PHOTODOCUMENTATION OF THE DEVELOPMENT OF INTERARYTENOID ADHESION BANDS

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ABSTRACT

Interarytenoid adhesions secondary to intubation trauma are thought to cause vocal cord abductor immobility secondary to contraction band formation.

The photomicrographs shown here document the progressive changes over two months (patient 1) and 6 months (patient 2) after acute endotracheal tube injury.

CASE REPORTS

Patient 1: A 23 year old male US Army soldier with a history of traumatic multi-limb amputation injury while serving in Iraq was emergently intubated and evacuated to Walter Reed Army Medical Center. Symptoms of acute dysphonia, breathy voice, and vocal fatigue were documented following extubation and closely monitored during his hospitalization and recovery.

Early endoscopic examination of the patient performed in the clinic revealed granulation tissue overlying the mucosa of the medial surface of the vocal process of the arytenoid. (See Photo 1).

Nonsurgical management (inhaled steroids, antibiotics, & anti-reflux medications) were utilized and monitored via serial video endoscopies. Transformation of the granulation tissue was monitored and voice and airway complaints were recorded. (Photos 2 - 3).

The patient’s early voice changes initially improved but worsened over the last few weeks of conservative management to include symptoms of dyspnea on exertion, mild dysphagia, and a foreign body sensation in the throat. (Photo 4).

This case demonstrates the sequential formation of an interarytenoid adhesion. Close monitoring of this individual’s symptoms and findings on video endoscopy enabled surgical intervention to be taken when the symptoms revealed early dysfunction. His recovery continued without incident. (see Photos 5 - 6).

Patient 2: A 30 year old male who suffered a traumatic brain injury following an assault required prolonged intubation. Following extubation, the patient was found to have a granuloma expanding the posterior commissure. (Photo 7).

Botox was utilized with reduction of granuloma size allowing identification of an interarytenoid bridge (Photo 8). Surgical intervention removed granuloma and interarytenoid bridge but granulation tissue recurred Photo 9). Repeat Botox administration and continued observation followed. Repeat posterior adhesion did not occur due to non-contact of opposing granulation tissue (Photo 10 – 11).

DISCUSSION

Endolaryngeal injuries continue to exist despite advances in endotracheal tube design and ICU management. Mucosal injury typically occurs at one or more of the three most sensitive mucosal areas: the medial surfaces of the vocal process, the interarytenoid area, and the posterior subglottis along the inferior aspect of the cricoid cartilage.

Factors such as local infection, chronic disease states, hypotension, gastric reflux, tube mobility, and impaired pulmonary toilet are key influencers in the development of complications. Additional factors that may influence long-term sequelae includes emergency intubation or traumatic intubation, an abnormal larynx, and patient healing characteristics.

PRINCIPLES OF TREATMENT

Management of the endotracheal injuries requires video endoscopic evaluation of the airway. Early edema and granulation tissue usually resolve within 3 weeks but should be monitored closely for resolution if symptoms or exam findings persist. Ulceration of the mucosa should be treated aggressively with proton pump inhibitors, antibiotics, steroids, and Botox injection should be considered. Granulation tissue may be removed for a symptomatic airway or to minimize contact between opposing surfaces of inflamed mucosa.

Visits to the otolaryngologist due to changes in voice or development of dyspnea on exertion or other aero digestive complaints a few months after surgery should prompt suspicion of restrictive posterior glottic stenosis or interarytenoid adhesions as potential causes of these symptoms. Immobile vocal cords may be best assessed during operative direct laryngoscopy with palpation of the arytenoid. Laryngeal EMG may also be used to differentiate immobile vocal folds from paralysis.

REFERENCES
