

ORIGINAL ARTICLE

Management of Post Tracheotomy Hemorrhage and Evaluation of Causing Factors

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ABSTRACT

Objective: To understand the frequency, causes, and treatment of post-tracheostomy hemorrhage.

Study Design: A prospective study of tracheostomy cases.

Place and duration: ENT, Head & Neck Surgery department of Lady Reading Hospital MTI, Peshawar and Azra Nahid Medical College, Lahore for duration of one year from July 2019 to June 2020.

Methodology: All hospitalized patients who underwent tracheostomy and had bleeding during this period were included. The parameters specified were demographics, time since surgery, degree of bleeding, causes of bleeding, and treatment. A total of 208 patients who have done with tracheostomy were selected.

Results: Tracheostomy was performed in a total of 208 patients, 142 men and 66 women. Their ages ranged from 20 to 70 years old. 22 patients (10.6%) had postoperative bleeding, most of them have oozing from or around the stoma, but 5 patients were taken to the operating room for hemostasis. Three of them had Tracheo-innominate artery fistula and two died before undergoing surgery. One of the three tracheo-innominate fistulae were successfully treated by a cardiac surgeon. The remaining cases required diathermy, transfixing thyroid isthmus or vein descent or resection of veins.

Conclusions: Hemorrhage after tracheostomy is not uncommon in intensive practice, bleeding occurred in 10.5% of our cases. Hemorrhage occurs because of inadequate hemostasis, aspiration trauma, infection, coagulopathy and granulation. Rarely, there may be massive and life-threatening bleeding from tracheo-innominate fistula that requires aggressive and urgent exploration. In such a situation, an experienced cardiac surgeon and anesthesiologist is very important and can lead to a better result.

Key words: Tracheostomy, post-tracheostomy hemorrhage, Tracheo-innominate artery fistula (TIF)

INTRODUCTION

One of the oldest surgical procedures described, the tracheostomy, was first described in the 1st century BC and is still a common procedure in busy ENT practice¹⁻². This life-saving procedure is best performed in the operating room using the standard technique described by Jackson in 1909³⁻⁴. It is now also performed at the patient's bedside, known as percutaneous dilatation tracheostomy. Some of the common complications include airway obstruction, aspiration, bleeding, infection, and damage to the laryngeal nerve; Of course, these complications are exacerbated with emergency tracheostomy⁵⁻⁶. Hemorrhage may occur during surgery / immediately within 24 hours of the postoperative period, or within a week of the early postoperative period, emphasizing the importance of postoperative care, with late bleeding occurring one week after surgery⁷⁻⁸. Insufficient hemostasis, coagulopathies, ligation slippage and thyroid bleeding are some of the causes of early postoperative bleeding, while late causes include granulation, infection, tracheo innominate fistula (TIF) and suction trauma⁹⁻¹⁰. The aim of this prospective study is to highlight the causes of post-tracheostomy hemorrhage and appropriate TIF management in our hospital.

METHODOLOGY

This is a prospective study of all hospitalized patients requiring tracheostomy at the ENT, Head & Neck Surgery

department of Lady Reading Hospital MTI, Peshawar and Azra Nahid Medical College, Lahore for duration of one year from July 2019 to June 2020. A total of 208 patients were selected, 142 men and 66 women who required Tracheostomy. Children under the age of 15 were excluded from the study because they were led by pediatric surgeons at our hospitals. Data were analyzed for the following demographic parameters, time since tracheostomy, degree of bleeding, cause (s) of bleeding, and treatment applied.

RESULTS

Tracheostomy was performed in a total of 208 patients, 142 men and 66 women with a male to female ratio of 1.2: 1. Their ages ranged from 20 to 70 years old with a median of 42 and mean age of 45-years (Table-1).

The demographic features of patients are given in Table 1

| | | |
|--------------------|-------|-------|
| Male (n) | 142 | 68.3% |
| Female (n) | 66 | 31.7% |
| Age Range (years) | 20-70 | |
| Mean Age (years) | 45 | |
| Median Age (years) | 42 | |
| Age Group | | |
| 20-40 | 98 | 47.1% |
| 40-60 | 74 | 35.6% |
| 60-70 | 36 | 17.3% |

Most of the cases came from the surgical, medical, thoracic, and stroke intensive care units. The most common indication for tracheostomy was chronic obstructive airway disease (51.9%), followed by trauma and vascular stroke (Table 2).

Various indications of Tracheostomy are given in Table-2

| Indications | Frequency (n) | Percentage (%) |
|---------------------------|---------------|----------------|
| COPD | 108 | 51.9% |
| Trauma | 64 | 30.8% |
| Cerebrovascular accidents | 17 | 8.2% |
| Head and Neck tumors | 8 | 3.8% |
| Meningitis | 6 | 2.9% |
| Tetanus | 5 | 2.4% |
| Total | 208 | 100 |

22 patients (10.6%) had some type of hemorrhage after tracheostomy. There was no intraoperative bleeding. The causes of post-tracheostomy bleeding included suppuration / infection of the wound, coagulopathy, suction trauma, severe ligation bleeding, granulation tissue, thyroid bleeding, and TIF (Table 3).

