Medico Research Chronicles
ISSN NO. 2394-3971
DOI No. 10.26838/MEDRECH.2024.11.6.748
Contents available at www.medrech.com

Surgical Management of Non-malignant Cases by Tracheostomy in a Tertiary Care Hospital

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ARTICLE INFO | **ABSTRACT** | **ORIGINAL RESEARCH ARTICLE**

Article History
Received: November 2024
Accepted: January 2025
Key Words:
Tracheostomy, Airway, Malignant and Non-malignant.

Background: Tracheostomy is a commonly performed surgical procedure that involves creating an opening through the neck into the trachea to establish an airway. It can be performed for both malignant and non-malignant conditions. In non-malignant cases, tracheostomy is typically indicated in scenarios where long-term airway management is necessary, and it is often performed in tertiary care hospitals, where specialized expertise is available. **Objectives:** The aim of the study was to evaluate the surgical management of non-malignant cases by tracheostomy in a tertiary care hospital. **Methods:** This cross-sectional study was carried out in the Department of ENT, Mymensingh Medical College Hospital, Mymensingh, Bangladesh during June 2022 to May 2023. A total of 100 patients participated in the study. Statistical analyses of the results were obtained by using window-based Microsoft Excel and Statistical Packages for Social Sciences (SPSS-24). **Results:** In this study, according to the age distribution, 10% of the patients were aged 15 to 24 years. Furthermore, 38% were between the ages of 35 and 44, with 12% between the ages of 55 and 64. And the majority 57% of the patients were male, while 43% were female. According to the socioeconomic position of the study population, 27% come from low class, 42% from middle class, and 31% from high class families. **Conclusion:** The surgical management of non-malignant cases

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requiring tracheostomy in tertiary care hospitals is highly specialized and ensures optimal outcomes through a multidisciplinary approach.

2025, www.medrech.com

INTRODUCTION

The word "tracheostomy" refers to the formation of an opening in the front wall of the trachea and its conversion into a stoma on the skin surface.[1] Tracheostomy is a simple but critical life-saving procedure. The first tracheostomy was done by Asclepiades of Bithynia. The choice to put a tracheostomy on a patient with respiratory insufficiency is primarily based on clinical observations. Upper airway obstruction is one of the most prevalent reasons for tracheostomy. [2,3] Tracheostomy may be required for infectious processes, laryngeal and hypopharyngeal cancer, foreign substances in the trachea or larynx, subglottic oedema, and, on rare occasions, oropharyngeal infections. Moser's aphorism "The time to do a tracheostomy is when you first think about it" is particularly relevant with upper airway obstruction.

Tracheostomy is well recognized as one of the surgical procedures most feared by patients suffering from laryngeal cancer. If necessary, it indicates the difficult conclusion of an obstructive laryngeal tumor and its treatment. In this situation, obstruction of the airways is typically caused by a large tumor, persistent voice cords, or complications from laryngeal cancer treatment. Although tracheostomies are unavoidable in cases of severe airway compromise, we must keep in mind that they have a considerable negative impact on patients' quality of life, notably speech and swallowing. [4]

The majority of nonmalignant tracheoesophageal lesions are caused by mechanical ventilation problems. Most are identified while the patient is still mechanically ventilated. Because mechanical breathing following tracheal reconstruction is associated with an increased risk of anastomotic dehiscence or restenosis, we employed a conservative approach until the patient was weaned. [5] Tracheoesophageal fistulas can cause devastating lung difficulties, but a few simple procedures can help. If possible, situate a new tracheostomy tube so that the balloon is beneath the fistula to reduce tracheobronchial tree soiling. If this is not practicable, the sealing cuff must be inflated to a minimum pressure. The head of the bed is raised, and patients are encouraged to suction oral secretions. A draining gastrostomy tube is positioned to reduce gastroesophageal reflux. [6]

METHODOLOGY

This cross-sectional study was carried out in the Department of ENT, Mymensingh Medical College Hospital, Mymensingh, Bangladesh. The duration of the study was from June 2022 to May 2023. This study was carried out on 100 patients to find out about the population including male and female patients from 15 years to 74 years of age. The study was done over admitted patients with surgical management of tracheostomy in non-malignant cases. After taking consent and matching eligibility criteria, data were collected from patients on variables of interest using the predesigned structured questionnaire by interview and observation. Statistical analyses of the results were obtained by using window-based Microsoft Excel and Statistical Packages for Social Sciences (SPSS-24).

