



## **Endolaryngeal Trauma**

Trauma to the larynx can have a wide-ranging impact on voice, breathing, and swallowing. Understanding the history of trauma, specific patient symptoms, and careful laryngoscopy will aid in diagnosing the particular pattern of injury. Depending on the mechanism of injury and the resulting scar formation primarily guide intervention. Treatment is primarily a surgical attempt to restore functional anatomy, but some patterns of injury are difficult to rectify, and permanent alterations of voice, breathing, and swallowing are common in this condition.

### **Pathophysiology**

- There is functional and anatomic division of the larynx into the anterior larynx (true vocal folds) responsible for voice, and the posterior larynx (inter-arytenoid space) which actively dilates to support breathing. The effects on voice and breathing can best be understood by localizing the area of injury. Anterior glottic webs will have significant effects on the voice, but breathing can be normal. Posterior glottic stenosis has devastating effects on breathing, but the voice can often be normal.
- The most common cause of endolaryngeal trauma is endotracheal tube damage, either at the time of intubation from direct trauma, or long-term term intubation where the pressure of the endotracheal tube causes ischemic mucosal trauma to the posterior larynx.
- Duration of intubation, ischemia, diabetes mellitus, and large ETT size (8.0 mm or greater) were significant risk factors for the development of PGS in a multi-institutional study.
  - Whited RE. Posterior commissure stenosis post long-term intubation. *Laryngoscope* 1983;93:1314–1318
  - Hillel AT, et al. Predictors of Posterior Glottic Stenosis: A Multi-Institutional Case-Control Study. *Ann Otol Rhinol Laryngol*. 2016 Mar;125(3):257-63. PMID: 26466860

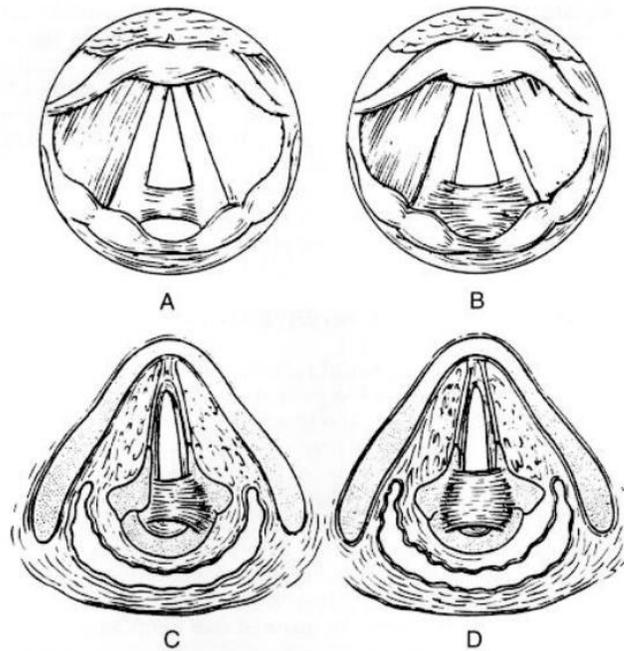
### **Assessment**

- Assessment of endolaryngeal injury is best performed with both office and operative examination. Office laryngoscopy will allow for visualization of vocal cord abduction and



adduction, as well as the extent of vibratory function of the musculomembranous vocal folds. Operative assessment by direct laryngoscopy enables palpation of the arytenoid joints to assess scar and fixation of the joints that indicate more severe stenosis.

- Posterior glottic stenosis can be graded according to the degree of scarring and fixation of structures.



- A. Interarytenoid synechia. B. Posterior glottic web with mobile arytenoids. C. Fixation of one arytenoid. D. Fixation of both arytenoid cartilages. Cotton RT, Manoukian JJ: Glottic and subglottic stenosis. In Cummings CW (ed): Otolaryngology Head & Neck Surgery. St. Louis; Mosby, 1986.

### **Treatment**

- In cases with significant airway symptoms, such as dyspnea or stridor, as well as in patients with poor pulmonary function, tracheotomy should be considered the safest and most efficient method to treat stenosis. In addition, for many reconstructive methods tracheotomy is a necessity for the surgical procedure and post-operative recovery.
- A variety of open and endoscopic techniques are described to release the scar tissue associated with endolaryngeal trauma, and most require the use of interposed tissue or stenting to prevent recurrence of scar tissue. With the absence of the dynamic functions



of the larynx, creating more space between the vocal folds for breathing vocal function and to a lesser extent swallowing function can be compromised by these techniques.