

Original Research Article

Tracheostomy in paediatric patients

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ABSTRACT

Background: The objective of the study was to evaluate paediatric tracheostomies in the Department of ENT, GMC. **Methods:** The present prospective study was performed in the Department of ENT, GMC Jammu from January 2018 to 2020 on 20 paediatric patients (<17 years of age). All children were evaluated with respect to age, indication of tracheostomy, complications (intra-operative and post-operative) and mortality.

Results: The most common indication for tracheostomy was prolonged intubation (85%). Intraoperative complication in the form of creation of false passage was seen in 1 patient (5%). The most common early post-operative complication was tube obstruction (20%). Late complication in the form of stomal granulation was seen in 2 patients (10%).

Conclusions: Over the years, more specific indications for tracheostomy are followed and better results are observed. Paediatric tracheostomy at our institute was associated with less procedure related morbidity and mortality.

Keywords: Paediatric, Tracheostomy, Granulation

INTRODUCTION

Tracheostomy is making an opening in the anterior wall of trachea and converting it into a stoma on the skin surface. Asclepiades is credited with carrying out first tracheostomy in Rome in 2nd century BC.¹ In 1766, Caron performed the first successful paediatric tracheostomy on 7 years old to remove foreign body.²

Initially in the 19th century, it was the technique to relieve airway obstruction in children suffering from diphtheria and poliomyelitis. Until the late 1970s, paediatric tracheostomies were mainly performed in acute airway infections like acute epiglottitis and acute laryngotracheobronchitis.³ With improved intensive care facilities, endotracheal intubation became a practical alternative for these indications.⁴

Nowadays, the general indications of paediatric tracheostomy have increased and these include- to relieve upper airway obstruction, prevent complications of

prolonged intubation, reduce anatomical dead space and allow suction toilet of trachea.⁵

The most common indications for tracheostomy in infant (<1 year) are subglottic hemangioma, subglottic stenosis, laryngeal cyst, glottis web and bilateral vocal cord paralysis. The most common indications in children are prolonged intubation, laryngeal edema due to chemical/thermal injury, diphtheria, acute epiglottitis and acute laryngotracheobronchitis.⁶

When performed on paediatric population, great care and caution is required as the trachea in children is soft and compressible, making its identification difficult and the surgeon can easily displace it to go deep or lateral to it, injuring recurrent laryngeal nerve and even carotid.

Owing to high associated mortality and morbidity, paediatric tracheostomy is an uncommonly performed procedure. Also, due to relative scarcity of the procedure, very few randomized controlled trials and medical studies

have been undertaken. The aim of our study was to evaluate paediatric tracheostomies at the institute.

METHODS

The present prospective study was performed after taking ethical approval from institutional committee in the Department of ENT, GMC Jammu from January 2018 to 2020 on 20 paediatric patients (<17 years of age).

All children were evaluated with respect to age, indication of tracheostomy, complications (intra-operative and post-operative) and mortality. Postoperative complications were labelled as early if occurred during operation or within 1st post-operative week and late if occurred after 1st post-operative week.

All patients were tracheostomised under general anaesthesia. All patients were positioned supine with neck extension, with head stabilized on a head ring. In all patients, following surgical steps were performed. A vertical skin incision from lower border of cricoid cartilage to just above the sternal notch was given. Subcutaneous fat, soft tissues were dissected. Strap muscles were retracted. Thyroid isthmus was retracted superiorly. Once trachea was visualized, cricoid was pulled superiorly with cricoid hook to stabilize the laryngo-tracheal complex prior to making an incision into trachea. A vertical incision was made in midline, usually in tracheal rings 3-4. Stay suture were placed in the wall of trachea on either side of the vertical incision and fixed to chest with tape. Tracheal dilator was used to dilate the incision and visualize the tracheal lumen. The anaesthesiologist was instructed to deflate the cuff of endotracheal tube and retract the tube just above tracheal incision. Proper sized tracheostomy tube with obturator was inserted, obturator was removed and tubing of ventilator attached to tracheostomy tube. When anaesthesiologist confirmed adequate ventilation, retractors and cricoid hook was removed. Tracheostomy tube was secured with ties so that only one finger passed through it.

All patients were kept under constant supervision for any bleeding from tracheostomy site or tube, displacement of tube or blockade of tube. Regular suction was done. Tube was first changed on 8th post-operative day and then weekly, depending on patient's condition.

Statistical analysis of the data was carried out by using SPSS 17.0. P values more than 0.05 were considered non-significant.

RESULTS

The most common age group involved was 1-5 years (45%), with mean age of presentation being 2.2 years. Out of 20 patients, 15 were males (75%) and 5 were females (25%).

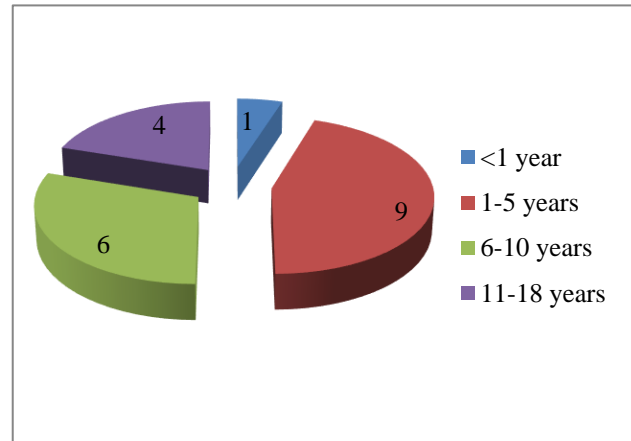


Figure 1: Age distribution.

