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RESEARCH ARTICLE

ANALYSIS OF ADVERSE AFTER EFFECTS AND BENEFITS OF TRACHEOSTOMY IN A TERTIARY CARE HOSPITAL IN JALGAON

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ABSTRACT

Background: The benefits of tracheostomy are not without associated complications and risks. The increasing use of tracheostomy has resulted in parallel increase in complications. Meanwhile little emphasis is given in medical and nursing instruction on post operative management to reduce the complications. **Material and methods:** This study was carried out at dr ulhas patil medical college and hospital jalgaon. The total number of patients included in the study were 130 of all ages including both males and females. The tracheostomy was done for various indications. The aim of the study was to evaluate the incidence of complications of tracheostomy and to suggest the preventive measures for the same. **Results:** The incidence of complications was 25.38% with mortality 1.8%. The commonest complication was surgical emphysema and the commonest indication for tracheostomy was artificial ventilation accounted for 69.8% of cases. **Conclusion:** Even though, Tracheostomy is a life saving procedure, is not without complications but fortunately all the complications are preventable.

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INTRODUCTION

Lot of studies are available on tracheostomy from urban centers but the same has been lacking for rural areas in our country where more than 70% of the population resides. On the basis of said reason the study was carried out at ENT department of medical college and hospital which is situated in the rural area. Goal of our study was to analyse the complications and benefits of tracheostomy. Among current surgical procedures tracheostomy has a surprisingly long history (Frost, 1976; McClelland, 1972). It is referred to in two 0f the three oldest known medical works, the Rig Veda and Ebers papyrus. Both Aretaeus and Galen, in the 2nd century AD, wrote that Asclepiades of Bithynia performed elective tracheostomy in around 100BC (McClelland, 1972). The word tracheostomy is derived from 2 greek words meaning I cut the trachea. It was first used by Heister in 1739 (Frost, 1976). The indications of tracheostomy are increasing with passing time. Initially the procedure was carried out to relieve airway obstruction, however its newer indications have started to include temporary airway access for anesthesia and artificial ventilation similarly the indications for long term or permanent tracheostomy include severe respiratory distress, sleep apnea syndrome and terminal malignant neoplasms are increasing (Patrick James Bradely, 1997). As with any other procedure the trachestomy is also associated with many complications. Increasing number in the trachestomies also resulted in parallel increase in the complication rate associated with the procedure. Elective tracheostomy is much more favourable than waiting for the situation to become emergency. In fact the best time to do the tracheostomy is when attending surgeon first thinks about it in a particular case. In pediatric patients this procedure is associated with with a higher degree of morbidity and mortality when compared to adult population. The morbidity and mortality due to procedure depend on number of factors like age of the patient, general condition of the patient, whether tracheostomy is the primary procedure or part of other procedure, the instrument kept in the tray, the skill of the surgeon, timing of the procedure, quality of the tracheostomy tube, postoperative care of the patient (Paul Pracy, 2008; Gilmore, 1986).

MATERIALS AND METHODS

The study was carried out at dr ulhas patil medical college and hospital jalgaon from January 2017 to jan 2018. About 130 cases included in the study were both males and females (both paediatric and adult). A proper written informed consent was

take from the patient or his relatives/parents before starting the treatment. All the patients were properly evaluated with regard to age and sex distribution, indications of tracheostomy, whether the procedure was planned or emergency. All the infants and children were operated under general anesthesia while as all the adults were operated under local anesthesia in the operating theatre as well as bedside as per the situation. Patient was placed in supine position. The neck was extended using a sand bag below the shoulder and a head ring below the head. After scrub the neck was draped with sterile surgical towels. Local anesthesia with 2% lignocaine and adrenaline was injected on anterior aspect of neck from just below the cricoids cartilage to suprasternal notch. In planned tracheostomy horizontal neck incision midway between cricoids cartilage and suprasternal notch was used while in emergency vertical incision staring from just below the cricoids cartilage to suprasternal notch was taken. The skin, subcutaneous tissue, fascia were retracted laterally. Then with blunt dissection strap muscles were separated in the midline and retracted laterally.

