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# **Indications of tracheostomy in patients who attend Baquba teaching hospital in Diyala, Iraq**

**Submitted to the Council of the College of Medicine, Diyala University, In Partial Fulfillment of Requirements for the Bachelor Degree in medicine and general surgery.**

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## **Abstract**

**Definition:** Tracheostomy is term used to describe the surgical opening of the trachea. It is one of the most frequently performed surgical procedures in medical practice. As many as 10% of patients requiring at least 3 days of mechanical ventilation will eventually receive a tracheostomy for prolonged mechanical ventilation or airway support.

**Objectives:** The main objectives were to identify the main indications of tracheostomy in Baquba teaching hospital

**Patients and methods:** Cross sectional study was conducted and 100 patients with tracheostomy was collected in the period from august 2021 to December 2022 in Baquba teaching hospital. We chose them randomly and with age groups from 12 to 95 years.

**Results:** The most common indications of trechestomy are:

1-Prolonged ventilation (70%) due to

- ❖ Trauma (71.5%) : head injury , chest injury and bullet injury in neck and chest.
- ❖ Tumors (13%): brain tumor
- ❖ Viral (1.5%): Guillain-Barre syndrome
- ❖ Systemic disease (18.5%): CVA, IVH

2-Upper airway obstruction due to (25%):

- ❖ Tumors (40%%): Ca thyroid , Ca larynx , Ca pharynx , Ca oropharyngeal parapharyngeal ca.
- ❖ Trauma (60%%): RTA , surgical (vocal cord paralysis), and bullet injury to neck

3-Part of another procedures (5%):

- ❖ Maxillofacial Trauma

**Conclusion:** the most common indication for tracheostomy in Baquba teaching hospital was prolonged ventilation due to trauma, upper airway obstruction and other procedures.

**Keywords:** tracheostomy, indication

## **Introduction**

Tracheostomy has been described since the Medieval Ages and Johannes Scultetus (1595–1645) quotes tracheostomy in his book “Armamentarium Chirurgicum” as a lifesaving intervention in cases of respiratory distress [1]. Some historical sources, report the origins of tracheostomy as early as 100 BC. However, this procedure became common since approximately the middle of the nineteenth century when doctors became increasingly open-minded towards the procedure as a means of providing immediate relief to patients with acute laryngeal obstruction, the majority of cases at that time being related to diphtheria [2,3].

Tracheostomy is a surgical procedure by which a stoma between skin and trachea is performed to relief upper airway obstruction<sup>1</sup>, this procedure is one of the oldest lifesaving operations that was performed according to many indication: now a days new technique developed to be performed in many centers with percutaneous dilatation tracheostomy<sup>1</sup>. In our hospital (Baquba Teaching Hospital) traditional tracheostomies routinely performed for various indications in different sex and age groups [4].

Patients experience discomfort with persistent translaryngeal intubation and are more comfortable following tracheostomy. Improved patient comfort and less requirement for sedation have been reported in several studies following placement of a tracheostomy Besides protecting the laryngeal injuries, tracheostomy may shorten the duration of mechanical ventilation because of reduced work of

breathing,6 the need for less sedation and analgesia, or because once a secure airway is in place clinician weaning behavior changes [5,6].



**Figure 1. components of stander tracheostomy tube**

Predicting who will need a tracheostomy and when to operate is a fair illustration of the art and science of intensive care medicine. Historically, tracheostomy has been performed on patients requiring prolonged mechanical ventilation to prevent the occurrence of tracheal scarring. Different benefits are evident in the current ICU era. Tracheostomy is felt to be more comfortable with a decreased risk of self-extubation and decreased sedation requirements [7].

Tracheostomy also removes the risk of damage to the endotracheal tube itself, which exposes the patient to the risk of endotracheal tube change. The shorter, inflexible tracheostomy tube results in more favorable airway dynamics compared to the longer, more torturous endotracheal tube, resulting in diminished work of breathing for the patient. Multiple studies have also demonstrated lower incidence of ventilator associated pneumonia (VAP) with tracheostomy [8].

Tracheostomy is a frequent adjunct in the trauma ICU. Two populations of patients primarily require this intervention – those suffering significant traumatic brain injuries and those sustaining chest wall and pulmonary injuries. The limited body of literature focusing specifically on the trauma population does little to define the best time to perform the procedure [9].

## **Aim of study**

To demonstrate the indications of tracheostomy in patients attending Baquba teaching hospital in Diyala governorate.

