

## **Original Article**

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# **Emergency Tracheostomy in a Tertiary Level Hospital in Bangladesh: Indications and Complications**

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### **Abstract**

**Objective:** To see the common indications, pattern of complications (during and post operative) of emergency tracheostomy in the tertiary level hospital in Bangladesh. It also gives the idea for minimizing the complications.

**Methods:** This cross sectional study was carried out in the Department of Otolaryngology & Head- Neck surgery of Dhaka Medical College Hospital, Dhaka, from 14<sup>th</sup> April 2015 to 14<sup>th</sup> October 2015. This study includes all emergency patients irrespective of age and sex whose tracheostomy was done in emergency operation theatre of ENT department of Dhaka Medical College and Hospital.

**Results:** The study reveals that the commonest indications of emergency tracheostomy were diagnosed case of carcinoma of larynx & base of tongue (30%) followed by post-irradiated carcinoma larynx (24%). Next common indications were stridor in undiagnosed case (18%), difficulty in intubation during surgery (10%), history of road traffic accident (6%), cut throat injury (6%), foreign body in throat (2%), laryngeal edema and blunt trauma in neck (2%) respectively. Commonest complications during the procedure were apnoea (12%), haemorrhage (18%), injury to surrounding structure (10%), cardiac arrest (4%) & respiratory arrest (2%). Common complications in early post operative period were surgical emphysema (10%), crusting or blockage (4%), tube dislodgement (4%), & stomal infection (2%). Late post operative complications were stomal granulation tissue (4%), pneumonia (2%), stomal infection (2%), tracheocutaneous fistula (2%), & tracheomalasia (2%).

**Key words:** Tracheostomy

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## Introduction

Tracheostomy is used to describe as the creation of a stoma at the skin surface which leads into the trachea.<sup>1</sup> The word tracheostomy comes from two Greek words: the root tom- meaning 'to cut' and the word trachea means wind pipe.<sup>2</sup>

Despite being one of the most common surgical procedures tracheostomy can be one of the most challenging because of the medical complexities presented by many patients. Tracheostomy was first described nearly 3500 years ago.

The first successful tracheostomy is attributed to Antonio Musa Brasaralo, who published his account of procedure in 1546 AD. Chevalier Jackson's description of his modifications to the procedure, published in 1909, improved its efficiency and safety and reduced the mortality of tracheostomy from 25% to 2%.<sup>3</sup>

The procedure has been given several different names, including pharyngotomy, laryngotomy, bronchotomy, tracheotomy and tracheostomy. Tracheostomy has many advantages and some disadvantages. Among the advantages it may act as a bypass in case of upper airway obstruction, reduce 50% (100 ml) of anatomical dead space, reduce airflow resistance, helps in toileting of tracheobronchial tree and protect against aspiration. Some disadvantages like normal function of nasal cavity and normal voice are lost, elimination of glottic stop and increased risk of pulmonary infection.

Commonest indications of tracheostomy are carcinoma of larynx, cut throat injury, Ludwig's angina, acute epiglottitis and after total thyroidectomy if both recurrent laryngeal nerves are injured.

Depending upon the urgency, there are mainly two types of tracheostomy. 1. Emergency, 2. Elective. Patient suffering from severe

stridor or respiratory distress need emergency tracheostomy in the emergency operation theatre aseptically after taking proper informed consent. All the procedures are carried out in the operation theatre using standard technique. Skilful surgeon, assistants and nurses are required during the procedure, while trained ward staff carry out post-operative tracheostomy care. Emergency tracheostomy has also been found to lead to life threatening complications like hypoxia, cardiac arrest, injury to structures immediately to the trachea, pneumothorax, haemothorax and even death.

After doing the procedure patient must be monitored carefully to avoid post-operative complications. In 1<sup>st</sup> 24 hours risk is proportionate to time then it reduces. Securing the tube to skin to prevent dislodgement, putting wet gauze over the tube, inflation (with short period of deflation) of the cuff of tracheostomy tube for the 1<sup>st</sup> 12 hours, repeated suction of the secretions as needed. Instillation of normal saline to soften the crusts is needed. A piece of clean gauze need to place around the tube to prevent soiling of the wound and maceration of the skin.

