laryngeal squamous papillomas are benign neoplasms, usually located on the true vocal cords, that form soft, raspberry-like proliferations rarely more than 1 cm in diameter (Fig. 16-11). On histologic examination, the papillomas are made up of multiple slender, finger-like projections supported by central fibrovascular cores and covered by an orderly stratified squamous epithelium. When the papillomas are on the free edge of the vocal cord, trauma

may lead to ulceration that can be accompanied by hemoptysis.

Papillomas are usually single in adults but are often multiple in children, in whom they are referred to as *juvenile laryngeal papillomatosis*. However, multiple recurring papillomas also occur in adults. *The lesions are caused by HPV types 6 and 11.* They do not become malignant, but frequently recur. They often spontaneously regress at puberty, but some affected patients endure numerous surgeries before this occurs.

Carcinoma of the Larynx

Carcinoma of the larynx is typically a squamous cell carcinoma seen in male chronic smokers.

Sequence of Hyperplasia-Dysplasia-Carcinoma. A spectrum of epithelial alterations is seen in the larynx. They range from *hyperplasia, atypical hyperplasia, dysplasia, and carcinoma in situ* to *invasive carcinoma*. Grossly, the epithelial changes vary from smooth, white or reddened focal thickenings, sometimes roughened by keratosis, to irregular verrucous or ulcerated white-pink lesions (Fig. 16-12).

There are all gradations of epithelial hyperplasia of the true vocal cords, and the likelihood of the development of an overt carcinoma is directly proportional to the grade of dysplasia when the lesion is first seen. Orderly hyperplasias have almost no potential for malignant transformation, but the risk rises to 1% to 2% during the span of 5 to 10 years with mild dysplasia and 5% to 10% with severe dysplasia. Only histologic evaluation can determine the gravity of the changes.

The epithelial alterations described above are most often related to tobacco smoke, the risk being proportional to the level of exposure. Indeed, up to the point of cancer, the changes often regress after cessation of smoking. Together



Figure 16-12 Laryngeal carcinoma. Note the large, ulcerated, fungating lesion involving the vocal cord and pyriform sinus.