

COMPLICATIONS OF TRACHEOSTOMY AT TERTIARY CARE HOSPITAL

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ABSTRACT

Tracheostomy is a very common emergency procedure & it is most widely used in patients suffering from airway obstruction either as emergency or electively. This Descriptive study was conducted to evaluate complications of tracheostomy from January 2008 to December 2009 at Department of oral & Maxillofacial Surgery & otorhinolaryngology Civil Hospital Karachi. This study included 175 patients who underwent tracheostomy, were evaluated for occurrence of various types of complications and also their frequencies. Out of 175 patients, age ranged from 10 years to 82 years (Std Deviation ± 15.06). 75.4% of patients were male and 24.6% of patients were female and male to female ratio was 3.1:1. The overall complications were 47.4%. Among them 28.9% suffered early complications while 40.9% and 30.2% had intermediate and late complication respectively. Obstruction of tube was seen in 21.7% as the most frequent intermediate complication whereas primary hemorrhage was the most frequent early complication that accounts for 19.3%. However Supra – stomal granulation tissue was reported 14.5% as late complication.

Key Words: Complication, Tracheostomy, Tube Obstruction, Hemorrhage.

INTRODUCTION

Tracheostomy is a very common procedure performed by head and neck surgeons and maxillofacial surgeons and it is most widely used in patients suffering from airway obstruction either as emergency or electively. Tracheostomy is not psychosocially acceptable to patients because of the difficulty with phonation and the stigma associated with it by some uninformed people. Asclepiades of Persia was first who performed the tracheostomies but Jackson in nineteenth century codified the modern technique for tracheostomy.¹ Tracheostomy is the procedure which deals with airway so the operation theatre is considered as the ideal place.²

Tracheostomy can substantially reduce the mechanical workload of ventilator- dependent patients.³ The indications of tracheostomy are respiratory obstruction, respiratory failure, and respiratory paralysis, removal of retained secretions and reduction of dead space.

The aggravation of dysphasia is an important index in judging the indication of tracheostomy.⁴ Standard surgical tracheostomy is an irreplaceable procedure in-patient with complex anatomic condition or in high-risk patient.⁵ There are complications associated with tracheostomy some of these include bleeding, injury to cricothyroid complex, injury in the posterior laryngeal wall, pneumothorax, subcutaneous emphysema.⁶ The high mortality may be due to the primary medical problems rather than the complications of tracheostomy alone.⁷ Complications of tracheostomy quoted as 6 to 66% in medical literature and complications could be either early or late. Mortality of the tracheostomy is reported as less than 2%.⁸

The purpose of this study was to find out various types and frequencies of complications of tracheostomy at tertiary care hospital.

METHODOLOGY

This descriptive, prospective study was carried out in the Department of Maxillo-facial Surgery and otorhinolaryngology at Dow University of Health Sciences, and Civil Hospital, Karachi from January 2008 to December 2009.

This study included 175 patients who underwent tracheostomy under local anesthesia either as emergency procedure or electively from all age groups and both

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genders and socio-economical class. Those patients who underwent another procedure like total laryngectomy or tracheostomy tube was removed within 24 hours after the procedure like temporo-mandibular joint arthroplasty or who were shifted to other health care facilities were excluded from this study. Frequencies and various types of complications of tracheostomy were recorded in purposely designed proforma.

Data were analyzed by using SPSS version 16. Frequency and percentage were computed for presentation of all variables including age, gender and various complications of tracheostomy. No inferential test was applicable for this descriptive study.

RESULTS

Out of 175 patients 132 (75.4%) were male and 43 (24.6%) were female and male to female ratio was approximately 3.1:1 (Fig 1). Patient's age ranged from 10 years to 82 years with mean as 40.5 years and Std Deviation of ± 15.06 (Fig 2).

