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EMERGENCY TRACHEOSTOMY - AN ANALYSIS OF ITS INDICATIONS

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ABSTRACT:

Objective: The objective of our study is to analyze the various indications of emergency tracheostomy at Civil Hospital Karachi and Liaquat University Hospital Hyderabad, Pakistan.
Study Design: Descriptive, Cross sectional study.
Place & Duration of Study: This study was conducted at the department of Otorhinolaryngology-Head & Neck Surgery, Dow University of Health Sciences, Civil Hospital Karachi and Liaquat University Hospital Hyderabad from May 2007 to April 2010.
Methodology: All patients admitted to emergency department, having a compromised upper airway as well as patients in the other departments of the same hospitals developing an upper respiratory tract obstruction/respiratory insufficiency were selected for this study. A quick assessment of the degree of upper airway obstruction was made from the patient's dyspnea, stridor, cyanosis & suprasternal and intercostal recession and patients were selected for emergency tracheostomy. All tracheostomies were done by open surgical technique under local anaesthesia in Emergency Operation Theater. Statistical analysis was carried out using SPSS 16.
Results: Out of 175 patients, 132(75.5%) were male and 43 (24.5%) were female. Mean age was 40.45 years and Std. deviation ±15.063, ranging from 07 to 80 years. The most common indication for emergency tracheostomy in our study was found maxillo-facial trauma (58.3%) followed by laryngeal & hypopharyngeal malignancies (23%), tetanus (8.6%), corrosive ingestion (7.4%), subglottic stenosis (2.2%) and diphtheria (0.5%).
Conclusion: Until the last two decades, the most common indication for emergency tracheostomy was upper respiratory infection such as diphtheria, epiglottitis but with the advent of new antibiotics and effective vaccination programs, these indications were reduced and rarely seen now a days. The most common recent indications are trauma (road traffic accidents) followed by malignancies of larynx &hypopharynx.

Key Words: Airway emergencies, Emergency tracheostomy, Maxillo-facial trauma, Laryngeal malignancy, Hypopharyngeal malignancy.

INTRODUCTION:

Tracheostomy is a life-saving procedure. It is an operative procedure that creates opening in the cervical part of trachea and opening is maintained with a tube called tracheostomy tube[1]. Tracheostomy is a most common emergency procedure & widely used in patients suffering from upper airway obstruction[2].
More than 4000 years ago Asclepiades of Persia reported performing tracheostomies but in 1921 Chevaliar Jackson codified indications & techniques for modern tracheostomy[3, 4]. In past the tracheostomy was regarded as procedure with high morbidity & mortality, however with the advent of better smaller devices and more practical instruments it is now easier to perform this procedure. Since tracheostomy deals with airway so the operating room is postulated as the ideal place[5].

Common presentations of patient are hoarseness, difficulty in breathing, stridor, cyanosis, difficulty in swallowing and neck swelling. Indication for tracheostomy included impending airway obstruction due to malignancy of upper aerodigestive tract or due to extrinsic compression of the airway[6]. Severeedema and bleeding in the upper respiratory passage due to maxillo-facial trauma, head injury, subglottic stenosis and a variety of other etiologies are also an important index in judging the indication of tracheostomy[7, 8]. Standard surgical tracheostomy is an irreplaceable procedure in patient with complex anatomic condition or in high risk patient[9,10].

The purpose of this study is to analyze the different indications in patient presenting with respiratory tract obstruction or insufficiency at Civil Hospital Karachi and Liaquat University Hospital Hyderabad. As far as no such study in this aspect has been done in our setup, this is important to know the gravity of situation and to create awareness in medical professional to plan the management and deal that condition in better way.

PATIENTS &METHODS:

This study was conducted at the department of Otorhinolaryngology - Head & Neck Surgery, Dow University of Health Sciences, Civil Hospital Karachi and Liaquat University Hospital Hyderabad from May 2007 to April 2010. One hundred and seventy-five (175) patients were selected, irrespective of age and sex. All patients admitted to emergency department, having a compromised upper airway as well as patients in the other departments of same hospitals developing an airway obstruction, were selected for this study. Patients presenting with difficulty in breathing due to maxillofacial trauma in road traffic accident and/or gunshot injury of head & neck region, corrosive ingestion, and suspected malignancy of larynx and hypopharynx. A quick assessment of the degree of upper airway obstruction or insufficiency was made by judging from the patient's dyspnea, stridor, cyanosis & suprasternal and intercostal recession. All operations were performed by an experienced ENT surgeon, using the standard open surgical technique under local anesthesia with patient's vitals being monitored in Emergency Operation Theater. A horizontal incision technique was used in all patients. Cuffed Portex tracheostomy tube of different sizes according to age and built of the patient was used. We included all those patients who had difficulty in breathing and failed to pass the endotracheal tube.Statistical analysis was carried out by using SPSS 16 version.

