Original Article

Awareness among anesthesia residents pertaining to various intubation techniques in craniofacial surgery: A questionnaire study

ABSTRACT

Aim: This study was intended to evaluate the knowledge and clinical skill of anesthesia residents pertaining to various intubation techniques employed in craniofacial surgery.

Materials and Methods: A cross-sectional survey research design was employed in this study. A self-administered questionnaire survey was used to validate the knowledge and clinical skill of anesthesia residents pertaining to various intubation techniques employed in craniofacial surgery. In this regard, a preliminary study with a convenience sample of 156 anesthesia residents studying in various medical institutions across South India was conducted so as to assess the knowledge and clinical skill of anesthesia residents pertaining to various intubation techniques employed in craniofacial surgery. This study, while limited in sample size, benefits the craniofacial surgeons and anesthetists as target readers to assess the knowledge and clinical skill of anesthesia residents pertaining to various intubation techniques employed in craniofacial surgery

Results: The results of this study reveal that majority of the anesthesia residents encountered craniofacial surgery during their residency period. However, only 19.87% have performed various intubation techniques that are employed in craniofacial surgery. Nearly 38.46% of the participants felt that blind awake intubation is the most difficult intubation technique to employ in the head-and-neck region and requires expertise. Nearly 78.84% of the participants felt that special training is required for handling craniofacial surgical cases under general anesthesia.

Conclusion: The results of this study reveal that there is a dearth of knowledge and clinical exposure among anesthesia residents regarding various intubation techniques employed in craniofacial surgery. Educational and quality improvement initiatives in various intubation techniques could enhance anesthesia residents' knowledge and clinical exposure in managing various craniofacial surgical cases.

Keywords: Anesthetist, craniofacial surgery, intubation

Malti Tuli, Shreyas Orvakonde[1], Shrinivas T R[2], Jyothsna Manchikalapudi[3], Dhananjay Rathod[4], Jignaben Patel[5]

Dental Surgeon, Guru Nanak Dev Dental College and Research Institute, Sunam, Punjab, [1]Department of OMFS, Chamarajanagar Institute of Medical Sciences, Chamarajanagar, [2]Department of Anaesthesia, Koppal Institute of Medical Sciences, Koppal, Karnataka, [3]Panineeya Mahavidyalaya Institute of Dental Sciences and Research Center, Hyderabad, Telangana, [4]Department of Orthodontics, Hazaribagh College of Dental Sciences, Hazaribagh, Jharkhand, [5]Dental Surgeon, Bharti Vidyapeeth Dental College and Hospital, Sangli, Maharashtra, India

Address for correspondence: Dr. Malti Tuli,
Guru Nanak Dev Dental College and Research Institute, Sunam, Punjab, India.
E-mail: maltitulli03@gmail.com

Received: 09 May 2020, **Revised:** 08 June 2020,
Accepted: 23 July 2020, **Published:** 16 March 2021

INTRODUCTION

Conventional orotracheal intubation cannot be employed in all clinical scenarios pertaining to oral and maxillofacial surgical interventions. In majority of the trauma involving the maxillofacial region, the airway is secured by nasotracheal intubation to prevent interference to the maxillomandibular fixation and surgical approach.[1] In the repair of cleft lip and palate, nasotracheal intubation would hinder with closure of muscle and mucosa.[2] Hence, oral intubation becomes more favorable in such clinical situations. In complex craniomaxillofacial trauma, the airway is secured through a tracheostomy.[3]

Access this article online	
Website: www.njms.in	Quick Response Code
DOI: 10.4103/njms.NJMS_85_20	

How to cite this article: Tuli M, Orvakonde S, Shrinivas TR, Manchikalapudi J, Rathod D, Patel J. Awareness among anesthesia residents pertaining to various intubation techniques in craniofacial surgery: A questionnaire study. Natl J Maxillofac Surg 2021;12:62-6.

