

## Review

## Resuscitating the tracheostomy patient in the ED☆☆

Brit Long, MD<sup>a,\*</sup>, Alex Koyfman, MD<sup>b</sup><sup>a</sup> Department of Emergency Medicine, San Antonio Military Medical Center, Houston, TX 78234<sup>b</sup> Department of Emergency Medicine, The University of Texas Southwestern Medical Center, Dallas, TX 75390

## ARTICLE INFO

## Article history:

Received 3 December 2015

Received in revised form 18 March 2016

Accepted 19 March 2016

## ABSTRACT

**Background:** Emergency physicians must be masters of the airway. The patient with tracheostomy can present with complications, and because of anatomy, airway and resuscitation measures can present several unique challenges. Understanding tracheostomy basics, features, and complications will assist in the emergency medicine management of these patients.

**Objective of review:** The aim of this review is to provide an overview of the basics and features of the tracheostomy, along with an approach to managing tracheostomy complications.

**Discussion:** This review provides background on the reasons for tracheostomy placement, basics of tracheostomy, and tracheostomy tube features. Emergency physicians will be faced with complications from these airway devices, including tracheostomy obstruction, decannulation or tube dislodgement, stenosis, tracheoinnominate fistula, and tracheoesophageal fistula. Critical patients should be evaluated in the resuscitation bay, and consultation with ENT should be completed while the patient is in the department. This review provides several algorithms for management of complications. Understanding these complications and an approach to airway management during cardiac arrest resuscitation is essential to optimizing patient care.

**Conclusion:** Tracheostomy patients can present unique challenges for emergency physicians. Knowledge of the basics and features of tracheostomy tubes can assist physicians in managing life-threatening complications including tube obstruction, decannulation, bleeding, stenosis, and fistula.

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## 1. Introduction

Emergency physicians must be masters of airway management, often dealing with airways that are not in the pristine condition seen in operating room conditions before an elective surgery. One airway that can present difficulties for emergency physicians includes the patient with tracheostomy. The standard tracheostomy is a surgical procedure performed at bedside or, more commonly, in the operating room. Tracheostomies can be performed for life-saving measure or to improve quality of life. However, patients with tracheostomies can experience multiple complications. This review will discuss tracheostomy tube features; an approach to resuscitation; management of the

tracheostomy during cardiopulmonary resuscitation; and key complications including tube obstruction, decannulation, and bleeding.

## 2. Discussion

## 2.1. Basics of tracheostomy

An understanding of the components of a tracheostomy is important to manage potential complications. Tracheostomies are placed for several reasons including chronic mechanical ventilation, failed airway protection, chronic inefficient swallow or cough mechanism, or upper airway obstruction such as from a mass [1–5]. Studies have demonstrated improved ventilation with these patients through tracheostomy, although studies differ as to when a tracheostomy should be completed for ventilator-dependent patients [4–7]. The American College of Chest Physicians recommends consideration of tracheostomy placement in patients with mechanical ventilation more than 21 days. Tracheostomy benefits include improved patient comfort, improved ability to perform activities of daily living, and decreased laryngeal injury [8].

Multiple methods exist for placement of tracheostomy including surgically or percutaneously. The primary method includes surgical placement involving incision midway in the neck between the cricoid cartilage and sternal notch, below the usual location of a cricothyrotomy.

☆ Conflicts of interest: None.

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\* Corresponding author at: 506 Dakota St APT 1, San Antonio, TX 78203. Tel.: +1 719 339 5510.

E-mail addresses: [brit.long@yahoo.com](mailto:brit.long@yahoo.com) (B. Long), [akoyfman8@gmail.com](mailto:akoyfman8@gmail.com) (A. Koyfman).