RESULTS:

Out of 175 patients, 132 (75.5%) were male and 43 (24.5%) were female (Figure I) . Mean age was 40.45 years Std. deviation ±15.063, ranging from 07 to 80 years (Figure II). The most common indication was maxillo-facial trauma 102 (58.3%) cases followed by laryngeal &hypopharyngeal malignancies 40 (23%)cases. Tetanusin 15 (8.6%), corrosive ingestion in 13 (7.4%), subglottic stenosis in 04 (2.2%) and diphtheria was in 01 (0.5%) cases (Table I).

Out of 102 maxillo-facial trauma compound fracture of mandible was found to be the most common injury in 50 patients (49%) followed by fracture maxilla (Lefort type II & III) in 29 patients (28.4%) and fracture of mid face in 14 patients (13.7%). There was neck injury particularly anterior triangle in 09 patients (8.9%) (Table II). The major etiology of injuries were road traffic accidents 52 (51%) patients followed by the gunshot in 25 (24.5%) patients, assault in 18 patients (17.6%) and history of fall in 07 patients (6.9%) (Table III).

Malignancy of larynx & hypopharynx was the second most common indication of emergency tracheostomy in which laryngeal malignancies was found in 22 patients (55%) and hypopharynx malignancies was 18 patients (45%) in which all were T_3 and T_4

FIGURE I:
Gender Distribution

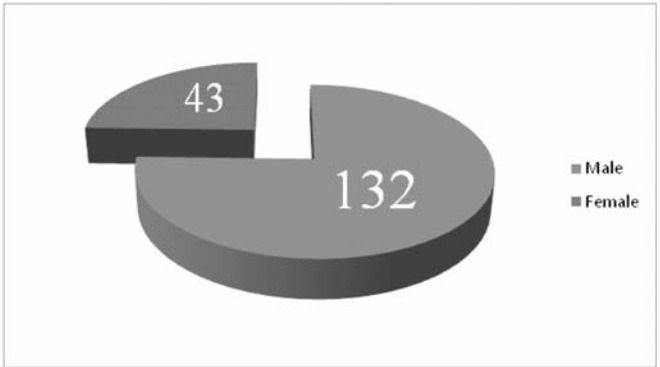
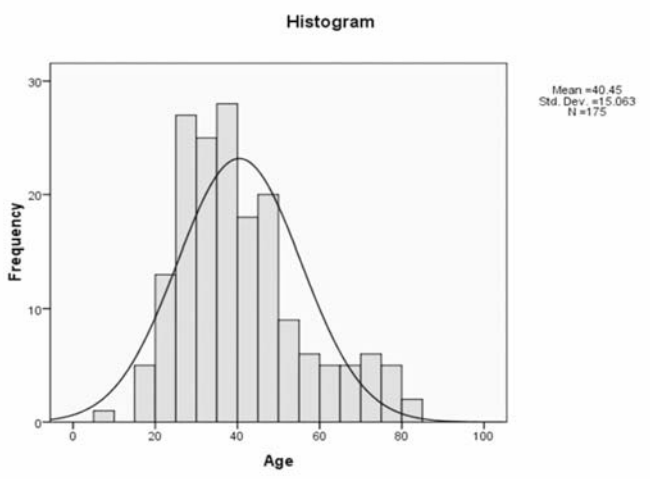


FIGURE II:
Age Distribution



GRAPH III:
Laryngeal &Hypopharyngeal Malignancies (n=40).

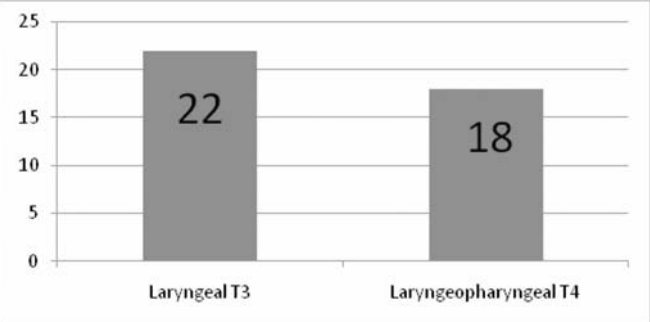


TABLE I:
VARIOUS INDICATIONS OF EMERGENCY TRACHEOSTOMY
(n=175)

S. No	Indications	Total	Percentage
1	Maxillofacial trauma	102	58.3%
2	Laryngopharyngeal Malignancies	40	23%
3	Tetanus	15	8.6%
4	Corrosive ingestion	13	7.4%
5	Subglottic stenosis	4	2.2%
6	Diphtheria	1	0.5%

TABLE II:
MAXILLOFACIAL TRAUMA TYPES
(n=102)

S. No	Types	Total	Percentage
1	Compound Fractures of Mandible	50	49 %
2	Fracture Maxilla (lefort type II & III)	29	28.4%
3	Fractures of Mid face	14	13.7%
4	Neck Injuries (Anterior triangle)	09	8.9%%

TABLE III:
AETIOLOGY OF MAXILLOFACIAL TRAUMA
(n=102)

S. No	Aetiology	Total	Percentage
1	Road traffic accidents	52	51%
2	Gun shot	25	24.5%
3	Assault	18	17.6%
4	Fall	07	6.9%

respectively (Figure III).

