

AN EXPERIENCE OF 31 TRACHEOSTOMIES PERFORMED AT SAIDU TEACHING HOSPITAL

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ABSTRACT

Study design: Observational descriptive.

Duration and place of study: March 2003 to December 2008 at Saidu Teaching Hospital Saidu Sharif Swat.

Material and methods: Relevant details of all the patients, who underwent tracheostomy from March 2003 to December 2008, were recorded on a pre-designed proforma for each patient separately. Name, age, sex, indications, complications, time of decanulation and followup were noted. Tracheostomies were performed both in emergency as well as electively, under general or local anesthesia. All the procedures were carried out in the operation theater of Saidu Teaching Hospital, using standard technique. An electric suction machine and tracheostomy trolley were provided on bedside. Decanulation was carried out from 05 days to 01 month depending upon the etiology and satisfactory management of the airway obstruction. The patients were kept under observation for 24 hours after decanulation and afterwards, sent home with tight dressing over the wound. Attendants were educated about the wound care, allowing stoma to heal by secondary intention. Follow up was done after 10 to 15 days at the beginning and monthly for 06 months to one year later on.

Results: A total of 31 patients, in the age group of 01 to 70 years, underwent tracheostomy. Two age peaks were noted below 10 years and above 25 years. The indications for emergency tracheostomy were mainly airway obstruction due to infectious diseases 09 (29%), neck trauma compromising airway 09 (29%) and foreign body laryngotracheobronchial tree 03 (9.6%), thyroid carcinoma 02 (6.4%), carcinoma larynx 01 (3.2%), metastatic nasopharyngeal carcinoma 01 (3.2%) and lymphoma 01 (3.2%). Where as for elective tracheostomies Nasopharyngeal Angiofibromas excision 03 (9.6%) was considered as indication. Overall our complications rate was 42.8%. 05 deaths were recorded due to terminal stage of the diseases and none directly related to tracheostomy. In 23 cases, decanulation was performed successfully. The time of decanulation ranged from 01 week to 04 weeks. 1st Follow up was done 10-15 days and then monthly for 01 month to 01 year. 01 patient was still tracheostomized till the completion of the study. Two patients did not turn up.

Key words: Tracheostomy, indication, complications, decanulation.

INTRODUCTION

The management of the obstructed airway is challenging and rewarding, especially pediatric airway obstruction management, because of the small caliber of the infant larynx and trachea. Furthermore, small changes from mucosal edema can rapidly cause dramatic and potentially life threatening narrowing of the airway. A swift, thorough and accurate assessment of the acutely asphyxiating child is required from the managing physician. With the relief of obstruction, through intubations or tracheostomy, the child may only then be stabilized¹.

Tracheostomy is still a life saving procedure in cases of infectious diseases in children and traumatic airways obstruction in adults in our region. The indications for tracheostomy in children have changed over the past couple of decades in developed countries because of endotracheal intubations and intensive care facilities^{2,3,4,5}

Vaccination programs, improvement in material engineering and anesthetic skills have dramatically reduced the risks in the procedure of emergency tracheostomies performed for acute upper way obstruction.⁶ A brief account on tracheostomy protocol is given as follows. The patient is placed on the operating table with a rolled

towel or sheet under the shoulder extend the neck unless the patient has document or suspected cervical spine injuries. Adult with airway obstruction may not be able to tolerate the supine position, and tracheotomy is performed with the patient in a sitting position. In children, the procedure is typically carried out under a general anesthetic, whereas in adult, a local anesthetic with or without intravenous sedation is usually satisfactory.

2% Xylocaine with adrenalin 1:200,000 is injected into the skin and subcutaneous tissue where the incision is to be placed. The neck, face, upper chest, and shoulders are prepared with antiseptic solution and patient is draped.

A transverse or vertical incision is made approximately between the suprasternal notch and cricoid cartilage. Blunt dissection is carried through the subcutaneous tissue. Four small retractors are used to provide good exposure. The anterior jugular vein is to be identified and retracted laterally. The strap muscles are split in the midline and retracted laterally. The thyroid isthmus is visualized and the anterior wall of the trachea is identified. In most adults, it is not necessary to cut and ligate the thyroid isthmus. It can usually be retracted superiorly and the trachea entered. If the trachea cannot be exposed otherwise, the isthmus is undermined and grasped with right-angled clamps, transected, and then ligated with 2/0 catgut. Once the trachea is identified, a tracheal hook is placed in the area of the second tracheal ring and secured by an assistant to immobilize the trachea. In infants and children, a vertical incision is made in the level between the second and the third or the third and the fourth tracheal rings without removing any cartilage. Traction sutures are then placed just lateral to the incision. In adults, the anterior portion of the third or fourth tracheal ring is removed. In older patients, the tracheal ring will be calcified. A rectangular window in the trachea is created. Removal of the anterior aspect of the tracheal ring ensures that cannula is placed in trachea.⁷

The tracheostomy tube is double secured by placing the securing sutures through the holes in the lateral aspect of the flanges or through the plastic on the central superior part of the flanges and skin and then tracheostomy tapes tied securely with a square knot with the neck flexed⁸. Only one fingertip should be admitted between the tape and the patient's neck, and the tapes should be tied over the skin. When tapes are tied over bulky dressing, the stability of the tracheostomy tube is compromised. This is a major cause of tube displacement in the early postoperative period.

