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Original article:

Tracheostomy : our experience in a tertiary care centre

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ABSTRACT:

Tracheostomy is one of the most commonly performed surgery in the casualty and ICU setting. This retrospective study comprising a 80 patients who referred from various departments and presented to ENT department with various indications for tracheostomy. The aim of this study is to outline the prevalence of tracheostomy in various age groups and frequent indications and also to identifying various complications in our Institution. Though the tracheostomy is a common procedure , there is paucity in the information in our local setting regarding this subject and hence the need for the study. This is a retrospective study comprising of 80 patients who underwent tracheostomy during 2017 june to-may 2019 in Kamineni academy of medical sciences and research centre Hyderabad. These patients presented to ENT department and referred from other department for tracheostomy. RESULTS 51-60 years was the most common age group for which tracheostomy was done and more in males than females and most common indication for tracheostomy is prolonged intubation as majority of the cases are referred from other departments for tracheostomy and are elective cases so we chosen general anesthesia and horizontal incision. And majority of cases we encountered short neck. we encountered bleeding more commonly as major complication during intra operative period and surgical emphysema as post op complication. To conclude we shared our experience and data in a tertiary care centre.

Key words: tracheostomy, prolonged ventilation

Introduction:

Tracheostomy is one of the oldest surgical procedures performed and had a liturature dating back to 3600BC [7] .The term “Tracheotomy” means making incision over the trachea and “Tracheostomy” is used to indicate a procedure by making an incision on the trachea followed by insertion of a tube which maintains the patency of the opening in trachea either temporarily or permanently. The main concern of tracheostomy is to establishing the secure airway immediately, apart from the obstructive indications we have we have indications like for tracheobronchial toilet and for prolonged need of mechanical ventilation. The advantages with the tracheastomy are it can lower the airway resistance, and it causes lowering dead space ,less trauma to larynx when comparing the endotracheal tube and , we can do tracheal toilet very efficiently. Tracheostomy can be permanent and temporary and elective and emergency.

Depend upon the need of secured airway. Now a days tracheastomy is more commonly performed procedure in ICUs for prolonged intubation where patients require mechanical ventilator assist more that a weak. With the advent of new techniques and team approach and protocols for tracheostomy care we can decrease morbidity, and mortality related to tracheostomy and we can improve the quality of life of tracheostomy patients[17]

The main aim and objectives of the study are to study the age group, gender and common indications where tracheostomy is performed.To study about prevalence of various complications of tracheostomy. To share the data and our experience regarding the tracheostomy**.**

Materials and method:

This is a retrospective study comprising of 80 patients who underwent tracheostomy during 2017 JUNE-MAY 2019 in Kamineni academy of medical sciences and research centre Hyderabad.These patients presented to ENT department and reffered from other department for trachesotomy who requires prolonged ventilation who are on ventilator with endotracheal tube for more than 5 days and have one or more failed trials of extubation, are predicted to be a difficult reintubation, and are unable to protect their airway or require prolonged tracheobronchial suction Patients of all ages & both sexes are included in this study. All the patients were subjected to detailed examination Intra operative and post-operative complications were noted during the follow up period of 3 months.

Patients were subjected to routine blood investigations, screening and x-ray neck lateral view and CT neck in required cases. Videolaryngoscopy was done in malignant & bilateral abductor paralysis cases. In cases reffered from other department are assessed for neck status and cervical spine status for position, adequate platelet count, anti coagulents stopped for 5 days prior to surgery.

All the cases were operated under general anesthesia. If there is compromised glottis chink for endotracheal tube passage then local anaesthesia was used.all cases done in operation theater, with consent taken prior to procedure. Audio video counseling done to patient attendants and consequences and complications explained and consent obtained. Standard operative procedure followed in all cases and all cases postoperatively shifted to icu for monitoring. We used Standard Portex cuffed tracheostomy tube with inner tube (size plus 0.5 size of the endotracheal tube for those who are on ventilator and 7.5 cuffed tube for females and 8.0 portex cuffed for males) The complications encountered per operatively were recorded in the operation notes. All patients were given intensive care during the first 48 hours postoperatively with strict attention paid for frequent suctioning of the tube, oxygen saturation monitoring and periodic deflation of cuff. A chest X ray was taken for all patients postoperatively. Complications like haemorrhage, surgical emphysema and tube displacement/ blockage etc were carefully monitored and managed on an emergency basis. Complications encountered during the first 24 hours were categorised as immediate (within 24 hours), intermediate (after 24 hours up to fourth week) and later on as late (after fourth week to 6months). The data was carefully noted down in the proforma during the follow up of each patient.

