

Original Research

To investigate the many underlying illness features of indications and outcomes of tracheostomy in the intensive care unit

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ABSTRACT:

Aim: The purpose of this research is to investigate the many underlying illness features of indications and outcomes of tracheostomy in the intensive care unit. **Material and methods:** This cross-sectional research was conducted in the ENT ICU. This research included 100 patients who received elective open tracheostomy in the ICU by ENT surgeons for a variety of reasons. Patient information (age and gender), a comprehensive clinical history relevant to the reason of the prolonged intubation/indication of tracheostomy, chronology, and complications were gathered and examined. **Results:** Out of 100 patients, 68 (68%) were male and 32 (32%), with a male to female ratio of 2.12:1. Patients ranged in age from 14 to 69 years, with the 25-35 year age group having the greatest incidence (32%) followed by the 45-55 year age group (23%). table 1 Out of 100 cases, the most common indication was head injury with h/o road traffic accident (RTA) (27%) and postoperative instance of intracranial space occupying lesion (ICSOL) (25%). Out of 100 patients, the overall complication rate was 10%, with surgical emphysema (3%) being the most prevalent, followed by bleeding (3%), tube displacement (2%), and wound infection (2%). **Conclusion:** If extended endotracheal intubation is indicated for a patient in the intensive care unit (ICU), tracheostomy is a crucial and risk-free operation that may be performed.

Keywords: Tracheostomy, Intensive care unit

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INTRODUCTION

Tracheostomy is defined as the formation of a stoma at the skin's surface that goes into the trachea¹, which was first done in ancient Egypt and is mentioned in several ancient medical literature such as The Rig Veda (2000 to 1000 BCE).² Tracheostomy is done on around 24% of all critical care unit patients (ICU).^{3,4} Tracheostomy has many advantages over endotracheal intubation in the ICU setting, including protection of the larynx and upper airway from prolonged intubation, which can lead to tracheal stenosis⁵, improved patient comfort, less need for sedation^{6,7}, faster weaning, which leads to shorter ICU and hospital stays, and a lower incidence of ventilator-associated pneumonia if done early. The most common indications for extended intubation include acute or chronic neuromuscular disorders, inadequate cardiorespiratory reserve, brain damage, and upper airway blockage.⁸ While the timing of tracheostomy differs for these indications and is recommended for

consideration only if extubation did not occur within 21 days in prolonged cases⁸, in selected patients with severe multi-trauma and/or head injury and a low Glasgow coma score, tracheostomy is advocated as soon as possible, within 3-4 days of intubation.⁹ Tracheostomy was formerly thought to be a safe surgery in the ICU, however it has been linked to life-threatening consequences such as hypoxia, cardiac arrest, harm to tissues directly adjacent to the trachea, pneumothorax, haemothorax, incision site bleeding, and stoma infection.¹⁰ Tracheostomy techniques include open surgical technique, which was previously performed routinely, and Ciaglia¹¹ advocated percutaneous dilatational tracheostomy (PDT), which is commonly performed in recent days in ICU because of its numerous advantages over the former, but PDT is not routinely practised in our institution. Although current research suggests that tracheostomy is a safe procedure in the ICU, it has also been linked to life-threatening consequences such

as hypoxia, cardiac arrest, harm to tissues close to the trachea, pneumothorax, and haemothorax. Because of aesthetic and speech challenges, many severely sick patients' families have been unwilling to authorise tracheostomy.¹²⁻¹³ Endotracheal intubation or percutaneous endoscopically guided tracheostomy has been used to treat an increasing number of airway issues in recent years. However, in many countries, percutaneous endoscopically guided tracheostomy is not yet regularly used, and traditional tracheostomy is used in the great majority of ICU patients.

MATERIAL AND METHODS

This cross-sectional research was conducted in the ICU, Department of ENT, among tracheostomy patients, with the agreement of the protocol review committee and the institutional ethics committee. The patient provided informed consent and provided a full history.

INCLUSION CRITERIA

- All patients who underwent tracheostomy
- Patient already intubated in ICU assumed to require prolonged intubation period.
- Patient with pre-operative planned tracheostomy and post operatively stay in ICU.

EXCLUSION CRITERIA

- Patients not willing for the study
- Not available for follow up.
- Patients who have undergone tracheostomy at other hospital

This research included 100 patients who received elective open tracheostomy in the ICU by ENT surgeons for a variety of reasons. Patient information (age and gender), a comprehensive clinical history relevant to the reason of the prolonged intubation/indication of tracheostomy, chronology, and complications were gathered and examined.

RESULTS

Out of 100 patients, 68 (68%) were male and 32 (32%), with a male to female ratio of 2.12:1. (Table 2). Patients ranged in age from 14 to 69 years, with the 25-35 year age group having the greatest incidence (32%) followed by the 45-55 year age group (23%). table 1 Out of 100 cases, the most common indication was head injury with h/o road traffic accident (RTA) (27%) and postoperative instance of intracranial space occupying lesion (ICSOL) (25%) (Table 2).

