Evaluation of the Current Tracheostomy Indications in Medical City Complex

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ABSTRACT

Background: Tracheostomy continues to be a surgical procedure for the management of airway obstruction. It can be a life saving procedure when performed with appropriate indications and surgical expertise.

Objectives: To evaluate the current indications for tracheostomy at a Medical City Complex, Baghdad, Iraq.

Methods: This was a prospective study of (125) consecutive tracheostomies that were performed during a one year period from May 2006 through May 2007 in Medical City, Baghdad, Iraq.

Results: Ninety-three patients (74.4%) were males. Thirty-seven patients (29.6%) were in their third decade. Tracheostomy indications were upper airway obstruction in eighty-four patients (67.2%), assisted ventilation in twenty-two patients (17.6%) and for protection of the tracheobronchial tree in nineteen patients (15.2%). Upper airway obstruction was due to maxillofacial or neck injuries in forty-eight patients (57.1%), and laryngeal carcinoma in twenty-seven patients (32.1%).

Conclusion: The upper airway obstruction was the major indication for tracheostomy in our center with maxillofacial and neck injuries being the commonest cause.

Keywords: Tracheostomy, Upper airway obstruction, Indications.

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The term tracheotomy refers to the formation of a surgical opening in the trachea. It refers strictly to a temporary procedure. Tracheostomy on the other hand refers to the creation of a permanent stoma between the trachea and the cervical skin[1,2]. The two terms are often used interchangeably[3]. In this paper, the term tracheostomy will be used.

The basic indications for tracheostomy are to bypass upper airway obstruction, to assist respiration over prolonged periods, to assist with the clearance of lower respiratory tract secretions, and to prevent aspiration of oral or gastric secretions[4]. In last decades the number of cases requiring tracheostomy increased due to the development of new intensive care units, the increasing use of mechanical ventilation, and the increasing number of patients needing prolonged ventilatory support[5].

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The objective of this study is to evaluate the indication of tracheostomy in the Medical City Teaching Complex, Baghdad, Iraq.

Methods

A prospective study of patients who underwent tracheostomy due to different reasons at hospitals of Medical City Teaching Complex; Baghdad, Iraq, during one year period, from May 2006 to 2007.

A total of 125 patients were enrolled in this study. Information concerning patient's age, gender, and indications were recorded in a questionnaire proforma and arranged accordingly. Tracheostomized patients referred from other hospitals were excluded from this study. All tracheostomies were performed conventionally.

Results

One hundred and twenty five patients were included in the study (mean age 36.2 years). Most of the patients (52.8%) were

between the third and fourth decades of life and most (74.4%) were males, (Table 1).

The main indication for tracheostomy was upper airway obstruction in eighty-four patients (67.2%), (Table 2).

Trauma was the major cause of upper airway obstruction in forty-eight patients. Laryngeal carcinoma was the second cause of upper airway obstruction identified in twenty-seven patients (32.1%), (Table 3).

Out of twenty-two patients who required assisted ventilation due to various conditions, eight patients (36.5%) had head injuries and needed prolonged ventilation and six patients (27.3%) had Guillain-Barre syndrome, (Table 4).

Nine patients (47.3%) of nineteen with tracheostomy for tracheobronchial tree protection and toilet, had maxillofacial trauma requiring tracheostomy as an adjunct to surgery or due to difficult intubation while four patients (21.1%) needed tracheostomy prior to head and neck surgery (vocal cord polyp, fibrolipoma of hypopharynx, tongue carcinoma and tonsillar tumour, (Table 5).

According to table 6, the main indication for tracheostomy in children (≤ 14 years old) was assisted ventilation in nine patients (81.8%) out of eleven children included in the study. However, in patients between 15 to 49 years, upper airway obstruction accounted for fifty-three procedures (67.1%) out of seventy-nine tracheostomies done in this age groups with trauma being the commonest cause. Fifteen patients (19%) required tracheostomy for protection of tracheobronchial tree with the major cause being maxillofacial, head or spinal cord injuries. In patients above fifty years of age, upper airway obstruction was responsible for thirty procedures out of 35 tracheostomies in this age group (85.7%) and the main cause was laryngeal carcinoma.

Table 1: Age and gender incidence.

Variables	Patients' no. (%)
Age (year)	
<10	8(6.4)
10 – 19	6(4.8)
20 – 29	37(29.6)
30 – 39	29(23.2)
40 – 49	10(8)
50 – 59	11(8.8)
60 – 69	16(12.8)
≥70	8(6.4)
Gender	
Male	93(74.4)
Female	32(25.6)

Table 2: Indications for tracheostomy.

Indications	Patients' no. (%)
Upper airway obstruction	84(67.2)
Assisted ventilation	22(17.6)
Tracheobronchial tree protection and toilet	19(15.2)

Table 3: Causes of upper airway obstruction.

Causes	Patients' no. (%)
Trauma (neck, maxillofacial)	48(57.1)
Laryngeal carcinoma	27(32.1)
Hypopharyngeal tumour	4(4.8)
Oropharyngeal tumour	2(2.4)
Goiter	1(1.2)
Congenital subglottic stenosis	1(1.2)
Bilateral vocal cord palsy post-thyroidectomy	1(1.2)

Table 4: Causes of assisted ventilation.

