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Complications of Tracheostomy in Otolaryngology Practice in Iraq Hospitals

Dr. Mohammed Khalid Abdulatef[1]

Dr. Ali Mohammed Khalaf[2]

Dr. Ali Khames Sarhan[3]

Abstract

Background: Tracheostomy may save the lives of individuals with blocked respirations. However, it is done more often on those people who are receiving long-term mechanical ventilation for respiratory failure associated with various pathological conditions. **Objective:** This study aimed to identify clinical outcomes of patients who underwent tracheostomy. **Patients and methods:** A cross-sectional study was conducted on 80 patients who underwent tracheostomy; their ages ranged from 10 to 60 years. Clinical and diagnostic data were collected for patients from different hospitals in Iraq for a period that lasted from March 12, 2022, to August 9, 2023. **Results:** Our findings enrolled clinical and surgical data, which found patients with age (41 - 50) years was highest and include 23 cases, where males were more, which had 44 cases compared with males had 36 cases, and the rate of comorbidities was 56 cases, smokers were 40 cases, the operative period was 56.38 ± 7. 93 min, which 44 cases of patients were conducted surgery under local anaesthesia, while 36 cases of patients were conducted surgery under general anaesthesia, Skin incision included Horizontal with 76 cases, Tracheal incision, which had Under thyroid isthmus was 90% of patients, Shape (I or H) of tracheal incision included 74 cases, Cannula material of metallic was 65% cases and cannula material of plastic was 35% cases, Length of stay in the hospital, days was 9. 74 ± 4.80 days, ICU admission was 24 cases, rate of patients had bleeding during surgery included 12 cases, rate of complications was 35%, and infection was most factor prevalence in the patients included 10 cases. **Conclusion:** Tracheostomy is a crucial life-saving procedure, particularly for children, addressing breathing issues and significantly affecting their overall well-being and outcomes.

Key words: Tracheostomy; Hospitalization time, Complications; Otolaryngology; and Symptoms.

[1] M.B.Ch.B., F.I.C.M.S. \ (ENT-Otolaryngology)

Iraqi Ministry of Health, Babylon Health Directorate, Al-Esxandaria Hospital, Babylon, Iraq.

Mohakh20@gmail.com

[2] M.B.Ch.B., C.A.B.M.S. \ (ENT-Otolaryngology)

Iraqi Ministry of Health, Al-Anbar Health Directorate, Al-Faluja Teaching Hospital, Al-Anbar, Iraq.

Khalaf.mohammed.ali.71@gmail.com

[3] M.B.Ch.B., F.I.C.M.S. \ (ENT-Otolaryngology)
Iraqi Ministry of Health, Al-Anbar Health Directorate, Al-Faluja Teaching Hospital, Al-Anbar, Iraq.
dr.alikhames@gmail.com

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Introduction

A tracheotomy can help anyone who has trouble breathing via their nose and mouth to survive. It is mostly carried out on patients who need continuous support with a ventilator since they are unable to breathe on their own because of various lung diseases [1]. By inserting a tube known as a cannula, a tracheotomy creates an opening within the windpipe, which can be left open or allowed to shut [2]. It is a crucial treatment in treating or preventing ear, nose, as well as throat ailments that might develop in respiratory emergencies. [3]

The procedure is well documented; documents from Guy de CHAULIAC (1300–1368), a French monk, date back to 3600 BC in Egypt [4]. Jackson was the one who systematized the procedure that is today known as surgical tracheotomy. The advent of endoscopy and the expansion of its uses in intensive care units have made less invasive methods—namely, percutaneous approaches—possible. [5]

Depending on the location, performing tracheotomy procedures presents different challenges. Poverty rates are often lower in sub-Saharan Africa [6], but there is also a shortage of otolaryngologists, who typically reside in towns and cities. In addition to being few in number, the majority of healthcare facilities are also often found in metropolitan regions [7,2,5,8]. This can involve minor concerns, including the development of granulation tissues, or it could entail perforations in the patient's windpipe, causing serious bleeding that ultimately results in death. Another possibility is the full closure of the patient's airway. [9,10]

Furthermore, the case mix can often be so challenging that patients who need continuous mechanical breathing suffer greatly, and even of the underlying illness, there is typically a large death rate [11].

