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THE FREQUENCY OF OROCUTANEOUS FISTULA AFTER SUBMENTAL INTUBATION IN PANFACIAL TRAUMA PATIENTS

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Abstract

Objective: *To determine the frequency of orocutaneous fistula after submental intubation in panfacial trauma patients.* ***Design****: Descriptive Case Series Study.* ***Subject and Methods:*** *A total of 135 patients with panfacial trauma were selected for this study. Surgery was performed and at the end of the surgery, the maxillomandibular fixation was released and the endotracheal tube was pulled back intra orally to convert sub mental intubation to oral intubation. The patients were followed up after 1 week and stitches were removed. The patients then were assessed for orocutaneous fistula 1 month postoperatively. All data was recorded in the proforma.*

Results: *The mean age of the patients was 35.66±8.62 years. Frequency of orocutaneous fistula after submental intubation in panfacial trauma patients was observed in 24.44%.* ***Conclusion****: Orocutaneous fistula is common complication after submental intubation in panfacial trauma patients. The patients who are contraindicated to nasotracheal intubation, in those patients submental intubation is a safe procedure for intraoperative airway control in maxillofacial trauma. It enables for the operative correction of occlusion and surgery for associated nasal fracture, and in the event of concomitant skull base trauma, moreover it avoids the risk associated with classical nasotracheal intubation.*

Key Words: *Orocutaneous fistula, Submental intubation, Panfacial trauma.*

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INTRODUCTION:

Panfacial fractures contribute approximately 40% of craniofacial fractures, including the cranium, midface and the mandible. For adequate reconstruction of facial fractures, maxillomandibular fixation is required intraoperatively for which the surgeon needs access to an unobstructed intraoral surgical field[2]. This precludes the use of orotracheal intubation. The use of nasotracheal intubation is often contraindicated in the presence of comminuted midfacial fractures, skull base fractures and cerebrospinal fluid rhinorrhea as it can interfere with surgical repair and reconstruction of fractures and can results to passage of tube into the cranium, sinusitis and epistaxis, also meningitis.[3]

Tracheostomy is a traditional method favored for airway control, when neither nasotracheal intubation nor orotracheal intubation is suitable. Tracheostomy has many complications such as subcutaneous emphysema, tracheal stenosis, damage to the laryngeal nerves, excessive scarring and tracheoesophageal fistula. It also requires careful surgical and perioperative management as well as long term postoperative care. A known alternative to tracheostomy is submental intubation. In this proximal end of an orotracheal tube is diverted through the floor of the mouth and submental region, provides a clear intraoral surgical field that allows maxillomandibular fixation along with access to nasal pyramid fractures[.3]

However submental intubation technique is not completely free from complications. de Toledo et al. reported 22% incidence of orocutaneous fistula after submental intubation[5], where as in other reported studies, no such complication has been observed after submental intubation[6,7]. The incidence of orocutaneous fistula in submental intubation which is a significant complication as its management may pose the patient to another surgical intervention[8].
Multiple studies were done on this topic but the sample was not adequate hence there is an issue of generalization of results to the target population. Therefore the present study is designed on an appropriate sample size thereby inference could be applied to the target population and actual magnitude of orocutaneous fistula can be assessed.

METHODOLOGY:

A descriptive case series study was conducted at oral and maxillofacial surgery department of Liaquat national hospital, Karachi from January 2018 to June 2018. Total 135 patients were included in the study with age of 20-60 years of either gender, having panfacial fracture with duration of fractures less than or equal to 4 weeks and in whom the oral and nasal intubation were not suitable. Patients excluded from the study were with assisted ventilation for prolonged period, neurologic damage, patients who need repeated surgical intervention and patients having any pathology or sever trauma in submental region or anterior floor of mouth.

After taking an informed consent from each patient, Patients' demographic, clinical history and findings were taken by the principal investigator. Surgery was performed by senior oral and maxillofacial surgeon having experience of more than 5 years. All the patients were intubated initially by experienced anesthetist with standard method oral endotracheal intubation after induction of general anesthesia. The orotracheal intubation was then changed to a submental endotracheal intubation by maxillofacial surgeon by following procedure: After taking all aseptic measures, lignocaine 2% with 1:80,000 adrenalines was infiltrated at site of incision. At inferior border of mandible, a midline incision of 1.5-2 cm in length was made. A curved hemostat was passed from the submental incision through the subcutaneous layer, platysma, mylohyoid muscle, submucosal layer and mucosa. An incision of 1.5 cm in length was made parallel to the gingival margin, after entering the oral cavity at the junction of the attached lingual alveolar mucosa and the free mucosa of the floor of the mouth. The hemostat was opened to create a soft tissue passage for the endotracheal tube. Then the endotracheal tube was disconnected from the breathing circuit and its distal end was grasped with the hemostat and withdrawn extraorally through the submental tunnel and reconnected. Tracheal position of tube was confirmed with lungs auscultation and capnography and 2-0 silk suture used to fix the tube at the submental level, in a similar manner as a drainage tube. Maxillomandibular fixation and anatomical reduction and rigid internal fixation of the maxillofacial fractures were then achieved temporarily. At the end of the surgery, the maxillomandibular fixation was released and the endotracheal tube was pulled back intraorally to convert submental intubation to oral intubation. The submental incision was closed with 3-0vicryl (resorbable) and 4-0 proline (non resorbable) sutures and intraoral incision was left to heal by secondary intention. The patients were followed up after 1 week and stitches were removed. The patients then were assessed for orocutaneous fistula 1 month postoperatively and labelled as per operational definition. The demographic information like age,

