

COMPLICATIONS AFTER SURGICAL TRACHEOSTOMY

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ABSTRACT

Objective: To define the prevalence of tracheotomy complications and list the factors leading to complications and manage the complications.

Materials and Methods: This study is cross sectional descriptive study conducted at Combined Military Hospital, Peshawar from January 2012 to January 2013. A total of 250 patients were included in the study, 195 were males and 55 females. Complications of tracheostomy are classified as early occurring within 24 hours of surgery, intermediate occurring between 24 hours to 14 days and late occurring after 14th day. Analysis was stated on the basis of observations of any complication observed post operatively like secondary hemorrhage, tube blockade, decanulation Apnea, infection, pneumothorax etc during the follow up period.

Results: Most common complications observed in our setup was hemorrhage, tube dislodgment and obstruction, apnea while infection crust formation and tracheocutaneous fistula are least common, all were managed successfully with no death attributable to our procedure.

Conclusion: Our study demonstrates that hemorrhage, apnea, tube obstruction and tube dislodgment are most commonly observed complication in our setup and all were managed successfully with satisfactory outcome.

Key Words: Tracheostomy, complications.

INTRODUCTION

Tracheostomy is one of the oldest surgical procedure first described by Jackson in 1909 and it is not only life saving procedure but it has become method of choice for patients requiring prolonged ventilation. The first tracheostomy was performed at the beginning of 20th century in patient of diphtheria with upper airway obstruction¹. There is recognized significant morbidity associated with tracheostomy².

In the beginning of 19th century tracheostomy complication was as much as 73%³. Tracheostomy can either be performed at bed side with per cutaneous dilatational tracheostomy or in Operation theater as surgical tracheostomy. Although per-cutaneous tracheostomy can be performed at bed side with the help of per-cutaneous dilators but it has various limitations. Elective tracheostomy must be performed in operation room in order to avoid or handle complications. Number of potential complications are associated with either technique, particularly related to bleeding, damage to structures adjacent to the trachea and airway compromise⁴. Reported complications in literature varies from 2.1% to 20%⁵. However there are no standards defined for

complications which make comparison difficult. There is 2 to 5 fold increase in incidence of complications if emergency tracheostomy is performed⁶.

Number of factors contribute towards post surgical complications which includes accidental decanulation, tube blockade, reactionary or secondary hemorrhage, tracheal stenosis, difficult decanulation and many more⁸. Pre operative and post operative complications associated with surgical tracheostomy have been reduced dramatically since it was described. Pre operative complications can be seen when there is altered anatomy due to trauma swelling or fibrosis or by an inexperienced surgeon. Early identification and smart management would prevent further or aggravation of complication. Most dangerous and life threatening complication in immediate post operative period is obstruction of tracheostomy tube. It may be due to mucus plug blocking the tube or blood clot causing obstruction. Another life threatening complication is accidental decanulation of tube. The insertion of loosely attached tracheal tube however can lead to decanulation and difficult re-insertion and mortality can be as high as up to 30%. Unsuccessful blind tube replacement may suffocate patient due to pressure over trachea. Some surgeons advocate Bjork flap at the time of surgery but it increases chances of tracheal stenosis⁹.

Complications in post operative period are dangerous and life threatening and requires prompt

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action and well trained staff. Different types and materials of tubes are available each with an aim to reduce morbidity and complications. Silicon tubes, cuffed or non-cuffed, fenestrated or non-fenestrated and tubes with inner canulas help to reduce complications and morbidity.

MATERIALS AND METHODS:

Two hundred and fifty patients will be selected presenting in CMH Peshawar during study period. 195 were males and 55 females. A questionnaire will be completed at insertion and patients then will be reviewed daily and weekly basis and complications will be recorded. Patients will be followed from at the time of insertion of tube up to 6 months. At every follow up complications will be observed and recorded. The inclusion criteria, patients of both gender with age range of 16-70 years who had undergone both emergency and elective tracheostomy. The exclusion criteria, was patients above 70 years of age and less than 16 years, all terminal cases and patients admitted to hospital with tracheostomy from some other setup. Detailed history was taken and examination was done. X-rays chest, blood culture and local swab for C/S, bleeding profile will be taken in cases having complications. Complication's type, site, severity and underlying cause were noted and analyzed by chi square test. There were no deaths attributable to tracheostomy.

