Original Article

TRACHEOSTOMY IN MAXILLOFACIAL SURGERY- 3 YEARS RETROSPECTIVE ANALYSIS OF PATIENTS TREATED AT KHYBER COLLEGE OF DENTISTRY

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ABSTRACT

Objective: *The objective of this study is to determine the frequency of different maxillofacial conditions requiring tracheostomy.*

Material and Methods: *A retrospective analysis of patient admitted to the department of Oral & Maxillofacial Surgery at Khyber College of Dentistry during a period from January 2014 to December 2016 was carried out. Patients with maxillofacial condition, requiring surgical tracheostomy, were included. Frequencies and percentages were calculated using SPSS version 20.*

Results: *Out of total 3707 patients 162 (4.37%) patients underwent surgical tracheostomy. Among them 102 (62.96%) where male and 60 were (37.04%) were female. Majority of the patients were in age group 11-20 years. The primary presenting complains was pan facial trauma (39.51%). Among the patients in whom surgical airway was performed, 79 (48.76%) acquired surgical airway in emergency while 83 (51.24%) went through elective procedure.*

Conclusions: *In Maxillofacial surgery, tracheostomy is needed in situations like Pan-facial trauma, limited mouth opening due to temporomandibular joint ankylosis and impending airway because of severe facial space infection. Careful evaluation and timely decision can prevent emergent situations and loss of lives.*

Key words: *Surgical airway, Tracheostomy, Maxillofacial surgery, Pan-facial trauma, temporomandibular joint ankylosis*

INTRODUCTION

A Maxillofacial surgeon of modern time is faced with a number of Oro-dental and maxillofacial diseases, injuries, as well as congenital and acquired defects in the head, neck, face and jaw region. These abnormalities, in most of the cases need the acquisition of surgical airway for both intraoperative as well as postoperative airway maintenance[1].

Maxillofacial surgical unit of Khyber College of Dentistry is the only specialized unit in public sector, overburdened by a number of maxillofacial injuries from different regions of Khyber Pakhtunkhwa, FATA and Afghanistan. Beside these injuries, different life threatening infections, tumours and facial deformities are also referred and treated. Most of these patients require surgical airway[2,3].

Traditional oro-tracheal intubation is considered to be the primary method of securing the airway in emergency. If the patient cannot be intubated in this way due to some reasons, other options are then executed. Difficult airway may be managed with fiberoptic-assisted nasotracheal intubation with the concern that intracranial extension is possible in patients with skull base injuries[4,5].

Tracheostomy is a time consuming procedure and requires a temporizing methods such as laryngeal mask airway or needle cricothyrodotomy before such procedure is attempted. Certain elective procedures may necessitate the acquisition of surgical airway by a planned pre-operative surgical tracheostomy[6].

In the presence of severe midface or nasoethmoid fractures, naso tracheal intubation is dangerous. Sometimes due to maxillomandibular fixation,

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maintenance of patent airway and airway parameters is challenging and the patient may need a sustained surgical airway[7,8].

This study is conducted with the primary aim of determining the frequency of different maxillofacial conditions requiring surgical airway.

METHODS AND MATERIALS

A retrospective analysis of patient admitted to the department of Oral & Maxillofacial Surgery at Khyber College of Dentistry during a period from January 2014 to December 2016 was carried out. Patients of all ages and gender with any maxillofacial condition, who underwent surgical tracheostomy, were included in the present survey.

First of all, a written institutional ethical permission was received. Data collection included demographic variable such as Hospital number, Gender and Age. Other information recorded were type of presenting maxillofacial condition, reason for acquisition of surgical airway. Frequencies and percentages were calculated through SPSS version 20.

RESULTS

Out of 3707 patients admitted to the department of Oral and Maxillofacial Surgery, difficult airway was predicted in 317 patients, where 162 (4.37%) patients underwent surgical tracheostomy.

Among these 162 patients, 102 (62.96%) were male and 60 (37.04%) were female with a male to female ratio of 1.7:1.

Majority of the patients were in age group 11-20 years (37.04%) followed in frequency by age group less than 10 years (20.99%). Detail is given in Table-1.

The primary presenting complains were documented and results showed that patient were presented with pan facial trauma in 39.51% cases followed by limited mouth opening due to temporomandibular joint ankylosis (32.09%). Result is given in Table-2.

Among the patients in whom surgical airway was performed, 79 (48.76%) acquired surgical airway in emergency while 83 (51.24%) went through elective procedure. The primary reason for acquisition of surgical airway as elective procedure was limited mouth opening in 47 patients, where blind nasotracheal intubation was not possible. Thirty six patients had surgical airway achieved as elective procedure because of a need for prolonged post-operative airway maintenance. Fig-1.

DISCUSSION

Difficult airway poses a potentially life threatening situation in maxillofacial surgery. The vicinity of the nasopharyngeal structures with fractured facial bones and tumors put both the surgeon and anesthesiologist in an awkward position during and after surgery. A variety of techniques have been described for the management of difficult airway including blind nasal intubation, fibreoptic device, and surgical acquisition of airway like tracheostomy[9]. Serious complications and even death can occur as a result of poor evaluation or management of difficult airway[10].

