

Endotracheal Intubation is More Safe in Upper Airway Management as Compared to Tracheostomy

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ABSTRACT

Aim: To compare the results of endotracheal intubation with tracheostomy.

Study design: Retrospective & descriptive

Place & study period: Multan Medical & Dental College Ibne Sina Hospital Multan from 2011 – 2012.

Methods: Twenty patients were intubated with endotracheal tubes in intensive care unit of Ibne Sina Hospital Multan and twenty consecutive patients who had operations of tracheostomy whether emergency or elective were included in the study.

Results: Endotracheal intubation is safe and rapid method of airway control in emergency. The main indication of tracheostomy is upper airway obstruction and main indication of endotracheal intubation is mechanical respiratory failure.

Keywords: Airway management, endotracheal intubation, tracheostomy

INTRODUCTION

The endotracheal intubation is one of the most common procedure performed in modern medical practice¹. It is the most rapid method of establishing the airway control². Endotracheal intubation involves the passage of a tube either orally or nasally in to the trachea.

Sir William Macewan a scottish surgeon in 1878 passed a tube into trachea from the mouth using a straight rigid tube made of metal³. Waters and Guedel introduced use of inflatable cuff tube. Boure pioneered the use of muscle relaxants to facilitate intubation. Most intubations are performed as emergency procedure to control airway in upper airway obstruction or as a part of cardiopulmonary resuscitation³.

Tracheostomy is a life saving procedure; one of the most frequently performed operation in the critically ill patients. Uptill recently tracheostomy was indicated mainly for airway obstruction and was usually performed in emergency. With the development of endotracheal intubation, the number of emergency tracheostomies performed have been reduced dramatically. Tracheostomy is a nowadays a planned procedure

PATIENTS & METHODS

It is a retrospective descriptive study conducted at Ibne Sina Hospital Multan. Twenty patients were subjected to endotracheal intubation in intensive care unit, other twenty patients who had tracheostomy,

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whether emergency or elective are included in the study. In some patients, immediate endotracheal intubation was required and in some emergency tracheostomy was done to control the airway. All these patients after the control of airway were examined clinically and investigated; help of other departments, if required was obtained to diagnose the primary disease. Endoscopy was done in patients with upper airway obstruction to assess the extent of disease and biopsy was taken to determine the histopathology. All the endotracheal intubations were performed by trained doctors in ICU and accident & emergency. Standard disposable cuffed endotracheal tubes were used.

Each patient who had intubation or tracheostomy was assessed for surgical emphysema, bleeding, dislodgement or displacement of the tubes. Infections, aspirations and cardiopulmonary embarrassment, cardiac arrest, and finally obstruction and decanulation were also assessed.

RESULTS

Twenty patients who were intubated in ICU of Ibne Sina Hospital Multan were selected for the study. The age range of these patients was 1 month to 80 years. The average age is 45 years. 12 of these patients (60%) were male and 8(40%) patients were female. six patients (30%) were intubated in emergency at the time admission and 14 patients (70%) were intubated after 24 hours or more after admission. Oral intubation was done in all 20 patients and none has nasotracheal intubation. In 4 patients out of 20, tracheostomy was done after two 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 1,2). Out of 16 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 three patients were of post operative problems (Table 1). Table 2 shows that out of 4 patients who were intubated for ventilatory insufficiency, two patients were suffering from brain meningeal infection. One patient was quadriplegic and one patient had congenital heart defect with chest infection. Over all complications rate in patients who were intubated was 30%. Three patients developed infections of tracheobronchial tree. After extubation, 2 patients complained of change in voice, which was temporary in nature. One patient developed post intubation granuloma of vocal cord (Table 3).

