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TRACHEOSTOMY;

COMPLICATIONS IN UPPER AIR WAY MANAGEMENT AS COMPARED TO ENDOTRACHEAL INTUBATION

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ABSTRACT… Objective: This study involves the review of management of patients who required temporary airway support and were treated either with tracheostomy or endotracheal intubatione in ear, nose, throat. Department and intensive care unit of Multan Medical & Dental College Ibne Sina Hospital Multan. Another important aspect of the study is to compare the results of tracheostomy with endotracheal intubation . **Study Design:** Retrospective and descriptive. **Place and Duration of Study:** Multan Medical and Dental College Ibnae e Sina Hospital Multan. From 2012 to 2013. **Patients and Method:** Twenty consecutive patients who had operation of tracheostomy whether emergency or elective, and were admitted in ENT ward of Ibne Sina Hospital Multan and twenty patients were intubated with endotracheal tube in the intensive care unit of the hospital. **Results:** The main indications of tracheotomy were upper air way obstruction (80)% and mechanical respiratory insufficiency (20)%. Indications of endotracheal intubation were mechanical respiratory failure(80)% and ventilatory insufficiency due to retention of secretions (20)%. Tracheostomy is better choice in prolonged air way control more than three 3 weeks. But endotracheal intubation is found to be better choice in early and quick management of short term airway control up to 3 weeks.

Key words: Upper air way management, tracheostomy, endotracheal intubation

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INTRODUCTION

The term tracheostomy is derived from Greek word meaning “Icut” the trachea. has been known for about 3500 years. In the past it has been considered as a method of choice in saving patients with upper air way obstruction. Nowadays ,indications of tracheostomy have been extended to patients with mechanical respiratory insufficiency and ventilatory insufficiency due to retention of secretions with the development of endotracheal tubes, which can be easily and rapidly use to manage the airway in emergency. The performance of this procedure has been shifted from emergency tracheostomy to elective or planned procedure. Complications of emergency tracheostomy are 3-5 times greater than elective tracheostomy. Complications followed by endotracheal intubation are less severe and better tolerated by patients as compared to complications following tracheostomy, which were more serious. The choice between trachostomy and endotracheal tube is controversial and more controversial is timing of tracheostomy after endotracheal intubation.

PATIENTS AND METHOD

This is retrospective descriptive study conducted at Ibnae –sina –Hospital Multan. Twenty consecutive patients who had operation of tracheostomy whether emergency or elective were admitted in the hospital and 20 patients who were intubated with endotracheal tubes in I-C-U are included in this study.

In some patients immediate endotracheal

intubation was required and in some emergency tracheostomy was done to control the airway.

All these patients after control of air way were examined clinically and investigated. Help of other departments, if required was obtained to diagnose the primary disease. Endoscopy was also done to see the extent of disease adnd biopsy was taken to determine the histopathology.

All the tracheostomies were performed using standard surgical technique under aseptic conditions in operation theatre by consultants. Appropriate size portex cuffed tracheostomy tubes were used.

All the endotracheal intubations were performed by the trained doctorts in I-C-U and Accident &emergency department.Standard disposable cuffed endotracheal tubes were used.

Each patient who had tracheostomy or intubation, was assessed for surgical emphysema, bleeding, dislodgement or displacement of tubes. Other complications like aspirations, cardiopulmonary embarrassment, cardiac arrest, obstructions and decanulations and its difficulties were also assessed.

RESULTS

Out of the total forty patients selected for this study, 20 patients had tracheostomy and 20 had endotracheal intubation.

Tracheostomy Patients

Those patients who underwent tracheostomy their age ranged from 42-78years. The mean age 58 years. Out of these tracheostomy patients 18 were male. 2 were females.

Table I shows the indications for which tracheostomy was done. In 16 patients (80%) it was done to relieve the upper air way obstruction and in 4 patients (20%) it was done to support the mechanical respiratory insufficiency.

Out of these group one patient had Ludwig's angina, one patient had carcinoma of hypopharynx and fourteen patients had carcinoma of the larynx. (Table II).

Indications	No. of patients	%age
Upper airway obstruction	16	80
Mechanical respiratory insufficiency	04	20
Total	20	100

Table-I. Indications for tracheostomy

Causes	No. of patients
Ludwig's angina	01
Carcinoma of hypopharynx	01
Carcinoma of larynx	14
Total	16

Table-II. Causes of upper airway obstruction

Out of 20 patients, 17 patients (85%) had tracheostomy under general anesthesia 3 patients (15%) had it under local anesthesia.