Information about mortality and complication rates following tracheotomy would therefore be pertinent to otolaryngologists, if not for all physicians in the near future while offering advice regarding the surgery [8,4,12]. Determining baseline measures for the process for developing subsequent quality improvement projects could benefit from this knowledge. [13]

Any investigation of the challenges associated with tracheotomy in a single institution had at least three drawbacks. One reason is that the incidence of issues may not be adequate to provide substantial statistical significance, even in environments with high tracheotomy surgery rates. In addition, examinations conducted by a specific institution are unable to identify regional variations. In single-institution research, publication bias is always a concern since poor performers typically do not disclose. [14

A report regarding tracheotomy problems in 1130 patients treated in one institution during a ten-year period was published by Goldenberg et al. They were able to delineate the primary problems and mortality caused by tracheotomy; nevertheless, this extensive retrospective case series had to be subjected to a descriptive analysis in the absence of any more robust statistical techniques. [15]

Patients and methods

A cross-sectional study was made in the Department of Otorhinolaryngology and Head and Neck Surgery at different hospitals in Iraq. It was based on the tracheotomies done from 2021 including the year 2021. Over an age range of 10-60 years, we had patient data from 80 cases in different hospitals in Iraq.

The inclusion criteria of our study encompassed all tracheotomies conducted in hospitals located in different hospitals in Iraq. Tracheotomy is carried out by a Senior or Resident Physician in the ENT department in different hospitals in Iraq. In addition, a comprehensive surgical report will be provided, including the kinds of tracheal and cutaneous incisions as well as the cannula type.

In contrast, patients who were lost to follow-up and incomplete data were included as exclusion criteria in our study. For scheduled tracheotomies, a pre-operative assessment involving a frontal chest X-ray, blood type, prothrombin, and cephalin time was necessary. There was no need for a preoperative test in emergency situations.

Patients scheduled for surgery or hospitalized during operating hours had tracheotomies done at the ENT department operation room. Tracheostomies were carried out at the emergency department's operating room during on-call hours.

Pre-medication for patients with upper obstructive dyspnea included corticosteroid treatment, pre-oxygenation, and prophylactic antibiotic therapy (amoxicillin + clavulanic acid and ceftriaxone). The dosage of corticosteroid treatment was given as a bolus, renewable every 15 to 30 minutes, at a rate of 1 to 10 mg/kg. Surgery was recommended if the dyspnea persisted. In order to complete the surgery in ideal conditions, the patient managed to be oxygenated, cleaned, and disinfiltrated thanks to these parenteral therapies.

The ENT department physicians recorded follow-up visits of all patients in their records. After the emergency was handled, the cause of the dyspnea and the suitable course of therapy were looked into. When a patient had a tumor, a CT scan identified the tumor's location and extent, and a histological examination determined the type of tumor.

Patients were considered cured when they were breathing properly and had trouble-free decanulation. Failed patients were individuals whose etiological therapy precluded an improvement or who were incapable to sustain decanulation.

The following parameters were examined: age, gender, whether the intervention was planned or emergency, indications, involved pathologies, type of anesthesia, tracheal and cutaneous incisions, types of cannulas, specific postoperative courses in tracheotomy with procedure-related complications, and time

before decanulation. The study concentrated upon the number for tracheotomies since some patients had several operations; the totals were determined for the features for each surgery as opposed to the total number of patients.

Results

Table 1: Identify the demographic and basic characteristics of patients.

Characteristics	*Number of patients [80]*	*Percentage [%]*
Age, years		
10 – 20	9	11.25%
21 – 30	14	17.5%
31 – 40	20	25%
41 – 50	23	28.75%
51 – 60	14	17.5%
Gender		
Male	44	55%
female	36	45%
BMI, [Kg/m2]		
Underweight	12	15%
Normal weight	20	25%
Overweight	32	40%
Obesity	16	20%
Comorbidities		
Yes	56	70%
No	24	30%
Hypertension	44	55%
Diabetes	24	30%

Anemia	12	15%
Heart failure	16	20%
Cardiovascular diseases	20	25%
Smoking status		
Smokers	40	50%
Non - smokers	40	50%
ASA classification		
I	12	15%
II	24	30%
III	40	50%
IV	4	5%
Education status		
Not in the school	6	7.5%
Primary	10	12.5%
Secondary	11	13.75%
College/university	20	25%
Post - graduated	33	41.25%
Working status		
Workers	28	35%
Non – workers	52	65%
Monthly income, $		
< 600	32	40%
600 – 800	28	35%

> 800	20	25%

Table 2: Determining causes and types related to patients who underwent tracheostomy.