In clinical scenarios where there is trismus secondary to temporomandibular joint (TMJ) ankyloses or oral submucous fibrosis, a blind awake intubation or a retrograde intubation needs to be employed. In pediatric patients with dysmorphic syndromes, especially those with retrognathism or micrognathia, obstructive breathing and difficulty in intubation are frequently encountered.[4] Literature is replete with articles that have evaluated the various intubation techniques for difficult clinical situations, with relevancy to the maxillofacial region.[5-7] Previous studies have undertaken endeavors to gather, examine, and denote a wide variety of aspects, to evaluate the optimal route of intubation that may be planned for different oral and maxillofacial surgical maneuvers.[2]

However, the critical factor in obtaining the ideal treatment outcome in all these various clinical scenarios is the clinical efficiency of the anesthesiologist. Hence, this study is designed to evaluate the knowledge and clinical skill of anesthesia residents pertaining to various intubation techniques in craniofacial surgery.

MATERIALS AND METHODS

A cross-sectional survey was undertaken to evaluate the knowledge and clinical skill of anesthesia residents pertaining to various intubation techniques employed in craniofacial surgery. The study included 156 anesthesia residents who were in the final year of their residency program in various medical institutions across South India. Prior to commencing the study, an institutional ethical committee clearance was obtained. Initially, a questionnaire with ten questions was designed, but two were eliminated to obtain a content validity ratio of 1, and a pilot study was done for which a Cronbach's alpha of 0.9 was obtained. A self-administered questionnaire with eight questions was distributed through Google Forms to the e-mails of these anesthesia residents. The questionnaire was sent to approximately 200 anesthesia residents, but unfortunately, the responses of only 156 participants who responded even after repeated reminders and gave consent for their participation were considered. The participants were instructed to answer the questionnaire very precisely without any descriptions. The questionnaire used is shown in Table 1. After collecting the filled questionnaires, the participants were given instructions pertaining to the spectrum of clinical work in the craniofacial region and various intubation techniques employed for craniofacial surgery, and doubts, if any, were cleared. Survey questions were aimed to assess the facts whether the anesthesia residents were totally aware of the various intubation techniques employed in craniofacial surgery and whether they have performed such procedures during their residency period. The survey forms were evaluated and critically analyzed.

Table 1: Type of questionnaire used in this study

Questionnaire
Are you aware that there is a specialty by the name of oral and maxillofacial surgery?
Have you encountered craniofacial surgical cases during your residency period?
Are you aware of the various intubation techniques that can be employed for craniofacial surgery?
Have you performed various intubation techniques that can be employed for craniofacial surgery during your residency period?
Which is the intubation technique which you are completely unaware of clinically?
Which intubation technique do you think is very difficult to perform and require expertise?
Most commonly encountered anesthetic complication during intubation?
Do you think any special training is required for anesthesia residents for handling oral and craniofacial surgical cases under GA?

GA: General anesthesia

RESULTS

The study included 156 anesthesia residents studying in various institutions across South India. The results of this study were as follows: 147 participants (94.23%) were aware that there is a specialty by the name of oral and maxillofacial surgery. However, only 93 participants (59.61%) have encountered craniofacial surgical cases during their residency period, as shown in Figure 1. While 121 participants (77.56%) were aware of the various intubation techniques that can be employed for craniofacial surgery, only 31 participants (19.87%) have performed various intubation techniques that can be employed for craniofacial surgery during their residency period, as shown in Figure 2.

It was observed that 52 participants (33.33%) have not seen blind awake intubation clinically during their residency period and sixty participants (38.46%) felt that blind awake intubation is very difficult to perform and require expertise followed by fiber-optic intubation (FOI), as shown in Figure 3. Sixty-seven participants (42.94%) have encountered nasal bleeding as the most commonly noticed complication during intubation for craniofacial surgical cases, whereas 21 participants (13.46%) have failed to perform difficult intubations in craniofacial surgery, as shown in Figure 4. The results of this questionnaire study revealed that 123 participants (78.84%) felt that special training in addition to adequate clinical exposure is required for anesthesia residents for handling craniofacial surgical cases under general anesthesia (GA) confidently. The results of the questionnaire are shown in Table 2.