Table 1 Demographic Profile of Patients

Gender	Number of patients=100	%
Male	68	68
Female	32	32
Age in years		
Below 25	7	7
25-35	32	32
35-45	18	18
45-55	23	23
55-65	6	6
Above 65	14	14

Table 2: Indications of tracheostomy (n=100).

Indications	Number of patients=100	%
Head injury with h/o RTA	27	27
Post-operative case of ICSOL	25	25
Guillain-Barre syndrome	21	21
CVA	11	11
Maxillo-facial trauma	5	5
RTA with spinal cord injury	6	6
Post-operative pneumonia	5	5

Out of 100 patients, the overall complication rate was 10%, with surgical emphysema (3%) being the most prevalent, followed by bleeding (3%), tube displacement (2%), and wound infection (2%). (Table 3).

Table 3: Complications of tracheostomy (n=100).

Complications of tracheostomy	Number of patients=10	%
Surgical emphysema	3	3
Haemorrhage	3	3
Tube displacement	2	2
Wound infection	2	2

DISCUSSION

Tracheostomy is a frequent treatment performed in the ICU that has advantages and disadvantages but is not always without difficulties. It is one of the life-saving procedures. In this research, 100 tracheostomy cases were evaluated in the ICU, and the patient demographics, indications, complications, and outcomes were assessed and compared to previous studies. Patients in this research ranged in age from 14 to 69 years, with the 25-35 year age group having the greatest frequency (32%) followed by the 45-55 year age group (23%). According to Chandra et al., the greatest age group was 21-30 years old (28%), followed by 21% from 41-50 years old (21%), which is comparable to our research.¹⁴ In our research, 68 (68%) of the 100 tracheostomy patients in the ICU were male, 32 (32%) were female, and the male to female ratio was 2.12:1. Mahmud et al found that male patients were 65% and female patients were 35%, with a male to female ratio of 1.8:1, which is comparable to our findings.¹⁵ In another research, Chandra et al found that male patients were 61% and female patients were 39%, which is similar to our findings.¹⁴ In a research conducted by Perfeito et al, the male to female ratio was found to be 1.8:1, which is comparable to our findings.¹⁶ In this research, the most prevalent justifications for tracheostomy in ICU were head injury with h/o RTA (27%) followed by post-operative instance of ICSOL (25%). Chowdhury et al. found that head damage with H/O RTA was 26.67% followed by post-operative case of ICSOL 26.67%, which is comparable to our research.¹⁷ Another research, Mahmud et al, found that head injuries with RTA were 27.5%, with post-operative cases of ICSOL being 25%, which is similar to ours.¹⁵ RTAs are common in our nation owing to overloaded or unroadworthy cars, a lack of understanding about safe road usage, poor traffic management and law enforcement, and inadequate driver training.¹⁸ In our research, the rate of tracheostomy problems in the ICU was 10%. Mahmud et al found 10%, Perfeito et al found 8.7%, and Chowdhury et al found 10%, which is similar to our finding.¹⁵⁻¹⁷ In our research, the most prevalent tracheostomy complication in the ICU was surgical emphysema (3%) followed by haemorrhage (3%) tube displacement (2%), and wound infection (2%). Mahmud et al. and Chowdhury et al. found comparable results.^{15,17} Another research, Perfeito et al, found that early complications were bleeding and late complications were wound infection in 2.73% of patients, which is similar to our findings.¹⁶ Another research, Datta et al, found that 2% of patients developed wound infection, which is similar to our findings.¹⁹ Rahman et al. and Ahmed et al. conducted comparable research on our difficulties.^{20,21} The most frequent complication in our research was surgical emphysema, which was addressed by removing a tight suture, bleeding, which was controlled by intraoperative pressure over bleeders and ligation, and

wound infection, which was treated by regular wound dressing and suitable antibiotics. Mahmud et al. and Chandra et al. conducted studies that yielded comparable results.^{14,15} Tracheostomy complications have been thoroughly examined and shown to be reduced with improvements in operational competence and developments in ICU.²² Prior to executing elective tracheostomy and during discharge, patents and carer education will assist to enhance patient outcomes and reduce problems associated with tracheostomy tubes. Complication rates associated with tracheostomy may be reduced by using a nonmetallic tube, performing a skilled surgical technique, and providing attentive post-operative care.²³ In our investigation, we discovered no incidence of dysphagia, aspiration, tracheo-esophageal fistula, tracheo-cutaneous fistula, or cardiac arrest, which is consistent with the findings of Chowdhury et al and Mahmud et al.^{15,17} In our investigation, no patient died during tracheostomy, which is consistent with the findings of Chandra et al.¹⁴ According to the research done by Mahmud et al., the cause for complication in our study might be related to the likelihood of executing the majority of tracheostomy by younger physicians.¹⁵ In this research, we discovered that 100% of patients preferred tracheostomy to endotracheal intubation in the ICU. Nursing care was simplified, particularly with regard to suctioning in 100% of patients, and the period of the ICU study was reduced in all instances. In all situations, better oral and airway care was achievable. This investigation followed the findings of Mahmud et al. and Perfeito et al.^{15,16}

CONCLUSION

If extended endotracheal intubation is indicated for a patient in the intensive care unit (ICU), tracheostomy is a crucial and risk-free operation that may be performed.

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