

## Original Research Article

# Our comprehensive experience with tracheostomy in tertiary multi-speciality hospital over four years

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### ABSTRACT

**Background:** Tracheostomy is a common surgical procedure used to achieve a secure airway in patients in elective as well as emergency conditions. Our study accounts for our first-hand experience with the procedure in our tertiary multi-speciality hospital.

**Methods:** It is a four year (January 2017 to February 2021) retrospective study in which all the 246 cases of tracheostomies were taken into account which were performed during this study period in the department of otorhinolaryngology (ENT), Surat Municipal Institute of Medical Education and Research (SMIMER), Surat (India). The patients were thoroughly followed up until the final outcome of the tracheostomy was established.

**Results:** A total of 246 tracheostomies were performed, 63.82% of which were in men. The mean patient age was 42 years. The majority (76%) were elective, performed for various indications, while the remaining 24% were emergency tracheostomies. All tracheostomies were performed by otorhinolaryngologists. Complications relating to tracheostomy were documented in 40 patients (16%) intra-operatively and/or post-operatively which included bleeding, surgical emphysema, granulations along the stomal site and rarely shock. The mean time to decannulation was 13.48 days.

**Conclusions:** Our study takes into account and discusses the findings of all the 246 tracheostomies which were performed during the study period of 4 years. Elective cases form the majority although there is a significant case series of emergency tracheostomies performed for a range of pathologies.

**Keywords:** Tracheostomy, Airway, Prolonged intubation

### INTRODUCTION

In the simplest possible words, tracheostomy is an artificial airway that allows passage of air directly into the trachea to the lungs, by passing the mouth and pharynx.<sup>1</sup> Tracheostomy is a commonly performed multispecialty procedure used to create a secured surgical airway in patients with upper airway obstruction, excessive respiratory secretions or neurological impairment of the airway. It is performed in a controlled elective general

anaesthetic (GA) environment, or under local anaesthetic (LA) in response to immediately life threatening pathology, most typically following failed endotracheal intubation. As with all artificial airways, regardless of the patient's presenting diagnosis, there are four indications for placement: relieving airway obstruction or circumventing the loss of native airway conduit; providing mechanical ventilation; preventing (or reducing) aspiration in the unprotected airway; and facilitating pulmonary toilet.<sup>2</sup>

Our study reviews elective and emergency tracheostomy formation in adult and paediatric patients over a four-year period (January 2017–February 2021). The aim of the study was to assess and analyse our experience with tracheostomy in a tertiary healthcare set-up.

**METHODS**

A four year (January 2017–February 2021) retrospective study was performed in which all the 246 cases of tracheostomies were taken into account which were performed during this study period in the department of otorhinolaryngology (ENT), Surat Municipal Institute of Medical Education and Research (SMIMER), Surat (India). The patients were thoroughly followed up until the final outcome of the tracheostomy was established. No patient identifiable data were included. The data parameters audited are listed in Table 1.

**Table 1: Data parameters audited.**

General	Surgical
Patient demographics	Procedure
Diagnosis	Securing the airway
Indications	Ward/ICU/OT in which procedure is performed
Decannulation	Proceduralist grade
Admitting specialty and ward	Decannulation technique and duration
Complications	
Mortality	

**Study type**

It was a prospective observational type of study.

**Sampling technique and sample size**

The sample included all tracheostomies - emergency and elective, performed during the study period, hence fitting the inclusion criteria, were included in the study. Purposive sampling technique was used.

**Total sample size**

The total size of the sample was 246.

**Inclusion criteria**

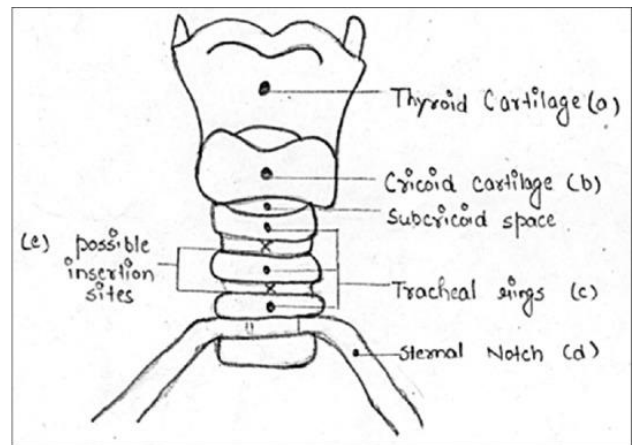
All tracheostomies - emergency and elective, performed during the study period (January 2017–February 2021) were included in the study.

**Exclusion criteria**

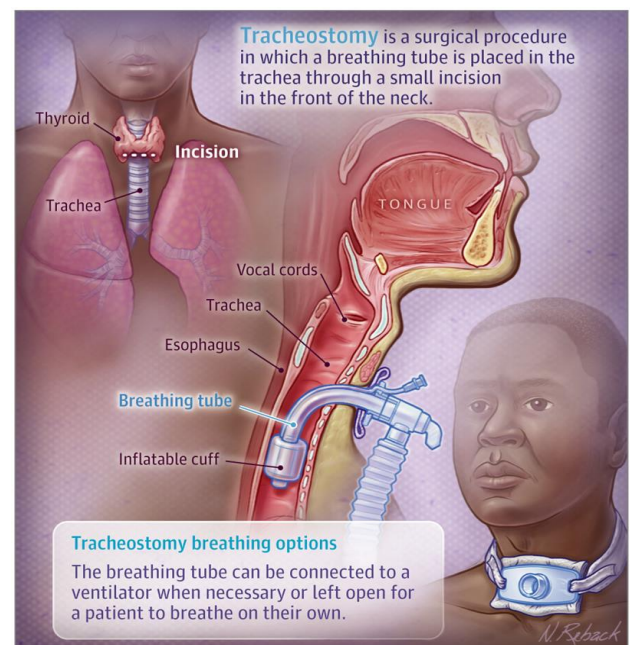
Patients not willing fit for withstanding the procedure and those patients with inadequate data were excluded from the study.