DISCUSSION

Airway management is considered to be the most critical intervention required for saving a life.[8] Failure in securing

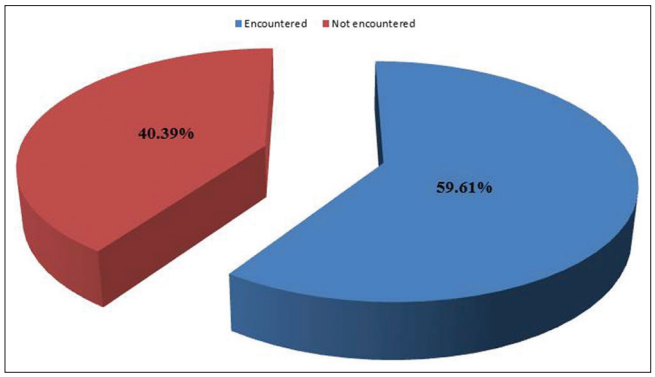

Figure 1: Participants who encountered craniofacial surgical cases during their residency period

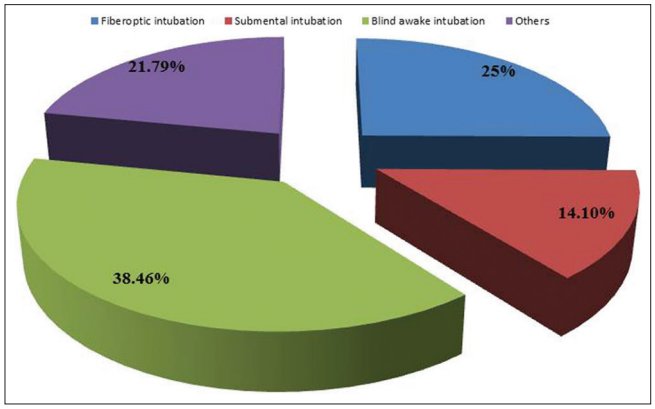

Figure 3: Intubation technique that is difficult to perform and require expertise by the participants

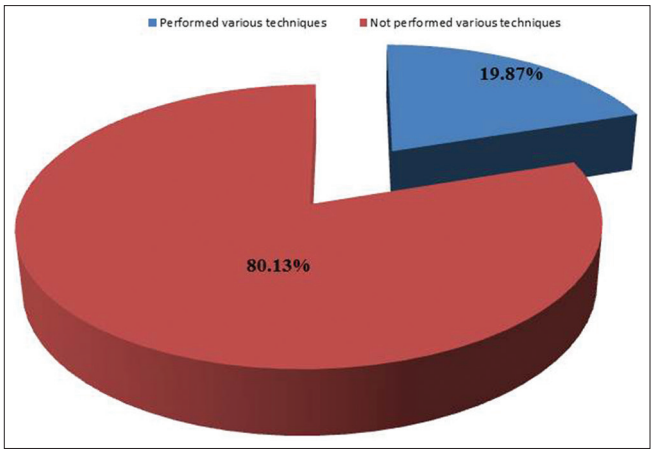

Figure 2: Participants who performed various intubation techniques that can be employed for craniofacial surgery during their residency period

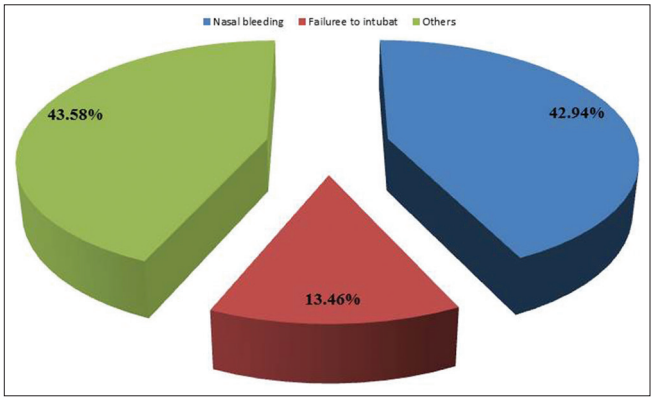

Figure 4: Commonly encountered complication during intubation in craniofacial surgery