When tracheostomy is carried out under ideal circumstances, with local anesthesia and enough time for vasoconstriction, bleeding is minimal. However, as the procedure progresses, it is important to secure all bleeding points, with either ligatures or electrocautery, to prevent bleeding postoperatively.

To prevent subcutaneous emphysema, the incision should not be sutured or packed.

When the cannula is removed, the wound heals by secondary intention, forming a transverse scar, which is generally less unsightly than the scars left by vertical incision.

Tracheostomy care is of crucial importance to save the patient from accidental decannulation and tracheostomy tube obstruction.

Immediate post op period: the following steps should be carried out.

Securing the tube to skin to prevent dislodgement. Putting wet gauze over the tube. Inflation (with short periods of deflation) of the cuff of tracheostomy tube for the first 12 hours. Repeated suction of the secretions as needed. Instillation of normal saline to soften crusts.

A piece of clean gauze around the tube to prevent soiling of the wound and maceration of the skin. Changing the tube as and when the need arises.

Communication with the patient is achieved by provision of speaking valve or making a hole in the tube in long term Tracheostomised cases. Making arrangements for the patient to call attention in the hour of need.⁹

PATIENTS AND METHODS

All those patients who underwent tracheostomies, from March 2003 to December 2008, at the Department of ENT, STH were included in the study. Name, age, sex, indications, complications and time of decannulation were recorded on a proforma designed for each subject separately. Tracheostomies were performed in emergency and electively both under general as well as local anesthesia. All the procedures were carried out in the operation theater using standard technique. Fellows performed all of them, while trained ward staff carried out postoperative tracheostomy care. An electric suction machine was provided at bedside for suction as needed. Tracheostomy trolley was made available for emergency. Decannulation was carried out from 01 day to 01 month depending upon the etiology and satisfactory maintenance of the airway. All of them were decannulated in the ward except one, who needed surgical decannulation in Operation Theater. They were kept under

observation for 24 hours after decanulation and were sent home. Instructing was given to do air sealed dressing over the stoma, allowing healing by secondary intension. Patient and attendant were educated that if the patient develops respiratory distress he should be brought to the hospital immediately. First follow up was done after ten to fifteen days. When no complication was observed at home, then monthly check up for one year depending upon the condition of the patient.

RESULTS

A total of 31 tracheostomies were carried out in 051/2 years of this study. Sex distribution has been shown in table 1. Age from 01 year to 70 years was noted. The youngest of them was 13 months, while the oldest was of 70 years. The age groups of the patients are shown in the table 2.

28 tracheostomies were performed for upper airway obstruction in emergency and 03 as elective procedures. Indications have been given in table 3.

Mortality occurred in 05 patients. None of them was directly related to tracheostomy.

Decanulations were successfully done in the patients who survived. Time of decanulation has been shown in the table 4. One patient still has tracheostomy with tracheal stint that had thressure injury causing tracheolaryngeal detachment. In one patient we did late decanulation because of suprastomal anterior tracheal wall flap. Two patients lost of follow-up.

03 patients referred to specialized center for chemo radiation, which died due to advanced stage of the diseases. 01 patient died due to fire-arm injury and another one died due to bomb blast injury.

Table 1: Showing sex wise distribution.

Sex of the Patient	No. of Patients	% Age
Male	24	77.4
Female	07	22.5
Total	31	100

Table 2: Showing age wise distribution.

Age group	0-5 Y	6-10	11-15	16-20	21-25	Above 25
No. of patients	08	03	04	02	01	13
Percentage	25.8	9.6	12.9	6.4	3.2	41.9

Table 3: Showing indications for tracheostomy.

Indications	No of Patients	% Age
Diphtheria	08	25.8
Fire arm injuries neck	04	12.9
Suicidal cut throat	03	9.6
Nasopharyngeal Angiofibroma	03	9.6
Thyroid malignancy	02	6.4
Carcinoma larynx	01	6.4
Epiglottitis	01	3.2
Foreign body larynx	01	3.2
Foreign body tracheo-broncheal tree	01	3.2
Bomb blast	02	6.4
Thressure injuries with tracheolaryngeal detachment	01	3.2
Subglottic heangioma	01	3.2
Post thyroidectomy	01	3.2
recurrent laryngeal nerve palsy		
MetastaticNasopharyngeal carcinoma	01	3.2
Lymphoma	01	3.2

Table 4: Showing Immediate Complications.

