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Clinical study of Tracheostomy in the intensive care unit in Babylon.

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Abstract

Background

The tracheostomy was done since the ancient Egypt, this is one of the oldest surgical procedures. It is indicated for relief of the upper airway obstruction, to assist ventilation, for removal of secretions, and as a part of another procedures.

Objectives

The study was designed to identify the indications, age distribution, and the rate of complications of tracheostomy in the intensive care unit in AL_Hilla general teaching hospital.

Patients and methods

A 63 patients were admitted to the I.C.U. of AL_Hilla general teaching hospital during the period from August 2009 to August 2010 for whom tracheostomy was performed, we categories them according to their age, gender, indications of admission to the I.C.U., and complications. And we follow them along their stay in the I.C.U.

Results

The age ranged from 2 – 84 years. Sixty two percent of patients were males, while thirty eight percent were females.The main indication for tracheostomy was for assisted ventilation.
The rate of complication was 53.9%, the commonest complication was primary bleeding (20.5%). Fifty seven percent of the studied patients were died, 40% were weaned and discharged successfully, three percent were discharged on their family responsibility.

Conclusion

The tracheostomy like any other surgical procedure has complications and meticulous attention to the scientific basis and careful dissection of the tissue planes will reduce the rate of these complications. The likely outcome of the admitted patients should be discussed with their families in regard to the tracheostomy while taking a consent.

Introduction

Tracheosomy is the term used to describe the surgical creation of a stoma at the skin surface which lead in to the trachea. It was performed in ancient Egypt, is one of the oldest surgical procedures[(1)] and included in many ancient medical texts.[(2)]

Tracheostomy derived from two Greek words " traxus" meaning rough and " stoma" meaning mouth is one of the oldest operations in surgery.[(3)]
at the beginning of twentieth century, the principles of the operation were described by Chevalier Jackson [(4)] and these remain the principles of the operation to the present day. In recent years, with the improvement in endotracheal tube technology, an increased number of upper airway emergencies can be managed with nasotracheal or orotracheal intubation, or percutaneous tracheostomy.

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Tracheostomy either temporary or permanent.

Effects

Tracheostomy may results in the following effects:

- Laryngeal bypass. All of the normal laryngeal functions are lost.
- A reduction in the respiratory dead space.
- A redundant area is created between the tracheal opening and the larynx in which the mucous tend to accumulate and then fall back in to the lungs.
- The filtration of the particulate matter and the humidification of the inspired air by the nasal mucosa is lost .
- An increased risk of infection.
- The tracheostomy tube will act as a foreign body causing local inflammation, and as it tend to move during swallowing and with normal neck movement, may cause abrasions along the length of the neck[5].

Indications of tracheostomy in the intensive care unit [6, 7]

indications for tracheostomy	I.C.U. patient group
Facilitate prolonged assisted ventilation	Coma • Major head injury • Cerebral bleed/ infarct/ lesion • encephalitis high spinal cord injury neuromuscular disorder • Guillain barre syndrome • Critical care polyneuropathy Chronic obsrective pulmonary disease.
Inability to prevent pulmonary aspiration	Posterior fossa, infratentorial lesions • Cerebellum, brain stem • Basilar/ posterior cerebral artery Cranial nerve dysfunction
Upper airway obstruction	Maxillofacial surgery or trauma Congenital malformation Facilitate upper cervical surgery Vocal cord paralysis.

PATIENTS AND METHOD

A. PATIENTS

A total of 63 patients (39 males and 24 females) their age ranging from (2 – 84) years (mean age 43 yrs) underwent tracheostomy procedures performed in the Department of Otolaryngology at AL- Hilla

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general teaching hospital in Babylon for the period from August 2009 to August 2010 on the patient whom admitted to the (16) beds I.C.U. those patients were admitted for different indications.

B. METHOD

The data concerning the patient's age, sex, indication, date of performing the tracheostomy, surgical technique, and the patient's outcome were collected and analyzed according to questionnaire formula.