gender, duration of fracture, type of fracture and the outcome variable of orocutaneous fistula were noted in the proforma attached as annexure.
Data was analyzed by using SPSS version 17. Mean and standard deviation was computed for quantitative variable i.e. age. Frequency and percentage was calculated for qualitative variables i.e. gender, type of fracture and orocutaneous fistula.

RESULTS:

A total of 135 patients with panfacial were selected for this study. The age distribution of the patients is presented in figure 1.
The mean age of the patient's as shown in table-1.

Frequency of orocutaneous fistula after submental intubation in panfacial trauma patients was observed in 24.44% (33/135) cases as presented in figure 2.

Rate of orocutaneous fistula after submental intubation in panfacial trauma patients was not significant among different age groups (p=0.478) as shown in table 2.

Regarding type of fracture, rate of orocutaneous fistula was also not significant with respect to fracture type as shown in table 3.

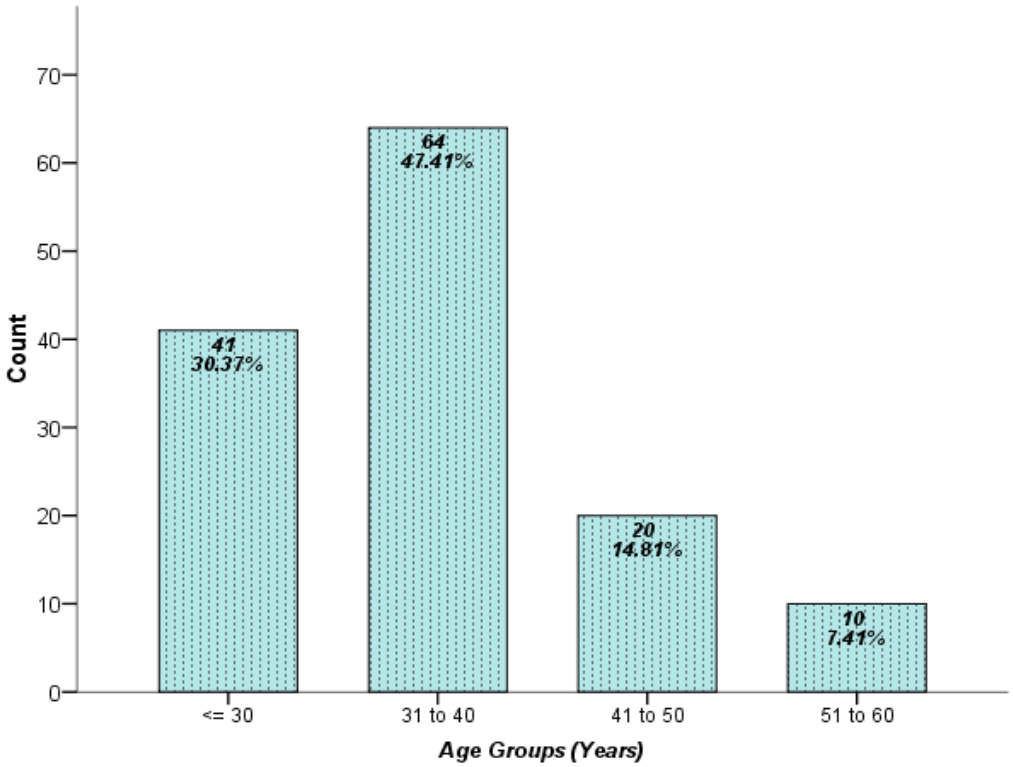

FIGURE 1
AGE DISTRIBUTION OF THE PATIENTS (n=135)

