
TRACHEOSTOMY: CROSS SECTIONAL STUDY OF INDICATIONS IN RELATION TO AGE GROUP IN AL-YARMOUK TEACHING HOSPITAL**Ammar Hadi Khammas*, Haider Wahab Al-Sarhan[@] & Abul-Hussein Kereem[#]**

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Tracheostomy is one of the oldest operations that performed as a life saving procedure and it is commonly performed in ENT Department in Al-Yarmouk Teaching Hospital for various indications and different age group.

This study designed to review the indications of tracheostomy and the age group commonly involved in AL-Yarmouk Teaching Hospital.

This is a cross sectional study in 150 patients in AL-Yarmouk Teaching Hospital for the period from August 2009 to September 2011. Cases involved in the study aged more than 10 years for whom tracheostomy was done in the AL-Yarmouk Hospital.

Upper airway obstruction was the most common indication for tracheostomy and mostly involved age group was 40-90 years. Airway obstruction caused by tumor, trauma and infection. Tracheostomy performed as a part of another procedure was the 2nd common indication and involved commonly age group 20-39 years. It was caused by trauma, tumor and difficult intubation. Prolonged ventilation was the 3rd common indication that involved mainly the age group 40-90 years. It caused by systemic medical illness, trauma, tumor and infections. Conclusion: Main indication was the upper airway obstruction. The age group 40-90 years most commonly involved.

Introduction

Tracheostomy is a surgical procedure by which a stoma between skin and trachea is performed to relief upper airway obstruction¹, this procedure is one of the oldest life saving operations that was performed according to many indication: now a days new technique developed to be performed in many centers with percutaneous dilatation tracheostomy¹. In our hospital (Al-Yarmouk Teaching Hospital) traditional tracheostomies routinely performed for various indications in different sex and age groups.

This study aimed to identify the indications of tracheostomy in relation to age group.

Patients and Methods

Total 150 patients from different age groups ranging from 10 to 90 years who underwent tracheostomy in Al-Yarmouk Teaching Hospital from the period from August 2009 to September 2011 were included in the study.

Data concerning patient age, indication of the operation were collected. Analysis of data was performed using Microsoft office Excel 2007 computer system.

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.

Data concerning indication of tracheostomy were collected and analyzed and divided to three main general categories which include airway obstruction (91 patients), part of other procedure with protection of airway (32 patients) and prolonged ventilation (27 patients).

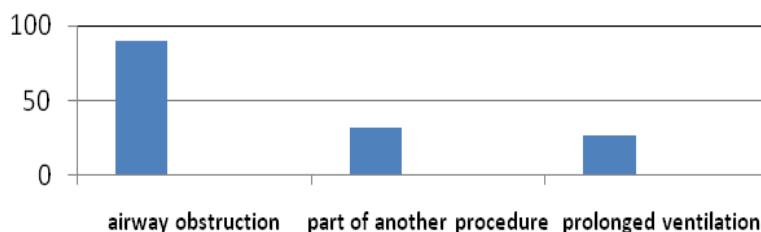
The ages of the patients divided in to three main groups. First group ranging from 10-19 years, second group ranging from 20-39 years, while the third group ranging from 40-90 years. Data concerning indications of each group were *P-value =0.026 (s)

analyzed. Exclusion criteria: Age less than 10 years of age tracheostomy done on other hospitals then referred to Al-Yarmok Teaching Hospital.

Results

Indications in general: Upper airway obstruction due to various causes was a cause in 91 patients (60.7%), prolonged ventilation and bronchial toilet was seen in 27 patients (18%), while as a part of another procedure with protection of airway was found in 32 patients (21.3%) as shown in figure 1.

Figure 1: Indications of tracheostomy.



Causes of upper airway obstruction: Tumor was a cause in 54 patients (59.34%), trauma was the second common

cause which occurred in 35 patients (38.46%), and infection was a cause in 2 patients (2.2%) as shown in table I.

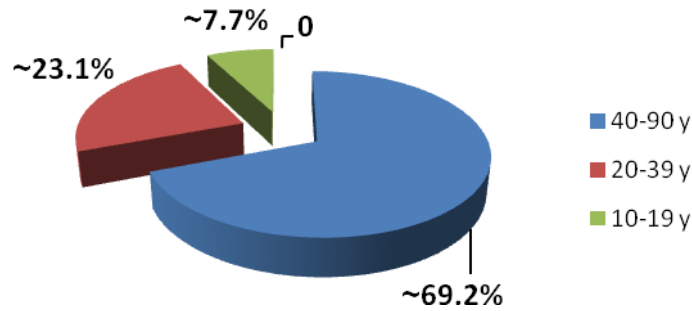
Table I: General causes of upper airway obstruction.

