Perception, feedback regarding post-surgical complications of tracheostomy

Ali Maeed Suliman Al-Shehri (1)
Alaa Abdulrahman H Alshehri(2)
Wajd Abdulwahab Saeed Almathami (2)
Zoha Saleh A Alghamdi (2)
Afnan Sultan M Alshehri (2)
Azza Mofareh Obaid Almarir (2)
Raghad Abdullah Y Asiri (2)
Rehab Saleh M Al doban (2)
Shuruq Zafer A Alshehri (2)

(1) Principal Investigator, Department of ENT, College of Medicine, King Khalid University, Abha, Kingdom of Saudi Arabia
(2) Department of Surgery, College of Medicine, King Khalid University, Abha, Kingdom of Saudi Arabia

Corresponding author:
Ali Maeed Suliman Al-Shehri
Department of ENT, College of Medicine King Khalid University
P.O. Box 641, Abha Kingdom of Saudi Arabia
Email: amsalshehri@kku.edu.sa

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Abstract

Introduction: The standard treatment for managing long-term ventilator-dependent patients is still tracheostomy. Lower airway resistance, smaller dead space, less tube movement inside the trachea, greater patient comfort, and more effective suction are all benefits over endotracheal intubation.

Methods: In this cross sectional study, data was collected from the purposely constructed questionnaire. The questionnaire was composed of demographical data and questions related to the tracheostomy; ethical approval was obtained, and consent from the respondents was taken, The questionnaire was anonymous and was constructed by the panel of experts including subject specialist, researchers and language specialist.

Results: Out of a total 70 patients who underwent tracheostomy, 35% were male while 65% were females, mean (SD) of age was 48.5 (10.2). Table 1 depicts that 33% have no pain while 26% have mild pain, 20% moderate pain , and 11 (10 %) have severe pain controlled by narcotics and medication respectively. 29% have not noticed any change in their appearance.

Conclusion: We conclude that tracheotomy may be successfully conducted in this group of patients and that it provides significant practical and psychological benefits over other options.

Key words: Tracheostomy, patients, surgery, practical, tube

Introduction

The standard treatment for managing long-term ventilator-dependent patients is still tracheostomy. Lower airway resistance, smaller dead space, less tube movement inside the trachea, greater patient comfort, and more effective suction are all benefits over endotracheal intubation [1, 2]. Despite the debate about when to perform tracheostomy in critically ill patients, prospective studies indicate that early tracheostomy can be beneficial [3]. In the absence of clear evidence based on randomised controlled trials, the decision to place a tracheostomy is taken on the basis of the procedure's advantages versus risks. Tracheostomy has been linked to severe side effects such as tracheal stenosis, bacterial invasion, and fatal hemorrhage [4,5]. Many of the complications and benefits of tracheostomy remain unknown when it comes to morbidly obese patients.

In chronically ill morbidly obese patients, several reports have contrasted the protection and complications of percutaneous tracheostomy to open tracheostomy [6,7]. Increased complications to a similar safety profile have all been reported in these studies.

In intensive care units (ICUs) all over the world, surgical and percutaneous tracheostomy tube placement has become standard procedure. Percutaneous tracheostomy was first identified in 1957, but it gained prominence in the 1990s, leading to the publication of the first blinded randomised trial comparing PCT versus surgical tracheostomy in 1999 [1]. Tracheostomy is generally regarded as a mild operation with few complications [2, 3]. In the United Arab Emirates, however, we found that ICU treatment was provided to patients who were older, less functional, and had more comorbidities than those who had been studied in western studies.

The main Aim of the Study: To find out the Perceptions and obtain feedback regarding post-surgical complications of tracheostomy. The study had some Specific Objectives: One of the goals of this study was to determine tracheostomy complications; to gather feedback regarding the post-surgical complications of tracheostomy; to correlate the findings with gender; to find out the duration of the stay of the patients who underwent tracheostomy surgery.

Tracheostomy has been used for over 2,000 years all over the world. When done with the right indication and with the right surgical technique it can save a person's life. It is a standard treatment for relieving upper airway obstruction, intermittent positive pressure ventilation, and lung toileting these days [3].