Approximately 47.4% patients encountered complication where as 52.6% recovered with any complication of the tracheostomy (Fig 3). Among them 28.9% suffered early complications while 40.9% and 30.2%

TABLE 1: TYPE OF COMPLICATIONS (n=175)

S. No.	Types	Number	Percentage
1.	Early	24	28.9
2.	Intermediate	34	40.9
3.	Late	25	30.2

TABLE 2: DISTRIBUTION OF COMPLICATIONS

Complication	Number	Percentage
Early		
Primary haemorrhage	16	19.3
Apnea	04	4.8
Damage to local structure	04	4.8
Intermediate		
Tube obstruction	18	21.7
Scabs & crusts formation	06	7.2
Superficial emphysema	04	4.8
Stomal infection	06	7.2
Late		
Disfiguring scar	10	12.1
Tracheal stenosis	02	2.4
Tracheocutaneous fistula	01	1.2
Supra-stomal Granulation tissue	12	14.5

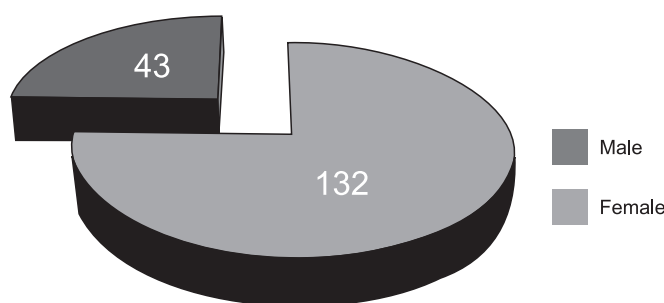


Fig 1: Gender Distribution: (n=175)

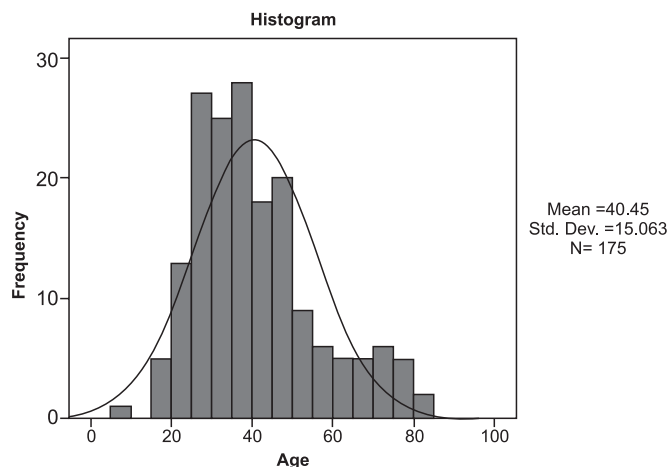


Fig 2: Age distribution (n=175)

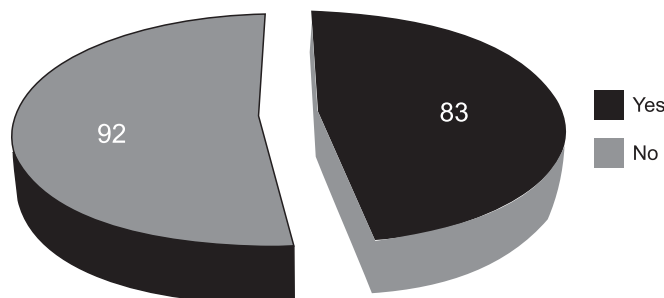


Fig 3: Frequency of complications

had intermediate and late complication respectively (Table 1).

Haemorrhage was the most frequent early complication that accounts for 19.3% followed by apnoea and damaged to local structure as 4.8% respectively (Table 2).

Whereas obstruction of tube was seen in 21.7% as the most frequent intermediate complication while stomal infection and scabs formation were second most commonly encountered complication as 7.2% respectively in intermediate complication group. Surgical emphysema was seen only in 4.8% and recorded as an intermediate complication (Table 2).

Supra-stomal granulation tissue was most commonly encountered late complication and accounts for 14.5%. Whereas disfiguring scar, tracheal stenosis and tracheocutaneous fistula were less common and comprised 12.1%, 2.4% and 1.2% respectively (Table 2).