TABLE 1

DESCRIPTIVE STATISTICS OF STUDY PATIENTS
n=135

Statistics	Age (Years)
Mean	35.66
Std. Deviation	8.62
Minimum	20
Maximum	60

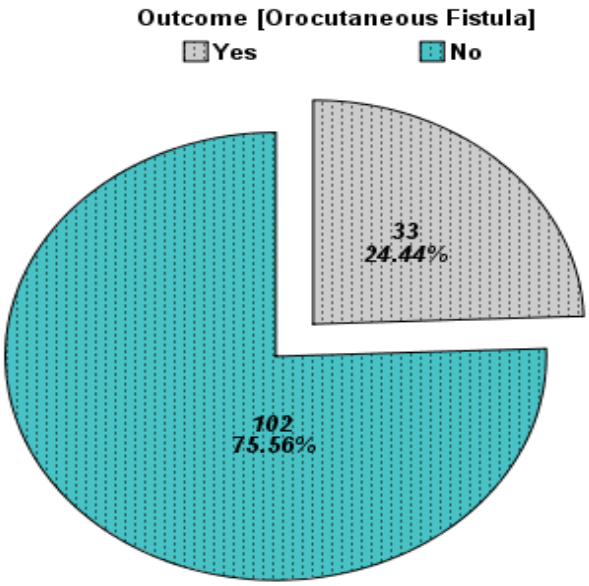

FIGURE 2
FREQUENCY OF OROCUTANEOUS FISTULA AFTER SUBMENTAL INTUBATION IN PANFACIAL TRAUMA PATIENTS

TABLE 2
FREQUENCY OF OROCUTANEOUS FISTULA AFTER SUBMENTAL INTUBATION IN PANFACIAL TRAUMA PATIENTS
WITH RESPECT TO AGE GROUPS

Age Groups (Years)	OROCUTANEOUS FISTULA		Total
	Yes n=33	No n=102	
≤ 30Years	9(22%)	22(78%)	41
31 to 40 Years	16(25%)	48(75%)	64
41to 50 Years	7(35%)	13(65%)	20
51 to 60 Years	1(10%)	9(90%)	10

Chi-Square=2.48; p=0.478

TABLE 3

FREQUENCY OF OROCUTANEOUS FISTULA AFTER SUBMENTAL INTUBATION IN PANFACIAL TRAUMA PATIENTS
WITH RESPECT TO TYPE OF FRACTURE

TYPE OF FRACTURE	OROCUTANEOUS FISTULA		Total
	Yes n=33	No n=102	
Naso-orbital ethmoidal fracture	1(11.1%)	8(88.9%)	9
Naso-orbital ethmoidal fracture+mandible fracture	4(25%)	12(75%)	16
Naso-orbital ethmoidal fracture+Le Fort II fracture	1(8.3%)	11(91.7%)	12
Naso-orbital ethmoidal fracture+Le Fort III fracture	4(14.8%)	23(85.2%)	27
Naso-orbital ethmoidal fracture+Le Fort II fracture + mandible fracture	4(36.4%)	7(63.6%)	11
Le Fort II+Mandible fracture	17(32.7%)	35(67.3%)	52
Le Fort III+Mandible fracture	2(25%)	6(75%)	8

Chi-Square=6.67; p=0.352

DISCUSSION:

During any maxillofacial surgery, management of the airway is always a primary concern. Surgeon need a clear and comfortable environment free from the intubation tube; while for an anesthesiologist must ensure the safety of the tube and ventilation of patient. Problems are encountered during surgeries of maxillofacial trauma particularly in regard of airway management.

For complex craniofacial injuries, a safe and acceptable alternative to tracheostomy for airway management is a prime objective. In the presence midfacial and basilar skull fracture, nasotracheal intubation may best be avoided in these groups of patients because of reported risk and complications of nasotracheal intubation such as cranial intubation, pressure necrosis of external nares, epistaxis and trauma to the pharynx, otitis media, sinusitis, sepsis and inability to pass a tube through nasal passages[9-11]

Frequency of orocutaneous fistula after submental intubation in panfacial trauma patients was observed in 24.44% (33/135) cases in present study. Similar result was also observed in a study, de Toledo et al. reported 22% incidence of orocutaneous fistula after submental intubation[5], where as in other reported studies, no such complication has been observed after submental intubation[6, 7]. The incidence of orocutaneous fistula in submental intubation which is a significant complication as its management may pose the patient to another surgical intervention[8]. Gadre and Waknis[12] (2010) described the complication related to the submental intubation is

formation of scar. The scar is less visible than a tracheotomy scar and proved to be well tolerated by the patients from the present study. Postoperative salivary fistula occurs, as reported in the literature regarding the cases of prolonged ventilation[13].

CONCLUSION:

Orocutaneous fistula is common complication after submental intubation in panfacial trauma patients. In maxillofacial trauma patients, submental intubation is a safe procedure for the airway control intraoperatively, who present contraindication to nasotracheal intubation. It allows for the operative correction of occlusion and enables surgery for associated nasal fracture, and it avoids the dangers of classical nasotracheal intubation, in the event of concomitant skull base trauma.

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