

# A Retrospective Study Analyzing the Complications Associated with Tracheostomy Procedures During Maxillofacial Trauma Management

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## ABSTRACT

**Background:** Tracheostomy is derived from a Greek word meaning stoma that basically is an artificial opening in patient's body for exchange of air between atmospheric air and lung parenchyma. The aim of the present study was to determine the complications associated with tracheostomy amongst subjects with maxillofacial trauma.

**Materials and Methods:** The present study enrolled 50 subjects with maxillofacial trauma reporting to the emergency of the hospital. Tracheal structures were identified by chin lift maneuver. Physiotherapy was provided postoperatively amongst all the patients. Surgical closure of the stoma was not performed postoperatively. Complications occurring operatively and postoperatively were noted in a tabulated form and analyzed using SPSS software. All the data was arranged as percentage of total.

**Results:** The study enrolled 50 subjects. The mean age of the subjects was 35.65 +/- 4.87 years. The complications that were encountered in the study were divided into operative and postoperative. Amongst the operative complications were

emphysema, seen in 2% cases and pneumothorax, seen amongst 2% cases.

**Conclusion:** The most frequently seen complication in our study was Endotracheitis followed by hemorrhage.

**Keywords:** Complications, Endotracheitis, Tracheostomy.

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## INTRODUCTION

Tracheostomy is derived from a Greek word meaning stoma that basically is an artificial opening in patient's body from exchange of air between atmospheric air and lung parenchyma. It originated during 3600 BCE in Egypt making it the oldest surgical procedures performed till date.<sup>1</sup> Tracheostomy is one of the most commonly performed procedures amongst critically ill subjects and is the cornerstone procedures amongst subjects with loss of ventilator support.<sup>2-4</sup>

It is a surgical procedure and it carries numerous complications associated with it. The complications can be broadly divided into perioperative, operative and postoperative. The complications can also be divided into immediate or delayed. Those complications that occur during decannulation and are temporary in nature are immediate complications.<sup>5-11</sup>

Tracheostomy is routinely performed for managing cases of respiratory derangements after surgery of larynx and pharynx, during respiratory paralysis, and various other conditions that compromise airway.<sup>12,13</sup>

Pain and mechanical adhesion of the trachea can cause decreased mobility of glottis and hence leading to insufficient closure of the glottis and decreased efficiency of coughing

mechanism. There can also be associated loss of proprioceptive capability of larynx.<sup>14</sup> The aim of the present study was to determine the complications associated with tracheostomy amongst subjects with maxillofacial trauma.

## MATERIALS AND METHODS

The present study enrolled 50 subjects with maxillofacial trauma reporting to the emergency of the hospital. The study was conducted for duration of 2 years. Subjects undergoing surgical procedures that compromised airway were considered as candidates for tracheostomy. Prior to initiation of the study, ethical committee clearance was obtained from the institute's ethical board. A written consent was obtained from all the subjects in their vernacular language. Single operator performed all the tracheostomies. For good hemostasis and adequate retraction, two assistants were also employed for the same. Tracheal structures were identified by chin lift maneuver. Vertical midline incision was used to perform all tracheostomies. Tracheal window was created at the level of third or fourth tracheal ring. Amongst most cases tracheostomy tube was removed on fourth post-operative day. Physiotherapy was provided postoperatively

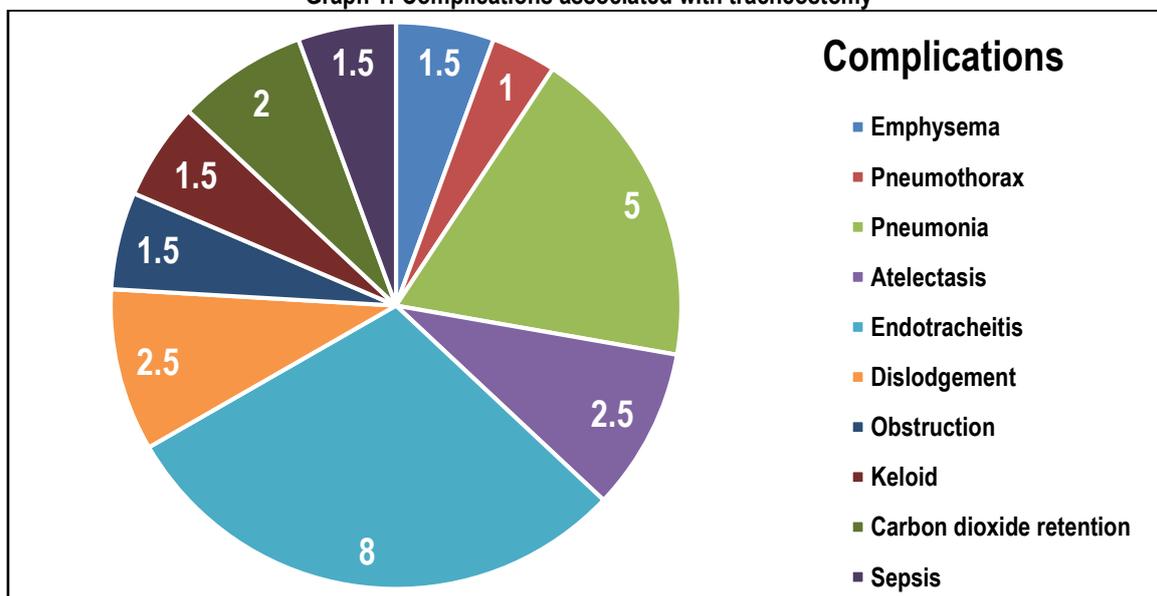
amongst all the patients. Surgical closure of the stoma was not performed postoperatively. All the subjects were carefully monitored at ICU and avid antibiotic regimens were followed

