

Etiological Factors Associated with Tracheostomy & its Complications : Our experience in a tertiary care centre of Upper Assam.

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Abstract: Tracheostomy is a life-saving procedure where an opening is made in anterior wall of trachea and converted into a stoma on skin surface for ventilation. First tracheostomy ever done dates back to 3600 BC in Egypt by Aschlepedius. This retrospective hospital data based analysis was done for a period of one year from February 2022- January 2023. A total of 80 cases were recorded. Most common complication was found to be as Surgical emphysema. Laryngeal malignancy was recorded as the etiological agent bringing the urge for tracheostomy (either elective or emergency) in about 37.5% of cases. Age group of 41-60 years and above recorded as having the most post tracheostomy complications, with a male: female ratio of 1:3. Besides functional aphonia and psychogenic dysphagia were also the functional complications associated with it.

Keywords: stoma, care, complications.

Introduction: Tracheostomy is a surgical procedure where an opening is made in anterior wall of trachea, connecting it to exterior and converted into a stoma on the skin surface with placement of a tracheostomy tube to facilitate ventilation. The procedure is executed after surgically excising skin, subcutaneous tissue & superficial fascia. The strap muscles & thyroid isthmus are retracted, thereby dissecting pre-tracheal fascia and opening a stoma in anterior wall of trachea.¹ Described in Rigveda in 2000 B.C, Sushruta performed tracheostomy in around 1000- 600 B.C.

Brasovola performed the first tracheostomy of modern era in 1546.² Tracheostomy can be of following types- Open (cervical/thoracic), Percutaneous dilatational and Cricothyroidotomy.

It can be initiated both as an elective or emergency procedure. This life saving procedure, with the evolution of various newer techniques, such as Percutaneous dilatational tracheostomy, Thoracic tracheostomy etc, enables the surgeon to choose the suitable method which is also dictated by the surgeons experience, circumstances under which it is done and the type of support staff available.³ In this review, tracheostomy complications, are primarily organised as procedural-related, maintenance-related, and those that occur after decannulation. The technique of open surgical tracheostomy and percutaneous tracheostomy, are also primarily described nowadays in its context. While surgical tracheostomy complications are the focus of this review, the percutaneous tracheostomy also contains many of the same risks, as well as some of its own unique complications.⁴

Methods & Materials : This is a retrospective hospital data based analysis, carried out in the Department of Otorhinolaryngology, AMCH Dibrugarh, for a period of one year – from February 2022 – January 2023. A total of 80 cases were recorded during this period.

The most common presenting symptom in these patients were stridor. The collected data was tabulated in Microsoft Excel Worksheet. Computerised analysis was performed using the Statistical Package for Social Sciences (SPSS) 20.0 SOFTWARE (SPSS, Chicago, Illinois, USA) and Microsoft Excel 2010. The categorical variables are summarised as percentages and proportions

Table 1- Age – wise distribution of cases

Age in Years	No. of cases	Percentage (%)
< 20 Years	2	2.5
21-40	18	22.5
41-60	25	31.25
>60	35	43.75

Table 2- Gender-wise distribution of cases

Gender	No of Cases	Percentage(%)
Male	45	56.25
Female	35	43.35
Male: Female Ratio - 1.3		

Table 3 –Etiological factors associated with need for tracheostomy

Etiology	No of Cases	Percentage(%)
Road Traffic Accident	15	18.75
Physical Assault/Cut Neck	15	18.75
Laryngeal Malignancy	30	37.5
Lung ailments	2	2.5
Prolonged intubation	18	22.5

Table 4- Complications following Tracheostomy

Complications	No of Cases	Percentage(%)
Tracheal stenosis	1	1.25
Stoma Site Recurrence of Malignancy	4	5
Wound Site Infection Maggot infestation	4	5
Surgical Emphysema	8	10

Table 5 – Type of tracheostomy

Type of tracheostomy	No of cases	Incidence of complications
Emergency	35	5
Elective	45	12

Table 6- Functional complications

Functional problems	No of cases	Percentage(%)
Psychogenic dysphagia	15	18.75
Functional aphonia	20	25

Results : From our study , we found that most common age group in which tracheostomy was done was > 60 years & 41-60 years (43.75%) & (31.25%) respectively. This was followed by 21-40 years (22.5%) & least in common was < 20 years (2.5%). The age group who presented with post tracheostomy complications was found to range from 41-60 years or above. Male : female ratio was found to be as 1.3.