The tracheotomy tube being obstructed is a common postoperative complication. It's normally caused by tube impingement on the posterior tracheal wall, partial displacement into the mediastinum, a blood clot, or a mucous plug if it happens within the first 24 hours. Hypoxemia occurs quickly in the morbidly obese patient who is lying supine and partly sedated as a result of diminished expiratory reserve volume.

The main objective is to find the perception and feedback regarding tracheotomy in Aseer region of Saudi Arabia.

Methods

In this cross sectional study, data was collected from the purposely constructed questionnaire. The questionnaire was composed of demographical data and questions related to the tracheostomy. Ethical approval was obtained, consent from the respondents was taken, the questionnaire was anonymous and was constructed by the panel of experts including subject specialist, researchers and language specialist. The questionnaire was composed in both Arabic and English languages. Study duration was Jan-2018 to April-2021. Study was conducted in the Aseer region of Saudi Arabia.

Data was coded and entered in SPSS ver.22 for analysis. Chi-Square test was used to measure the degree of association between variables and descriptive statistics were obtained. P- value less than 0.05 was considered as a significant value.

Results

Out of a total 70 patients underwent to the tracheostomy, 35% were male while 65% were females , mean (SD) of age was 48.5 (10.2). Table 1 depicts that 33% have no pain while 26% have mild pain, 20% moderate pain, 11 and 10 % have severe pain controlled by narcotics and medication respectively. 29% have not noticed any change in their appearance, while 20% have noticed minor changes. 30% have no changes in their exercise routine with 20% doing the same amount of exercise but feel more tired. 30% agreed that tracheostomy may not produce any impact on their neck movement while 20% stated that tracheostomy produced minor impact on their neck movement. 30% have no difficulties in swallowing while 20% have problems occasionally.

Table 2 depicts that when plugging the tube 55% of patients have no difficulties in understanding the procedure, 33% are not feeling anxious when sitting outside because of tracheostomy, 40% and 30% respectively find it not limiting and occasionally limiting their social activities. 29% and 27% respectively believe that people did not notice rarely noticed their tracheostomy.

Table 3 depicts that we did not observe any significant gender differences while comparing Tracheostomy care (P not less than 0.05).

As per Figure 1, 26% have changed their tube after every 6-8 months , while 20% and 20% have changed after 4-6 and 2-4 months respectively

As per Figure 2, 36% are very satisfied with tracheostomy, 7% were very unsatisfied while 21% were indifferent.

Table 1:

Variables	Frequency	Percentage
1. Pain		
I have no pain/discomfort	23	33%
There is mild pain/discomfort not needing medication	18	26%
I have moderate pain/discomfort- requires regular medication (not narcotic)	14	20%
I have severe pain/discomfort controlled only by narcotics	8	11%
I have severe pain/discomfort not controlled by medication	7	10%
2. Appearance		
I have not noticed any change in my appearance	20	29%
The change in my appearance is minor	14	20%
The change in my appearance bothers me, but I have not changed my daily activities because of my appearance	12	17%
I feel significantly disfigured and limit my activities because of my appearance	14	20%
I feel significantly disfigured and can not be with people because of my appearance	10	14%
3. Physical Activity		
1. Exercise tolerance		
There has been no change in my ability to exercise	21	30%
I am able to do the same amount of exercise, but am more tired	14	20%
My exercise tolerance has decreased, but I am still able to do my daily activities	15	21%
I do not have the energy to do my daily activities	14	20%
I am usually in bed or in a chair and house-bound	6	9%
ii. Limitations to moving neck –implications in daily life		
Tracheostomy does not limit my neck movement	21	30%
Tracheostomy limits my neck movement to a minor degree	14	20%
Tracheostomy limits my neck movement, but I am still able to do my daily activities without difficulty	15	21%
Tracheostomy limits my neck movement, and it prevents me from doing some my daily activities	14	20%
I am unable to move my neck because of the tracheostomy	6	9%
Swallowing		
I never have difficulties with swallowing	19	27%
I occasionally have difficulties with swallowing (less than once a week)	14	20%
I often have difficulties with swallowing (1-6 times per week)	12	17%
I have difficulties with swallowing on a daily basis	15	21%
I always have difficulties with swallowing	10	14%