the airway is considered to be the most common cause of serious morbidity and mortality, accounting for up to 0.13%–0.3%.[9] Previous studies have shown that the complications of difficult airway range up to one-tenth of the cases among elective GA.[10] The incidence of difficult intubation in the operating room was reported to range from 1.5% to 8.5%.[9] However, for oral and maxillofacial surgical interventions, the incidence of difficult airway ranges between 15.4% and 16.9%.[11] This necessitates the need for not only a well-qualified and experienced anesthetist but also a well-trained and experienced anesthetist pertaining to various intubation techniques in head-and-neck surgery, which can aid both the anesthetist and the surgeon to efficiently work together and facilitate better patient safety and surgical outcome. Hence, this study is designed to evaluate the knowledge and clinical skill of anesthesia residents pertaining to various intubation techniques in craniofacial surgery.

Nasotracheal intubation still remains the preferred technique in the majority of oral and maxillofacial surgical interventions. This intubation technique provides airway control through nose, securely facilitating the surgeon with more scope for surgical maneuver for surgical interventions in the head-and-neck region.[12]

Blunt or penetrating injury to the larynx, trachea, hyoid structure, and facial bones would unquestionably result in difficulty in managing the airway.[13] FOI is considered the ideal option for management of difficult airways. Even though FOI can be performed in an unconscious individual, it is particularly suited to the awake patient. This technique when employed properly would produce minimal discomfort with a greater degree of safety.[14] However, it cannot be employed in patients with massive facial injury, complete upper airway obstruction, apnea, severe hypoventilation, or profuse upper airway bleeding.[15] Lightwand-guided nasotracheal intubation is an alternative to fiber-optic bronchoscope. The illumination of the lightwand is not influenced by blood or secretions and hence is more effective than the fiber-optic bronchoscope in patients with active bleeding in the oral cavity following faciomaxillary trauma.[16] The results of this study reveal that 33.33% of the participants have not seen blind awake intubation clinically during their residency period

Table 2: Results of the questionnaire

Questionnaire	Response
Are you aware that there is a specialty by the name of oral and maxillofacial surgery?	Yes - 147
	No - 08
Have you encountered craniofacial surgical cases during your residency period?	Yes - 93
	No - 63
Are you aware of the various intubation techniques that can be employed for craniofacial surgery?	Yes - 121
	No - 35
Have you performed various intubation techniques that can be employed for craniofacial surgery during your residency period?	Yes - 31
	No - 125
Which is the intubation technique which you are completely unaware of clinically?	FOI - 41
	Submental intubation - 28
	Blind awake intubation - 52
	Others - 34
Which intubation technique do you think is very difficult to perform and require expertise?	FOI - 39
	Submental intubation - 22
	Blind awake intubation - 60
	Others - 34
Most commonly encountered anesthetic complication during intubation?	Nasal bleeding - 67
	Failure to intubate - 21
	Others - 68
Do you think any special training is required for anesthesia residents for handling craniofacial surgical cases under GA?	Yes - 123
	No - 33

GA: General anesthesia, FOI: Fiber-optic intubation

and 38.46% of the participants who have seen or performed blind awake intubation felt that this intubation technique is very difficult to perform and require expertise. Nearly 25% of the participants felt that FOI is very difficult to perform and require expertise.

Submental intubation is a versatile technique that facilitates intubation of polytrauma patients in addition to facilitating maxilla–mandibular fixation. Submental intubation has no significant reported major complications when compared to tracheostomy. In addition to fewer reported minor complications, submental intubation requires less time than a tracheostomy, costs less, and results in an esthetically well-tolerated scar.[17] The mortality rate of tracheostomy has been reported to range from 0.5% to 2.7%.[13] The results of this study show that 17.94% of the participants have not seen submental intubation clinically during their residency period and 14.10% of the participants felt that they need the surgeon's help for dissection for placing a submental tube.

The results of this questionnaire study reveal that 123 participants (78.84%) felt that special training in addition to adequate clinical exposure is required for anesthesia residents from the beginning of their residency program for handling craniofacial surgical cases with the aid of various intubation techniques under GA confidently. Hence, it can be concluded that there is a dearth of knowledge and clinical exposure among anesthesia residents regarding various intubation techniques employed in craniofacial surgery. Educational and quality improvement initiatives in various intubation techniques could enhance anesthesia residents' knowledge and clinical exposure in managing various craniofacial surgical cases.

