ORIGINAL ARTICLE

Tracheostomy: Surgical Audit of 250 Patients at Mayo Hospital, Lahore

SALMAN AFTAB AHMED, MAROOF AZIZ KHAN, KHALID MUNIR CHEEMA, *AZHAR HAMEED*

ABSTRACT

Objectives: To evaluate indications, complications and outcome of patients requiring tracheostomy.
Methods: We designed a study on 250 patients who were offered this surgery as a life saving procedure. The study spanned over a period of three years from June 2002 to June 2005.
Results: Upper airway malignancies were the most common indications accounting for 62% and Diphtheria and Tetanus together accounted for 16% of all procedures. Primary hemorrhage was the most common complication seen in 6% of all patients.
Conclusion: Authors while describing their experience conclude that this procedure has a life saving role in under developed parts of the globe.
Key words: Tracheostomy, decannulation, airway

INTRODUCTION

Tracheostomy is an operative procedure that creates a surgical airway in the cervical trachea to relieve obstruction to breathing. The technique of tracheostomy practiced today is popularly accredited to Chevalier Jackson (1921) although earlier techniques were described in ancient times even in 2000 BC.[1]

The early indication for airway control was acute obstruction of the upper airway resulting from diphtheria, trauma and especially war-related injuries. Subsequently, the indications for tracheostomy expanded as advances in medical technology occurred.

The aim of this study was to evaluate the indications, complications, outcome and the procedure of tracheostomy in a public sector hospital.

MATERIALS AND METHODS

250 consecutive cases of tracheostomy were carried out and managed at the ENT Unit I, Mayo Hospital, Lahore over a period of three years from June 2002 to June 2005. The information gathered included age, sex, presenting symptoms, clinical findings, surgical technique, post-operative complications and follow-up.

Chest x-rays were carried out in all patients post-operatively. Patient and family education was provided to all patients. Patients were properly followed up and issues of speaking, swallowing and suction were taken care of.

Department of ENT Unit I, Mayo Hospital, King Edward Medical University, Lahore.
Correspondence to Dr. Maroof Aziz Khan, Associate Professor ENT Email: maroof.aziz@gmail.com

RESULTS

Patients of all ages were considered. There were 200 males (80%) and 50 females (20%). The age ranged from 02 days to 75 years. The age group of 51-60 years had the highest number of patients. Out of these 250 patients, 58 were admitted through OPD, 51 were referred from other departments and 141 were admitted through the A& E department. Laryngeal growths causing airway obstruction was the most common pathology seen in patients admitted trough OPD (42) and A& E (114). The other pathologies encountered were different in each mode of admission (Table 1).

There were 20 planned procedures which were done under general anesthesia with endotracheal intubation and all others (230) were done in the awake patients. In 3 patients, having spinal injury, the procedure was done at the bedside and the rest were done in the operating rooms. The isthmus of thyroid was divided in 30 patients and retracted superiorly in 220 patients. Metallic tracheostomy tubes with inner cannulas were used in the majority (210) of the patients. Portex tubes were used in 40 patients.

In 78 patients (31.2%), transverse skin incision and 172 patients (68.8%) vertical or midline skin incision was employed. The type of tracheal incision used depended very much on the primary indication, estimated duration of tracheostomy and the preference of the surgeon. Vertical incision in the trachea was made in 75 cases (30%), excision of the tracheal cartilage in 20 patients (8%) and a U-flap (Bjork flap) was created in 150 cases (60%). 5 cases (2%) had their trachea opened in the transverse (intercartilaginous) fashion without excising any cartilage.

Decannulation was done in 110 patients (44%). No. decannulation was possible in 140 patients (56%) because of upper aerodigestive tract malignancy when tracheostomy was needed for either curative or palliative management.

Table 1. Indications of tracheostomy in 250 patients

Diagnosis	OPD	A&E	Referrals
Laryngeal growths	42	114	-
Tetanus	-	-	33
Trauma neck	-	10	-
Diphtheria	-	-	7
Post-thyroidectomy VC paralysis	6	-	-
Maxillofacial and Spinal Trauma	-	6	-
Laryngeal Polyps	5	-	-
Idiopathic VC paralysis	5	-	-
Neck Space Infections	-	5	-
Acute Laryngeal Edema	-	5	-
Tuberculous Laryngitis	-	-	2
Laryngeal Foreign Bodies	-	-	2
Laryngeal Stenosis	-	-	2
Corrosive Intake	-	-	2
Drug Reaction	-	1	-
GB Syndrome	-	-	1
Choanal Atresia	-	-	1
CVA	-	-	1
Total	58	141	51

The overall complication rate was 25% (Table 2). There were 15 cases (6%) of primary hemorrhage and 6 cases (2.4%) of secondary hemorrhage (Table 2). There were another 10 cases (4%) with surgical emphysema involving the neck and upper trunk but they were managed conservatively There was 1 case (0.4%) of tracheo-esophageal fistula, 10 cases (4%) of postoperative dysphagia and 11 cases (4.4%) of stomal stenosis. Peristomal granulation accounted for 11 situations (4.4%). Some patients had more than one complication. There were a total of 2 deaths (0.8%). All the deaths were directly related to the patients' primary conditions and not resulting from the tracheostomy operations per se.