Table 2 : Communication

When plugging my tracheostomy tube:	No.	%
People have no difficulties understanding my speech	38	55%
People occasionally have difficulties understanding my speech	14	20%
People understand my speech half of the time	10	14%
More often than not, people do not understand my speech	7	10%
I am unable to speak	1	1%
I feel anxious when I'm out in a public setting because of my tracheostomy		
Not at all	25	36%
Occasionally	24	34%
Half of the time	7	10%
Often	6	9%
All the time	8	11%
Social activity		
i. Does having a tracheostomy limit your social activity with friends and strangers?		
Not at all	28	40%
Occasionally	21	30%
Half of the time	12	17%
Often	7	10%
All the time	2	3%
ii. Does having a tracheostomy limit your interaction with your family?		
Not at all	28	40%
Occasionally	19	27%
Half of the time	8	11%
Often	8	11%
All the time	7	10%
iii. How easy is it to conceal your tracheostomy?		
People never notice my tracheostomy	20	29%
People rarely notice my tracheostomy	15	21%
People notice my tracheostomy about 50% of the time	15	21%
People almost always notice my tracheostomy	14	20%
People immediately notice my tracheostomy	6	9%

Table 3: Tracheostomy care

Tracheostomy care		
	Male	Female
How much time are you spending daily on tracheostomy care?		
5 minutes or less	21	10
5-15 minutes	15	7
15- 30 minutes	8	4
30 minutes to 1 hour	1	2
more than 1 hour	1	1
P (N.S)		