RESULTS

Table-1: Age distribution of the study population (n=100).

Age (years)	n=100	%
15-24	10	10
25-34	20	20
35-44	38	38
45-54	14	14
55-64	12	12
65-74	6	6

Table-1 shows age distribution of the study population, it was observed that 10% patients belonged to age 15-24 years. Besides, 38% belonged to age 35-44 years and 12% belonged to age 55-64 years respectively.

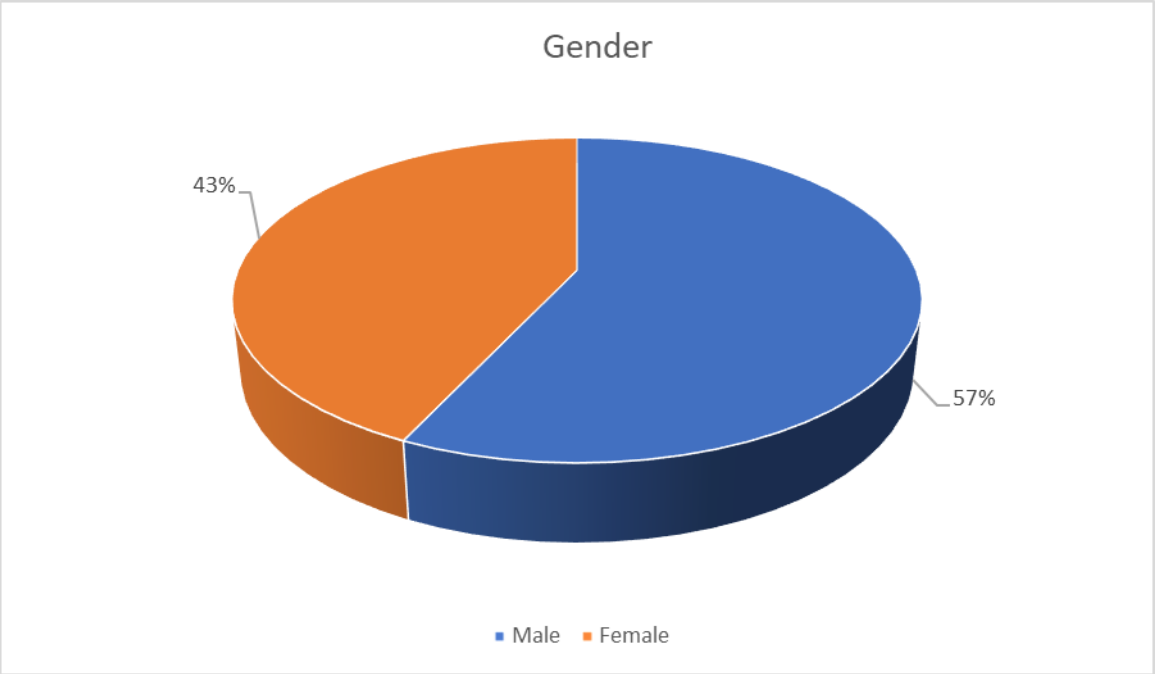

Figure -1 Gender distribution of the study population (n=100).

Figure - 1 shows Gender distribution of the study population, it was observed that majority 57% patients were male and 43% patients were female.

Table - 2 Socio-economic condition of study population (n=100).

Socio-economic condition	n=100	%
Low	27	27
Middle	42	42
High	31	31

Table - 2 shows socio-economic status of the study population, it was observed that 27% of the patients come from low class, 42% of the patients come from middle class and 31% of the patients come from high class family respectively.

Table 3: Distribution of indications of tracheostomy of study population (n=100).