Table-3

| Cause | Frequency (n) | Percentage (%) |
|------------------------|---------------|----------------|
| Wound infection/oozing | 6 | 27.3% |
| Suction trauma | 3 | 13.6% |
| Ligature slippage | 2 | 9.1% |
| TIF | 3 | 13.6% |
| Coagulopathy | 2 | 9.1% |
| Granulations | 3 | 13.6% |
| Thyroid bleed | 3 | 13.6% |
| Total | 22 | 100 |

5 patients were taken to the operating room for hemostasis. Three of them had Tracheo- innominate artery fistula and two died before undergoing surgery. One of the three trachea-innominate fistulae were successfully treated by a cardiac surgeon. The remaining cases required diathermy, transfixing thyroid isthmus or vein descent or resection of veins.

DISCUSSION

A tracheostomy is a simple yet life-saving surgical procedure with few complications if performed correctly¹¹⁻¹². As with Amus et al., More men underwent tracheostomy in this study. This was probably because men smoke more and suffer injuries more, as the two most common indications for a tracheostomy were chronic obstructive airway disease and trauma¹³⁻¹⁴. Bleeding after tracheostomy is a very critical problem and is estimated to be around 3%. Of the 208 patients in our study, 22 had some type of bleeding after tracheostomy. Most cases bleed immediately after surgery, but in some cases, bleeding is delayed. This result is in agreement with Allan et al. Initial hemorrhages were mainly due to wound discharge, infection, aspiration trauma, ligament sliding, and bleeding / coagulation abnormalities¹⁵⁻¹⁶. While most of these patients were treated with simple measures such as proper wound care, compression with antiseptic gauze and absorbable gauze, patients with coagulopathy also required a fresh frozen plasma transfusion¹⁷. The causes of the late bleeding were likely due to wound infection, granulation and TIF. Before all these life-threatening events, 2-3 days ago, there were small spots of blood known as "paroxysmal bleeding". The incidence of TIF is reported as 0.3-0.7%. The incidence rate in this study was 1.4% (3/208), which is slightly higher than reported in the literature¹⁸⁻¹⁹. Mortality from TIF is 50-70%. Some ITFs have also been reported after percutaneous dilating tracheostomy, but none have been reported in our previous series. One of the three TIF cases in this study died before adequate surgical assistance could be arranged to reduce the severity of the condition²⁰⁻²¹. Two other TIF patients had successful outcomes with prompt and effective first aid until an anesthetist and cardiac surgeon specialist arrived in the operating room²². First aid measures included over-inflation of the tracheostomy cuff (Fig. 1), digitally pressing the nameless vessels against the handpiece (Fig. 2), while ensuring that the tracheostomy tube was not removed until the cardiac surgeon was in the operating room.

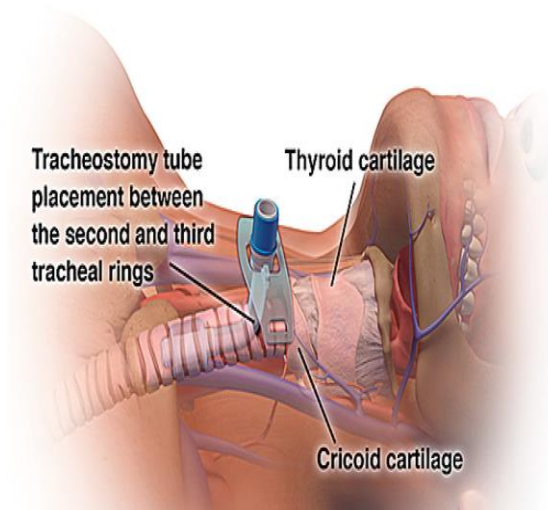


Fig-1 Endotracheal tube procedure

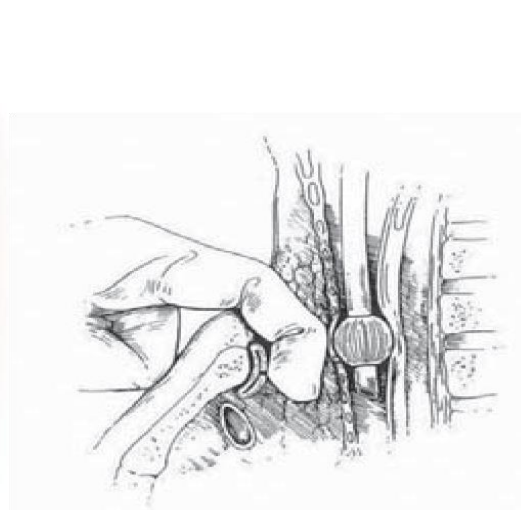


Fig-2 shows Innominate vessel pressed against sternum

An endoscopy was also performed to view the fistula, followed by a sternotomy, and then the fistula was repaired with a pericardial graft. Singh et al. Also recommend this when treating an 80-year-old patient with uncomplicated TIF bleeding²³⁻²⁴.

CONCLUSION

Post-tracheostomy bleeding is not an uncommon problem; some bleeding occurred in about 10.5% of our cases. Most of the early bleeding events are mild and can be managed with medical care. Late bleeding can be caused by TIF, about 50-70% of which may be fatal. Prompt and effective TIF first aid is important for better outcomes and should be continued until a trained team of experienced cardiac surgeons and anesthetists arrives. Over inflation of the tracheostomy cuff, pressing innominate vessels against the manubrium, not to remove the tracheostomy tube, and proper blood replacement are the keys to successful initial TIF treatment. Tracheostomy should be removed only after all specimens have been prepared for examination, therefore flexible / rigid bronchoscopy should be attempted to determine the cause and location of the bleeding.

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