Cause of airway obstruction	NO. of patients	%
Tumor	54	59.34
Trauma	35	38.46
Infection	2	2.2
Total	91	100

Incidence of upper airway obstruction according to the age group: Upper airway obstruction was a cause for the tracheostomy in 63 patients (69.2%) who were aged from 40-90 years, while it was a cause in age group 20-39 years in 21

patients (23.1%), in age group 10-19 year it was a cause in 7 patients (7.7%) as in figure 2.

Table II, shows site of tumour that led to airway obstruction and their relations to age group.

Figure 2: Airway obstruction according to the age group.**Table II: The site of tumor**

Site of Tumor	NO. of patient	age group		
		10-19 y	20-39 y	40-90 y
nasopharyngeal mass	1			1
oropharyngeal mass	2			2
hypopharyngeal mass	2			2
laryngeal mass	44			44
Ca. thyroid	3			3
vocal cord granuloma	1			1
parapharyngeal mass	1		1	
Total	54		1	53

Table III, shows types of trauma that led to airway obstruction and their relations to age group.

Table IV, shows types of infection that led to airway obstruction and their relation to the age group.

Table III: The types of trauma

Types of trauma	No. of patients	Age group		
		10-19 y	20-39 y	40-90 y
blast and bullet inj.	14	1	9	4
Burn	5		4	1
RTA	2	1	1	
Foreign body in the larynx	2	2		
Surgical trauma				
oropharyngeal haematoma by N/G	1			1
Laryngeal edema due to laser cordectomy	3		1	2
bilateral vocal cord palsy post-thyroidectomy	8	2	5	1
Total	35	6	20	9

Table IV: The types of infection.

Types of infection	No. of patient	age group		
		10-19 y	20-39 y	40-90 y
diphtheria	1	1		
Ludwig's angina	1			1
Total	2	1		1

Tracheostomy as a part of another procedure with protection of airway was seen in the following conditions: Trauma was the dominant cause in 20 patients (62.5%), while difficult intubation occurred in 10 patients (31.2%); lastly tumour was a cause in 2 patients (6.3%) as in table V.

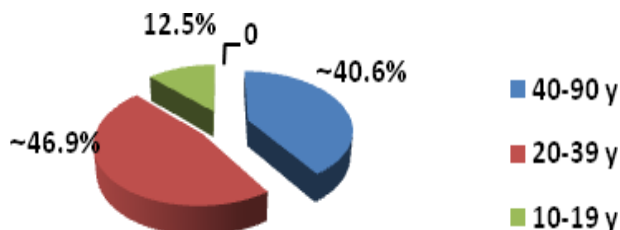
Table V: Causes of tracheostomy as a part of another procedure and protection of airway.

Cause	No. of patients	%
Trauma	20	62.5
Difficult intubation	10	31.2
Tumour	2	6.3
Total	32	100

Table VI: the cause of tracheostomy as a part of another procedure.

Causes	No. of patients	age group		
		10-19 y	20-39 y	40-90 y
Trauma				
Neck trauma	10	3	5	2
Maxillofacial trauma	10	1	7	2
Tumour				
total laryngectomy for ca.larynx	2			2
difficult intubation				
vallecular cyst	2		1	1
retropharyngeal abscess	1		1	
parapharyngeal mass	1			1
lingual thyroid	1		1	
laryngeal mass	3			3
difficult neck extension	2			2
Total	32	4	15	13

Incidence of the tracheostomy as a part of another procedure with protection of the airway according to the age group: Tracheostomy as a part of another procedure occurred in 13 patients (40.6%) in age group 40-90 years, while it occurred in 15 patients (46.9%) in age group 20-39 years, while in age group 10-19 years it occurred in 4 patients (12.5%) as demonstrated in figure 3.

Figure 3: Incidence as a part of another procedure according to the age group.

Causes of prolonged ventilation: Systemic medical diseases were the common causes of prolonged ventilation found in 16 patients (59.2%), Trauma was found in 5 cases (18.6%), tumour was found in 4 patients (14.8%), while infection found in 2 patients (7.4%) as in table VII.

Table VII: The cause of prolonged ventilation.