Tracheostomy was done as an emergency procedure in 9 patients (45%) as planned procedure in 11 patients (55%).

Complications were encountered in 7 patients (35%), out of 20 who had tracheostomy (table III).

Three patients developed infection of tracheobronchial tree and 2 patients developed surgical emphysema in the neck. One patient complained of difficulty in swallowing and in 1 patient decanulation was difficult.

Patients with Endotracheal Intubation

Twenty patients who were intubated in intensive care unit of IBNAE –SINA hospital were selected for this study.

The age range of these patients was from 1 month to 80 years. The average age being 45 years.

Complications	No. of patients	%age
1. Immediate	-	-
2. Intermediate	-	-
Infection of tracheo bronchial tree	03	15
Surgical emphysem of the neck	02	10
Dysphagia	01	05
3. Late	-	-
Difficulty in decanulation	01	05

Table-III. Complications of tracheostomy patients

Twelve of these patients (60%)were male and 8 patients (40%) were females.

Six patients (30%) were intubated in emergency at time of the admission and 14 patients (70%) were intubated after 24hours or more after the admission.

Oral intubation was done in all 20 patients and none has nasotracheal intubation.

In 4 patients out of 20, tracheostomy was done after 2 weeks or more of endotracheal intubation.

Sixteen patients (80%) were intubated for mechanical respiratory failure and 4 patients (20%) were intubated for ventilator insufficiency (table IV, V).

Indications	No. of patients
Guillain Barre Syndrome	10
Chest disease	03
Post operative causes	03
Total	16

Table-IV. Causes of endotracheal intubation for mechanical respiratory failure

Out of sixteen patients who were intubated for mechanical respiratory failure, 10 patients were suffering from Guillain Barre. Syndrome, 3 patients were suffering from different diseases of pulmonary origin and 3 patients were of post operative problem (table-IV).

Table-V shows that out of 4 patients who were intubated for ventilator insufficiency, 2 patients were suffering from brain and meningeal infection, one was quadriplegic and one patient had congenital heart defect with chest infection.

Indications	No. of patients
Brain meningeal infection	02
Quadriplegia	01
Congenital heart defect	01

Table-V. Causes of endotracheal intubation for ventilatory insufficiency

Over all complications rate in patients who were intubated was 30%. Three patients developed infection of tracheobronchial tree.After extubation, 2 patients were complained of change in voice, which was temporary. One patient developed post –intubation granuloma of vocal cord (table-VI).

Complications	No. of patients	%age
1. During intubation		
Damage to lip	-	-
Damage to teeth	-	-
2. With tube in place		
Sore throat	-	-
Infections of tracheobronchial tree	03	15
3. Late		
Dysphonia	02	10
Vocal cord intubation granuloma	01	05

Table-VI. Complications of endotracheal intubation

DISCUSSION

Tracheostomy is one of the oldest operations

known in the history, for the 3000 years (Lewis,2009)[1]. Tracheostomy originally was used as an emergency for the management of upper airway obstruction (wood et al,2008)[2]. The development of endotracheal tube has dramatically reduced the need for emergency tracheostomy (Lewis,2009)[1]. Now a days a primary indications of tracheostomy are to clear the secretions of tracheobronchial tree and long term mechanical ventilation (Wood et al,2008)[2].

The complications rate after emergency tracheostomy is 2to 5 times greater than the elective tracheostomy (Kato et al,2008)[3]. One of the causes of the high rate of complications in emergency tracheostomy appears to be related to the amount of time required to open the trachea (Kato et al,2008)[3] Endotracheal intubation is always preferred over tracheostomy as the initial mean of obtaining access to the airway. Once control of airway has been achieved with an endotracheal tube, an Elective tracheostomy is performed which is safer and easier to perform and better tolerated by the patients (Orringer, 2006)[4]. Patients requiring prolonged support with mechanical ventilation to provide adequate alveolar ventilation are best managed with tracheostomy tube(Gracey, 2008)[5]. Tracheostomy tube with intermittent positive pressure ventilation has been considered essential in the long term management of high level spinal cord injured patients(Bach et al, 2007)[6]. A timely tracheostomy is helpful to assist ventilation, frequent bronchial toilet and an artificial respiration in patients with ventilator insufficieny due to secretory retentions (Guo etal 2009)[7].

