Available online at **www.ijmrhs.com**

ISSN No: 2319-5886

International Journal of Medical Research & Health Sciences, 2022, 11(7): 39-44

Comparison between Blind Nasal and Fiber Optic Intubation in Maxillofacial Trauma Posted for Elective Surgery

S. Jyotsna*, R. Rajeshwar Reddy, and Prattipati Swathi

Department of Anaesthesiology, Alluri Sitarama Raju Academy of Medical Sciences, Andhra Pradesh, India

**Corresponding e-mail: vlnvraju@gmail.com*

Received: 31-May-2022, Manuscript No. ijmrhs-22-65464; **Editor assigned:** 01-June-2022, PreQC No. ijmrhs-22-65464(PQ); **Reviewed:** 04-July-2022, QC No. ijmrhs-22-65464(Q); **Revised:** 14-July-2022, Manuscript No. ijmrhs-22-65464(R); **Published:** 30-July-2022, J-invoice: J-65464

ABSTRACT

Background: *Airway management of patients with maxillofacial trauma is complex and crucial because it can dictate a patient's survival. Securing the airway of patients with maxillofacial trauma is often extremely difficult because the trauma involves the patient's airway and their breathing is compromised. In these patients, mask ventilation and endotracheal intubation are anticipated to be difficult.* ***Objectives:*** *To compare the safety and complications of blind nasal and fibre optic intubation in maxillofacial trauma.* ***Methods:*** *This is an observational study, approved by the institutional ethical committee. An individual informed consent was taken from all the patients selected for the study. All the patients belonging to the American Society of Anesthesiologists (ASA) grades 1 and 2 are between the age group of 18 years-50 years of either sex. Posted for maxillofacial surgery under general anaesthesia patients with comorbidities like Chronic obstructive pulmonary disease (COPD), cardiovascular problems, and patient refusal are excluded from the study. A total of 40 patients with different types of facial fractures are included in the study they were divided into a blind nasal group (20 patients) and a fiberoptic group (20 patients).* ***Discussion:*** *The patient with maxillofacial trauma presents serious challenges for the physician because airway management in these patients can be complicated by their injury. The first challenge is to secure the airway for sufficient and effective breathing and/or ventilation. Fiberopticbronchoscopic intubation is the best option for elective patients but has been considered difficult in maxillofacial trauma, and patients with intraoral bleed. In both groups of patients, securing the airway before induction of general anaesthesia adds to the safety of anaesthesia and helps minimize the possibility of major complications.* ***Conclusions:*** *Awake fiberoptic intubation, is the best method for securing the airway in patients with facial trauma when compared with blind nasal intubation.*

Keywords: Maxillofacial injuries, Blind awake nasal intubation, Fiberoptic bronchoscopic intubation

INTRODUCTION

Multiple facial fractures are not uncommon in road traffic accidents and pose a great difficulty for an anaesthetist to maintain the airway. Anesthesiologists must be conversant with alternative techniques and appliances.

Preservation of patients' spontaneous respiration and consciousness are the most important recommendations in any case of a difficult airway. It allows the patients to maintain the tonicity of airway muscles providing a degree of safety that may be lost in anaesthetized patients. Awake blind nasal endotracheal intubation is a modification of Sir Ivan Magill's technique of blind nasal intubation under ether anaesthesia. Nasotracheal intubation is commonly used in patients undergoing maxillofacial surgery. If a difficult airway is not anticipated, the tracheal tube is passed through the nose after induction of anaesthesia and neuromuscular blockade [1].

Nasal intubation which improves surgical exposure and increases tube stability during intra-oral manipulation of facial structures is requested often by oral and maxillofacial surgeons. Also for postoperative airway maintenance and/or

mechanical ventilation, a nasal endotracheal tube is preferred as it is well tolerated and potentially less hazardous to surgical repair [2].

The presence of maxillary or mandibular fractures, restricted mouth opening, bleeding in the naso-oropharynx, facial oedema, and associated cervical spine injury are anticipated factors of difficult intubation [3]. Airway management in patients with Le Fort 2 with symphysis fracture of the mandible is an ever-challenging situation. So using a fiberoptic bronchoscope helps in securing the airway.

We report 40 patients with facial trauma posted for maxillofacial surgery.

This study aimed to compare the safety and associated complications of awake endotracheal intubation in maxillofacial surgery patients using either blind nasal or fibre optic techniques.