Indications	n=100	%
Upper Airway Obstruction	21	21
Tumours Non malignant	06	6
Trauma	02	2
-Neck	01	1
-Maxillofacial	01	1
Infections	01	1
Tetanus	02	2
Diphtheria	02	2
Subglottic Stenosis	01	1
After Major Surgery	03	3
Bilateral abductor vocal cord palsy	02	2
Anaplastic carcinoma of thyroid	02	2
Angio oedema	03	3
Artificial Ventilation	34	34
Snake bite with neuroparalysis	02	2
Insecticide Poisoning	02	2
Seizure disorder	01	1
Alcohol intoxication	02	2
Hypocalcemia with tetany	03	3
Tracheobronchial Toilet	01	1
Head Injury *	01	1
CVA	02	2
ARDS	02	2
Anesthesia	03	3

Table - 3 shows indications of tracheostomy of study population, it was observed that, 21% patient had upper airway obstruction. Acounting to Artificial Ventilation, 2% patient had Insecticide Poisoning, 1% had Seizure disorder and 3% had Hypocalcemia with tetany respectively. Based on Tracheobronchial had Head Injury and 2% toitetting had CVA.

Table 4: Demonstration and distribution of the study according to Patient's treatment and tracheostomy characteristics (n=100).

Treatment and tracheostomy characteristics	n=100	%
Lymphadenopathy		
Infectious	10	10
Inflammatory diseases		
Sarcoidosis	6	6
Wegener's disease	1	1
Vascular		
Rings	0	0
Rings anatomical variants	4	4
Granulation tissue	6	6

Endotracheal tubes	10	10
Tracheostomy tubes	20	20
Airway stents	20	20
Strange bodies	10	10
Surgical anastomoses	14	14
Wegener's granulomatosis	1	1
Pseudotumor		
Hamartomas	4	4
Amyloid	6	6
Papillomatosis	8	8
Hyperdynamic		
Tracheobronchomalacia	4	4
Excessive wall collapse	6	6
Membranous	10	10
Idiopathic		
Tuberculosis	60	60
Sarcoidosis	30	30
Other		
Goiter	10	10
Mucus plug	6	6

Table 4 demonstration and distribution of the study according to Patient's, treatment and tracheostomy characteristics. According to Inflammatory diseases, Sarcoidosis were (6%) and Wegener's disease was (1%). And according to Vascular, Rings anatomical variants were (4%); granulation tissue were (6%); endotracheal tubes were (10%); Airway stents were (20%) and surgical anastomoses were (14%).

Table -5 Outcome of the Surgical Management of Non-malignant Cases by Tracheostomy (n=100).

Cases	n=100	%
Discharge with good recovery	84	84
Discharge with otitis extema	4	4
DORB	4	4
Referred	4	4
Death	4	4

Table 5 shows the outcome of the Surgical Management of Tracheostomy in Non-Malignant Cases. Where 84% was discharge with good recovery, 4% were discharge with otitis externa, 4% were DORB, 4% were Referred and 4% were Death.

DISCUSSION

This cross-sectional study was carried out in the Department of ENT, Mymensingh Medical College Hospital, Mymensingh, Bangladesh, Dhaka. During 1 year of study period (July 2022 to June 2023), total 100 samples were included in this study. The word "Tracheostomy" refers to the formation of an opening in the front wall of the trachea and its conversion into a stoma on the skin surface. Upper airway obstruction is one of the most prevalent reasons for tracheostomy.

Tracheostomy is now one of the most regularly done operations in severely ill patients, having been reported in the first century B.C. [7] Tracheostomy is a lifesaving

treatment that is typically performed in an emergency to remove upper respiratory blockage in patients who are in respiratory distress. It is used as an alternative to difficult intubation and in ventilated patients to improve tracheobronchial toileting. Tracheostomy, which was previously used almost solely to circumvent upper airway obstruction, is now a highly common elective therapeutic operation used to permit extended intubation and mechanical breathing in the critically ill. [8]

In the current study, tracheostomy was performed most frequently in the 35-44 age range. Chandrika's study found that the majority of tracheostomies were performed on people aged 60 to 70. [9] According to a study conducted by Choudhury, the most common age group for tracheostomy was 40-50. [10] A research conducted by Kodiya in Nigeria, 79 (71.2%) of the 111 cases studied were men, while 32 (28.8%) were female. The male:female ratio is 2.4 to 1. [11] A research conducted by Santosh, the male: female ratio was 3.5:1. [12] Males have a higher frequency of disorders such CA larynx and CA hypopharynx, most likely due to personal habits such as smoking, drunkenness, tobacco chewing, gutkha and poor oral hygiene.