The trachea was palpated and position confirmed by the aspiration of air through syringe and needle and a small amount of local anesthesia was also injected into the tracheal lumen. The thyroid isthmus was identified, separated from anterior aspect of trachea and retracted upward and sometimes divided. After fully exposure of trachea the pretracheal fascia was separated from the anterior wall of trachea by blunt dissection (Chew John, 1972). In case of adults a vertical midline incision was taken over the second, third or third, fourth tracheal rings. Stay sutures were placed on either side of the incision line. The stay sutures were to allow the tracheostomy to be held open if the tube needs to be resided prior to formation of good track and edges of the tracheostomy could be pulled up to the skin to fascilitate the tube change. A proper size and type of tracheostomy tube was then inserted along with the obturator. The position of tube was then confirmed by the feel of air blast on the back of the hand, after removing obturator. All the operative steps were same in children but after identifying the 3rd and 4th tracheal rings a small vertical incision was given between 3rd and 4th tracheal ring. A tracheal dilator was then inserted. As all the procedures in the children were carried under the general anesthesia, the anaesthetist has to withdraw the endotracheal tube gradually till at the upper end of incision, tube was visible. The tracheostomy tube was then secured in position by using appropriate suture material. Remaining wound was closed with silk. Sterile gauze dressing was placed around the tube.

RESULTS

The most common age group for tracheostomy was 14-52 years of age about 90 cases but only 6 patients belonged to paediatric age group and the remaining 36 patients belonged to old age group(55-70years).The average age of the patients was was 38.9 years. Out of 130 patients 75% were males and 25% were females. The male female ratio was 3:1.The most common indication for the trachaeostomy in the study was assisted ventilation. About 70% of tracheostomies were performed for this indication. The prevalence of emergency and planned tracheostomies was 24.50% and 75.50% respectively. Most of the tracheostomies i,e (123) 94.61% both I adults and children were performed under local anesthesia of these 100 were planned and and 23 emergency. Out of 12 cases requiring general anesthesia 8 were planned and 4 were emergency. A total of 42 patients died during hospital stay, making the mortality rate of 32.3%. 40 patients died of cause unrelated to tracheostomy, 2 deaths were related to tracheostomy, one due to apnoea during the procedure and one elderly patient died because of sudden massive haemorrhage. Thus in present study tracheostomy specific mortality rate was found to be 1.60%. There were no significant difference in complication rates with the type of anesthesia used. Tracheostomy was safely performed bedside, ICU, in wards provided proper aseptic conditions were maintained. Portex cuffed tracheostomy tubes were used in most of the cases 115 as compared to metallic tubes 15. DISCUSSION: Statistically no significant difference in the incidence of complications were found between the male and female cases, adult and paediatric patients and emergency and elective procedures. A review of 1928 cases evalvated by Chew and Cantrell in 1972 found that overall complication rate was 1.5% with mortality b1.6% (Chew John, 1972). The most common complication was haemorrhage and tube displacement. Wood and Methison *et al* found that mosty of the late complication, can be prevented by proper surgical procedure and postoperative care (Wood, 1991). Mehta and chamyal in their study of 100 cases noted complications in 48% of cases (Mehta, 1993). Early and relatively minor complications were encountered commonly. Complications were twice more common in emergency than planned cases. No tracheostomy related death was noted. Zeitouni and Kost studied 281 cases of tracheostomy and found a total complication rate of 24% (Zeitouni, 1994). A statistically significant increased risk of complications was found in emergency situation and in ICU patients. Haemorrhage was the common intra-operative complication (2.8%). Infection was common postoperative complication (7.9%). No tracheostomy related deaths were reported. Goldenberg *et al*. studied 1130 cases of tracheostomy and found major complications in 49 cases(4.3%) and 8 tracheostomy related deaths (0.7%) (Goldenberg *et al*., 2000).