CONCLUSION

Blunt or penetrating injuries to the maxillofacial region often present with difficult airway due to changes in normal anatomy. Trismus secondary to TMJ ankyloses or oral submucous fibrosis or dysmorphic syndromes, especially retrognathism or micrognathia, often lead to a difficult intubation. Hence, conventional techniques of securing an airway in the form of an orotracheal or nasotracheal intubation may not always be applicable. Therefore, there is a need for a craniofacial surgeon–anesthetist team who should always have alternative techniques in their armamentarium to reduce the morbidity associated with these patients. The results of this study reveal that there is a dearth of knowledge and clinical exposure among anesthesia residents regarding various intubation techniques employed in craniofacial surgery. Educational and quality improvement initiatives in various intubation techniques could enhance anesthesia residents' knowledge and clinical exposure in managing various craniofacial surgical cases.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Hall CE, Shutt LE. Nasotracheal intubation for head and neck surgery. J Anesth 2003;58:249-56.
2. Vadepally AK, Sinha BR, Subramanya AV, Agarwal A. Quest for an ideal route of intubation for oral and maxillofacial surgical manoeuvres. J Maxillofac Oral Surg 2016;15:207-16.
3. Bernard AC, Kenady DE. Conventional surgical tracheostomy as the preferred method of airway management. J Oral Maxillofac Surg 1999;57:310-5.
4. Lane G. Intubation techniques. Oper Tech Otolaryngol 2005;16:166-70.
5. Stella JP, Kageler WV, Epker BN. Fiberoptic endotracheal intubation in oral and maxillofacial surgery. J Oral Maxillofac Surg 1986;44:923-5.
6. Morgan JP 3rd, Haug RH, Holmgreen WC. Awake blind nasoendotracheal intubation: A comprehensive review. J Oral Maxillofac Surg 1994;52:1303-11.
7. Dhara SS. Retrograde tracheal intubation. Anaesthesia 2009;64:1094-104.
8. Benumof JL, editor. Clinical procedures in anesthesia and intensive care. In: Conventional (Laryngoscopic) Orotracheal and Nasotracheal Intubation (Single-Lumen Tube). Philadelphia, New York: J. B. Lippincott Company; 1992. p. 133-4.
9. Crosby ET, Cooper RM, Douglas MJ, Doyle DJ, Hung OR, Labrecque P, *et al*. The unanticipated difficult airway with recommendations for management. Can J Anaesth 1998;45:757-76.
10. Ajay S, Singhania A, Akkara AG, Shah A, Mayur A. A study of flexible fiberoptic bronchoscopy aided tracheal intubation for patients undergoing elective surgery under general anesthesia. Indian J Otolaryngol Head Neck Surg 2013;65:116-9.
11. Tuzuner-Oncul AM, Kucukyavuz Z. Prevalence and prediction of difficult intubation in maxillofacial surgery patients. J Oral Maxillofac Surg 2008;66:1652-8.
12. Piepho T, Thierbach A, Werner C. Nasotracheal intubation: Look before you leap. Br J Anaesth 2005;94:859-60.
13. Jaisani MR, Pradhan L, Bhattarai B, Sagtani A. Intubation techniques: Preferences of maxillofacial trauma surgeons. J Maxillofac Oral Surg 2015;14:501-5.
14. Telford RJ, Liban JB. Awake fibreoptic intubation. Br J Hosp Med 1991;46:182-4.
15. Delaney KA, Hessler R. Emergency flexible fiberoptic nasotracheal intubation: A report of 60 cases. Ann Emerg Med 1988;17:919-26.
16. Agrò F, Hung OR, Cataldo R, Carassiti M, Gherardi S. Lightwand intubation using the Trachlight: A brief review of current knowledge. Can J Anaesth 2001;48:592-9.
17. Jundt JS, Cattano D, Hagberg CA, Wilson JW. Submental intubation: A literature review. Int J Oral Maxillofac Surg 2012;41:46-54.