All the parameters and observations made during the study period were subjected to descriptive statistical analysis (statistical method used) to draw conclusions.

A variety of techniques are employed to create a tracheostomy. A midline vertical incision is made superior to the sternal notch through skin and subcutaneous tissues, with retraction of the strap muscles and retraction or division of the thyroid isthmus. The trachea is entered by creating a window either through multiple tracheal cartilage rings or between two rings to create the stoma, through which a tracheostomy tube is sited (Figure 1 and 2).



**Figure 1: Anatomy of neck pertaining to tracheostomy.<sup>3</sup>**



**Figure 2: Anatomy of neck pertaining to tracheostomy with tracheostomy tube in-situ.<sup>1</sup>**

Local anaesthesia is used in complex cases with subtotal airway obstruction and/or for those in whom general

anaesthesia possesses an unacceptable risk. The most common indications for surgical tracheostomy include prolonged intubation, head and neck malignancy, infection, trauma and non-infectious swelling.

## RESULTS

In our study, total of 246 tracheostomies were performed, of which 157 (63.82%) were in men and 69 (36.18%) were in women. The mean patient age was 42 years.

Amongst these, 187 (76%) were elective and 59 (24%) were emergency which were performed for securing airway. 72 (29.26%) tracheostomies were done in operation theatres, 19 (7.72%) tracheostomies in casualty and remaining 154 (62.6%) tracheostomies in periphery in ICU settings. The mean time to decannulation was 13.48 days. The decannulation rate was 52%.

There were 91 deaths (37%) overall due to underlying medical/surgical conditions, 128 (52%) were successfully decannulated and remaining 27 were discharged with tracheostomy in situ and couldn't be decannulated (permanent tracheostomy).

Of the 187 elective tracheostomies performed for a variety of indications: prolonged intubation for various underlying medical conditions like poisoning, hanging, post-operatives (like craniotomy), diabetic ketoacidosis etc, head and neck malignancy/trauma, head injury, respiratory failure, infections, central nervous system (CNS) causes, others.

Complications relating to tracheostomy were documented in 40 patients (16%) intra-operatively and/or post-operatively which included bleeding, surgical emphysema, granulations along the stomal site and rarely shock.

There were 59 emergency tracheostomies performed in total during our study period. Head and neck malignancy with compromised airway was the most common indication for emergency tracheostomy (59%) followed by head and neck trauma and inability to intubate for securing airway.

## DISCUSSION

It is an established fact that tracheostomy is a commonly performed multispecialty procedure. Amongst the 246 tracheostomies performed during our 4-year study period, 76% were elective. Most of the tracheostomies were performed under local anaesthesia (LA).

The complication rate in the cases was 16% intra-operatively and/or post-operatively which included bleeding, surgical emphysema, granulations along the stomal site and rarely shock. It was compared with complication rates of similar studies performed by Young et al, Terragni et al and Blot et al which were 6.3%, 38% and 39% respectively.<sup>4-6</sup>

Removal of the tracheostomy tube should be considered only if the original upper-airway obstruction is resolved, if airway secretions are controlled, and if mechanical ventilation is no longer needed. Predictors of success include ability to produce a vigorous cough and the absence of aspiration. Tracheostomy decannulation requires caution, particularly following a prolonged period of tracheostomy use.<sup>7-9</sup>

The mean time to decannulation was 13.48 days. The overall decannulation rate was 52%. It is comparable with another similar study performed by Wilkinson et al where the decannulation rate was 49% for critical care and 61% for ward patients.<sup>10</sup>

The limitation of this study is the small rather limited sample size and retrospective design.

## CONCLUSION

Our study takes into account the observations of a comprehensive anaesthetic and surgical audit of tracheostomy experience at our tertiary hospital. Most tracheostomies were performed under local anaesthesia (LA). There was no evidence of change in rate of elective tracheostomy performed over the study period. Head and neck cancer is the most common pathology in patients undergoing emergency tracheostomy while prolonged intubation was the most common indication for elective tracheostomy. Bleeding was observed to be the most common complication while most mortality pertained to underlying medical conditions and were not due to the tracheostomy performed.

As a tertiary multi-specialty hospital performing frequent tracheostomy, we have significant experience in performing both elective and emergency tracheostomy. Head and neck cancers and cases wherein prolonged intubation is anticipated are the most significant disease burden on our service. Complications attributable to tracheostomy occur infrequently but are accountable and hence discussed. Tracheostomy being a life-saving procedure in emergency conditions and being a vital tool to reduce morbidity and mortality in elective cases, should always be considered early and be a given choice to the treating doctor to ensure that we practise realistic medicine and focus our efforts on enhancing quality of life. It is advocated in most of the similar studies as well.<sup>11</sup>

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