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Results

TABLE 1: AGE DISTRIBUTION

1	AGE GROUP	NO	PERCENTAGE
2	21-30	10	12.5%
3	31-40	10	12.5%
4	41-50	12	15%
5	51-60	25	31.25%
6	61-70	15	18.75%
7	71-80	5	6.2%
8	81-90	3	3.7%
TOTAL		**80**	

In this present study younger patient is of 22 yrs age with history of RTA which require prolonged ventilation reffered from neurosurgery and maximum age is 87 years is a case of CVA reffered from critical care department who required prolonged ventilator support. Most of the patients are from the 51 to 60 age group (31.25%).

RK dutta, vishwantha [1] noted majority age group is 4th to 6 th decade. Chandrika[2] at al noted that 60-70 age group is more predominant.

Ahmed Rohail et al[3], noted that the commonest age group that underwent tracheostomy was 61-70 years of age.

Study by ashwin menon[4] noted that most common age group is 6 th decade

TABLE 2: MALE : FEMALE RATIO

S No	MALE	FEMALE
1	54	26
2	67.5%	32.5%

Ashwin menon et al [4] study quoted that they operated on males at the ratio. Of 3.3:1 ratio and RK dutta B viswanatha [1] noted that predominant male patients at the ratio of 5.6:1 ,Crysdale et.al [5] study also more male patients underwent tracheostomy than female patients. In ths study males are underwent tracheostomy than females at the ratio of 2:1.In the study done by Chandrika A et al [2] males underwent tracheostomy more than females with a ratio of 3.4:1. In the retrospective study done by Crysdale[5] in 1976-1985 on 319 cases, more males underwent tracheostomy than female.

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TABLE 3 INDCATIONS

	INDICATION	NO	PERCENTAGE
1	Ca LARYNX	8	10%
2	CVA	23	28.75%
3	RTA	22	27.5%
4	BILATERAL PNEUMONIA WITH ARDS	6	7.5%
5	HYPOXIC ISCHEMIC ENCEPHALOPATHY	3	3.75%
6	BILATERAL ABDUCTOR PALSY	2	2.5%
7	ASIPARATION PNEUMONIA	1	1.25%
8	UROSEPSIS	1	1.25%
9	CA THYROID	1	1.25%
10	HAIRDYE POISONONG	2	2.5%
11	COPD	3	3.75%
12	SUBGLOTTIC STENOSIS	1	1.25%
13	BRAIN TUMOUR EXCISION POSTOP	1	1.25%
14	ASSAULT POLYTRAUMA	2	2.5%
15	CA OESOPHAGUS	1	1.25%
16	SWINEFLU	1	1.25%
17	CAD POST CABG	1	1.25%
18	POST CPCR LV DYSFUNCTION	1	1.25%

TABLE 4: CAUSES

S No	OBSTRUCTIVE CAUSES	NON OBSTRUCTIVE CAUSES
1	15	65
2	18.75%	81.25%

In a study by Crysdale et.al.[5] in 1976-1985 and Zetonni & Manoukian [6] in 1993, where 319 and 44 cases were taken up respectively. In Crysdale et.a l[5] study, 222 cases (70%) were of airway obstruction, 65 cases (20%) were of tracheobronchial toilet and 32 cases (10%) were of continued assisted ventilation.

In Zetonni & Manoukian,[6] 25 cases (57%) were of airway obstruction.

In the present study 80 patients who underwent tracheostomy in three years period. In this group 65 cases (81.25%) were of non obstructive causes and airway obstruction is in 15 cases (18.75%) as this due to most of the cases are reffered from other departments for tracheostomy due to required for prolonged ventilation

In the study by chandrika [2] et al the most common indication for tracheostomy was upper airway obstruction (84%). In a study carried out by Mahadevan M et al [16] with 122 cases from the Starship Hospital in New Zealand between 1987 and 2003, also airway obstruction (70%) was the main reason for doing a tracheostomy. But in our study most of the cases referred from the ICU so non obstructive causes are predominant

In a retrospective study of 1130 cases by Goldenberg et al [7] showed most common indication is prolonged mechanical ventilation and the present study correlated with the study

