

## Research Article

# Tracheostomy Apply by Emergency Residents; Airway Management Animal Simulation

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## Abstract

**Introduction:** Tracheostomy means making an opening below the larynx. This procedure is undertaken to open the upper air way obstruction. Yet, the surgical tracheostomy is the gold standard method of this procedure so knowing the steps of this procedure, is so critical for the medical team members.

**Method:** On a clinical trial study on animal models, 20 billy goats (makoui) were selected. The study was performed base on approved protocols of animal care and use of laboratory animals. All the emergency residents of Tabriz University emergency department were asked to perform surgical tracheostomy on the goats. They do classic tracheostomy. The duration of the procedure was calculated from the beginning of making incision until conformation of intubation and the collected data was analyzed by SPSS 15.0 software and descriptive statistics tests.

**Result:** Our study was done on 20 goats and all the cases were successfully intubated by tracheostomy technique and after inserting the tracheostomy tube completely, ventilation was started. The average duration of the whole procedure, from beginning of making incision until intubation conformation, was calculated 3.9±0.18 minutes.

**Conclusion:** The duration of tracheostomy is an important factor in succeed of the procedure and with proper training of the skills and having enough experience, this procedure will lead to lesser complications and more advantages over other methods.

**Keywords:** Tracheostomy; Emergency residents; Critical; Air way management

## Introduction

Tracheostomy is one of the frequently performed procedure which means making an opening below the larynx [1,2]. This procedure is undertaken mostly as an emergency or electively to open the upper air way obstruction, and also with the patients receiving long-term mechanical ventilation and eases the weaning [2,3]. This procedure is done in two techniques of percutaneous and surgical tracheostomy which each has specific indications [1]. At the beginning of the procedure the patient should be positioned with a neck hyper extended. Then an incision is made below the cricoid cartilage and over the 2<sup>nd</sup> - 4<sup>th</sup> tracheal ring. Most of the times a local anesthesia is used before the procedure [1,2]. After opening up the airway with a dilator, the tracheostomy tube is inserted in the trachea. Recent studies indicate that, this method has several superiority over the traditional method of prolonged Translaryngeal intubation [2]. The results of previous studies, which compare early and late tracheostomy shows that in patient with early tracheostomy, the duration of mechanical ventilation was reduced and also length of staying in Intensive Care Unit (ICU) was shorten [2,4]. Against these founding some studies show no difference in patients receiving early tracheostomy versus late tracheostomy in staying in ICU and length of timing of using artificial ventilation [5]. So the effectiveness of timing of tracheostomy is still a controversial subject and further researches are needed. There are number of studies and meta-analysis

comparing percutaneous and surgical tracheostomy and evaluating their benefits over each other. According to these founding the percutaneous tracheostomy has fewer complications and is preferred over surgical tracheostomy. Yet, the surgical tracheostomy is the gold standard method of this procedure [6-8]. So knowing the steps of this procedure is so critical for the medical team members.

## Method

On a clinical trial study on animal models, 20 billy goats (makoui) with mean weight of 28kg were selected. The study was performed base on approved protocols of animal care and use of laboratory animals. All the emergency residents of Tabriz University emergency department were asked to perform surgical tracheostomy on the goats. This procedure was done at animal lab of the emergency department. At the beginning of the procedure all the goats were sedated with 15 mg/kg intravenous ketamine, after comparative sedation and fixing IV line, 1 Liter of Normal saline serum was used to keep the veins open. Simultaneously the goats pulse rate and heart rate was monitored continuously. Then venous PSA with 0.1mg/kg Midazolam and 2mg/kg Ketamine was used. After shaving goat's necks, a classic incision was made over the third tracheal ring and after inspection of trachea and exodus of air, the tube (number 5) was completely inserted in. after filling the cuff and certifying the proper place of intubation by a comptometer, the incision was sutured.

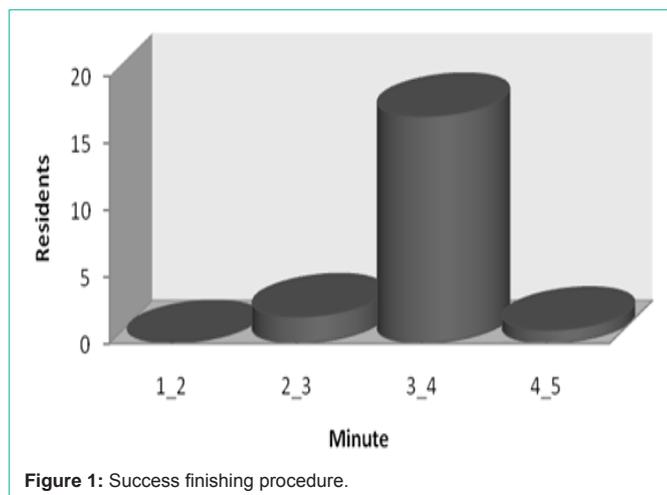


Figure 1: Success finishing procedure.

The duration of the procedure was calculated from the beginning of making incision until conformation of intubation and the collected data was analyzed by SPSS 16.0 software and descriptive statistics tests. Some equipment used in the procedure was gloves, small scalpel, short grooved director, retractor, artery forceps, Hemostatic forceps, scissors, tracheal dilator, endotracheal dilator, endotracheal tube (number 5), ligature and sponge.

Data was gathered in SPSS 15.0 and descriptive analysis (Mean, Mode) was run.

## Results

Our study was done on 20 goats and all the cases were successfully intubated by tracheostomy technique and after inserting the tracheostomy tube completely, ventilation was started. None of the cases had severe complications such as esophageal perforation or subcutaneous Emphysema. In one of the goats a massive bleeding happened during the procedure which was controlled immediately by ligating. The average duration of the whole procedure, from

beginning of making incision until intubation conformation, was calculated  $3.9 \pm 0.18$  minutes (mode=3.8min). It's regardable that the goat with massive bleeding was excluded to receive supplementary care and it's time period was not considered in mean time calculation (Figure 1).

## Conclusion

According to the importance of this procedure in emergency conditions, for rescuing the patient with minimum complications, having enough skill and experience seems critical for the medical team members and our study indicates that this goal is achievable by having proper education and doing the procedure as fast as possible.

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