RESULTS

Early complications were hemorrhage 16 (6.4%), apnea 2 (0.8%). Tube dislodgment 3 (1.2%). Intermediate complications seen in our cases were tube obstruction 8 (3.2%), crusts and scab formation 4 (1.6%), surgical emphysema 2 (0.8%) and infection in only 1 case (0.4%). Late complications observed in our cases was only tracheocutaneous fistula seen in only 1 case (0.4%). Of total 250 patients 153 were brought in an emergency (61.2%) on which emergency tracheostomy was done while in rest of cases elective tracheostomy was done (38.8%). All tracheostomies were done with skin crease (horizontal) incision. In all the cases except 5 (2%) opening was made between 2nd and 3rd tracheal ring while in other 5 high tracheostomy was done due to tumor in larynx. 43 cases (17.2%) were done under local anesthesia while remaining 207 cases were done under general anesthesia (82.8%).

Commonest cause was hemorrhage 6.4%, tube obstruction 3.2% and tube dislodgment 1.2%. Of all the complications 37 % were managed surgically while rest were managed conservatively.

DISCUSSION

In our study hemorrhage is found to be the most common complication 6.4%. The hemorrhage which

occurred was moderate to severe in intensity and was due to damage to the anterior jugular veins and thyroid isthmus. In one study hemorrhage during the procedure is not very common (5%) but even a minor bleed can be life threatening. Bleeding during the performance of a tracheostomy is most commonly the result of errors in surgical technique¹¹. In several studies there were large number of patients who lost to follow up even up to 75% in one of studies⁷ but in our study almost all patients were indoor and they were either de-cannulated before discharge or they expired because of its primary cause which in our cases were most commonly blast injuries and burns.

Many complications on insertion are labeled as minor complications and now according to a study they fall in category of 'technical difficulties'¹⁰. Another most common complication observed in our study was tube obstruction. It was most probably due to clot in the lumen of tube and it was recognized by sudden choking of patient and dropping oxygen saturation. Tube was removed immediately and new tube was inserted which restored normal breathing and normal oxygen saturation. Newer tubes with inner canulas are recommended by latest guidelines issued by intensive care society¹².

In a study performed by Barbetti JK tube blockage was found to be 3.6% and it was more for surgical tracheostomy as compared to percutaneous tracheostomy¹³. Silvester also carried out study on 20 patients and found to have hemorrhage and tube obstruction as major complications of surgically performed tracheostomy¹⁴.

In our study 1.2% had tube dislodgment and it was due to excessive cough or constipation in a post operative period and matter was catered by stitching the tracheostomy tube with a skin for initial period (stitches removed after first tube change). Our study is comparable with the study performed by K. Dingli where rate of tube dislodgment was much more¹⁵. Another complication seen was infection though not very common as only one male (0.4%) suffered with this and it was due to poor nutrition and delay in change of tracheostomy tube and was managed successfully with a removal of tube and course of antibiotic after culture and sensitivity report.

Apnea was another complication observed in 0.8% of patients both were males and was identified with sudden drop in oxygen saturation and shallow breathing. This was due to the sudden discharge of retained carbon dioxide from within the lungs when the obstruction was suddenly bypassed by making a hole in the trachea. In another study performed by Stauffer the infection of stoma was as high as 36%¹⁶.

The complication of infection is avoidable if the procedure is carefully performed together with strict postoperative management. Surgical emphysema was

seen in 2 patients (0.8%) again both were males and were seen in post operative period with swelling in the neck and emphysema and it could be appreciated in digital radiographs of neck and upper chest. It was self resolving and disappeared in 3-4 days time.

In another study David M labeled the surgical emphysema as a life threatening complication appeared as a result of tear in posterior tracheal wall and must be identified and if extensive must be treated at an early stage¹⁷. Tracheocutaneous fistula is another long term complication which was seen in one male patient (0.4%) and it occurs due to factors delaying the healing of wound, poor nutrition or anemia. It was surgically closed with a satisfactory healing results.

A study was conducted by David goldenberg where he reported 6 cases of fistula and all were surgically closed with good healing results¹⁸. Crusts and scab formation was observed in total of 4 cases (1.6%). Crusting is a common phenomenon observed but it requires regular suction of tracheostomy tube and cleaning of tracheostome and removing any scabs formed. Excessive crust in and around the tube can itself block the tube or may contribute to infection and secondary hemorrhage. All the cases were managed by removing the crust and scabs surgically and keeping the wound clean.

CONCLUSION

We can prevent the complications by early identification and prompt management. These complications can be minimized by improving our operative techniques and early identification and expert post operative management.

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