In the current study , we perform all the procedures under general anaesthesia, and we elevate the thyroid isthmus rather than its division and ligation.we arrange these patients in to tables according to their age, sex, duration of endotracheal intubation prior to tracheostomy, indication of admission to the I.C.U., complications and the patient's outcome.We follow them along their stay in the I.C.U. for the adverse events related to the tracheostomy.

Results

Age distribution

In the current study, the commonest age ranged from < 10 years and between 16 to 30 years (30 patients). While the age above 70 years was the lowest incidence for tracheostomy.

<10 yrs	10-15 yrs	16-20 yrs	21-30 yrs	31-40 yrs	41-50 yrs	51-60 yrs	61-70 yrs	>70 yrs
10 16%	7 11%	10 16%	10 16%	5 8%	9 14%	6 9.5%	4 6.3%	2 3%

Sex distribution

In the current study, 39 patients were males, while the remaining 24 were females.

Number of patients	male	female
63	39 62%	24 38%

Indication of admission to the I.C.U. and the role of tracheostomy

In the current study, the majority of patients were admitted to the intensive care unit had head injury due to R.T.A. (31) patients (49%), bullet to the head were (9)patients (14%), the role of tracheostomy in those patients is to assist ventilation.

RTA Head injury	Bullet injury	Gullian barre	Brain tumour	Respiratory failure	Myasthenia gravis	Myxedematous coma	Fall from height	Brain abscess	Cervical spine fracture	Sub arachnoid haemorrhage	I.V.H.	Ludwigs' angina
31 49%	**9 14%**	**5 8%**	**4 6%**	**3 5%**	**2 3%**	**2 3%**	**2 3%**	**1 2%**	**1 2%**	**1 2%**	**1 2%**	**1 2%**

Duration of the endotracheal intubation prior to tracheostomy

In the current study, early tracheostomy (≤ 7 days)was performed in 57 patients (90.4 %), while late tracheostomy (> 7 days) was performed in the remaining 6 patients (9.6%).

	1	**3**	**4**	**5**	**6**	**7**	**8**	**10**	**13**	**14**	**15**

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Same day of admission	day	days	days	days	days	days	days	days	days	days	days
1 1.5%	2 3%	18 28.5%	17 27.5%	8 12.6%	3 5%	8 12.6%	1 1.5%	1 1.5%	1 1.5%	1 1.5%	2 3%

The outcome of patients In the current study, 25 patients discharged from the I.C.U. after successful weaning, 2 patients discharged on their families responsibility, while 36 patients were died from their initial diseases not from complications of tracheostomy.

Discharged Following weaning	Discharged on their family responsibility	died
25 40%	2 3%	36 57%

The complications of tracheostomy

The commonest complication in our study was primary haemorrhage which occurred in 13 patients (20.5%), ten of these bleedings are controlled at time of surgery (two of them from the thyroid isthmus), while three only required re exploration and ligation of the bleeding vessel (one patient), or division and ligation of the isthmus (two patients).

One patient (1.5%) had unilateral air entry managed by reducing the size of the tube. Cardiac arrest occurred only in one case (1.5%).

Intermediate complications including blockage of the tube occurred in (4) patients (6%), infection occurred in three patients (4.7%) , dislodgment of the tube occurred in two patients (3%), surgical emphysema occurred in two patients (3%), and dysphagia occurred in two patients (3%).As a late complication, difficult weaning or decannulation occurred in six patients (9.5%) managed with a much slower sequence of occlusion have been followed.

Complications of tracheostomy

In the current study, the incidence of early complication was 23.5%, intermediate complications was 19.7%, the late complication was 9.5%.