Among the various etiological factors laryngeal malignancy was found to be the most common (37.5%) . This was followed by prolonged intubation (22.5%) , physical assault & road traffic accident (18.75%) & lung ailments (2.5%).

On enumerating complications of tracheostomy we got that most common complication following tracheostomy was surgical emphysema (10%) . This was followed by wound site infection & stoma site recurrence of malignancy (5%). However 1 case of tracheal stenosis was also recorded (1.25%) of a post radiated laryngeal carcinoma patient who presented with stridor .

During the study period , 45 elective cases & 35 emergency cases of tracheostomy were recorded . Out of which 5 cases of elective & 12 cases of emergency tracheostomy showed some complications with an average of 6.25 % and 15% respectively.

Besides functional complications cannot be ruled out. Psychogenic dysphagia was recorded in 18.75% of cases and functional aphonia in 25% of cases respectively.

Figures 1- showing healing of stoma site after post operative care



Figure 2 :showing a patient of tracheal stenosis with healing following proper care



Discussion: From our study we found that most common age group with the need for tracheostomy was >60 years whereas Chopra et al⁵ in their study found that 61 years was the median age with a range from 18-92 years. The age group with most rate of complications was found to be 41-60 years or above , which was similar to study done by Mehta et al⁶ who found that the most extreme age group 51-60 years of age recorded 44.4% complicacy rate. Phookan et al⁷ in their study found that 51-60 years of age was the most commonly affected age-group , with an average of 32.99%.

In our study , male : female ratio was found to be 1.3 whereas Chopra et al⁵ in their study found that males were most commonly affected (71.1%) compared to females (28.9%).

In our study laryngeal malignancy was recorded as the most common etiological factor , whereas Cheung et al⁸ in their study found that prolonged intubation due to acute respiratory failure was the most common indication .

In our study we found that surgical emphysema was the most common complication associated with tracheostomy, and tracheal stenosis as least common finding which is similar to the study done by Mehta et al⁶ where they found emphysema to be the most common complication. Cheung et al⁸ in their study found that haemorrhage was the most common immediate and early complication whereas tracheal stenosis was the late complication.

Out of the 80 cases recorded in our study period , there were 35 emergency tracheostomies and 45 elective tracheostomies, of which 5 cases of emergency & 12 cases of elective tracheostomies had incidence of complications. Besides 18.75 % and 25 % of cases had functional complications of psychogenic dysphagia and functional aphonia respectively. According to Mehta et al⁶ 80% of emergency cases and 44.4% of elective cases of tracheostomies presented with complications in their study. Cheung et al⁸ in their study found that dysphagia was an early and late complication of tracheostomy. According to Parida et al⁹ , 76.9% presented with normal voice, 19.2% presented with hoarse voice and 3.8% presented with breathy voice which is similar to our study where 25% of cases presented with functional aphonia. According to Yong Dai et al¹⁰ , most cases of tracheostomy were followed by dysphagia and aspiration pneumonia.

Conclusion: Even though it's a life saving procedure, tracheostomy on it's own has complications. Proper pre-operative evaluation , assessment and skilful hands can avoid it's occurrence. Besides , as an emergency procedure , it's outcomes cannot be ignored to have adverse effects. Post operative stoma care , vigilant and experienced

surgeon can however nullify its loopholes. Post-operative psychobehavioural therapy can limit the functional dysfunctions upto some extent. Lastly, early detection, immense care and regular follow up can lead to a smooth healing.

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