DISCUSSION

Tracheostomy is an ancient surgical procedure indicated for management of upper airway obstruction. It is the procedure that creates surgical opening into the trachea and exteriorizing it into anterior cervical region. Historical description of tracheostomy was found even 2000 years ago. Tracheostomy can be either as an elective surgical procedure or as an emergency procedure. It is most commonly performed in patients who have had difficulty weaning off a ventilator, followed by those who have suffered trauma or some catastrophic neurologic insult. Infectious and neoplastic processes are less common in diseases that require a surgical airway. Indications of tracheostomy have been evolved during a couple of decades.¹⁰⁻¹¹

This study was directed to evaluate frequency and types of complications of tracheostomy in two departments of tertiary care setting. Mean age of the patient was noticed as 40.5 years which in fact is slightly higher from an international study.¹² Even another local study also reported younger mean age.¹³ Male to female ratio was identical to Santosh and colleagues although sample size in their study was small.¹⁴ Another local study also reported closer findings with 2.9:1 ratio and even lower stated by Imran Munir and his colleagues probably because of difference in number of the patients received at private and public sector hospital.¹⁵

Final outcome of tracheostomy patient is significantly influenced by post operative complications. Complication rate of tracheostomy have been quoted between 6-66%,^{16,17} while the overall complication rate in this study was 47.4%, however Abdul Aziz Hamid¹⁸ reported higher incidence of overall complication in his research. In contrast significantly lower incidence of complications was observed in international literature.¹⁰ This variation in incidence of complication reflects the difference in quality and standard of operating circumstances and post operative care.

In present study intermediate complications were more frequently encountered than early and delayed. However lower intermediate complication reported by Munir et al.¹⁵ In other study early complications were more frequently observed.¹⁹ Another local study reported higher incidence of intermediate complications as compared to the early and late complications.²⁰ However, their rate of intermediate complications was still

lower than that of ours because their study comprised of patients in intensive care unit where better nursing care was provided to the patients.

Primary hemorrhage was the most frequent one among the complications in early phase. Significantly lower rate reported in local research.¹⁵ Comparable observation was documented by other local and international studies.^{19,21} Tube obstruction was most common intermediate complication and in fact was the most common complications among the all groups. Almost similar incidence reported in the local study.²² In contrast to our study, Harriet J et al reported tube obstruction in 14% cases of his series.²³

Among late complication in this study, supra stomal granulation tissue was the most common one. In comparison to the local literature Munir et al¹⁵ reported decannulation as most common late complication and similar finding documented by Christopher KL²⁴. In another international study stomal granulation was observed as most frequent late complication in consistency on our observation.²⁵

Occurrence of early complications can be attributed to surgical expertise, operative circumstances and indication of procedure whereas intermediate complications are related to quality of post operative nursing. Delayed complications are usually related to late hospital and home care, time of decannulation, disease process and further management of underlying problem.

CONCLUSION

It is concluded from this study that complication of tracheostomy is not something uncommon and intermediate complication are most frequent event and among them tube obstruction was most commonly encountered complication. However improved and vigilant nursing care may result in minimizing the incidence of intermediate complications. Proper training of hospital staff including resident, house surgeons and nursing staff about tracheostomy care may help in improving outcome of the procedure.

Tracheostomy is a life saving procedure can be considered as a mandatory surgical skill. However of adherence to surgical principles and understanding of complications can be improved the ultimate outcome of this procedure.

REFERENCES

1. Walts PA, Murthy SC, DeCamp MM. Techniques of surgical tracheostomy. Clin Chest Med. 2003; 24(3): 413-22.
2. Trachsal D, Hammer J. Indications for tracheostomy in children. Paediatric respiratory reviews. 2006; 7(3): 162-68.
3. Blot F, Melot C. Indications, Timing and Techniques of Trache-