amongst all the subjects. Complications occurring operatively and postoperatively were noted in a tabulated form and analyzed using SPSS software. All the data was arranged as percentage of total.

**Table 1: Complications associated with tracheostomy**

COMPLICATION	FREQUENCY	PERCENTAGE
<b>Operative</b>		
Emphysema	1	2
Pneumothorax	1	2
<b>Postoperative</b>		
Pneumonia	3	6
Atelectasis	2	4
Lung abscess	0	0
Endotracheitis	4	8
Dislodgement of cannula	2	4
Too long cannula	0	0
Too short cannula	0	0
Obstruction	1	2
Premature cannula removal	1	2
Hemorrhage	2	4
Carbon dioxide retention	1	2
Sepsis	1	2
Stenosis	0	0
Keloid formation	1	2
Total	60	30

**Graph 1: Complications associated with tracheostomy**



**RESULTS**

The study enrolled 50 subjects. The mean age of the subjects was 35.65 +/- 4.87 years. There were majority of males compared to females in the study. The complications that were encountered in the study were divided into operative and postoperative. Amongst the operative complications were emphysema, seen in 2% cases and pneumothorax, seen amongst 2% cases. The postoperative complications were pneumonia, amongst 6% cases. Atelectasis and Endotracheitis were seen in 4% and 8% cases respectively. There were 2 cases of dislodgement of cannula. Short cannula was seen in no subject. There were 4% cases of hemorrhage and 2% cases of carbon dioxide retention. Sepsis was seen amongst 1 subject. There was one case of postoperative keloid formation. (Table 1, Graph 1)

**DISCUSSION**

The deciding factor for tracheostomy is straightforward, like in cases of permanent loss of airway loss. However, these situations are not normally encountered and the decision to perform tracheostomy is based on personal preference, institute's standard care and the training of the operating surgeon. The thing that is more confusing is the exact time to perform tracheostomy. Some people prefer early tracheostomy i.e. between 3 to 10 days while others recommend late tracheostomy i.e. between 7 to 28 days. Studies have shown that in subjects if tracheostomy is performed early i.e. within 48 hours tend to spend less time in ICU and had lesser chances of ventilator associated pneumonia. These subjects were associated with lower mortality rate compared to subjects undergoing late tracheostomy.<sup>15</sup>

Various studies have demonstrated wide difference in the outcomes ranging from no significant difference to significant benefits of early tracheostomy.<sup>16-19</sup> The complication rate of tracheostomy varies considerably amongst different individuals.<sup>20</sup> According to our present study, the complications that were encountered in the study were divided into operative and postoperative. Amongst the operative complications were emphysema, seen in 2% cases and pneumothorax, seen amongst 2% cases. The postoperative complications were pneumonia, amongst 6% cases. Atelectasis and Endotracheitis were seen in 4% and 8% cases respectively. There were 2 cases of dislodgement of cannula. Short cannula was seen in no subject. There were 4% cases of hemorrhage and 2% cases of carbon dioxide retention. Sepsis was seen amongst 1 subject. There was one case of postoperative keloid formation. Pneumothorax is one of the most known postoperative complications, with the chances as high as 17% per some reports. Higher chances of this complication are generally seen amongst children as their pleural domes mostly located at a relatively higher position.<sup>21</sup> Another complication is bleeding that is also one of the common intraoperative complications during tracheostomy procedure, although a major hemorrhage is rare. Very obese subjects are at a higher risk of displacement of cannula due to increased distance from skin to trachea, and that reduces visualization and allows more subcutaneous tissue to create a tract for a false passage of air.<sup>22</sup> According to a review published in the year 2005, cannula misplacement and creation of a false passage were more commonly seen with percutaneous tracheostomies compared to open type.<sup>7</sup> Subcutaneous emphysema is another major complication that has a wide clinical spectrum and can also be life threatening. It is generally associated with another underlying complication like pneumothorax or injury to trachea.<sup>23</sup> It can occur because of disruption of the respiratory tract leading to air leak into the contiguous subcutaneous spaces. Tube displacement is another life-threatening complication that can occur at any time during the patient's life with tracheostomy. The prevalence of displacement of tube varies in the range of 0.35–2.6%.<sup>5</sup>

## CONCLUSION

Though tracheostomy is a lifesaving procedure but it is also associated with various complications. The complications can also be divided into immediate or delayed. The most frequently seen complication in our study was Endotracheitis followed by hemorrhage.

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