Table 2.Complications

Complications	=n	%age
Primary hemorrhage	15	6
Peristomal Granulations	11	4.4
Surgical Emphysema	10	4
Post operative Dysphagia	10	4
Stomal stenosis	8	3.2
Secondary Hemorrhage	6	2.4
Deaths	2	0.8
Tracheo Esophageal Fistula	1	0.4
Total	63	25.2

DISCUSSION

The indications of tracheostomy are diverse and changing. Astrachan et al[2] considered the practical effects of tracheostomy and concluded that patients with disorders likely to require airway support can be optimised by early tracheostomy. By far, the two basic indications for tracheostomy are airway obstruction and ventilatory support. Interestingly, the indications for tracheostomy in our setup were different with different modes of admission. Laryngeal growths accounted for majority of tracheostomies for OPD and A& E admission. Referrals from sister departments of medicine and pediatrics were mainly for infective conditions especially tetanus and diphtheria which are a rarity in the western world.

Occasionally tracheostomy under local anesthesia may not be possible however awake tracheostomy should be considered in any patient with impending or ongoing airway obstruction or with potential for difficult intubations. This should be performed in a timely manner before an emergent situation arises because the complications of emergency surgical airway can be devastating.[3] Bedside tracheostomy is not uncommonly indicated but it is discouraged by many authors, who advised any form of tracheostomy to be performed in the operating theatres where there are proper equipment and lighting.[4] In our situation, only 2 bedside tracheostomy were performed under local anesthesia for patients having head injury with cervical vertebrae fracture. These patients could not be moved to theatre for obvious reasons. In all other situations it is mandatory to do tracheostomy in the operating room.

The types of skin incisions made for tracheostomy may or may not have a direct relationship to the likely development of stomal stenosis after intubations. [5] In our study, there were78 cases of transverse skin incision and 172 cases with vertical skin incision. In a study carried out by Bryant et al[6] they evaluated different tracheal incisions for tracheostomy. They showed that there were no significant difference between the types of tracheal incisions and its association with tracheal narrowing at the stomal site. The U-flap is designed frequently and in our series. 150 patients had the U-flap (Bjork) done. The Bjork flap when sutured to the skin provides a bridge of tracheal conduit that guides the tracheostomy tube and avoids creation of a false passage and is therefore safer to use[7] Chew and Cantrell routinely used the U-flap and boasted that no dysphagia or persistent stomas were experienced.[8]
The complications associated with tracheostomy regardless of their indications are well documented. Our complication rate with tracheostomy was 25%.

In a retrospective review of tracheostomy complications over a 10 year period in which a total of 179 tracheostomies performed on 168 patients, 69 complications (38.6%) were documented. There were a significantly greater number of complications in the emergency cases (54%) than in the elective cases (46%). The overall mortality rate was 2.2%. The most common complications of tracheostomy were infective in origin; representing 43% of all complications.[9] Complications of prolonged intubations include ulceration, granulation tissue formation, subglottic edema, and tracheal and laryngeal stenosis. A recent series of 1130 patients who underwent tracheostomy had a combined procedural, early and late complication rate of about 4 % which is an improvement from the earlier complication rate. In the recent series, tracheal stenosis overtook hemorrhage as a leading complication by 2:1. All patients who had tracheal stenosis had endotracheal tubes for more than 12 days before tracheostomy.[10]

Decannulation is employed when the patient can maintain his own ventilation and the indications for doing the tracheostomy in the first place are treated or removed. Some patients, especially those who have undergone elective tracheostomy without intubation, may have their tubes simply removed (spontaneous decannulation). Our protocol for decannulation was creating fenestrated tubes and blocking the stomal end. The patients are kept hospitalized for observation for 48-72 hours before permanent decannulation.

CONCLUSION

Tracheostomy is a commonly performed procedure in ENT Department of Mayo Hospital, Lahore. The most frequent indications are related to upper airway obstruction by malignant tumors and infections like Diphtheria and Tetanus. The procedure has few complications and should be taught to residents of all levels. Postoperative care requires hospital admission for a few days and the patients can be discharged with tracheostomy tubes with inner cannulas and can be managed effectively at home as well especially in cases of aerodigestive tract malignancies.

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