Cricohyoidoepiglottopexy in Laryngeal Trauma

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Keywords
laryngeal trauma, cricohyoidoepiglottopexy

Received December 31, 2015; revised June 14, 2016; accepted June 21, 2016.

Laryngeal fractures occur in 1 in 30,000 trauma patients admitted to dedicated trauma centers.1 Once a laryngeal fracture is suspected or identified, the primary goal is to secure the airway, followed by reconstruction to conserve laryngopharyngeal function.1 Cricohyoidoepiglottopexy is a surgical approach typically used in the management of glottic carcinoma. In this study, a case of laryngeal trauma requiring a novel use of cricohyoidoepiglottopexy is reviewed. This article was approved by the Ethics Committee of the Centro Académico de Medicina de Lisboa (Hospital de Santa Maria, Hospital Pulido Valente, Faculdade de Medicina de Lisboa e Instituto de Medicina Molecular).

Case Report

A 33-year-old man survived a motorcycle accident that caused a penetrating neck wound and a laryngeal fracture. He was referred to our otorhinolaryngology department after 8 days in the trauma hospital of an underdeveloped African country. The patient had undergone a tracheotomy and an attempt to reconstruct the larynx with sutures at the referring hospital. A computed tomography scan at admission showed a cervicomediastinal abscess and a partial destruction of the thyroid cartilage (Figure 1).

The patient was immediately scheduled for surgery, which began by exploring the dehiscence a few centimeters above the tracheotomy. This dehiscence was found to penetrate the supraglottic area and the left piriform sinus, allowing an external direct visualization of endolarynx and hypopharynx, which were severely swollen (Figure 2). The epiglottis was found to be displaced superiorly to the wound. Necrotic tissue was excised and the abscess was drained. Friability of tissues and the need to control infection prevented any attempt to reconstruct the larynx at this time; thus, the surgical decision was made to create a pharyngolaryngeal stoma and a gastrostomy to allow the wound to granulate in by secondary intention.

Over the following weeks, the pharyngolaryngeal stoma’s dimensions decreased and the hypopharyngeal defects apparently remucosalized. However, at 6 months postoperatively, the remaining supraglottic and glottic mucosa was still showing significant edema, and granulation tissue was seen covering the remainder of thyroid cartilage in spite of local care, antibiotics, steroids, and proton pump inhibitors.

At this stage, a decision was made to perform a supracricoid horizontal partial laryngectomy with cricohyoidoepiglottopexy (SCPL-CHEP) to restore laryngopharyngeal function. Surgery went ahead uneventfully, except for the intraoperative finding of a mucosal defect on the left pyriform sinus caused by the initial trauma, which was addressed by covering it with local sliding flaps of adjacent hypopharyngeal mucosa.

Figure 1. Computed tomography scan at admission showing a partial destruction of the thyroid cartilage.

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On the third day after SCPL-CHEP, a left pharyngocervical fistula was identified and successfully managed conservatively with daily changing of compressive dressings. The tracheostomy cannula was removed on the 14th day after the SCPL-CHEP procedure, and the patient was immediately started on speech rehabilitation. After a negative methylene blue fistula test on the 30th postoperative day, the patient began oral intake and the gastrostomy was closed.

Eight months after SCPL-CHEP, he developed a purulent discharge at the surgical cervical scar. The computed tomography scan revealed it to be due to a late-appearing fistula, which was managed by total resection under general anesthesia. Twelve months after SCPL-CHEP, the subject presented a functional larynx with a socially effective voice.

**Discussion**

As a rule, laryngeal reconstruction should be performed in the first 24 to 48 hours after a traumatic fracture, and care should be taken to prevent infection, tissue necrosis, and denuded mucosal areas.

SCPL-CHEP is usually indicated in anterior glottic carcinomas that spare at least 1 functional cricoarytenoid unit. In this nononcologic subject, SCPL-CHEP proved, however, that it could also be used to achieve laryngeal function in a case where conventional larynx reconstruction is not possible. It is our opinion that, due to the described thyroid cartilage lesion with functional preservation of both cricoarytenoid units, SCPL-CHEP was the simplest, safest, and more effective way to restore laryngeal function. To our knowledge, there has been no previous report of the use of this procedure in a non-oncologic setting, making this the first description of the possible use of the technique in laryngeal trauma management.

A final word on the pharyngocutaneous fistulae: as preservation of the pharyngeal mucosa seems to prevent this complication in oncologic patients, its occurrence is attributed to the pyriform sinus mucosal laceration caused by the laryngeal trauma.

**Conclusions**

SCPL-CHEP can be used to restore laryngopharyngeal function in trauma patients. Such patients, however, may be at risk for pharyngocutaneous fistula following the procedure.

**Acknowledgment**

We thank Borges Dinis, MD, for the revision of the manuscript.

**Author Contributions**

Eduardo Ferreira, conception, drafting and revision of the article, literature review; Carlos Nabuco Araújo, conception, drafting and revision of the article, literature review; Sandra Agostinho, drafting and revision of the article, literature review; Ana Rita Santos, revision of the article, literature review.

**Disclosures**

Competing interests: None.

Sponsorships: None.

Funding source: None.

**References**