- ostomy in 152 French ICUs. *Chest* 2005; 127 (4): 1347-52.
- 4 Kimura Y, Sugiura M, Ohmae Y, Kato T, Kishimoto S. [When should tracheotomy be performed in bilateral vocal cord paralysis involving multiple system atrophy?]. *Nihon Jibiinkoka Gakkai Kaiho*. 2007; 110 (1): 7-12.
- 5 Lukas J, Stritesky M. Tracheostomy in critically ill patients. *Bratisl Lek Listy* 2003; 104 (7-8): 239-42.
- 6 Moorthy SS, Gupta S, Laurent B, Weisberger EC. Management of airway in patients with laryngeal tumors. *J Clin Anesth*. 2005; 17 (8): 604-09.
- 7 Amusa YB, Akinpelu VO, Fadiora SO. Tracheostomy in surgical practice: experience in a Nigerian tertiary hospital. *West Afr J Med* 2004; 23(1): 32-34.
- 8 Amusa YB, Akinpelu VO, Fadiora SO, Agbakwuru EA. Tracheostomy in surgical practice: experience in a Nigerian tertiary hospital. *West Afr J Med*. 2004; 23 (1): 32-34.
- 9 De Leyn P, Bedert L, Delcroix M, Depuydt P, Lauwers G, Sokolov Y et al. Tracheotomy: clinical review and guidelines. *Eur J Cardiothorac Surg*. 2007; 32 (3): 412-21.
- 10 Adetinuola EJ, Bola AY, Olanrewaju MI, Oyedotun AA, Timothy OO, Alani AS, et al. Tracheostomy in south western Nigeria: Any change in pattern? *J Med Med Sci*. 2011; 2(7): 997-1002.
- 11 Amusa YB, Akinpelu VO, Fadiora SO, Agbakwuru EA. Tracheostomy in surgical practice: experience in a Nigerian tertiary hospital. *West Afr J Med*. 2004; 23(1): 32-34.
- 12 Gilyoma JM, Balumuka DD, Chalya PL. Ten-year experiences with Tracheostomy at a University teaching hospital in North-western Tanzania: A retrospective review of 214 cases. *World J Emerg Surg*. 2011; 10; 6(1): 38-44.
- 13 Muhammad R, Khan F, Rehman F, Iqbal J, Khan M, Gohar-Ullah. Early Complications Of Elective and Emergency Tracheostomy. *J Ayub Med Coll Abbottabad* 2012; 24(1): 44-47.
- 14 Santosh UP, Patil BS, Bhat V, Pal S. Elective open tracheostomy for patients under prolonged mechanical ventilation – a study. *Indian J otolaryngol Head Neck surg*. 2009; 61(1): 44-46.
- 15 Munir I, Iqbal SM, Ali SA. Open surgical tracheostomy and complications. *Pak J Surg*. 2012; 28(3): 217-21.
- 16 Khan FA, Ashrafi SK, Iqbal H, Sohail Z, Wadood. Operative complications of tracheostomy. *Pak J Surg*. 2010; 26(4): 308-10.
- 17 Haspel AC, Coviello VF, Stevens M. Retrospective study of tracheostomy indications and perioperative complications on oral and maxillofacial surgery service. *J Oral Maxillofac Surg*. 2012; 70(4): 890-95.
- 18 Asmatullah, Inayatullah, Rasool G, Billah M. Complications of emergency Tracheostomy. *J Postgrad Med Inst*. 2004; 18(2): 225-29.
- 19 Fazal-i-Wahid, Hamza A, Khan Q, Zada B, Khan IA. An Audit of Tracheostomy at A Tertiary Care Hospital. *JPMI*. 2012; 26 (02): 206-11.
- 20 Khan FA, Ashrafi SK, Abbasi Z, Khambaty Y, Musani MA, Jawaid I, et al. Our experience of tracheostomy in patients of ICU versus trauma centre. *Pak J otolaryng*. 2011; 27: 9-11.
- 21 Kiakojouri K, Amiri AP, Ahmadi MH, Madadian M. Indication and early complications of tracheostomy in the intensive care unit patients in Shahid Beheshti and Shahid Yahyanejad Hospital (Babol, Iran; 2001 - 2006). *J Babol Univ Med Sci*. 2009; 11(1): 67-71.
- 22 Maheshwari PK, Khan MR, Anwar-ul-Haque. Elective Tracheostomy in Mechanically Ventilated Children. *JCPSP*. 2012; 22 (6): 414-15.
- 23 Corbett HJ, Mann KS, Mitra I, Jesudason EC, Losty PD, Clarke RW. Tracheostomy--a 10-year experience from a UK pediatric surgical center. *J Pediatr Surg*. 2007; 42(7): 1251-54.
- 24 Christopher KL. Tracheostomy decannulation. *Repair Care*. 2005; 50(4): 538-41.
- 25 Fasunla JA, Aliyu A, Nwaorgu OGB, Ijoduola GTA. Tracheostomy Decannulation: Suprastomal Granulation Tissue in Perspective. *East Centr Afr J Surg*. 2010; 15(1): 81-85.