## **Patients and methods**

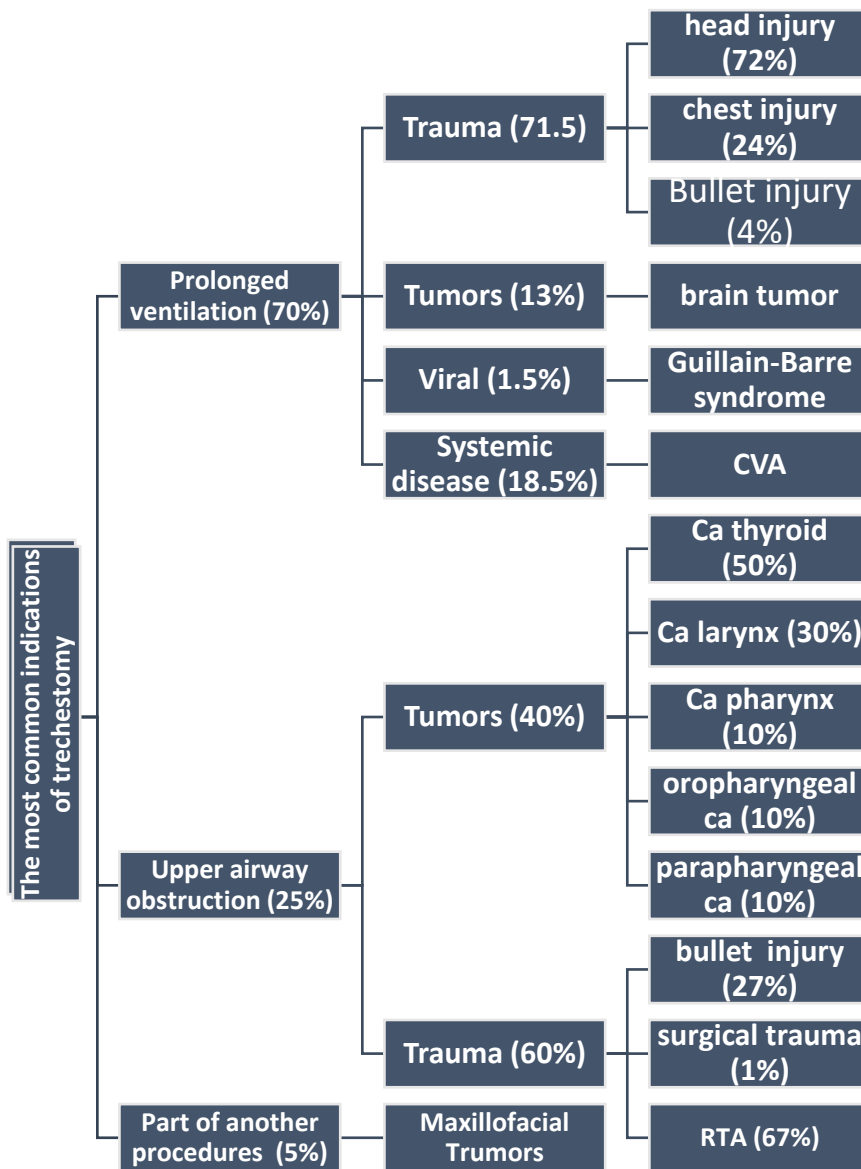
Cross sectional study total 100 patients from different age groups ranging from 10 to 90 years who underwent tracheostomy in Baquba Teaching Hospital from the period from August 2021 to December 2022 were included in the study. Data concerning patient age, indication of the operation were collected. Analysis of data was performed using Microsoft office Excel 2013 computer system and SPSS software. Chi square was used to identify the association between variables when  $P < 0.05$  considered significant. All surgical procedures done either in the operative theater at the otolaryngology department, respiratory care unit or in the emergency department. All patients were followed up and observed for the nursing care of the tracheostomy. The ages of the patients divided in to three main groups. First group ranging from 10-30 years, second group ranging from 30-40 years, while the third group ranging from 41-100 years.

## Results

100 patients were enrolled in this study, we choose the sample randomly and we divided the sample into 3 age groups as in table 1.

Table 1. age groups.

Age groups	Frequency	Percent
[12-30]	32	32%
[31-40]	19	19%
[41-100]	49	49%
Total	100	100%



The most common indications of trechestomy in figure2

The causes of prolonged ventilation are demonstrated in table 2.

**Table 2. The indications of tracheostomy in prolonged ventilation.**

<b>Causes</b>	<b>Frequency</b>	<b>Percentage</b>
Trauma	50	71.5%
Tumors (Brain tumor)	9	13%
Systemic diseases ( CVA )	13	18.5
Viral (Guillain-Barre syndrome)	1	1.5%
Total	70	100%

The types of traumas due to prolonged ventilation are enlisted in table 3.

**Table 3. types of trauma**

<b>Causes</b>	<b>Frequency</b>	<b>Percentage</b>
Head injuries	36	72%
Bullet injuries	12	24%
Chest injuries	2	4%
Total	50	100%



The types and sites of tumors That causes the upper airway obstruction are enlisted in table 4.