Characteristics	**Number of patients [80]**	**Percentage [%]**
Tumors	**40**	**50%**
Larynx	30	37.5%
Mandible	3	3.75%
Hypopharynx	6	7.5%
Cavum	8	10%
Oropharynx	3	3.75%
Traumatismes	**24**	**30%**
Larynx foreign bodies	16	20%
Face	5	6.25%
Laryngotracheal injury	3	3.75%
Infections	**16**	**20%**
Cervical cellulitis	10	12.5%
Laryngitis	6	7.5%

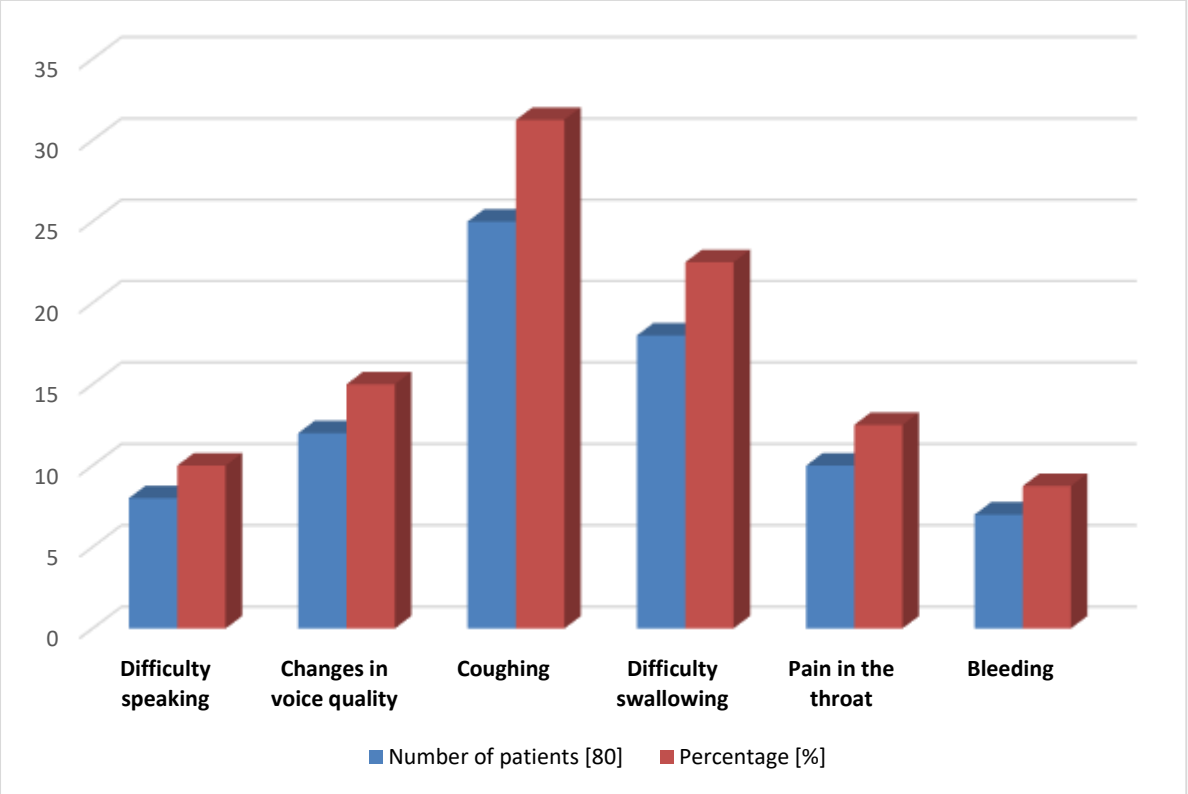

Figure 1: Distribution of the main symptoms prevalent in the patients who underwent tracheostomy.

Table 3: Identify clinical findings of surgical techniques related to tracheostomy.