METHODS

The present clinical observative, analytical study entitled Comparison between blind nasal and fibre optic intubation in maxillofacial trauma posted for elective surgery was conducted on 40 patients posted for elective surgeries selected randomly. General anaesthesia was provided after intubation for all the patients [4].

- The study was conducted between December 2020-December 2021 at Alluri Sitarama Raju Academy of Medical Sciences, Eluru, after getting approved by the institutional ethical committee. An individual informed consent was taken from all the patients selected for the study from the Ear, Nose, and Throat (ENT) and Dental Surgery departments posted for elective surgeries [5,6].

Inclusion Criteria

- Patients are aged 18 years-50 years of either sex.
- American Society of Anesthesiologists (ASA) grades I and II.
- Patients posted for maxillofacial surgery under general anaesthesia.

Exclusion Criteria

- Patients with comorbidities like Chronic Obstructive Pulmonary Disease (COPD), and cardiovascular problems.
- Unwilling patients.

A total of 40 patients with different types of facial fractures are included in the study. All patients were preoperatively assessed for airway, and systemic examination and detailed history were taken.

In pre-anaesthetic assessment, patients were evaluated for type and mechanism of injury. Airway assessment by Mallmpatti classification, Thyromental distance, and atlantoaxial mobility. Based on the type of injury and procedure, the intubation technique was decided [3]. Nasal patency was checked for all patients. The fiberoptic intubation technique was selected for patients with restricted mouth opening of one finger or less.

In all 40 patients' nasal preparation was done with xylometazoline drops, a pack soaked with 4% lignocaine, and nebulization with 4% lignocaine in the pre-operative room [7].

40 patients of both genders were randomly allocated into two equal groups of 20 each.

Group A: Blind nasal intubation group. In this group, blind nasal intubation was done before induction of anaesthesia.

Group B: Fiberoptic intubation group. In this group, fiberoptic intubation was done after giving bilateral superior laryngeal nerve and transtracheal blocks.

Procedure

All the Patients were examined the day before surgery, and pre-anaesthetic counselling was done. All patients received Alprazolam 0.5 mg orally on the night before surgery. Injection Ondansetron 0.1 mg/kg i.v. and Injection Ranitidine 1 mg/kg i.v. given on the day of surgery.

In the operation theatre patients were secured with an 18 gauge bore cannula and preloaded with ringer lactate,

all the monitors like Electrocardiogram (ECG), Human Non-invasive Blood Pressure (NIBP), pulse oximetry, and capnography were connected.

After nasal preparation, all patients are premedicated with an injection of Midazolam 1 mg, injection of Glycolpyrolate 0.2 mg, and injection of Fentanyl 100 mcg. A proper size nasopharyngeal airway coated with 2% lidocaine jelly was inserted smoothly being act as a nasal passage dilator just before intubation. Pre-oxygenate patient with 100% O_2 for 3 min-5 min.

In the group, a proper-sized 6.5 mm or 7 mm Endotracheal (ET) tube was lubricated and inserted gently into the nostril. The Endotracheal (ET) tube then advanced gently until slight resistance was felt.

The resistance is encountered when the Endotracheal Tube (ETT) approaches the posterior pharyngeal wall, then retracts ETT, extends the patient's neck if possible, and gradually advances the ET tube into the trachea by asking the patient to take deep breaths & keep on hearing breath sounds. The position of the endotracheal tube was confirmed by auscultation and capnography [2,4,8].

In group B fiberoptic intubation is done after bilateral superior laryngeal nerve block given by injecting 2.5 cc of Lignocaine 2% on either side of the greater cornu of the hyoid bone. Transtracheal block given with 3 ml of 4% lignocaine after identifying cricothyroid notch. Intraoral spraying is done with lox 10% to prevent cough reflex and gag reflex.

A 6.5 mm or 7 mm reinforced nasotracheal tube was advanced into the nasopharynx. A fiberoptic scope was advanced through the nasotracheal tube and then the scope was advanced towards the glottis. The fiberoptic scope was then passed behind the epiglottis to visualize the vocal cords and then advanced through the glottis opening into the trachea during spontaneous breathing the tip of the scope was positioned immediately proximal to the carina [9]. Then the endotracheal tube was advanced smoothly into its final position and the tube was secured. The endotracheal position of the tube was confirmed by capnography and bilateral chest auscultation.