Figure 1

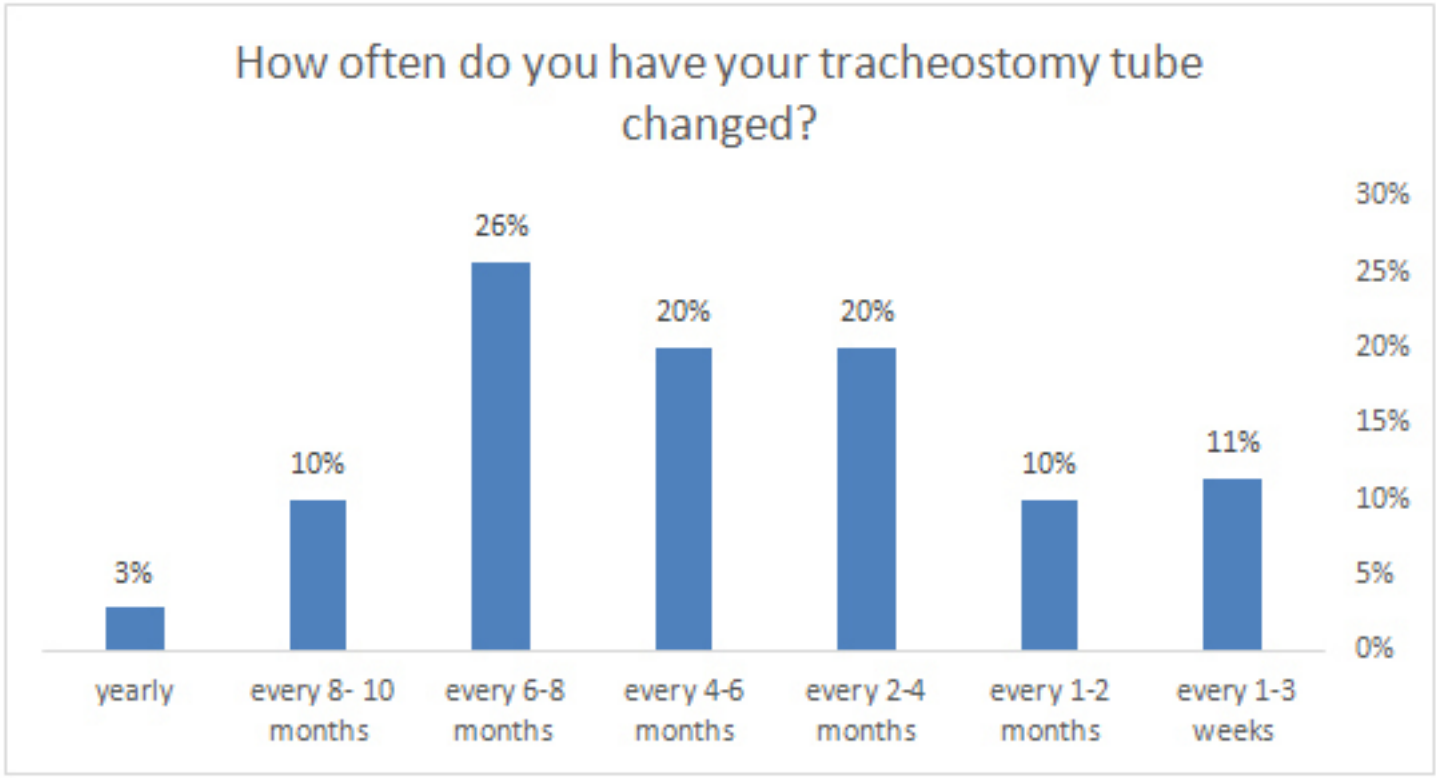
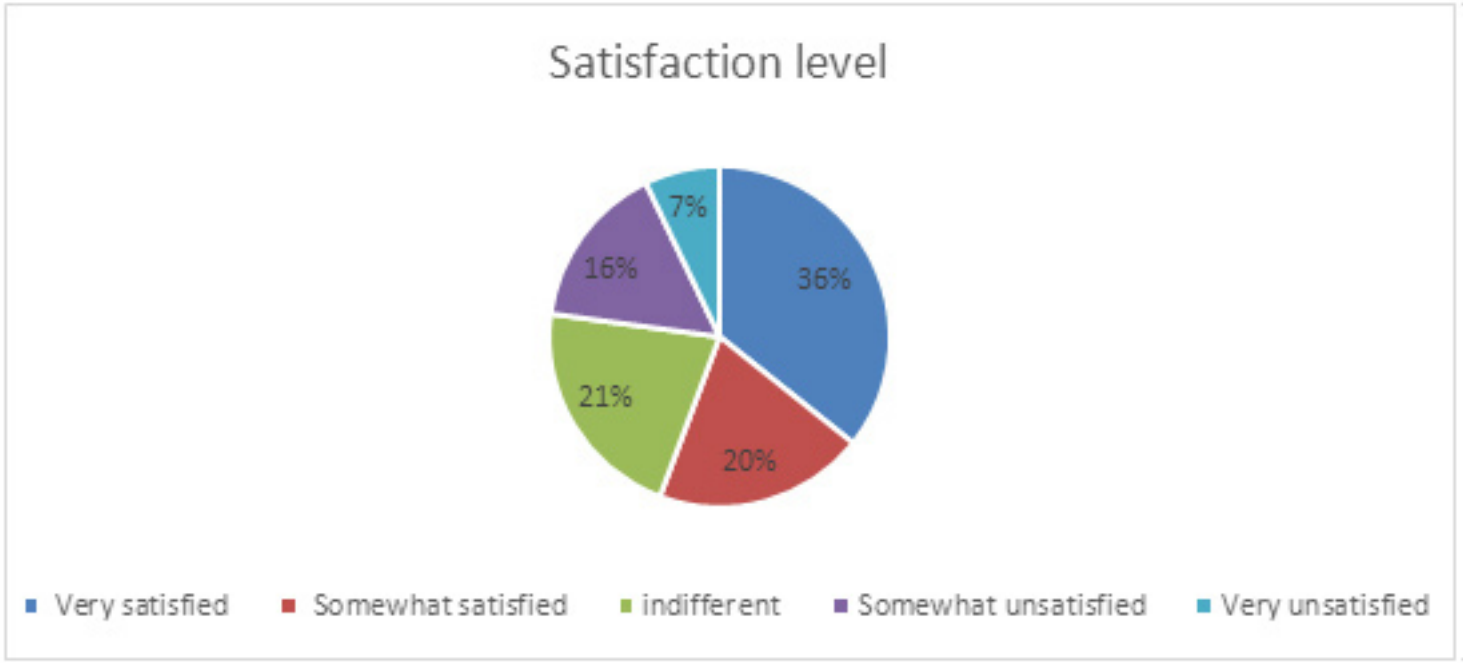


Figure 2



Discussion

Since this technique was first identified, the peri- and postoperative complications associated with surgical tracheostomy have been greatly reduced. However, special anatomic conditions in obese patients make this a difficult technique. In the current research, the prevalence of tracheostomy-related complications was 25% in morbidly obese patients, with a 2% mortality rate. The majority of these complications were minor; however, life-threatening complications were more common than in the comparator community, and were primarily due to the lack of airway accessibility.