Variables	**Number of patients [n = 80]**	**Percentage [%]**
Operative period, min, (mean ± SD)	56.38 ± 7.93	
Anesthesia		
Local	44	55%
General	36	45%
Skin incision		
Horizontal	76	95%
Vertical	4	5%
Tracheal incision		
Under thyroid isthmus	72	90%

Sus-isthmic	6	7.5%
Trans-isthmic	2	2.5%
Shape of tracheal incision		
I or H	74	92.5%
U	6	7.5%
Cannula material		
Metallic	52	65%
Plastic	28	35%
Type of cannula		
Complete	50	62.5%
Incomplete	30	37.5%
Length of stay in hospital, days	9.74 ± 4.80	
ICU, N [%]		
Yes	24	30%
No	56	70%
Bleeding, N [%]		
Yes	12	15%
No	68	85%
Death cases, N [%]		
Yes	0	0%
No	80	100%

Table 4: Determine the complications prevalence in the patients after tracheostomy surgery.

Complications	**Number of patients [80]**	**Percentage [%]**
Infection at the tracheostomy site	10	12.5%
Bleeding	3	3.75%
Blockage of the tracheostomy tube	1	1.25%
Displacement of the tube	2	2.5%
Difficulty speaking or swallowing	4	5%
Pneumothorax	3	3.75%
Tracheal stenosis	2	2.5%
Tracheoesophageal fistula	3	3.75%
Total	**28**	**35%**

Table 5: Assessment of quality of life for patients who underwent tracheostomy surgery by TQOLQ scale.

Items	***TQOLQ scale***
Physical functioning	98.75 ± 12.80
Interpersonal relationships	88.76 ± 9.66
Psychological well-being	104.60 ± 10.55
Respiratory symptoms	84.86 ± 8.09

Discussion

This study comprehensively evaluated a large population of patients who underwent tracheotomy to examine factors that make in-hospital mortality following this procedure more likely. Perhaps the most striking finding is that, on a national basis, almost 20% of all adult patients who undergo tracheotomy will not survive to discharge. [17]

Helping care providers counsel patients and families requires identifying those patients that have a high chances of dying when they are still in the hospital; this would as well give an indication into why they tend to pass away more often, hence paving the way into intervening specifically at some point. [18]

It is rarely the case that tracheotomy directly causes death because, in these cases, it is much more likely that people would survive [19]. Clearly, this observation aligns with their own observations because the majority of those who die with tracheotomy eventually die from their primary illnesses and not its complications. Our investigation revealed that the most serious risk factors for in-hospital death were individuals aged over 50 years, all patients who presented with heart conditions and suffered from pneumonia, especially those of them who were on public insurance [20]. Meanwhile, there were also factors contributing to decreased prevalence rates among patients, such as chronic obstructive pulmonary diseases (CPODs), disorders related to neurology like stroke or tumors in the brain, etc., high-impact injuries like gunshot wounds or car accidents—even though they could still pose great danger to life depending on the conditions surrounding them e.g., collapsed lungs since air could not get into other parts of the body including brain; moreover, there were others such as asthma, upper airway infections etc. [21,22]

Ideally, two variables should be considered independently through Multivariate Analysis. However, most Americans over 65 years are under public cover; as such, age may hardly separate itself from payer through multivariate analysis. There was an unprecedented finding here: in-hospital mortality rates post tracheotomy had huge regional variation, with the Midwest having 14.8% while the Northeast had 26.8%. [23,24]

The simplest explanation of this variation is that Northeastern hospitals are more likely to perform tracheotomies on patients who have more severe underlying illnesses, particularly CHF because both these data and clinical experience suggest strongly that mortality after tracheotomy is determined primarily by other underlying illnesses. [25]

It is impossible to foresee that a tracheostomy in individual patients will be futile a priori, but it is likely

that in retrospect, many patients and families who have tracheostomies and eventually die before discharge would regard the tracheostomy as ‘‘futile [26].’’ Despite being hard to gauge, another advantage of tracheotomy involves enhancing pulmonary cleanliness, comfort achieved upon extubating after use of an orotracheal tube and aiding weaning from a ventilator [27]. Tracheotomy supporters and their responsibilities are very important as far as chances of their success are concerned. These are useful in advising adult patients on their rate of survival to discharge after undergoing tracheotomy. [28]

Conclusion

Tracheostomy is a therapeutic procedure of survival whose usefulness and effectiveness are certain. It is necessary to know how to perform it cold in order to save human lives, especially children. In general, a tracheostomy is a life-saving procedure that caters for breathing problems and significantly influences the well-being and overall outcomes of this group of patients.

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