In our study, it shows that, 10% of the patients were between the ages of 15 and 24. Furthermore, 38% were between the ages of 35 and 44, with 12% between the ages of 55 and 64. The majority of patients (57%) were male and 43% were female. In terms of socioeconomic position, 27% of the patients are from the low class, 42% from the middle class, and 31% from the high class.

Non-malignant (benign, non-tumoral) origin and pathogenesis are common features of tracheostomy, traumatic, and idiopathic stenosis involving the subglottis and trachea, hence concerns related to surgical care of this condition are commonly discussed together. Traumatic and idiopathic lesions are less common than tracheostomy stenosis. [13] The frequency of stenosis during extended tracheal intubation and/or tracheostomy has dramatically decreased since the introduction of current tubes with low strain and big volume cuffs into medical practice. Nonetheless, stenosis of this foundation remains the most common rationale for laryngotracheal surgery. [14]

In this study, according to the tracheostomy indications of the study population, 21% of the patients reported upper airway obstruction. According to Artificial Ventilation, 2% of patients had insecticide poisoning, 1% had seizure condition, and 3% had hypocalcemia with tetanus. Based on tracheobronchiatoi letting, 1% suffered a head injury and 2% had a CVA. In addition, 3% had undergone anesthesia. The similar thing happened in Liliana's research, which found that pharyngeal or laryngeal tumors and deep neck infection were the most commonly indicated conditions in patients undergoing emergency tracheostomy. [15]

Our study also shown that the Surgical Management of Tracheostomy in Non-Malignant Cases. 84% of patients were discharged with satisfactory recovery, 4% with otitis extema, 4% with DORB, 4% with referral, and 4% with death. Klemm Ehad's study revealed a 0.62% death rate. [16] The most common causes of mortality were hemorrhage and misplaced tubes. A tracheostomy procedure would reduce the risk of mortality in the misplaced tube. Rahman's investigation revealed a death rate of 1.78%. [17] The fatalities were the result of tube displacement and blockage.

The outcomes of surgical tracheostomy care in non-malignant cases are determined by the location of the stenosis, which affects the type of resection and anastomosis. Postoperative complications are more common following cricotracheal excision with subsequent thyrotracheal anastomosis. Other potential risk factors for permanent tracheostomy include male gender,

supraglottic location, and tracheostomy performed for severe respiratory distress. These effects may also play an important part in the development of nomograms for personalized treatment strategies for patients at risk of tracheostomy before, during, or after laryngeal cancer treatment.

Limitations of the study

The present study was conducted in a very short period due to time constraints and funding limitations. The small sample size was also a limitation of the present study.

CONCLUSION

The surgical management of non-malignant cases through tracheostomy in a tertiary care hospital proves to be an effective and life-saving procedure, especially in patients with airway obstruction, respiratory failure, or those requiring prolonged mechanical ventilation. Our study highlights the significance of tracheostomy in reducing morbidity and improving patient outcomes when timely intervention is performed. The procedure, while generally safe, requires skilled post-operative care and multidisciplinary management to mitigate complications such as infections, bleeding, and tracheal stenosis. The role of early intervention in non-malignant cases cannot be overemphasized, as it allows for better long-term recovery, improved quality of life, and more efficient utilization of healthcare resources. In conclusion, tracheostomy remains a crucial surgical option in the management of airway-related conditions in non-malignant cases, with favorable outcomes in a well-equipped tertiary care setting.

RECOMMENDATION

This study can serve as a pilot to much larger research involving multiple centers that can provide a nationwide picture, validate regression models proposed in this study for future use and emphasize points to ensure better management and adherence.

ACKNOWLEDGEMENTS

The wide range of disciplines involved in the surgical management of non-malignant cases by tracheostomy in tertiary care hospital research means that editors need much assistance from references in the evaluation of papers submitted for publication. I would also like to be grateful to my colleagues and family who supported me and offered deep insight into the study.

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