Immediate resuscitation is needed to prevent anoxic encephalopathy. As a result, even though mechanical ventilation has been turned off, all morbidly obese patients in our health care facility are monitored in an ICU environment for at least 72 hours. Nonetheless, the risk of developing this complication remains beyond this time period, and the disastrous outcomes experienced by two of the three morbidly obese patients in our sample highlight the importance of close supervision. Despite the fact that the tracheostomy cuff was deflated prior to transfer to the ward in all three situations, the obstruction of the tracheostomy tube is believed to be partly due to the morbidly obese's distorted anatomical neck structure, which may restrict sufficient air entry. When a deflated cuffed Shiley tube is in use, it's possible that the relative narrowing of the cervical tracheal region compared to the non-obese [11-12] retains a tight seal. Submental fat deposition that extends below the sternal notch can obstruct the outer opening of a standard tracheostomy, making oxygenation extremely restricted or nonexistent. To get the chin out of the way, Simmons [13] suggested using an elastic bandage or a Barton bandage. Others also suggested attaching an extension to the outer opening [14]. On all morbidly obese patients with a well-formed tracheostomy tract, we have implemented a strategy of replacing the cuffed Shiley tube with a metal tracheostomy tube. We haven't had any catastrophic obstructive events since the policy was implemented.

Decannulation and reinsertion complications may occur when a tracheal tube is inserted too loosely. The fact that decannulation is correlated with 30% mortality in morbidly obese patients emphasises the seriousness of the situation. Patients that are morbidly obese and have a short, thick neck have so much soft tissue between the trachea and the skin. Blinded reintubation attempts that fail can result in tube misplacement in the pretracheal fascia, resulting in tracheal compression and respiratory arrest. To avoid this complication, some surgeons recommend performing a Björk flap during surgery [15]. In the anterior tracheal wall, between the second and fourth cartilaginous rings, an inverted U-shaped flap is incised. The flap is mirrored downward and outward, with the upper border sutured to the skin, forming a tracheal tissue bridge that directs tube replacement and prevents a false channel [15, 16] from forming. Opponents of this procedure have claimed that tracheal flaps are linked to a higher rate of tracheal stenosis after decannulation [17], but long-term studies have failed to support this claim [18]. Gross and colleagues [19] recommended a cervical lipectomy with tracheostomy as an alternative. There is no research that provides a definitive response as to whether morbidly obese patients would benefit from the implementation of these strategies in reducing the incidence of extratracheal placement. We have followed the use of an uncuffed endotracheal tube of a size that will pass into the internal diameter of the tracheostomy tube before a consensus is reached. The endotracheal tube's beveled tip aids in proper positioning and provides temporary ventilation control. A paediatric laryngoscope is used to examine the wound if the tube insertion is unsuccessful. After determining that there is no obstruction, the tracheostomy tube is advanced over the obturator airway.

One of the oldest procedures for treating airway obstruction is tracheostomy. Tracheostomy is depicted on Egyptian tablets dating back to 3600 BCE [1]. Following the introduction of a safer standardised procedure by Chevalier Jackson in the twentieth century [2], tracheostomy surgery was commonly used to alleviate upper airway obstruction during the polio epidemic. Later, tracheostomies were also recommended for sustained mechanical ventilation, and today, the vast majority of tracheostomies are performed for ventilator-dependent respiratory failure. Patients who need an endotracheal tube for more than 21 days [3] should suggest a tracheostomy, according to the American College of Chest Physicians. Reduced direct laryngeal injury, improved comfort, and improved daily living activities such as mobility, voice, and feeding, as well as shorter intensive care unit (ICU) and in-hospital stays are all advantages of establishing a tracheostomy rather than using an endotracheal tube [4-6].