Causes	Patients' no. (%)
Head injury	8(36.5)
Gullian-Barre syndrome	6(27.3)
Pneumonia	3(13.6)
Spinal cord injury	3(13.6)
Myasthenia gravis	1(4.5)
Flail chest	1(4.5)

Table 5 Causes of tracheobronchial tree protection and toilet

Causes	Patients' no. (%)
Maxillofacial trauma	9(47.3)
Head and neck surgery	4(21.1)
Head injury	3(15.8)
Spinal cord injury	3 (15.8)

Table 6: Distribution of tracheostomy indications according to age.

Age (years)	Upper airway obstruction	Assisted ventilation	Tracheobronchial tree protection	Total
	Patients' no. (%)	Patients' no. (%)	Patients' no. (%)	Patients' no. (%)
≤ 14	1(9.1)	9(81.8)	1(9.1)	11(8.8)
15-49	53(67.1)	11(13.9)	15(19)	79(63.2)
≥ 50	30(85.7)	2(5.7)	3(8.6)	35(28)
Total	84(67.2)	22(17.6)	19(15.2)	125

Discussion

Unfortunately, the war and violence in our country has increased the incidence of multiple body trauma including penetrating neck injuries and maxillofacial trauma and this may explain the large number of tracheostomies within one year's period.

In our study 52.8% of patients were young and in their third or fourth decade of life which is consistent with usual age of general trauma patients in that most of them are young, while in a similar study carried by Hussam et al at Basra province, Iraq in 1999, 50% of patients were above 50 years of age with laryngeal carcinoma being the commonest cause[6].

The most common indication for tracheostomy was to relieve upper airway obstruction in eighty four patients (67.2%), which is similar to Hussam et al[6] and Nafi et al[7] studies. This study showed that trauma was the major cause of upper airway obstruction in forty eight patients; thirty had neck injuries mainly penetrating shells or bullets associated with direct injury to larynx or trachea or a haematoma compressing the airway, while eighteen patients had maxillofacial trauma leading to impending airway obstruction.

Laryngotracheal trauma is a deadly spectrum of injuries with a mortality of around 26.8%. The most fundamental intervention for patients with

laryngotracheal injury is airway control by intubation or tracheostomy[8]. The oropharynx and nasopharynx are frequently compromised in severe maxillofacial trauma, posing an immediate threat to the airway from resulting deformity or from aspiration of teeth, dentures, bone or blood[9].

In comparison with similar studies done in our country during different periods there is a change in the trend regarding the causes of upper airway obstruction in which Hussam et al[6] and Nafi et al[7] reported that laryngeal carcinoma was the main cause of upper airway obstruction while in our study neck and maxillofacial injuries were the commonest cause, and this can be explained by the conditions in the country at present time.

Tracheostomy has become the method of choice in managing patients requiring long term mechanical ventilation[10]. In the present study assisted ventilation due to respiratory insufficiency was the second indication for tracheostomy in twenty two patients (17.6%). While in Wetmore et al series prolonged ventilation was the commonest indication for tracheostomy (53%)[11]. Hussam et al in their study stated that two patients had tracheostomy as an indication for prolonged assisted ventilation (5%), one case having spinal cord injury, the other respiratory failure[6].

In the present study seventeen tracheostomies (15.2%) were done for protection of the airway. Hussam et al reported that 22.5% of tracheostomies in their study were for tracheobronchial tree protection and toilet, six cases having maxillofacial trauma, and two other cases head and chest injury[6].

Indications for paediatric tracheostomy have changed; upper airway obstruction secondary to infectious diseases being no longer the commonest indication[12]. In the present study the main indication of tracheostomy in children was for assisted ventilation in 9 patients 81.8% out of 11 children in this study. Of these nine cases; six had Gullian-Barre syndrome and three had severe chest infection (pneumonia). These results were in contrast to similar studies done in our country previously in which Nafi et al reported that tracheostomies in children were mainly performed to relieve upper airway obstruction secondary to infectious diseases in 55% of cases and in 30%, tracheostomy was required for assisted ventilation[7]. Moreover, Parrilla et al stated that the most common indication for tracheostomy in children under 14 years old was prolonged ventilation due to respiratory problems and/or neuromuscular disease 44.7%[13]. Similarly, Putra SH et al reported that the main indication for tracheostomy was for prolonged ventilation 94.5% followed by pulmonary toilet 5.5% and none are performed for upper airway obstruction[12].

In the present study, upper airway obstruction was the main indication for tracheostomy for older patients due to different causes. In patients between 15 to 49 years upper airway obstruction accounted for 53 procedures out of 79 tracheostomies done in this age groups with trauma being the commonest cause. Meanwhile 15 patients (19%) needed tracheostomy for protection of tracheobronchial tree with the major cause being maxillofacial, head or spinal cord injuries. Amusa YB et al stated that the mean age of tracheostomy due to trauma in their series was 33.6 years[14].

In patients above fifty years, upper airway obstruction was responsible for thirty procedures (85.7%) out of 35 tracheostomies in this age group and the main cause was laryngeal carcinoma. All the patients with carcinoma of the larynx in this study were above fifty years old.

In conclusion; tracheostomy was performed particularly for young adult patients. Upper airway obstruction was the major indication for tracheostomy. Neck injuries, with or without laryngotracheal injury and maxillofacial injuries were the commonest cause of upper airway obstruction at the present time.

Most of the paediatric tracheostomies were performed for assisted ventilation due to respiratory problems and/or neuromuscular diseases.

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