These patients who underwent tracheostomy, their age ranged from 42-78 years. The mean age was 58 years. Out of these tracheostomy patients 18 were male and 2 were female. Table 4 shows the indications of tracheostomy. In 16 patients (80%) it was done to relieve the upper airway and in 4 patients (20%) it was done to support the respiration by mechanical ventilation. Out of these groups one patient has Ludwig's angina, one patient had carcinoma of hypopharynx and fourteen patients had carcinoma of larynx (Table 5). Tracheostomy was done as emergency procedure in 9 patients (45%) as planned procedure in 11 patients (55%). complications were encountered in 7 patients (35%), out of twenty who had tracheostomy (Table 6). In three patients (15%) tracheostomy was done under local anesthesia. 17 patients were operated under general anesthesia. 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 one patient decannulation was difficult.

Table 1: Causes of endotracheal intubation for mechanical respiratory failure

Indications	=n
Guillain Barre Syndrome	10
Chest disease	03
Post Operative Causes	03
Total	16

Table 2: Causes of endotracheal intubation for ventilatory insufficiency

Indications	=n
Brain meningeal infection	02
Quadriplegia	01
Congenital heart defect	01

Table 3: Complications of endotracheal intubation

Complication	=n	%age
During intubation		
Damage to lip	-	-
Damage to teeth	-	-
With tube in place		
Sore throat	-	-
Infections of tracheobronchial tree	3	15
Late		
Dysphonia	2	10
Vocal cord intubation granuloma	1	5

Table 4: Indications for tracheostomy

Indications	=n	%age
Upper airway obstruction	16	80
Mechanical respiratory insufficiency	04	20
Total	20	100

Table 5: Causes of upper airway Obstruction

Causes	=n
Ludwig's angina	01
Carcinoma of hypopharynx	01
Carcinoma of larynx	14
Total	16

Table 6: Complications of tracheostomy patients

Complications	=n	%age
Immediate	---	---
Intermediate	---	---
Infection of tracheo bronchial tree	03	15
Surgical emphysema of the neck	02	10
Dysphagia	01	05
Late	---	---
Difficulty in decannulation	01	05

DISCUSSION

Endotracheal intubation is the most rapid method of controlling the air way. It may be performed transnasally or transorally². Endotracheal intubation is preferred to control the air way in emergency management. Once the airway is under control, it is easier and safe to perform elective tracheostomy. If the obstruction of air way is temporary then air may be controlled by endotracheal tube for shorter duration⁴. In study of 104 patients who required mechanical ventilator support of respiration, Gracey et al, 2008⁵ found survival rate of 57.6% in patients. Majority of the patients of his study were surgical patients. In the study of 208 children who required relief of severe airway obstruction due to acute laryngotracheobronchitis, 181 patients were managed with endotracheal tubes. No serious complications were reported in this study⁶. Lanza et al 2008⁷ reviewed the 52 patients of head injury, who required respiratory support all of them 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 airway which was obstructed due to retention of secretions, leading to ventilator insufficiency.

Complications rate which we found in our study was 35%. Majority of the patients reported, mild complications like sore throat with cough, they were treated accordingly. Beckford et al (2009)¹ in their study reported change in voice which was temporary and no active management was required.

Anand et al (2009)⁸ in their study of 43 patients of tracheal stenosis, reported 74% of his patients had developed acquired tracheal stenosis as a complications of prolonged intubation. Weber et al (2006)⁹ in his study of acquired tracheal stenosis in children found that out of 62 patients, 44 patients developed tracheal stenosis as complications of prolonged intubation. In our study we found no serious complication like tracheal stenosis and tracheo-oesophageal fistula, which required surgical repair. We found endotracheal intubation is a safe and easier method for airway control, especially in emergency and is free of any serious complications.

In this study I found main indications of tracheostomy are upper airway obstruction, especially tumours of larynx and mechanical respiratory failure especially G.B syndrome. Complications of emergency tracheostomy are 3-5 times more than elective tracheostomy¹⁰. Berlauck in 2008¹¹ reported 3% complication rate after elective tracheostomy and 15% after emergency tracheostomy. In our study complications like stomal infection, surgical emphysema, dysphagia and difficulty in decanulation were not serious and were managed easily.

