Original Article

Peadiatric Tracheostomy: An experience in Tertiatry Care Hospital

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ABSTRACT

Introduction: Tracheostomy is the surgical procedure originally described in 1st century BC. It is the life saving procedure when performed with appropriate indications and surgical technique. Tracheostomy in the pediatric population is a particularly hazardous procedure.

Study Design: Retrospective chart review

Duration & place of study: This study was conducted at the Peoples University of Medical & Health Sciences Hospital Nawabshah between 2004 to 2008.

Materials and methods: Retrospective review of pediatric tracheostomy done in emergency or elective procedure under general anesthesia or local anesthesia was under taken. Name, age, indications, time of decanulation and follow up were evaluated.

Results: 31 Pediatric patients had tracheostomies within study period. There were 19 males and 12 females. Age range was 2 months to 10 years. The most common indication of tracheostomy was upper respiratory tract obstruction due to traumatic causes (54.83%). 83.87% tracheostomies were done in emergency while 16.12% as elective procedure under general anesthesia or local anesthesia. Complications were encountered in 32.25%of patients. Most frequent complication was granulation tissue formation in the area around stoma (30%). Complication rate was high in patients below 2 years of age (63%) and in patients having emergency tracheostomy (73.9%). Decanulation was successfully done in all alive patients (87%). Overall mortality rate was 12.9%. There was no tracheostomy related mortality.

Conclusion: The indications for pediatric tracheostomy are changed from airway obstruction due to infection to trauma. Complication rate of tracheostomy is higher in younger age groups. Mortality and outcome of these patients depends primarily on underlying medical condition of the patient, otherwise pediatric tracheostomy is safe when performed in tertiary hospital settings.

Keys Words: Tracheostomy, pediatric, indications, complications, decanulation.

INTRODUCTION

Tracheostomy is the surgical procedure originally described in 1st century BC[1]. It is the life saving procedure when performed with appropriate indications and surgical technique[2]. Tracheostomy in the pediatric population is a particularly hazardous procedure. It is technically more demanding than adult tracheostomy, and carries a higher mortality and complication rate particularly with younger children and especially with pre- term infants[3]. There is how ever a changing trained in indications and out comes in the use of tracheostomy in children for airway management[4]. In the past the commonest indication was acute inflammatory airway obstruction, but in recent times prolonged intubation has become the commonest indication[5].

The aim of this retrospective study is to highlight our own experience with Tracheostomy out lining the common indications and outcome of patients with pediatric tracheostomy and compare our results with those from other centers in the world.

MATERIALS AND METHODS

A retrospective review of case notes was undertaken of children who underwent tracheostomy at ENT Department of peoples university of Medical & Health Sciences Hospital Nawabshah between 2004 to 2008. Names were obtained from our data base and from theater records. Notes were examined to find the age, and gender of the patients at the time of tracheostomy, indications, its complications while in situ and following the decanulation (if achieved).

All tracheostomies were performed either in emergency or electively in the operation theater under local or general anesthesia, using the standard technique. Horizontal skin incision was employed in all the cases. Most operation were performed by 1st author. Initial post operative care was in surgical intensive care unit, and there after in the ward with staff experienced in caring for tracheostomized child.

Our decanulation protocol is out lined below. The first step towards decanulation comes with formal airway endoscopy to determine the adequacy of the airway. If the airway appears satisfactory clinically, the tracheostomy tube is reduced in size. The child carriers are encouraged to occlude the tracheostomy tube for increasing periods of time, leading eventually to almost permanent occlusion. The tracheostomy tube is than removed under general anesthesia and an assessment of the airway is made my both surgeon and anaesthetist. Stridor can be heard easily by 6 listening through the

anesthetic tubing. If the airway is clearly satisfactory, the tube can be left out. Post- decanulation, the child is observed as an in- patient for 48 hours, and only allowed home after careful assessment by an experienced clinician.

RESULTS

Thirty one pediatric patients had tracheostomy with in the study period. There were 19 males and 12 females ranging in the age from 2 months to 10 years. 22.55% of the patient were less then 2 years and the commonest age of tracheostomy was ranging between 7-10 years.

The most common indication for tracheostomy was upper airway obstruction due to traumatic causes in 54.83% of the patients followed by upper airway obstruction due to neoplastic causes in 16.12% of cases (Table 1). High incidence of traumatic causes of upper airway obstruction was found between age ranging from 7-10 years, although the laryngeal pepillomas causing upper airway obstruction were recorded as most common indication for tracheostomy in first decade of life. 26 tracheotomies (83.87%) were performed as an emergency while 5 (16.12%) as elective procedure.