The common complications were tracheal stenosis (21cases), severe bleeding in 9 cases (including 2 cases of trachea-innominate artry fistula), trachea –cutaneous fistula(6 cases), infection(5 cases) and trachea-oesophageal fistula (1case), 8 deaths occurred which included 4 cases of accidental decannulation, 2 cases of severe bleeding and 2 cases of tension pneumothorax. He further stated that complications can be minimized by avoidance of emergency tracheostomy by endotrachealintubationor cricoththyroidotomy, correct surgical technique and meticulous postoperative care. Yellon reported 7 cases of totally obstructing tracheostomy associated suprastomal granulation tissue (Yellon, 2000). He noted that the complications due to granulations include progression of subglottic stenosis, posterior laryngeal stenosis, and supraglottic stenosis. He also noted that dislodgment of granulations may cause distal tracheal obstruction. Carr *et al*. studied 142 cases and found granulations as the most common complication in pediatric age group (44cases I,e26%) (Carr *et al*., 2001). Yaremchuk found that regular tube changes, at least once in two weeks, are associated with fever complications from the granulation tissue (Yaremchuk, 2003). Arola *et al* found 9 cases of tracheal stenosis in 812 cases with a incidence rate of 1.1% (Arola *et al*., 1981). All cases were diagnosed within 10 weeks of extubation. Cases were managed by various methods including the resection and anastomosis (5 cases) dilatation (4cases) and removal of granulation in (1cases). He concluded that the use of low pressure cuff and

Sr. No	Indications	No. of patients	Percentage
A.	• Upper airway obstruction • Tumours: • Truma • Infections • After majoir surgery • B/L abductor vocal d.cord palsy e.carcinoma thyroid • Angio-oedema • Artificial ventilation	33 13 5 2 2 3 1 1	25%
B.	• Snake bite with neuroparalysis • Insecticide poisioning • Seizure disorder • Alcohol intoxication • Hypocalcemia with tetyany	87 03 80 02 01 01	66%
C	Tracheobronchiasl toilet Head injury CVA ARDS	5 2 1 2	3%
D.	Anaesthesia (Difficult intubation)	5	3%

Sr. no	Complications	No. of patients	Percentage
	Intraoperative haemorrhage Apnea	8 6 2	6.1 4.61 1.53
	Early postoperative (1-10days) surgical emphysema infection(peristomal) Tube disoplacement tube blockage Delayed haemorrhage trachea-esophageal fitula	34 20 6 2 2 2 2	26.15 15.38 4.61 1.53 1.53 1.53 1.53

avoidance of over inflation of the cuff are the most important measures to prevent cuff related tracheal stenosis. Park *et al* found that early maturation of stoma by placement of 4-quadrant sutures from cartilage to dermis, resulted in a decreased morbidity from accidental decannulation and did not increase the incidence of tracheaocutaneous fistulas of granulation tissue formation (Park *et al*., 1999). In our study complication rate was found to be 25.38 % which was comparable to the study of Munir *et al*.i,e 30%. In the study subcutaneous emphysema and peristomal infection were the most common complications. Tracheal stenosis, trachea, innominate artery fistula and trachea-esophageal fistula were very rarely seen. Thus the present study can be compared with the previous studies. In our study surgical complication like emphysema was common but was usually minimal and resolved spontaneously. Only 2 cases of severe subcutaneous emphysema required multiple skin incisions and removal of sutures for relief. Haemorrhage during after the procedure was managed by proper haemostasis. Peristomal infection was managed by proper antibiotics and aseptic dressing. Tubal blockage required regular suction and changing of tube if required. One case of trachea-esophageal fistula was managed conservatively by Ryles tube insertion keeping nil by mouth. Decannulation was difficult in two cases of pediatric age group due to formation of peristomal granulations that was managed by excision of granulations followed by chemical cautery.

Conclusion

As all the complications are preventable our study stands valid the Moser dictum- the best time to do tracheostomy is when you first think about it. Lot of valuable time should not be wasted during the emergency to stop bleeding but airway should be secured first.

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