Complication	No. of patients
Apnea	10
Heamorrhages	01
Subcutaneous emphysema	02
Obstruction and excessive crusting	05
Odynophagia	10

Table 5: Showing late complications.

Difficult decanulation	01
Problem with neck scars	01
Revision tracheostomy	01

Table 6: Showing duration of decanulations.

Duration	No. of Patients
01 day to 01 week	12
02 weeks	06
03 weeks	01
04 weeks	01

DISCUSSION

Our results in this study indicate that most of the patients were male (23) 74.1%. The ratio of male to female is 3.4:1. The study done by A.Alladi,AE which shows male outnumbered although the ratio is 2:1.¹⁰

We found out that there are two age group peaks, one below 05 years of age 25.8% and the other is above 25 years 41.9%. Recent study done by Johannes also showing tracheotomies done in 72.9 % below age 07 years¹¹. Another study was conducted by Butnaru CS in Jan 2006 showing age group below 5years of age¹². Similar studies have been done by Gaudet's (1978) and tucker and Siberan (1972) showing 32%, 30% results in children respectively². One can see the same results in older studies^{13, 14}. However some recent studies showing age below 01 year as study done by Katie, Rooz showing 65% tracheostomies done below 1 year and 70% in another study². The reason for tracheostomy below 1 year in the study is because of effective vaccination program and better children care in infancy and childhood who needed tracheostomy for a prolong period. The other peak is above 25 years. In our study it is due to more exposure to trauma and tumors. This is supported by the study of Ajmal Hussain 15 locally and in others part of the world^{11,15,16}.

Our study shows that most of the indications in children are for upper respiratory tract infections. This is Mainly due to diphtheria and acute epiglottitis 29% and foreign body laryngo-tracheo-bronchial tree 6.4%. This is similar to the study done by Johannes showing 27% tracheostomy done for upper airway obstruction¹¹. We observed in this study that next common indication in adults is neck injuries (29%). This is due to increase violence in the Swat valley during the last two years of our study, like Firearm, suicidal and homicidal assaults, agriculture accidents and bomb blast injuries. A study done by Ajmal Hussain, tracheostomy done in severs head injuries caused by Rroad traffic accident and fall¹⁵. Johannes shows 16.5% tracheostomies performed for trauma and its sequel¹¹. We had 3.2% tracheostomy for bilat-

eral recurrent laryngeal nerve palsy in thyroidectomy. Johannes had tracheostomies 4.7% for bilateral recurrent laryngeal nerve palsy¹¹. A study done by EiBashier EM showing 6% incidence of tracheostomy for thyroidectomies¹⁷.

Neck tumors compromising airway is also one of the indication for tracheostomy. Our study reveals that tracheostomies done for Thyroid malignancy 6.4%, carcinoma Larynx 3.2% Nasopharyngeal carcinoma 3.2% and lymphoma 3.2%. A study done by HIRAKI 2003 who did 06 tracheostomies for neck tumors¹⁶. According to our study 3.2% of the patients underwent tracheostomy for subglottic haemangioma. HIRAKI in 2003 did 01 tracheostomy out of 06 patients for subglottic haemangioma¹⁶.

We did 9.6% tracheostomies as elective procedures to protect the airway in cases of excising Nasopharyngeal Angiofibromas. One can adopt tracheostomy as an elective procedure to protect the airway⁹.

Overall tracheostomy complications rate in our study is 42.8%. Which is similar to the study done by Katie I 46%, 50% Butnaru, and 38.9% Sisk EA showing rates of complications respectively^{2,12,18}.

Decanulation was successfully carried out in 23 patients (74.1%), which is almost similar to the study done by Butnaru showing 52% decanulation accomplished successfully¹².

10.5% patients have decanulation problems. This is in comparison with the study showing 17% decanulation problems². In one case we did revision tracheostomy having recurrent subglottic edema, 01 out of these 03 patients has been surgically decannulated, while one still has tracheostomy because of the tracheal stint.

Our mortality rate is 0% directly related to tracheostomy. Similar study carried out by Johannes, while EiBashier and Butnaru having mortality of 3.4% and 2.7% respectively. 05 deaths occurred in a study done by Sisk EA. All of them directly related to tracheostomy^{11,12,17,18}.

In our study 05 patients died because of terminal stage of malignancies and not related directly to tracheostomies.

Two patients lost to follow up.

Neurosurgical intensive care unit facilities are not available in this hospital, patients are referred to other centers where these facilities are available. A study done locally which shows that tracheostomy is a life saving procedure in severe head injury patients¹⁵.

CONCLUSION

The advent of endotracheal intubation has modified to some extent, indications of the tracheostomy but still tracheostomy has stood the test of time regarding saving man's life with obstructed breathing & maintaining the airway patent to as long as the patient needs it. Every medical personnel must acquire the necessary knowledge and training in performing the procedure & delivering the post-op care.

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