Propofol and vecuronium were administered to induce general anaesthesia. Intraoperative analgesia was achieved with an injection of Fentanyl and injection of Diclofenac. Anaesthesia was maintained with oxygen (33%), N_2O (67%), and isoflurane (1%). An intraoral pack was placed to prevent aspiration by using a direct laryngoscope. Vital parameters were monitored throughout the procedure and found to be stable [10-13].

RESULTS

Fourty patients with maxillofacial injuries were reported to tertiary care hospitals over one year. The majority of patients were in the age group of 21 years-40 years. Fracture mandible was found to be the most common injury, followed by fracture maxilla and zygoma and pan facial trauma [14].

In group A Patient's airway was secured by blind awake nasal intubation, it was successful in 13 (60%) patients. This group constituted multiple fractures of unilateral zygomatic, maxilla and mandible, limited TMJ movement c-spine injuries [1,15-19]. 7 patients (40%) needed assistance with a fibreoptic bronchoscope after failed blind nasal intubation attempt [20].

Failed blind nasal intubation seen in patients of restricted mouth opening, restricted TMJ movement, mallampatti unable to assess and along with leeforte 1 and 2.

In group B most of the patients for maxillofacial surgery with difficult airways were intubated successfully and one was unsuccessful with fiberoptic intubation (Table 1 and Table 2).

Table 1 Comparison of success rate in blind nasal group and fiberoptic group

S.No.	Type of intubation	Successful	Unsuccessful	*p-value
1	Blind nasal intubation	13 cases	7 cases	<0.05
2	Fiberoptic intubation	19 cases	1 case	
*P is calculated by Chi-square test using Statistical Package for Social Sciences (SPSS) software trial version 26.				
*The p-value is 0.0177, significant at <0.05.				

Table 2 Complications associated with blind nasal and fiberoptic intubation

S.No.	Complications	Blind nasal intubation	Fiberoptic intubation
1	Bleeding	4	2
2	Gag reflex	8	8
3	Laryngospasm	2	0

While Heart Rate (HR) and Mean Arterial Blood Pressure (MABP) was slightly increased immediately after successful intubation in both groups with insignificant differences between each group [21,22].

DISCUSSION

Management of the airway is a major concern in patients with maxillofacial trauma because a compromised airway can lead to death.

Various airway management strategies have been suggested like blind nasotracheal intubation, fiberoptic endoscope-guided intubation, and preliminary tracheostomy [23].

When planning to secure the airway, the physician has to consider several aspects

- The nature of the trauma and its effect on the airways.
- Potential difficulties in mask ventilation or endotracheal intubation.
- Possible trauma of the cervical spine.
- The risk of regurgitation and aspiration of gastric contents.
- Significant bleeding precludes a view of airway anatomy and may cause circulatory deterioration.
- The type of maxillofacial operation that is to be done and whether the oral cavity needs to be empty for performing the procedure, In this review the complexity and difficulties of securing the airway in maxillofacial trauma.

Fiberoptic bronchoscopic intubation is the best option for elective patients but has been considered difficult in maxillofacial trauma, and patients with intraoral bleed [7].

In both groups of patients, securing the airway before induction of general anaesthesia adds to the safety of anaesthesia and helps minimize the possibility of major complications.

Awake intubation should also be considered in patients with a history of difficult intubation, patients with questionable airways who are at high risk of aspiration, patients who have an unstable cervical spine, upper body morbid obesity, and ventilator failure [24,25].

CONCLUSION

Nasotracheal intubation is an effective and safe technique that is underused in the current practice. The skill of fibre-optic intubation has become essential for a practising anaesthetist today to safely manage patients in whom orotracheal intubation is anatomically difficult. From the present study, it can be concluded that awake fiberoptic intubation, is the best method for securing the airway when compared to awake blind nasal intubation in patients with facial trauma.

DECLARATIONS

Conflict of Interest

- The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

[1] Hutchison, Iain, Michael Lawlor, and David Skinner. "ABC of major trauma. Major maxillofacial injuries." *British Medical Journal,* Vol. 301, No. 6752, 1990, p. 595.

[2] Walls, Ron M. "Management of the difficult airway in the trauma patient." *Emergency medicine clinics of North America,* Vol. 16, No. 1, 1998, pp. 45-61.

[3] Dhasmana, Satish, Vibha Singh, and U. S. Pal. "Awake blind nasotracheal intubation in temporomandibular joint ankylosis patients under conscious sedation using fentanyl and midazolam." *Journal of maxillofacial and oral surgery*, Vol. 9, No. 4, 2010, pp. 377-81.