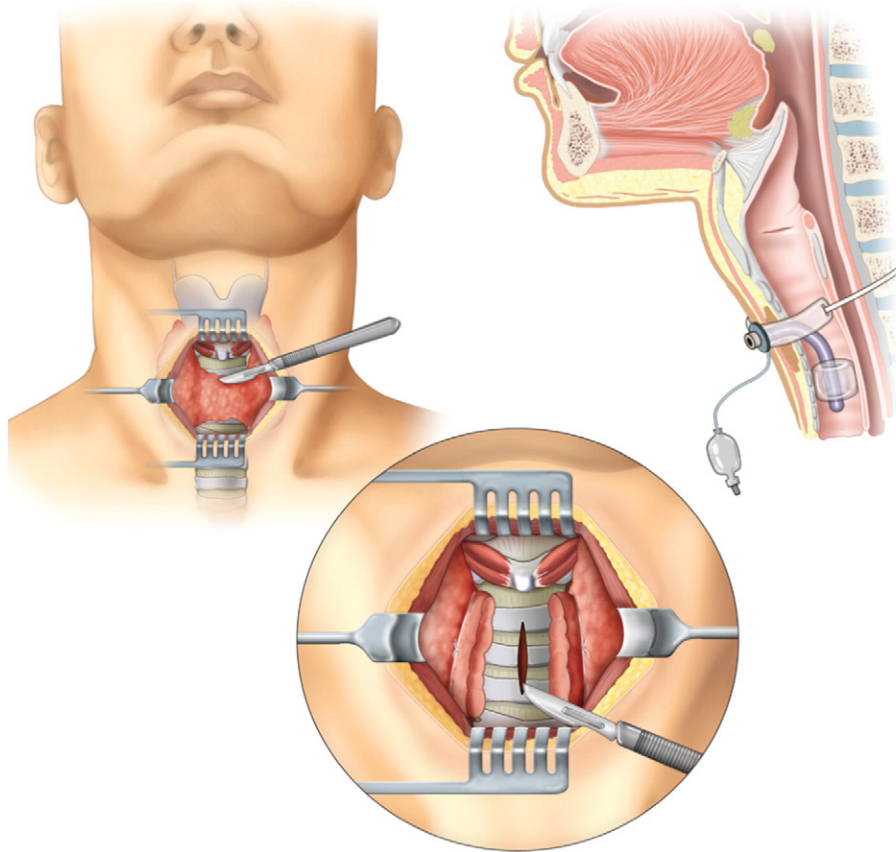


Fig. 1. Normal location and anatomy of tracheostomy site. Image from <http://biology-forums.com/index.php?action=gallery;sa=view;id=10069>.

The trachea is opened with a vertical or horizontal incision. The majority are completed with vertical incision through 2 to 3 tracheal rings, with the skin surrounding the surgical site tagged with stay sutures that are removed before patient discharge. These stay sutures allow the trachea to be pulled back to the incision site in case accidental decannulation occurs. The sutures are not only placed in the skin but also through the anterior trachea that pulls the trachea up to the cutaneous surface.

This reduces the distance between the skin incision and tracheostomy, promotes mature tract formation, and reduces the risk of false passage if a new endotracheal tube (ETT) has to be placed through the stoma in the first 7 to 10 days of placement. Fig. 1 depicts the usual location, incision, and appearance of the tracheostomy site.

A Bjork flap is an essential component of the tracheostomy, as it creates a path for tube reinsertion should decannulation occur, reducing

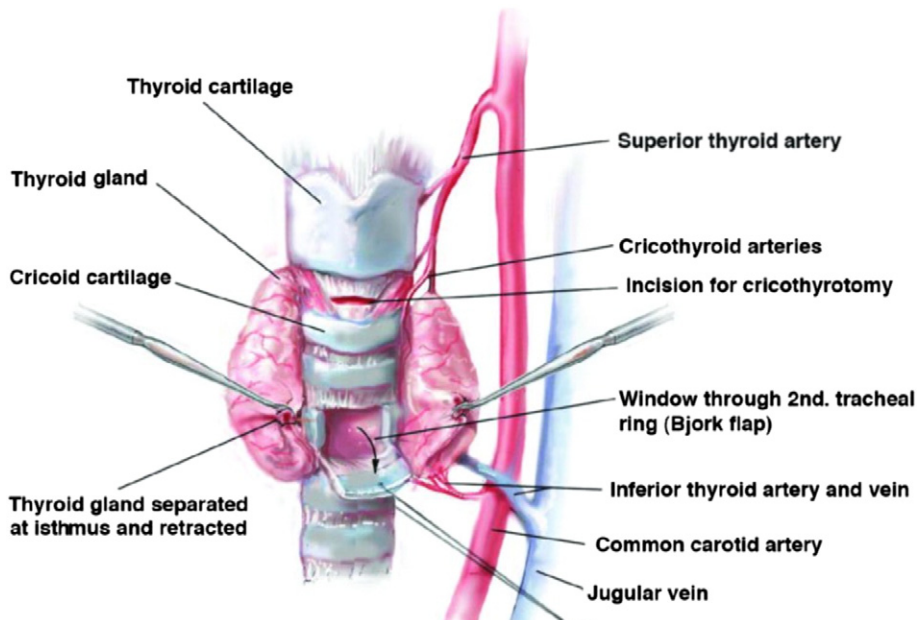


Fig. 2. Bjork flap with anatomy of tracheostomy site. Image from <http://pocketdentistry.com/12-surgical-management-of-the-airway/>.

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