Many critically ill patient's families have been denied in authorizing tracheostomy because of cosmetic issues and speech problem.<sup>4,5</sup>

## Methods

This was a cross-sectional study done at the Department of Otolaryngology and Head-Neck surgery of Dhaka Medical College Hospital, Dhaka for six months, from 14<sup>th</sup> April 2015 to 14<sup>th</sup> October 2015. This study included all emergency patients irrespective of age & sex, whose tracheostomy was done in emergency operation theatre of Dhaka Medical College and Hospital. A total of 50 patients who met the inclusion criteria were selected for this study. Data were collected in a prescribed data collection sheet. All data were compiled and analyzed.

**Results**

**Table-I**  
*Age distribution of the patient (n=50)*

Age in years	Numbers	Percentage
0-10	1	2%
11-20	1	2%
21-30	2	4%
31-40	6	12%
41-50	17	34%
51-60	12	24%
61-70	8	16%
71-80	3	6%
Total	50	100%

Table-I showing distribution of the age where the lowest age was 6 years and the highest was 72 years. The highest number of patients in 5<sup>th</sup> decade, (mean age= 49.39year).

**Table II**  
*Sex distribution of the patient*

Sex	Number	Percentage
Male	32	64%
Female	18	32%
Total	50	100%

Table- II showing sex distribution among the 50 patients. Male to female ratio was 1.8:1

**Table III**  
*Distribution of socio-economic condition*

Socio-economic status	Number	Percentage
Low	8	16%
Middle	37	74%
Affluent	5	10%

Table-III showing distribution of socio-economic conditions of 50 patients. Among the patients, 37 (74%) belonged to middle class family. The lowest group belongs to affluent society, 10%.

**Table IV**  
*Indication of Emergency Tracheostomy*

Indications	Numbers	Percentage
Stridor in undiagnosed case	9	18%
Diagnosed case of Ca of larynx/ base of tongue	15	30%
Post irradiated Ca larynx with stridor	12	24%
H/O road traffic accident	3	6%
Cut throat injury	3	6%
FB in throat	1	2%
Difficulty in intubation during surgery	5	10%
Laryngeal oedema	1	2%
Blunt trauma in neck	1	2%

Table-IV: The commonest indications are diagnosed case of carcinoma of larynx with stridor and post irradiated carcinoma of larynx with stridor.

**Table-V**  
*Complication during procedure*

Complications	Numbers	Percentage
Haemorrhage	9	18%
Apnoea	6	12%
Cardiac arrest	2	4%
Respiratory arrest	1	2%
Injury to surrounding structure	5	10%

Table- V showing 23, (45%) subjects experienced complications during the procedure. Most common complications are haemorrhage (18%) and apnoea (12%).

**Table- VI***Early post- operative period complication*

Complications	Numbers	Percentage
Crusting/ blocking of tube	2	4%
Surgical emphysema	5	10%
Tube dislodgement	2	4%
Stromal infection	1	2%

Table- VI showing early post-operative period complications. 10 patients experienced early post operative complications which were surgical emphysema (10%), tube dislodgement (4%), crusting (4%).

**Table- VII***Late post- operative complications*

Complications	Numbers	Percentage
Pneumonia	1	2%
Stomal infection	1	2%
Stomal granulation tissue	2	4%
Tracheo cutaneous fistula	1	2%
Tracheomalacia	1	2%

Table- VII showing late post-operative complications. Only 7 patients were undergone through this complication.

**Discussion**

Tracheostomy is a life-saving procedure. Emergency tracheostomy is mostly performed in case of upper airway obstruction when the patient can not be intubated. In this study 50 cases of emergency tracheostomy were performed in the emergency operation theatre in the Otolaryngology & Head- Neck surgery department of Dhaka Medical College

Hospital, to evaluate their various socio-demographic characters, indications and their complications as a whole.