DISCUSSION:

Life is very prestigious and it is a gift of God but critical airway is a life-threatening condition, from hypoxemia to become hypoxia followed by failure or inadequate ventilation. The two classical indications for emergency tracheostomy, i.e. laryngeal pathologies and failure to pass the endotracheal tube for ventilate the patient to relieve the respiratory distress[11,12]. Tracheostomy remains a very important life-saving surgical procedure worldwide and particularly in our environment where patients presented with upper airway obstruction either due to severe trauma of head and neck region or advanced laryngeal and hypopharyngeal malignancies etc[13].

In our study, we found male preponderance of 75.5% as compared to female 24.5% with a ratio of 3:1. While this is consistent finding in local as well as international literatures[14,15,16], whereas one study in 2004 shows equal gender distribution[17]. The mean age was 40.45 years and Std. deviation ±15.063, ranging from 07 to 80 years[16].

Maxillofacial trauma in our region assumes so much importance as it involves vital and non-vital organs looks terrible and may lead to severe edema and massive hemorrhage so it is potentially life-threatening scenario[18]. The most important thing in these patients is to secure the airway, stop bleeding and restore the blood volume. Our observation is similar to the international studies[19,20]. Road traffic accidents are the major etiology of the maxilla-facial trauma due to the rash driving of drivers especially the motorbike drivers. They are not adopted the protective rules of driving and not obey the rules and regulation of the traffic. Most of patients are males and particularly young age groups. This group represents the economically active age and portrays an economic loss both to the family and the nation and the reason for their high incidence of head and neck injuries reflects their high activity levels and participation in high-risk activities i.e. welling motorbike / cycle[21]. Our figure is a reflection of the other studies that the road traffic accidents are the major etiology maxilla-facial trauma in which we performed emergency tracheostomy followed by the gunshot injuries, assault, and fall from height respectively[22, 23,24].

In our findings we have found that mandibular fracture was the most common injury followed by fracture maxilla, fracture of mid face and neck injuries particularly the anterior compartment which involving the larynx. This was comparable with the international study[24]. The findings of this study, compared with similar studies reported in the literature, support the view that the causes and incidence of maxillofacial injuries vary from one country to another[23,25].

The indications of tracheostomy are diverse and changing. There has been a change in the indications for tracheostomy over the past two decades ago[26]. In the past, infective conditions such as epiglottitis and laryngeal diphtheria were major indications for tracheostomy but the invention of the vaccination and the better handling of infections with the use of intubation and conservative management in the intensive care unit have reduced the incidence of these indications[27]. In our experience, all cases with laryngeal and laryngo-pharyngeal malignancies present late and most of the patient came with severe respiratory distress and so an emergency tracheostomy was always performed even before confirming the diagnosis. The second most common indication for emergency tracheostomy in our series was upper airway obstruction due to laryngo-pharyngeal malignancies. The majority are the laryngeal malignancies which were all the T_3 lesions followed by the advanced laryngo-pharyngeal malignancy which all were T_4 lesion respectively. These findings are consistent in the local as well as the international studies[28, 29].

In our study, we have found patients suffered from the tetanus with severe respiratory distress and complete trismus, an urgent emergency tracheostomy was performed, the cause of the tetanus was the road side injuries. Initially we tried for nasal intubation and relieve the respiratory distress but after failing all emergency treatment we done the tracheostomy. One study has mentioned its importance[30].

In our observation, patients reported in emergency department with history of corrosive ingestion with severe respiratory distress due to the severe oedema of oropharynx and larynx, majority of patients were female. They do this for attempting the suicide for their house related problems[31].

In our experience patients presented with history of sudden breathlessness, after the securing airway weassessed the patient we found the subglottic stenosis. Out of 4 half of patient give history of trauma and half patient was given the history of prolong intubation due to complications of major surgeries[32].

In our study, we have found only one patient for diphtheria which was 7 years of age and not vaccinated, came with severe respiratory distress. We did emergency tracheostomy but patient did not survive after the securing the airway. He died due to the complication of disease. Now a days the Laryngeal Diphtheria is very rare due to the improve vaccination program.

Emergency tracheostomy remains a very important life-saving surgical procedure worldwide and particularly in our environment where patients present late in upper airway obstruction. Little work has been done on this subject in our environment and therefore it was necessary to conduct this study to describe our own experiences with tracheostomy, outlining the common indications in our setting and compare our results with those from other centers in the world.

CONCLUSION:

Until the last two decades ago, the most common indication of tracheostomy was upper respiratory infection such as laryngeal diphtheria, and epiglottitis but with the advent of new antibiotics and vaccination program these indications were rarely seen nowadays. The recent indications are trauma (road traffic accidents) & malignancies of larynx & pharynx.

RECOMMENDATIONS / SUGGESTION:

Tracheostomy should be considered in any patient with impending or ongoing airway obstruction or with potential for difficult intubation. This should be performed in a timely manner before an emergent situation arises because the complications of emergency surgical airway can be devastating.

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