In the United States, tracheostomies are conducted on an annual basis in excess of 100,000 [3] people. General surgeons and otolaryngologists are the most popular providers of this service. A tracheostomy operation may be performed using a variety of procedures, depending on the surgeon's choice [7]. Immediate complications including bleeding, pneumothorax, pneumomediastinum, airway fire, and posterior tracheal wall perforation with esophageal injury are uncommon, but they do happen and must be treated appropriately [8, 9].

For a number of reasons, a tracheostomy may be done surgically or percutaneously as an emergency or elective treatment. There is insufficient evidence to support one surgical or percutaneous procedure over the other [10-12]. In intensive care unit patients, a percutaneous dilatational tracheostomy is performed. It is a straightforward technique that can be completed at the bedside in a short amount of time [9, 13]. When conducting tracheostomy in critically ill adults, it is the preferred method. It is a basic process that can be completed at the bedside in a limited amount of time. Since it has a lower rate of postoperative complications than surgical tracheostomy, percutaneous dilatational tracheotomy is considered a better method [14]. Elective surgical tracheostomy should be done in the

operating room [15]. A sub thyroid incision of the trachea is made between the second and third tracheal rings in traditional surgical tracheostomy. Due to the initially recorded high incidence of subsequent complications, cricothyroidotomy has historically been used as an emergency treatment. This treatment causes subglottic stenosis, which necessitates a difficult surgical repair [16].

When it comes to perioperative and early postoperative complications, Heffner concluded that percutaneous dilatational tracheostomy is as healthy as the normal surgical technique, according to several articles and facts. In recent years, the morbidity and mortality associated with tracheostomy have been extremely low. Bleeding [18,19], subcutaneous emphysema[1,21], wound infection[20,22], tube displacement[1,21] and tube obstruction[21] are all early complications of tracheostomy, whether it is elective or emergency. Rare complications include pneumomediastinum[1], tracheoesophageal fistula[1], pneumothorax,[20,21] and persistent laryngeal nerve damage. The aim of this study is to compare the risks of emergency tracheostomy versus elective tracheostomy in our setting.

In our study most of the respondents were satisfied with the procedure which is matchable with other studies as tracheostomies can be safely performed in various types of intensive care patients, according to our retrospective chart analysis of tracheostomies performed in our hospital's Medical, Surgical, Neurological and Cardiac intensive care units.

In other studies, Delany et al. [4] looked at 17 RCTs in a meta-analysis of PCT versus surgical tracheostomies in 2006. They found that the average age of study participants ranged from 36 to 68.8 years which is in line with our findings, while our cohort had a median age of 71 years. In addition to their advanced age, more than half of our patients were bedridden prior to admission, owing to chronic medical conditions.

Putensen and colleagues looked at 14 RCTs that linked PCT to surgical tracheostomy in critically ill patients in another meta-analysis. They discovered that PCTs were completed more quickly and with a lower risk of stoma irritation or infection. The PCT group, on the other hand, had a higher risk of technical issues [5].

Our tracheostomies were performed on average 14 days after intubation, which agrees with the TrachMan trial's [6] findings that early tracheostomy has no effect on 30-day mortality. In a randomised study comparing early PCT versus prolonged intubation in patients following cardiac surgery (n = 216), Trouillet et al [7] found similar findings. Following this, a French expert panel on tracheostomy in the intensive care unit [8] advised that tracheostomy in the intensive care unit should not be done until the fourth day of mechanical ventilation. Our patients had low oxygen and PEEP requirements at the time of the tracheostomy, as well as acceptable haemoglobin, platelet, and white blood cell counts, as per the recommendations.

A variety of methods for reducing the morbidity associated with tracheostomy have been identified. Percutaneous dilatational tracheostomy is easy, saves operating room time, and has a lower complication rate, but its high cost and surgical experience are the only drawbacks in our situation. In contrast, traditional surgical tracheostomy has a higher rate of postoperative complications.

In our study average duration tracheostomies to discharge time was 21 days which was found to be associated with a substantial reduction in the duration of mechanical ventilation and ICU LOS in trauma ICU patients, without affecting patient outcome.

Conclusion

We conclude that tracheotomy may be successfully conducted in this group of patients and that it provides significant practical and psychological benefits over other options.

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