[4] Kramer, A., et al. "Fibreoptic vs video laryngoscopic (C-MAC® D-BLADE) nasal awake intubation under local anaesthesia." *Anaesthesia,* Vol. 70, No. 4, 2015, pp. 400-06.

[5] Rosenstock, Charlotte V., et al. "Awake fiberoptic or awake video laryngoscopic tracheal intubation in patients with anticipated difficult airway management: a randomized clinical trial." *The Journal of the American Society of Anesthesiologists,* Vol. 116, No. 6, 2012, pp. 1210-16.

[6] Chauhan, Varun, and Gaurav Acharya. "Nasal intubation: a comprehensive review." *Indian Journal of Critical Care Medicine: Peer-reviewed, Official Publication of Indian Society of Critical Care Medicine,* Vol. 20, No. 11, 2016, p. 662.

[7] Calder, I. "Murphy P. A fibre-optic endoscope is used for nasal intubation. Anaesthesia 1967; 22: 489-91." *Anaesthesia,* Vol. 65, No. 11, 2010, pp. 1133-36.

[8] Hopkins, Harold H., and N. Singh Kapany. "A flexible fibrescope, using static scanning." *Nature,* Vol. 173, No. 4392, 1954, pp. 39-41.

[9] Benumof JL. "Management of the difficult adult airway." *Anesthesiology,* Vol.75, 1991, pp. 1087–110.

[10] Ovassapian, Andranik. "The flexible bronchoscope: a tool for anesthesiologists." *Clinics in chest medicine,* Vol. 22, No. 2, 2001, pp. 281-99.

[11] Hastings, Randolph H., and James D. Marks. "Airway management for trauma patients with potential cervical spine injuries." *Anesthesia & Analgesia,* Vol. 73, No. 4, 1991, pp. 471-82.

[12] Lee JA and Atkinson RS: "A Synopsis of Anaesthesia.", 7th edn, Bristol, *John Wright and Sons Ltd*, 1973.

[13] Stone DJ and Gal TJ, "Airway management: Anesthesia." *New York, Chur-chillLivinstone*, 1990; pp 1278-1281.

[14] Bell, C. N. A., et al. "Pharyngoplasty: a hazard for nasotracheal intubation." *British Journal of Oral and Maxillofacial Surgery,* Vol. 24, No. 3, 1986, pp. 212-16.

[15] Larijani, Ghassem E., et al. "The efficacy and safety of EMLA® Cream for awake fiberoptic endotracheal intubation." *Anesthesia & Analgesia,* Vol. 91, No. 4, 2000, pp. 1024-26.

[16] Lloyd, E. Ll. "Fibreoptic laryngoscopy for difficult intubation." *Anaesthesia,* Vol. 35, No. 7, 1980, pp. 719-19.

[17] Cobley, M., and R. S. Vaughan. "Recognition and management of difficult airway problems." *British Journal of Anaesthesia,* Vol. 68, No. 1, 1992, pp. 90-97.

[18] Grindlinger, GENE A., et al. "Acute paranasal sinusitis related to nasotracheal intubation of head-injured patients." *Critical care medicine,* Vol. 15, No. 3, 1987, pp. 214-17.

[19] Magill, I. W. "Technique in endotracheal anaesthesia." *British medical journal,* Vol. 2, No. 3645, 1930, p. 817.

[20] Vaughan, R. S. "Editorial Ii: training in fibreoptic laryngoscopy." *British Journal of Anaesthesia,* Vol. 66, No. 5, 1991, pp. 538-40.

[21] Atchabahian, Arthur, and Ruchir Gupta. "The anaesthesia guide." *McGraw-Hill*, 2013.

[22] Gerheuser, F., and K. Gurtler. "Awake fiberoptic intubation." *Der Anaesthesist,* Vol. 60, No. 12, 2011, pp. 1157-74.

[23] Jacomet, Alfred, and Abel-Jan Tasman. "Airway management in facial trauma patients." *Facial Plastic Surgery,* Vol. 31, No. 4, 2015, pp. 319-24.

[24] Barak, Michal, et al. "Airway management of the patient with maxillofacial trauma: a review of the literature and suggested clinical approach." *BioMed research international,* 2015.

[25] Wong, Jolin, et al. "Fibreoptic intubation in airway management: a review article." *Singapore medical journal,* Vol. 60, No. 3, 2019, p. 110.