Early complication			intermediate					late
bleeding	Unilat. Air ntery	Cardiac arrest	infection	Dislodgment of tube	Blockage of the tube	dysphagia	Surgical emphysema	Difficult weaning
13 20.5%	1 1.5%	1 1.5%	3 4.7%	2 3%	4 6%	2 3%	2 3%	6 9.5%

Discussion

Age and sex distribution

In the current study, the tracheostomy was performed for the all age groups but mainly for those between (10 – 20) years old (17 case, 27%).

The mean age for the patients is 43 years, the youngest age is 2 years while the oldest age is 84 years. we found that 62% of tracheostomized patients were males, and 38% were females. While in a study of Aga Khan

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university hospital, Shahla Siddiqui et al, the everage age of patients was 50.6 +¨ 14 years which near our results, but inconsistent with our results in which 56% of their patients were females, 44% were males[8].

Indications of admission to the I.C.U.

The majority of our patients had a head injury either from RTA (31 patients, 49%) or bullet injury (9 patients, 14%), the main indication for tracheostomy was the need for assisted ventilation this is consistent with Shahla Saddiqui et al in that all their patients were admitted for assisted ventilation[8].

The Complications

In the current study the rate of complications was 53.9% this rate is consistent with the reported rate in the literature which quoted rate between (6 and 66%)[9].

Waldron et al. (1990) reported that overall complication rate was 25%[10] . Moreover, John et al. (1972) reported that the overall rate was 16%, the main causes of death were hemorrhage and displaced tube[11] .

Zeitouni and Kost (1994) reported that overall complication rate was 24% and no death from tracheostomy[12].

In the current study, the commonest complication was bleeding (20.5%), this is higher than the results of John et al. (1972) reported that the percentage of hemorrhage was 2%but it was the main complication of his study.[11]

Also in Waldron study (1990) reported that the main complication was chest infection (5%), and wound infection (3.5%)[10] while in the current study the hemorrhage represent the main complication.

Displaced tube occurred in 3% of patients , with no death, while in Moyasser et al. study (1997)[13], it happened in 2% of patients, in a study of John et al. (1972) reported that the complication rate of displaced tube was 1.5% and resulted in 7 deaths.[11]

Moreover, Waldron (1990) reported this complication in 2.6% of patients with no fatality[10]. Which near the current study results.

Wound infection occurred in 4.7%, this less than the results of Rasheed et al (1999)[14] whose quoted rate of wound infection of 25%, and les than the results of Moyasser et al. (1997)[13] which quoted rate of 10%.

While Dayal et al. (1985)[15] reported that 12% had tracheal site infection. These in comparision with Waldron (1990) reported that the rate of wound infection was 3.5%[10] which near the current study results .

Tube obstruction occurred in 6% of the studied patients, this is higher than the rate reported by John et al. (1972) which is 2%.[11]

Cardiac arrest occurred in one patient (1.5%) which occurred in a patient with cardiac and respiratory failure with a history of chronic obstructive airway diseases, but its lower than result of Rasheed et al.(1999)[14] which reported rate of death related to tracheostomy as 5% due to cardiac arrest.

Conclusion and recommendations

Conclusion

- The likely outcomes of patients who require long term ventilation should be discussed with patients and their families to assist them in making informed decisions.
- We found that the median age group was in the fourth decade with male predominance.
- The majority of the admitted patients had head injury due to RTA.
- The main indication of tracheostomy was for assisted ventilation.
- The main complication was primary haemorrhage, while the least complication was cardiac arrest.
- Fifty seven of the studied Patients were died either because of their advanced diseases or because of the development of the complications of their diseases.
- The tracheostomy like any other surgical procedure has complications and meticulous attention to the scientific bases and careful dissection of the tissue planes will reduce the rate of these complications

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Recommendations

- The division and ligation of the thyroid isthmus at the procedure if practiced routinely can reduce the rate of bleeding from the isthmus if it was elevated or retracted not divided.
- Comparison between early and late tracheostomy should be studied in favor of reduction the anaesthetic medication during admission to the I.C.U.

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