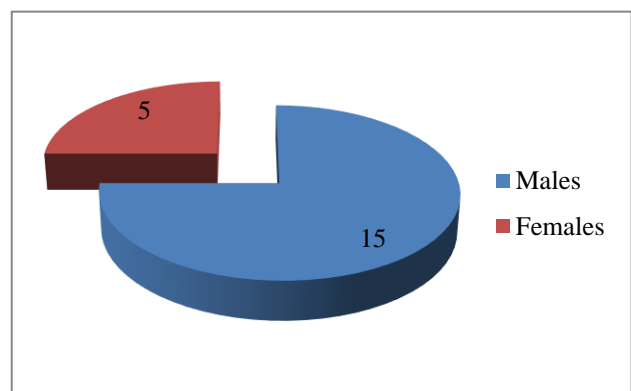


Figure 2: Sex distribution.

The most common indication for tracheostomy was prolonged intubation (85%) followed by laryngeal edema due to thermal burns (10%) and subglottic stenosis (5%).

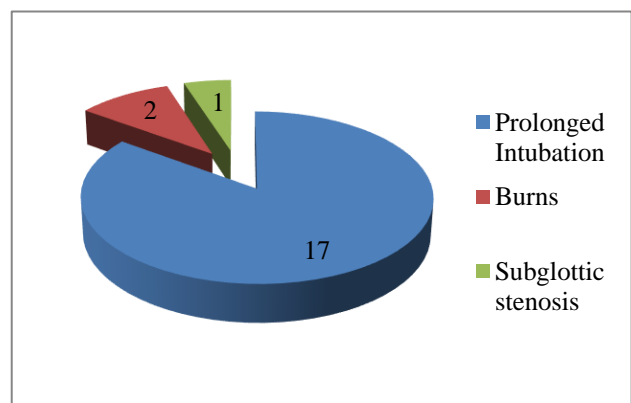


Figure 3: Indications for tracheostomy.

Intraoperative complication in the form of creation of false passage was seen in 1 patient (5%). The most common early post-operative complication was tube obstruction (20%), followed by bleeding (5%) and accidental decannulation (5%).

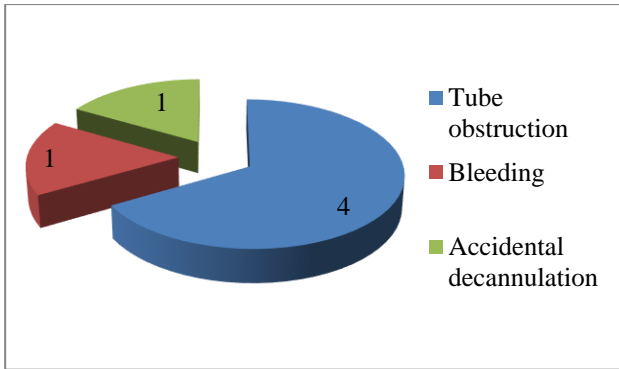


Figure 4: Early post-operative complication.

Late complication in the form of stomal granulation was seen in 2 patients (10%). There was no mortality in our study (0%).

DISCUSSION

Tracheostomy has been recommended for children of all age groups. The decision to perform tracheostomy on a child is complex and depends on several factors, including severity of airway obstruction, difficulty and duration of intubation, and child's medical condition.⁷

The most common age group involved in our study was 1-5 years (45%), with mean age of presentation being 2.2 years. This finding was consistent with study done by Wetmore et al.⁸ However, Mahadevan et al, in their study showed median age of presentation to be 4.5 months.⁹

Out of 20 patients, 15 were males (75%) and 5 were females (25%). Similar male preponderance was reported by Atmaca et al in their study.¹⁰

The most common indication for tracheostomy was prolonged intubation (85%) followed by laryngeal edema due to thermal burns (10%) and subglottic stenosis (5%). This finding was in accordance with studies conducted by Atmaca et al and Wetmore et al who also reported prolonged intubation to be the most common indication.^{10,8} However, Ozmen et al and Mahadevan et al in their study reported that most common indication for tracheostomy was upper airway obstruction.^{11,9}

In all patients, vertical skin incision was given for tracheostomy. However, Campisi et al in their study preferred horizontal skin incision as it was cosmetically appealing.¹² We used vertical skin incision as vertical incision minimizes risk of vascular injury and gives rapid access to trachea.

Intraoperative complication in the form of creation of false passage was seen in 1 patient (5%). This was in case of child with burn injury to neck as there was excessive soft tissue edema. However, subsequently tube was inserted into trachea and ventilation was considered adequate by anaesthesiologist.

The most common early post-operative complication was tube obstruction (20%), followed by bleeding (5%) and accidental decannulation (5%). This was consistent with study conducted by Wetmore et al.⁸

Late complication in the form of stomal granulation was seen in 2 patients (10%). There were no cases of trachea-esophageal fistula or tracheocutaneous fistula. This finding is comparable to study conducted by Mahadevan et al.⁹

There was no mortality in our study (0%). This finding is consistent with study conducted by Parilla et al.¹³ However, Carron et al reported mortality of 3.6% in their study.¹⁴

CONCLUSION

Although tracheostomy is a life-saving procedure, the risks associated with it are higher in children than adults. Also, care of a child with tracheostomy has significant psychosocial and financial implications for parents. Over the years, more specific indications are followed and better results observed. Paediatric tracheostomy at our institute was associated with less procedure related morbidity and mortality.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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