The indications of tracheostomy in our part of world are different from modern western world. Yousaf and Khan (2010)[8] in their study found laryng-tracheobronchitis, Diphteria and foreign bodies as major indications of tracheostomy at Peshawar. In anthor study of Bais (2010)[9] from New Delhi Indis, major indications of tracheostomy are laryngotracheobronchitis. Diphteria and poliomyelitis.

This in sharp contrast to studies in the Western world where main indications are congenital, acquired sub glottic stenosis and ventilator insufficiency. This contrast reflects poor medical cover, poor communication ,lack of proper neonatal care and early diagnosis of airway problem.((Trimizy 2006)[10].

In my study at Ibnae-Sina hospital Multan, I found indications of tracheostomy are upper air way obstruction, especially tumours of larynx and mechanical respiratory failure especially G.B syndrome. This is in contrast to peripheral area of Punjab, as the people from better socio economic group report to our hospital and second reason is, presence prerequisites of intubation i-e ventilators, intensive care unit ,blood gas monitors and trained staff at intensive care unit of the hospital, so first preference is given to endotracheal intubation if required airway support is of short duration.

Zaidi in his study of 131 tracheostomies reported the complications rate at Jinnah Postgraduate Medical Cetre Karachi, of 15-23%. Gnawardana reported complication rate of 47% in his 34 patients on elective tracheostimies were done. (Pak J oto, 2008)[11].

Bais in 2010 reported complication rate 7.6% (McEniey et al,2010)[12] from Sydney, Australia reported death in one of their patients who had tracheostomies and 30% complication rate.

Guo et al 2009, reported 13.4% complication rate of tracheostomies in patient of respiratory failure due to retention of secretions in trachebronchial tree. Serious complications like tracheal stenosis, tracheo-oesophageal fistula and tracheo-innominate fistula have also been reported(Wood et al 2008)[2].

Complications o f emergency tracheostomy is 3-5 times more than elective tracheostomy(Kato et al, 2008)[3]. (Berlauk in 2009)[13] reported 3% complication rate after elective tracheostomy and 15% in emergency tracheostomy.

In our study, complications rate which we

recorded is 35%, 7 patients in this study developed some sort of complication. But all these complications like surgical emphysema, Dysphagia and difficulty in decanulation were not serious and were managed easily.

Endotracheal intubation is the most rapid method of controlling the air way. It may be performed trans nasally or orally (Spector,2010)[14]. Endotracheal intubation is preferred to control the air way in emergency management. Once the air way is under control, it is easier and safer to perform elective tracheostomy. If the obstruction of the air way is temporary then air way may be controlled by the endotracheal tube for shorter duration. (Orringer,2006)[4].

In the study of 208 children, who required relief of severe air way obstruction due to acute laryngotracheobronchitis,181 patients were managed with endotracheal tubes. NO serious complications were reported in this study (McEniery et al 2010)[12].

Lanza et al 1999, reviewed 52 patients of head injury, who required respiratory support all were managed comfortably with endotracheal intubation.

In our study we found that out of 20 patients,16 patients (80%) were intubated because of mechanical respiratory failure and 4 patients (20%) were helped to clear the air way which were obstructed due to retention of secretions, leading to ventilatory insufficiency.

Complications rate which we found in our study was 30%.Majority of the patients reported, mild complications like sore throat with cough, they were treated accordingly (Beckford et al 2009)[15], in his study reported change in voice, after short term intubation. But majority of our patients reported subjective change in voice which was temporary and no active management was required.

In our study we found no serious complications like tracheal stenosis and tracheo-oesophageal fistula, which required surgical repair. We found endotracheal intubation is a safe and easier method for air way control, especially in emergency and is free of any serious complications.

CONCLUSIONS

The study concludes as follows:
Patients who presented to us in our hospital, with upper air way obstruction as main indication for tracheostomy are 90% males because malignancies in upper air way is more common in males. Majority of the patients were of old age group.

The main indication of tracheostomy is upper air way obstruction and main indication of endotracheal intubation is respiratory failure.

Enndotracheal intubation is safe and rapid method of air way control in emergency.

Tracheostomy is a safe and better tolerated procedure in the management of a patients who need long term ventilation.

Availability of good medical facilities has decreased the number of emergency tracheostomies, which carry higher percentage of complications.

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"A ship in port is safe,

but that's not

what ships are built for."

Grace Murray Hopper