**Table 4. types and sites of tumors**

<b>Causes</b>	<b>Frequency</b>	<b>Percentage</b>
CA larynx	5	50%
CA thyroid	2	20%
Ca pharynx	1	10%
oropharyngeal tumor	1	10%
Parapharyngeal ca	1	10%
Total	10	100%

The types of traumas that causes upper airway obstruction are enlisted in table 5

<b>Causes</b>	<b>Frequency</b>	<b>Percentage</b>
Bullet injury	4	27%
Surgical trauma (vocal cord paralysis)	1	6%
RTA	10	67%
Total	15	100%

Causes of part of another procedures are enlisted in table 6

<b>Causes</b>	<b>Frequency</b>	<b>Percentage</b>
Maxillofacial trauma	5	100%

The age groups distribution is demonstrated in the following table 7.

**Table 7. age group distributions**

Causes	Age groups				Significance
	12-30 years	30-40 years	41-100 years	Total	
Prolonged ventilation	25	9	35	70	0.001
Upper airway obstruction	5	6	14	25	0.001
Part of another procedures	2	3	0	5	0.237

## Discussion

Tracheostomy can facilitate weaning in long-term ventilated patients, potentially shortening the duration of mechanical ventilation and intensive care unit (ICU) stay, and reducing complications from prolonged tracheal intubation, such as ventilator-associated pneumonia (VAP) and tracheal lesions [10].

In our study we found that the majority of tracheostomized patients are due to prolonged ventilation (70%) and this due to a higher rate of extubation failure and the need for prolonged protection of the airways secondary to neurological injury. In general RCU patients, tracheostomy is most commonly performed after 14 days from admission [11]. There was significant association between incidents of head injuries and tracheostomy insertion ( $P < 0.05$ ).

Penetrating tracheal injuries are rare but potentially life-threatening injuries. Laryngotracheal injuries have a combined incidence of 10% among patients with penetrating neck trauma [12]. In our study, there were 25% of the patients with trauma which included bullet injuries, chest injuries and road traffic accidents.

Penetrating tracheal injuries present with varying symptoms depending on the severity of the injury and any associated injuries, primarily vascular or esophageal. Early recognition and management are required to avoid adverse outcomes resulting from airway compromise [13].

Carcinoma of the larynx is the most common noncutaneous cancer of the head and neck. The probability of cure is excellent in early-stage disease, but suboptimal in locally advanced presentations. In our study there were 11% with tracheostomy and this is mainly due to impending threat to the airway, usually in the presence of bulky laryngeal disease, cord fixation, or both. Most procedures are performed on a semielective basis. Urgent procedures are reserved for patients with severe inspiratory stridor. On occasion, radiation-induced laryngeal edema may reduce the caliber of an already compromised airway and precipitate urgent intervention [14].

The need to tracheostomize a patient with ischemic or hemorrhagic stroke results from the patient's prolonged inability to breath and/or protect his airway sufficiently. This can be caused by various types of stroke, such as severe acute ischemic stroke (AIS, eg, large hemispheric stroke, space-occupying cerebellar stroke, basilar thrombosis or embolism with brainstem infarction), large or brainstem intracerebral hemorrhage (ICH), intraventricular hemorrhage, severe cerebral sinus venous thrombosis, and subarachnoid hemorrhage (SAH) [15]. 9% of the patients in our study have CVA and this mainly due to ICU admission to minimize the VAP as much as possible. There was strong association between the age group and the insertion of tracheostomy ( $P < 0.001$ ) in the old age group (41-100 years).

In current study, the common cause of tracheostomy to be performed as a part of other procedure was due to trauma which included neck and maxillofacial

trauma in them tracheostomy performed to protect the airway from edema either due to trauma or due to postoperative swelling, also to avoid aspiration of blood and to provide clear surgical field for maxillofacial surgeon. In those we suspected difficult intubation and post operative aspiration due to full stomach so securing of airway is mandatory pre- and postoperative and this is consistent with the findings of Hadi et al [16].

These results disagree with other studies like, (A. Allam Choudhury et al, 2008) which reported that most common cause of airway obstruction was tumor of the neck (80%), commonly the laryngeal carcinoma which found in 53.33%, while the 2nd common cause of airway obstruction was trauma, which different from current result, that road traffic accident was the common cause of trauma [17].

In the past, tracheostomy was the most common procedure performed in patients with bilateral vocal cord to establish a secure airway. It provides the greatest airway diameter and maintains the laryngeal structure, so it is potentially reversible without long-term sequelae. Although tracheostomy remains the standard in settings of glottic obstruction, it is associated with significant chronic care burden, cost, psychosocial impairment, and increased mortality. Patients experienced a reduced quality of life and must undergo continuous management of their tracheostomies, which can be particularly undesirable in children [18]. In our study, 5% of the cases suffered bilateral vocal cord paralysis for therapeutic reasons and this agree with the study of Salik et al [19].

## **Conclusion and recommendations**

The most common indication for tracheostomy was trauma and then carcinoma of larynx and prolonged bedridden ICU patients. We recommend conducting more studies about the specific role of tracheostomy and the comparison between the endotracheal intubation and tracheostomy.

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