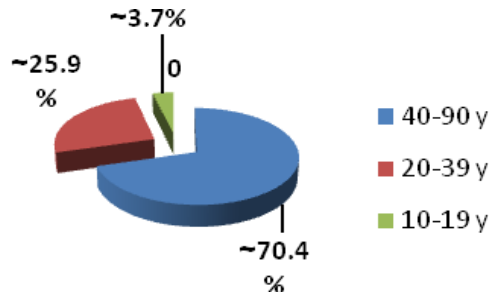
Cause of prolonged ventilation	No. of patients	%
Systemic medical diseases	16	59.2
Tumour	4	14.8
Trauma	5	18.6
Infection	2	7.4
Total	27	100

Table VIII, shows the causes of prolonged ventilation and their relation with age group.

Table VIII: The causes of prolonged ventilation

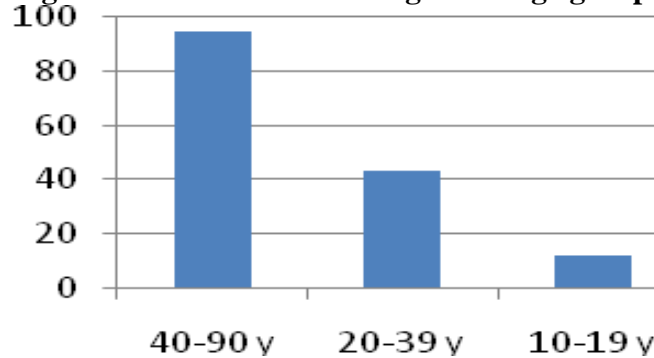
Causes	No. of patients	age group		
		10-19 y	20-39 y	40-90 y
Infection				
CNS infection	2		2	
Trauma				
Poisoning	2	1	1	
spinal cord inj.	3		2	1
Tumor				
brain mass	3		2	1
thyroid CA.	1			1
Systemic medical diseases				
heart failure and pulmonary edema	5			5
C.V.A	11			11
Total	27	1	7	19

Incidence of prolonged ventilation according to the age group: In age group 40-90 years the incidence was found in 19 patients (70.4%), while in age group 20-39 years was found in 7 patients (25.9%), the incidence was found in 1 patient (3.7%) in age group 10-19 years as demonstrated in figure 4.

Figure 4: Incidence of prolonged ventilation according to the age group.

Incidence of tracheostomy according to the age group: The incidence was more in patients aged from 40-90 years which occurred in 95 patients (63.3%); while in age group from 20-39 years occurred in

43 patients (28.7%), while the incidence was the least in age group from 10-19 years old which occurred in 12 patients (8%) as in figure 5.

Figure 5: Incidence according to the age group.

Chi square (X²) test was used to evaluate the significance of categories variables.

Discussion

Indication of tracheostomy: In current study, the upper airway obstruction was the main indication for the tracheostomy (60.7%); this is due to the high incidence of laryngeal tumor in which the patient presented in advanced stage, also the high incidence of blast injury during the period of study led to the upper airway obstruction to be a main cause. The 2nd common cause of tracheostomy was when it performed as a part of other procedure for protection of the airway or due to difficult intubation, it was found in 21.3%, while prolonged ventilation as a cause for the tracheostomy was found in 18%.this

results agreed with other study like, (Adeyi A Adoga, et al, 2009)² reported

that upper airway obstruction was the commonest cause of tracheostomy it found in 63% of his patients, (Kato et al, 1990)³ reported that airway obstruction was the predominant cause of tracheostomy found in 42%, Hussam, Rasheed, 1999⁴ also reported that upper airway obstruction was the commonest indication found in 72.5% followed by tracheostomy for protection of airway in 22.5% and lastly for prolonged ventilation in 5%. Garap, J P et al, 1999⁵ Reported that "the mechanical airway obstruction is the commonest cause of tracheostomy,

followed by prolonged ventilation and lastly for protection of airway". The main cause for upper airway obstruction, in current study, was upper airodigestive tumor (59.34%), commonly at the larynx (48.35%), because the laryngeal carcinoma is the most common head and neck cancer worldwide 6, those patients presented as emergency with stridor due to advanced tumor.

Trauma was the 2nd common cause of airway obstruction 38.46%, it include extrinsic trauma and surgical trauma. Bullet and blast injuries were the commonest causes of trauma which found in 40% out of trauma, this fact due to the poor security condition during the period of the study.

These results compared with other studies like, (A. Allam Choudhury et al, 2008)⁷ 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.

