Salvaging a Shattered Larynx: A Challenge in Clinical Otorhinolaryngology

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ABSTRACT

Laryngotracheal trauma is a life-threatening clinical scenario at times. Although considered rare, it is on the rise due to high speed vehicular accidents. Failure to recognize such injuries and promptly secure an airway may have fatal consequences. We are reporting three cases of laryngotracheal blunt trauma, all of whom subsequently developed absolute dysphagia, difficulty in breathing and difficulty in phonation. These patients were appropriately managed in the critical time period. Two patients were surgically managed and one patient was treated conservatively. They are on regular follow-up and are physiologically stable. In this report, the treatment strategies adopted leading to good clinical outcomes are highlighted.

Keywords: Laryngeal trauma, Dyspnoea, Emphysema, Odynophagia, Counter tracheostomy, False passage, Laryngeal stabilization.

INTRODUCTION

Laryngeal trauma patients present with symptoms that require emergency management by experienced professionals. With an overall mortality approximated at 2%, airways management is the priority. External injuries to the larynx threaten both the quality and maintenance of life. The quality of phonation is the product of the aerodynamic and myoelastic properties of the larynx. Air passing through the glottis is acoustically filtered by the vocal tract. Essential to preservation of these two laryngeal functions are early recognition, accurate evaluation and proper treatment of injuries. Those patients who need emergent surgery should be differentiated from those who can undergo further investigations in the emergency room. A neck wound that penetrates the platysma is significant. In-depth knowledge of the assessment and treatment of such complicated injuries to the aerodigestive tract would help to reduce the long-term morbidity associated with such clinical entities.

CASE REPORT

This is a case series of three patients with laryngeal trauma due to varied etiology who presented in the emergency room with similar complaints but required different management strategies.

Patient ‘A’ was a 40-year-old male with alleged history of cut throat injury. He presented to the emergency room with a tracheostomy tube at the wound site. Examination revealed a metal tracheostomy tube at the wound site with continuous blood-stained mucoid secretions (Fig. 1). X-ray soft tissue neck lateral view revealed a defect in the thyrohyoid membrane. The lower end of the existing tracheostomy tube was abutting the posterior pharyngeal wall and clearly seen to be in a false passage (Fig. 2). In the operating room, a counter tracheostomy was done to secure the airway and administer anesthesia. Surgical decannulation of the existing tube was done following which the pharyngeal injury was repaired with thyrohyoid membrane approximation. During the postoperative period, the patient was on Ryle’s tube feed. He was decannulated on the 10th day and started on oral feeds from the 15th day. He was phonating well with no aspiration or salivary leak at the time of discharge from hospital.

Patient ‘B’ was a 58-year-old male who came to the emergency room with alleged history of road traffic accident following which he developed difficulty in swallowing and spitting out blood-stained sputum. Examination revealed subcutaneous emphysema and tenderness over the laryngeal framework. Computed tomography (CT) scans of the neck showed extensive emphysema with extension into the superior mediastinum (Fig. 3) and fracture of thyroid cartilage at the midline with mild lateral displacement of the right side ala (Fig. 4). Laryngeal endoscopy revealed displacement of bilateral aryepiglottic folds (Fig. 5), ballooned up arytenoids (Fig. 6)
and displaced fragments of thyroid cartilage causing partial compromise of vocal tract (Fig. 7).

Patient was monitored in the intensive care unit for 24 hours, after which, tracheostomy, followed by neck exploration and laryngeal stabilization under general anesthesia were performed. The fragmented thyroid cartilage and the displaced parts were stabilized by suturing. He was on nasogastric feed for 2 months following which he was decannulated and Ryle’s tube was removed after ascertaining absence of aspiration.
Patient ‘C’ was a 25-year-old male who came to the emergency room with history of accidental strangulation following which he developed odynophagia and dysphonia. Examination revealed diffuse swelling in the anterior aspect of the neck and subcutaneous emphysema. Radiological evaluation by CT scanning showed extensive subcutaneous emphysema with extension into posterior pharyngeal space and left posterior neck space (Figs 8 and 9).

He was monitored in the intensive care unit for 24 hours following which direct laryngoscopy was done under general anesthesia. This revealed transection of right pharyngoepiglottic fold and presence of supraglottic edema. He was conservatively managed with anti-inflammatory and antireflux medications. A videolaryngoscopy done 6 weeks later showed a normally functioning vocal tract.

**DISCUSSION**

Traumatic airway injuries are fortunately rare. Though injuries can be obvious and initial management straightforward, the diagnosis can be difficult. Laryngeal trauma could either be a blunt trauma or a penetrating injury. It has been reported that less than 1% of all trauma involves the larynx. The incidence of both forms of injury ranged from one in 5,000 emergency visits in the 1980s to one in 30,000 emergency visits in the 1990s. Concurrent injury to the pharynx and esophagus is infrequent in both penetrating and blunt laryngeal trauma. The most common finding in these patients has been dysphonia and tenderness of the larynx. Computed tomography imaging is beneficial in patients with a significant history of blunt force trauma to the anterior neck with or without significant abnormal findings on physical examination, particularly with dysphonia or hemoptysis, and if the condition and continuity of the endolarynx and trachea is not observable due to edema or hematoma. Video stroboscopic laryngoscopy provides an excellent assessment of vocal fold mobility and integrity, and potential reversibility of injuries. Stroboscopic examination is also useful for the assessment of recovery if the primary injury is borne by the true vocal cords. The timing of early surgical management ranges from within 24 hours to several days. However, it has been reported by Herbert Harris in 1965 and 1970 that surgery is beneficial within 24 hours of injury. Following acute airway management, laryngeal injuries are managed based on the severity of injury and specific elements of each lesion. A classification and treatment protocol has been described by Schaefer. Group I laryngeal traumas demonstrate only minor laryngeal edema or lacerations. Typically, this group can be treated with steroids, antibiotics, antireflux therapy and close observation. Group II includes more demonstrative edema or hematomas without exposed cartilage. Diagnostic endoscopy and tracheostomy are frequently indicated for this group. Group III laryngeal traumas demonstrate massive edema or large mucosal lacerations. Conservative management includes anti-inflammatory and antireflux medications.
drugs, along with antibiotics and corticosteroids. Surgical management includes tracheostomy, direct laryngoscopy and esophagoscopy, open interventions and laryngeal stenting.

CONCLUSION

The clinical profile of the three patients with similar presentations of compromised airway and effect of blunt trauma on the laryngeal framework helped to formulate a reasonably effective management protocol which addressed the physiological functions of respiration, phonation and deglutition sans aspiration adequately. The pearls of wisdom would be to manage such patients aggressively in the golden hour to prevent long-term morbidity and residual physiological deficit. It would suffice to state that the role of CT scans and endoscopic evaluation cannot be overemphasized.

REFERENCES