Table-1: Age Distribution (n=162)

Age in years	Frequency	Percent
< 10	34	20.99
11-20	60	37.04
21-30	33	20.37
31-40	13	8.02
41-50	10	6.17
51-60	7	4.32
> 60	5	3.09
Total	**162**	**100**

Table-2: Maxillofacial Conditions in which surgical airway was performed (n=162)

Presenting complaints	Frequency	Percent
Pan facial Trauma	64	39.51
TMJ ankylosis	52	32.09
Tumors	31	19.14
Ludwig's Angina	15	9.26
Total	**162**	**100**

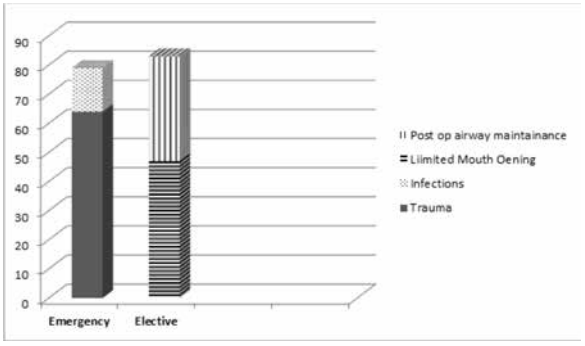

Fig-1: Reasons for acquisition of surgical airway

In the present study, out of 3707 patients scrutinized, 162(4.37%) needed surgical airway. Taicher[11] in a study conducted on maxillofacial trauma patients showed that 3.26 % acquired tracheostomy. In another study Geeta Mittal et al[12] while working on maxillofacial conditions demonstrated that 6.16 % patients received tracheostomy as a result maxillofacial trauma and other conditions.

Age is considered to be the important factor in prediction of difficult airway. In the present study, 58.03% patients who underwent surgical airway were below the age of 20 years. Contrasting results has been shown by Ezri et al[13] stated that difficult intubation is evident in age group 40-59 largely because of age related osteogenic changes and poor dentition. This difference may be due to the fact that in the present setting where this study was conducted, majority of the patients with limited mouth opening as a result of temporomandibular joint ankylosis were young. Moreover motorcyclists are usually young agressive drivers who sustain severe maxillofacial injuries necessitating surgical airways[14].

Pan-facial trauma was the primary cause of difficult airway and subsequent surgical airway acquisition in the present investigation (39.51%). Similar results were given by Geeta Mittal et al[12] and stated that 39.83 % patients who received tracheostomy as a surgical mean of airway were having pan-facial trauma. The findings of study conducted by Raval et al[15] does not support the finding of the present study and showed that among 177 patients who needed airway, only 6% were pan-facial trauma and none of them needed tracheostomy. This difference in opinion may largely be due to sample size and the presence or absence of other specialized units where critical patients who need surgical airway may be referred. In the present study, maxillofacial surgical unit at Khyber College of Dentistry is only specialized center, where patients from almost every part of the province, FATA and Afghanistan are referred for maxillofacial trauma and other conditions[16].

Limited mouth opening due to temporomandibular joint ankylosis was the second most common (32.05%,n=162) cause of difficult airway in our study, where tracheostomy was performed. Data from King George's Medical University, India[17] shows that out of 210 patients with TMJ ankylosis, 87% of the patients were successfully intubated through blind nasal intubation technique and 13% of the patients had to undergo tracheostomy. This data was obtained before the introduction of fibre-optic endoscope, once this facility was introduced, no single case was sent for tracheotomy. Similarly in our department, fire-optic endoscopic facility is lacking, so majority of the cases were intubated with blind nasal intubation or tracheostomy.

Tracheostomy for the tumor ablation with or without neck dissections was performed in 31 cases (19.04%) in the present study. This is in contrast to the findings of Crosher et al[18] who demonstrated a percentage of 2.76% while working on 109 patients. The only difference is that, this study was done on tumors patients only. Anehosur et al[19] suggested that American Academy of Otolaryngology has recommended tracheostomy to be one of the effective methods of difficult airway management in major tumor surgeries. Marsh et al[20] in 2009 found that worldwide "39% of units would almost always and 30% would usually do an elective tracheostomy" in tumors surgery.

Ludwig's angina is a serious complication of odontogenic infection and life threatening situation may be encountered in the form of airway obstruction. Because of the high failure rate of blind nasal intubation in deep facial space infections, it can also lead to loss of airway and laryngospasm. Pus may also rupture into the oral cavity causing aspiration. In the present study, 9.26% patients who needed surgical airway were suffering from Ludwig's angina which is in agreement with worldwide studies[21,22].

Larawin et al[21] in a retrospective study conducted on 103 patients with facial space infections mostly Ludwig's angina showed that 10% patients required tracheostomy. Similar results were given by Kurien et al[22] in a 13 years review of patients with Ludwig's angina. Although the result of Greenberg et al[23] does not correlate with the present statistics and demonstrated 3 % of patients who required tracheostomies. One point is worth mentioning that these differences in results is attributed to the fact that there is a wide variation in sampling size and technique, difference of opinion, the facilities available for tracheostomies or modern fiber- optic equipment. No single method or study is sufficient to provide simple guidelines for the surgical airway need in urgent or emergent situation.

CONCLUSION

Airway management in emergency is a challenging task both for the surgeon and anesthetist. In Maxillofacial surgery, surgical air way is needed in situations like Pan-facial trauma, limited mouth opening due to temporomandibular joint ankylosis and impending airway because of severe facial space infection. Careful evaluation and timely decision regarding acquisition of surgical airway is vital and can prevent loss of lives.

RECOMMENDATIONS

Maxillofacial surgery department of Khyber College of Dentistry is overburdened by the maxillofacial trauma, tumors and pathological lesions, cosmetic procedures, and other modern surgical interventions. There is a need for fully equipped intensive care unit as well as modern armamentarium like fiber-optic endoscope for difficult airway management. This will help in improving the quality of surgical interventions as well as reducing the morbidities and complications.

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