TABLE 5:ELECTIVE / EMERGENCY

S No	ELECTIVE	EMERGENCY
1	76	4
2	95%	5%

IN PRESENT STUDY out of 80 cases 76 cases were elective tracheostomy and 4 are emergency tracheostomy as most of the cases reffered from other department we operated In operation theatre under anaesthetic control, out 4 emergency tracheostomies 3 operated In theatre and one in casualty.RK Dutta at al [1] noted that 46% elective cases and 54% emergency tracheostomy cases Chandrika at al noted 87% emergency tracheostomy cases . as in the present study more number of cases are referred from other departments for elective tracheostomies

TABLE 6:TYPE OF ANAESTHESIA

S No	LOCAL	GENERAL
1	6	74
2	7.5%	92.5%

Out of 80 cases we operated 6 cases under local anaesthesia due to endotracheal intubation cannot possible in these cases as compromised glottis chink due to malignancy. And remaining cases we operated in theatre under anaesthetic control. . Ashwin menon at al proved that 58% of cases done under local anaethesia and RK Dutta at al [1] noted 60% cases are under general anaesthesia. In this present study majority cases are elective cases and operated in theatre with anaethetic contol and suction and diathermy control and better operating facilities.

TABLE 7: NECK STATUS

S No	SHORT NECK	NORMAL NECK
1	62	28
2	65%	35%

Out of 80 cases 70 cases are referred from the other department ICUs and in our hospital prolonged ventilator required cases underwent percutaneous tracheostomy and where PCT not possible like short neck are referred to ENT department for tracheostomy. Out of 80 cases 62 cases have short neck and remaining cases are normal neck.

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Pic 1: showing patient referred from neuro ICU post decompressive craniotomy due to CVA for tracheostomy with short neck.

TABLE 8 : CERVICAL SPINE STATUS

S No	UNSTABLE CERVICAL SPINE	STABLE SPINE
1	5	75
2	6.25%	93.75%

As neck extention should be adequate to ease the tracheal opening in 4 cases due to RTA where cervical spine is unstable and tracheostomy done in semi extention position

TABLE 9: TYPE OF INCISION

TYPE OF INCISION	HORIZONTAL	VERTICAL
No	73	7
PERCENTAGE	91.25%	8.75%

As we used vertical incision in only in 7 cases where all 7 cases are short neck and remaing cases we started with horizontal incision. RK dutta [1] noted in his study 64% horizontal incision and 36% cases vertical incision, it may vary because of the surgeon choice and expertise and local factors.

TABLE 10: INTRAOPERATIVE DIFFICULTIES and COMPLICATIONS

S No	DIFFICULTY	NO	PERCENTAGE
1	BLEEDING	11	13.75%
2	DIFFICULT TO IDENTIFY TRACHEA	4	5%
3	LARGE THYROID	8	10%
4	FALSE PASSAGE	3	3.75%
5	DEATH	2	2.5%

6	ABONDED PROCEDURE	1	1.25%
7	EXTENSIVE SCARRING DUE TO REVISION	2	2.5%
8	LARGE VESSELS OBSTUCTING THE WAY	2	2.5%
9	total	33	41%

Discussion:

Out of 80 cases we noted intra op complications in 33 patients and during the surgery we encounter bleeding as a main concern in 11 cases and we operated 8 cases on large thyroid and we addressed bleeding with monopolar cautery and ligature. In 4 cases it is difficult to identify 2nd tracheal ring due to short neck and we managed with difficulties. In 3 cases we had a false passage and again we reintroduced tracheostomy tube. We had 2 cases of revision and scaring causes difficult for dissection. We had 2 cases of intra operative death due to anaestehsia complications.in one case we abandoned procedure due to short neck and we unable to identify trachea and wehre it require sternotomy as general condition of patient didn't permit us to go for further dissection and we abandoned procedure. RK Dutta at al [1] also noted bleeding as a main intra op complication.

Chandrika a et al [2] study of 205 cases, the general incidence of complication was 28.3%. Out of 180 emergency cases, 55 (30.6%) developed complications and 3 (12%) out of 25 elective cases developed complications

Abdul Aziz Hamid et al [8] who also had more complications in the emergency group. Immediate complications occurred in 8 emergency and 1 elective case. The most common immediate complication was haemorrhage that occurred in 4 cases (6.9%), cardiopulmonary arrest in 4 (6.9%) cases and apnoea in 3 cases (3.4%). In a cross-sectional descriptive study of complications of tracheostomy and their management on 50 patients done by Ahmad Rohail et al,7 the early complications were haemorrhage (16%), cardiac arrest (4%), apnoea (8%) and damage to local structures (8%).