Salman A A, et al., 2005⁸ reported that the commonest cause of airway obstruction was laryngeal growth found in 62.4%, while the 2nd common cause of airway obstruction was the infection 16%, followed by trauma which found in 12.5%, in his study he included all the age groups including children which led to high percentage of infection caused upper airway obstruction that led to tracheostomy. Nafi, Moyasser, 1997⁹ Reported that common cause of airway obstruction also was tumour 74.2%, mainly laryngeal tumor which occurred in 44%, while 2nd cause was trauma 12.8%, followed by infection 8.5%. Garap, J P et al, 1999⁴. Also reported that the commonest cause of airway obstruction that led to tracheostomy was laryngeal tumour. Altman K W, et al, 2005¹⁰ reported that the common indication of a

wake tracheostomy was upper airway obstruction from malignancy of airodigestive tract in 80%.

In contrast to the current study, Japhet M Gilyoma et al, 2011¹¹ reported the commonest cause of airway obstruction was trauma 55.1%, followed by neoplastic diseases 39.3%. Amusa Y B, et al, 2004¹² reported that the common cause of upper airway obstruction that led to tracheostomy was trauma 33%, followed by tumor 29.5% in which laryngeal tumor was common 20.4%, while infection was found in 27.2%.

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. Amir A Krausz et al, 2009¹³ Stated "In most cases, the patient undergoes surgery for maxillofacial trauma or for other, more severe, life-threatening injuries, and securing the airway is the first step in the introduction of general anaesthesia. In such patients, we anticipate difficult Endotracheal intubation and, often, also difficult mask ventilation. In addition, the patient is usually regarded as having a "full stomach" and has not been cleared of a C-spine injury, which may complicate airway management furthermore". So in the current study tracheostomy performed either preoperative or postoperative.

Other causes of tracheostomy were difficult intubation which due to either presence of pathology in upper airodigestive tract that obscuring the field for the larynx or due to difficult in the neck extension that made visualization of larynx difficult. Some of those cases

anticipated preoperatively, so tracheostomy was done under mask anaesthesia after failure of an attempt of intubation, while other, tracheostomy performed for them under local anaesthesia after history of failure of an attempt intubation by an expert anesthetist. Altman K W, et al, 2005⁹ Stated that a wake tracheostomy should consider in any patient with potential for difficult intubation. Hussam, Rasheed, 1999⁴ Reported that maxillofacial trauma was the commonest cause of tracheostomy performed for protection of airway, found in 66.7% of trauma.

Regarding tracheostomy for prolonged ventilation, current study showed that the main cause for assisted ventilation that required tracheostomy was systemic medical illness like cerebrovascular accident and pulmonary edema (59.2%), while other causes as follow, trauma (18.6%), tumor (14.8%), and infection (7.4%). A. Allam Choudhury et al, 2008⁷ reported that the common cause of assisted ventilation that led to tracheostomy was intracranial space occupying lesion (26.67%) and Head injury (26.67%); while C.V.A was the last. This result different from the current result due to the fact that AL-Yarmouk Hospital have no neurosurgical center with limited capacity of the respiratory care unite so cases that required neurosurgical management referred to other center. Hussam, Rasheed, 1999⁴ Reported that prolonged ventilation was due to respiratory failure from various medical diseases found in 50%, while spinal cord injury found in 50%.

The more common age group was 40-90 years (63.3%).which can be explained by high percentage of laryngeal tumor, which is commonly presented in the seventh decade of life⁶. Also high incidence of systemic medical diseases that may need prolonged ventilation and bronchial toilet,

which are mainly the diseases of the old age. This result agreed with other study like, (Salman A, 2005)⁸ who reported that "The age group of 51-60 years had the highest number of patients". A. Allam Choudhury et al, 2008) reported that the mean age group for elective and emergency tracheostomy was 45 years. In (Garap, J P et al, 1999)⁵ the age group 51-60 had the highest percentage of patients. Hussam, Rasheed, 1999⁴ Also his resulted agreed with the current result that the procedure performed commonly for those more than 50 years old.

This age group was commonly involved when tracheostomy was indicated in upper airway obstruction or prolonged ventilation, While the age group 20-39 years was the commonest age group for tracheostomy as a part of another procedure and protection of the airway and this due to high incidence of trauma that need tracheostomy, as a part of other procedure, also some benign diseases that made intubation difficult which required tracheostomy also involved the age group 20-39 years. This result agreed with Japhet M Gilyoma et al, 2011¹¹ who reported that "high incidence of traumatic causes of tracheostomy was found between the third and fourth decades of life ,while the 7th -8th decades of life recorded high incidence of laryngeal and other head and neck malignancy". So he reported that the majority of his patients were in the third decade of life which due to the fact that traumatic causes of tracheostomy were the common cause in his study.

Conclusion

- 1-The main indication of the tracheostomy is the upper airway obstruction.
- 2-The commonest age group that the tracheostomy performed for them was 40-90 years old.

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