Table No.1: Indications for Tracheostomy (n= 31)

Sr. No	Indications	No of Patients	%age
01	Diptheria	02	6.45 %
02	Fire Arm Injuries Neck	02	6.45 %
03	F.B. Larynx	01	3.22 %
04	F.B. Tracheo Bronchial Tree	02	6.45 %
05	Lymphoma	03	9.67 %
06	Severe Head Injuries	10	32.25%
07	Server Maxillo Fascial Injuries	07	22.58%
08	Laryngeal Papilloma	02	6.45 %
09	Tetanus	01	3.22 %
10	Retropharyngeal Abscess	01	3.11 %
Total		31	100 %

Table No.2: Post- Tracheostomy Complications (n=10) (32.25 %)

Period	Complications	Frequency
Intraoperative	No Complication	---
Imdiate Complications	Bleeding Subcutaneous Emphysema	01 01
Early Complications	Tracheal Tube Obstruction Accidental Decannulation	02 02
Late Complication	Suprastomal Granulation Tissue Tracheo Cutenous Fistula	03 01

Table No.3: Duration of Decannulation (n=27)

Duration	No of Patients
1 Day- 1 week	12
2 weeks	06
3 weeks	05
4 weeks	04
Total	27 (87%)

Complications were encountered in 10 out of 31 trach-eotomies (32.25%). The most frequent complication was granulation tissue formation in the area around the stoma (30%) which required its removal before decanulation process. In children under one year, the complication rate was higher, affecting 63 % of the children. Post operative complication rate was significantly higher in emergency tracheostomy then in elective one (73.9% versus 26.1%).

Table 2 summarizes the complications of tracheastomy in this study population. The median period of hospital stay was 26 days (range:7-52days).

Decanulations were successfully done in all the patients who survived (87%). Time of decanulation is shown in table 3.

DISCUSSION

Tracheostomy is one of the more commonly performed surgical procedures in critically ill patients who require prolonged mechanical ventilation[6]. This procedure has become more common as demand for intensive care services increases[7]. It is a life saving procedure when performed with an appropriate indication and surgical technique[8].

In this review, there is male predominance of the patients who required tracheostomy. This may be due to their increased susceptibility to trauma which necessitated prolonged intubation and assisted ventilation. All injuries were from road traffic accidents specially involving motor cycles which are a major means of transportation in Pakistan. It has become recognized that the indication for pediatric treacheastomy have changed over the past couple of decades[9]. In the past infective conditions of upper respiratory tract like epiglottitis and laryngotra-cheobronchitis were major indications for tracheostomy but better handling of infections with the use of intubation and conservative management in ICU has reduced the incidence of these indications[10]. The most common indication for tracheostomy in our series was upper airway obstruction secondary to traumatic causes. This is in accordance with the other studies done in Malaysia[11]. Only 4 patients out of 31 patients (12.89%) underwent tracheostomy for upper airway infections in contrast 43 % of patients in Gaudet's 1978 study[12].

The surgical technique employed in all our patients was transverse skin crease incision in the operation theater. This method is preferred by us whether during emergency or as an elective tracheostomy because of

the advantage of better cosmetic results though, the vertical incision has the advantage of remaining in line of trachea and it is easy to perform and less vascular.

The rate of post operative complications in our study was (32.25%) which is higher than reported by others[13]. In other studies the complication rate between 6-66% have been quoted[14]. The reason for high rate of complications following tracheostomy in our studies may be because the majority of the tracheotomies in our patients were performed on emergency basis, which is comparable to other studies where post-tracheostomy complication rates were found to be significantly higher in emergency tracheostomy than in elective one[15,16].

The high rate of complications (63%) among the children aged below one year is attributed to the fact that tracheostomy in small children is challenging and technically more difficult due to small caliber of their larynx and trachea and therefore caries higher post operative complication rate. In the present study suprastomal granulation tissue is found to be the most common complication of tracheostomy. Similar findings are also reported by Fasunla etall[17]. It is late complication of tracheastomy which can be prevented by good surgical technique, sparing cricoid cartilage during dissection.

Tracheostomy decanulation was successfully carried out in 87% of the patients who survived which is almost similar to the study done by ChristopherKL[18]showing 82.5% decanulation accomplished successfully.

The overall mortality recorded in our series was 12.9%, which were due to underlying disease, although there was no mortality attributed to tracheostomy procedure itself. This reflects significant improvement in the skill of surgical procedure as well as the post operative management of these patients in our hospital.

Overall mortality rate was 4 (12.9%). There was no tracheostomy related mortality. Follow-up of majority of the patients after decanulation was uneventful, except one who had tracheo-cutenous fistula (3.22%). (Table 3).

CONCLUSION

The indications for pediatric tracheostomy are changed from airway obstruction due to infection to trauma. Complication rate of tracheostomy is higher in younger age groups. Mortality and outcome of these patients depends primarily on underlying medical condition of the patient, otherwise pediatric tracheostomy is safe when performed in tertiary hospital settings.

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