Among the 50 cases of emergency tracheostomy, lowest age was 6 years old who was tracheostomized due to foreign body in larynx. The eldest person was 72 years old. The mean age was found 49.39 which was consistent with the articles of Chowdhury AA, Sultana T, Mahmud M, Hossain A et al.<sup>6,7</sup> Highest numbers of cases were found in between 41-50 years.

Amongst 50 cases 32 cases were male and 18 cases were female. Male and female ratio was 1.78:1.<sup>8</sup> Male predominance is being seen. About 74% cases belong to middle class group. Second most common group was low class group. In this study, affluent groups are only about 10% who needed emergency tracheostomy.

The commonest indication showing laryngeal carcinoma or carcinoma of base of tongue (15%), which is followed by post irradiated carcinoma larynx with stridor, (12%). History of radiotherapy may damage small blood vessels result in endarteritis obliterans and consequent local ischaemic damage also causes larynx necrosis.<sup>9</sup> Next common indication is stridor in undiagnosed case about 9%. Then proper evaluation of the disease is done after doing the life- saving procedure. 10% cases belonged to difficulty in intubation during surgery. Next common indications are history of road traffic accident (6%), cut throat injury (6%), laryngeal oedema (1%), blunt trauma in neck (1%) & foreign body in throat (1%).

Published rates of tracheostomy related complications vary greatly (5-65%) and depends on study designs, length of follow up and definition of complications. Among the complications during the procedure haemorrhage occurs in 10% cases. Most

commonly haemorrhage results from injury to the anterior jugular vein early in the dissection, specially during the emergency procedures or to the thyroid isthmus later in the dissection during attempts to mobilize it.<sup>10</sup> Next common complications were apnoea (12%), injury to surrounding structures (10%), cardiac arrest (4%) & respiratory arrest (1%).

Early post operative complications often happen within 1<sup>st</sup> post-operative week. In this study among the 50 cases surgical emphysema(10%) happens in early complications. It is usually mild and manifest as an area of crepitus in the region of skin surrounding the tracheostomy site. It is mostly confined to neck but can extend to face & chest wall. It is usually presents with in 1<sup>st</sup> day & resolved spontaneously within few days unless the precipitating factors persist. Tight closer of skin, large incision in the trachea, use of uncuffed tube are the causative factor. Next common complications are tube dislodgement (4%) due to presence of mucus plugs, blood clots & haemorrhage (5%).

Late post operative complications of tracheostomy which typically occur after 1<sup>st</sup> post-operative week includes stromal granulation tissue, tracheo cutaneous fistula, stromal infection, tracheal stenosis, tracheoesophageal fistula & tracheomalasia. In this study it is difficult for us to find out late complications as most of them are poor & belongs to low socio economic conditions, held from remote areas & they are lack of consciousness & communication. Among 50 cases 4% suffered from stomal granulation tissue & 2% were found to have tracheocutaneous fistula, tracheomalasia & pneumonia respectively.

Mortality rate was 2% which was directly related to performed tracheostomy procedure. Similar study carried out by Johannes,

Elbasher and Butnaru having mortality rate of 3.4% & 2.7% respectively. 5 deaths occurred in a study done by Sisk EA. All of them are directly related to tracheostomy.<sup>11,12,13,14</sup>

In this study 2 patients died because of terminal stage of malignancy not related to tracheostomy.

### Conclusion

In this study of 50 cases of tracheostomy have been analysed in the department of Otolaryngology & Head- Neck surgery of Dhaka Medical College Hospital. It is an ancient procedure in the surgical field and is a life saving procedure. In this study there were few complications. Most of the complications were preventable & could have been avoided by careful operative technique and meticulous post operative management. Most of the patients lost to follow up. So that it is difficult to study any late complications of the cases. Probably it happens due to their lack of awareness and lack of communication.

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