Incidence of complications varies in different author's series. In the similar studies by Crysdale et.al. [5] in 1976-85 and Zetonni & Manoukian, [6] in 1993 the incidences of complications were 54% and 27% respectively. In study RK Dutta et al [1] by complications were encountered in 24 patients (48%), it was more during the emergency procedure .. Intra-operative bleeding was the commonest problem encountered during the study and was effectively managed with cautery and ligation

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Pic 2: patient posted for trachestomy with goiter.

TABLE 11: POSTOPERATIVE COMPLICATIONS

S No	COMPLICATION	NO	PERCENTAGE
1	SURGICAL EMPHYSEMA	7	8.75%
2	TUBE DISPLACEMENT	1	1.25%
3	TUBE BLOCK	4	5%
4	POST OP BLEEDING	3	3.75%
5	GRANULATIONS	3	3.75%
6	WOUND INFECTION	2	2.5%
7	TRACHEOCUTANEOUS FISTULA	1	1.25%
8	TRACHEOSPHAGEAL FISTULA	4	5%
TOTAL		**25**	**31.25%**

We closely followed all post op tracheostomy cases and associated with primary consultant for follow up. Out of 80 cases we encounter surgical emphysema in 7 cases and reduced with time being. And one tube displacement noted during mobilization of patient and prompted immediately. We encounter 4 cases of tube block and identified by efforts of breathing and hard to suction and we overcome with tube change in time. We noted granulations and stomal infection in 5 cases with regular dressings both subsided.trachesosophageal fistula encountered in 4 cases and addressed with prolonged ryles feeds. Trachesocutaneous fistula in one case adressed with secondary suturing.

In the study by RK dutta [1] tubal occlusion was encountered in 4 cases (8%),

In our study it is 5% and managed by proper humidification and NaHCO3 instillation and regular suctioning. Wound infection was noticed in 2.5% and was managed with broad spectrum antibiotic after culture sensitivity test. And RK dutta et al [1] also noted the similar wound infection percentage.

Goldenberg et al [7] noted complications are in 49 cases(4.3%) and the most common is tracheal stenosis(21 cases) haemorrhage in 9 cases tracheocutaneous fistula in 6 cases infection in 5 cases and tube obstruction 4 cases.

Crysdale [5] and zetonni [6] noted 54% and 27% complication rates respectively.

Kawale et al [9] noted that complication rate was found to be 29.83%. and in the study with of Munir et al [11] stated complication rate as 30%. The complication rate in Adedeji TO [10] study was 21.2%. and The complication rate in of various other studies was within 10–45%. [12,13,14,15]

TABLE 12: PRIMARY DEPT/REFFERED FROM

DEPT	NO CASES	PERCENTAGE OF CASES
ENT	10	12.5%
NEUROLOGY AND NEUROSURGERY	36	45%
ONCOLOGY	2	2.5%
UROLOGY	1	1.25%
PULMONOLOGY	1	1.25%
GENERAL SURGERY	1	1.25%
GENERAL MEDICINE	1	1.25%
CRITICAL CARE MEDICINE	28	35%
TOTAL	**80**	

As our hospital has well established neurology and critical department s as patients require prolonged ventilator support so most of the cases for tracheostomy reffered to ENT department. As many patients from critical care department would undergo percutaneous trachesotomy and for those who have short neck and where PCT cant be taken those cases referred to ENT department and after trachestomy these cases transferred back to respective intensive cares and closely followed by a ENT department consultants for complications. Those patients who recover from primary illness they underwent decannulation before they discharge. And patients with laryngeal malignancy are reffered to oncology department for further management.

Conclusion:

In our study,we shared our data and experience and 51-60 years was the most common age group for which tracheostomy was done and more in males than females and most common indication for tracheostomy is prolonged intubation. As majority of the cases are referred from other departments for tracheostomy and are elective cases so we chosen general anesthesia and horizontal incision. And majority of cases we encountered short neck. we encountered bleeding more commonly as major complication during intra operative period and surgical emphysema as post op complication. This study also confirms the low mortality and morbidity when the best post-operative care

is instituted. This is evidenced by preventable and curable low post operative complications in present study, and even with short neck and co morbid conditions. Finally even today tracheostomy remains as a life saving procedure.

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