CONCLUSIONS

Endotracheal intubation is safe and rapid method of airway control in emergency. The oral or nasal intubation is the best choice when artificial airway support is required for less than 3 weeks. Tracheostomy is the best choice for artificial respiration of longer duration i.e., more than 3 weeks. Availability of good medical facilities has decreased the number of emergency tracheostomies which carry higher percentage of complications.

REFERENCES

1. Beckford NS, Mayo, Wilknsn A, Ttiarney M. Effect of short term endotracheal intubation on vocal function. *laryngoscope* 100.2007.,331-36.

2. Spector GJ. Respiratory insufficiency, tracheostenosis and airway control. In Ballenger JJ, Editor. *Diseases of nose, throat, ear, head and neck* 14th edition. Philadelphia, Lea and Febiges 2007; 530-67.
3. Allan D. patients with an endotracheal tube or tracheostomy *Nurs times*, 2000, 28: 3 80(13): 36-8
4. Orringer MB. Endotracheal intubation and tracheostomy, indications, techniques and complications. *Surgical clinics of North America* 2004, Vol 60 (6) 1447- 64
5. Gracey DR, Naessens JM, Iqbal K, Marach HM. Hospital and post hospital survival in patients Mechanical ventilated for more than 29 days *Chest* 101/1 2008., 211
6. McEniey J, Gillis J, Kiham H, Benjamin B. Review of intubation in severe laryngotracheobronchitis *paediatrics* 2006 Vol. 87 (6): 847-53.
7. Lanza DC, parnes SM, Koltei PJ, Fortone JB Early complications of airway management in head – injured patients *laryngoscope* 2007; 100: 958-61.
8. Anand VK, Alemar G, Warren T. Surgical considerations in tracheal stenosis. *Laryngoscope* 2009; 102; 237-43.
9. Weber TR, Connors RH, Tracy TF. Acquired tracheal stenosis in infants and children. *J Thorac Cardiovasc Surg* 2006., 102; 29-35
10. Kato I, Uesugi K, Kikuchi H et al. Tracheostomy- the horizontal tracheal incision *J laryngology and Otolology*, 2008; Vol. 104; 322-25.
11. Berlauck JF. Prolonged endotracheal intubation vs tracheostomy., *Critical care medicine*. 2008., vol. 14 (8), 742-45.
12. Trimizey MA. indications of paediatric tracheostomy in Faisalabad. *Pak J Oto* 1992., 8: 16-18.
13. Bradley PJ. The obstructed airway. In Stell P.M. *Laryngology*. Scott-Brown, s *Otolaryngology* 6th edition . Vol .5 Butter worth International edition. 155-68.
14. Hall IS, Colman BH. Acute diseases of larynx. In *disease of nose, throat and ear* 13th edition. Chrchill Livingstone, Edinburgh 179-88
15. Zaidi SH. Elective tracheostomy, an essential pre-requisite for radical head and neck surgery *Pak J Oto* 1999; 8: 130-34.
16. Lewis RJ. Tracheostomies, indications, timing and complications. *Clinics in chest medicine*. 2000., 13(1): 137-49.
17. Guanawardna RH. Experience with tracheostomy in medical intensive care patients. *Postgraduate Med J* 2008., 68; 338-41.
18. Buckwalter JA, Sasaki CT. Effect of tracheostomy on laryngeal functions. *Otolaryngologic Clinics of North America* 2007., vol 17 (1)
19. Wright D. Tracheostomy and laryngotomy. In, Rob & Smith, s *Operative surgery*. 4th edition. *Nose & Throat*, edited by Ballantyne JC., Harrison DFN. Butter Wirth 2009., 269-75.
20. Freezer NJ, Robertson CF. Tracheostomy in children with Gullain Barre Syndrome. *Critical Care Medicine*. 2007 vol 18 (11); 1236-38.