IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 20, Issue 8 Ser.6 (August. 2021), PP 59-63
www.iosrjournals.org

A Comparative study of awake blind nasal intubation V/S awake fibre -optic intubation in cases of restricted mouth opening.

Dr. Bipin shah[1], Dr. Kinjal Sanghvi[2];, Dr Asmita chaudhary[3],
Dr Vyoma Parmar[4],(Dr Nikhil Kacha[5] , Dr Sanjay Baldaniya[6]
(Professor in anesthesia[1-3], Associate professor in anesthesia[2] , Resident in anesthesia[4-5-6]
Department of Anaesthesia, GCS Medical College, Hospital and Research Centre, Opp, DRM office, Near Chamunda bridge, Naroda Road, Ahmedabad,380025 Gujarat.India
Corresponding author: Dr Kinjal Sanghvi,
Associate Professor, Anesthesia department 21, Rushabh Society,Opp, Nirav flat
Near Dhanvantari garden, Fatehpura PALDI AHMEDABAD 380007, Gujarat INDIA

Abstract:
Background: *In restricted or nil mouth opening, airway management during any operative procedure is critical, challenging and requires experienced and skilled Anesthesiologist for Fiber optic or Blind Awake Intubation technique. It also requires comfortable and cooperative patient with anaesthetized airway with local anesthetic.*
Aim: *We studied two different methods comparing intubating condition, hemodynamic changes, and time taken for the intubation and any adverse events.*
Methods: *In this prospective randomized comparative study 40 patients of ASA physical status, I to II, either sex, posted for maxillo-facial surgery with mouth opening < 1.5 cm, requiring nasal intubation were randomized into two equal groups. After complete airway block, In Group A patients were intubated with Blind nasal technique monitored by spontaneous respiratory movement in breathing circuit and EtCO2 during intubation. In Group B Patients were intubated with awake fibreoptic technique. Intubation attempts, hemodynamic changes and time taken for the intubation were noted.*
Results: *In Group A 16, 3 and 1 patients were intubated in first, second and third attempts respectively. In Group B 17 and 3 patients were intubated in first and second attempts respectively. The mean time required for successful intubation was (86 ± 12.5sec) in group (A). and (95.5±17.1sec) in group B, Haemodynamic changes and intubating conditions were not significant with No major adverse events.*
Conclusion: *Both techniques are valuable in difficult airway management with no significant difference between the success rates. Awake blind nasal intubation may provide an alternative safe technique in cases of anticipated difficult intubation, particularly if the fibreoptic bronchoscope is not available.*
Key Words*: Fibreoptic intubation, Awake blind nasal intubation, Restricted mouth opening*

Date of Submission: 01-08-2021 Date of Acceptance: 15-08-2021

I. Introduction

To maintain airway and respiratory physiology is challenging task for anesthetist during intubation and anesthesia in a restricted mouth opening patients[1].

Blind nasal, Fiber optic intubation, retrograde intubation & tracheostomy are the different techniques of securing airway in restricted mouth opening patient. Fibre-optic endotracheal intubation is the gold standard technique[2], Still awake blind nasal intubation remains the technique of choice when fibre-optic scope is not available.

Dr. Macewen had done first awake intubation in 1880.[3)] Since that time many reports of awake intubation for management of difficult airway are available. Both techniques require sufficient patient cooperation and comfort and expertise. Blind nasal intubation was introduced in 1928 by Stanley Row Botham and Evan [4l], which is a useful in old days when scope was not available. The fibre-optic intubation is extensively accepted for managing difficult airway. However, it sometimes become difficult to locate the glottis with fibrescope when blood, vomitus, or secretions obscure the view.[5] Formal training required to develop skill in both techniques.

This study aimed to compare the number of attempts, mean time taken to do procedures, hemodynamic changes, safety and associated complication of awake endotracheal intubation in oral and maxillofacial surgery either using blind nasal or fibre-optic nasal techniques.

II. Materials And Methods

The present study was done in G C S Medical College, Hospital and research Institute, Ahmedabad. After obtaining Research and Ethical Board approval and informed patient consent the current study was performed in 40 cases of ASA physical status I to II, either sex, posted for oral surgery with mouth opening < 1.5 cm, requiring nasal intubation for CA buccal mucosa, CA oral cavity, maxillo-facial surgery. Below figure showing mouth opening less than 1.5cm

The study design was , prospective and randomized. The current study was performed with back up of emergency different difficult airway management option including cricothyroidotomy or tracheostomy. Detail preoperative evaluation and investigations were done in all patients. Main purpose of preoperative visit was airway evaluation and meaningful communication. Here patient's cooperation is the major factor for success of this technique. We have to communicate here that routine anaesthesia procedure like first anaesthetic drugs and then intubation, which is not possible here so that create difficulty. Here first local airway anaesthesia in awake status followed by nasal intubation & then anaesthesia.

All the procedure from decongestant drop, nebulization, superior laryngeal nerve block, transtracheal block, position etc to be explained, and in worst scenario consent for the tracheostomy also to be taken.

Our goal was dry airway and calm patient. Nasal mucosal decongestant drops Xylomist contain Xylometazoline 0.1% was used to clear passage and reduced chance of bleeding. Lignocaine 4% 4 ml in nebulisation for topicalization before 20 min & advised to take deep breadth for 10 min from nostrils & 10 min from mouth. Various nasal airways, nasal endotracheal tubes, tracheostomy tube were kept ready. In case of failure of fibreoptic scope retrograde intubation kit, endotracheal tube exchanger, cricothyroid set for emergency should be kept ready. Emergency crash cart to be kept ready.

Patients were randomly allocated in two groups A and B of 20 each. In Group A patients were intubated with Blind nasal intubation technique monitored by spontaneous respiratory movement in breathing circuit and EtCO2 during intubation. In Group B Patients were intubated with awake fibreoptic technique. In OT monitors were applied. to the patient and I/V line were secured. And a big pillow was kept under the shoulder /thorax and ring was kept under neck and instructed to keep head in extended position for alignment of all three axis, so that sniffing position can be achieved. During Awake nasal intubation ECG, NIBP, SPO2 and ETCO2 were used as a part of basic standard monitoring. Depending on the complexity of surgery and patient condition more monitoring like invasive hemodynamic monitors can be used

Patient was premedicated with Inj Midazolam 0.02 mg/kg I/V and Inj Glycopyrolate 0.05mg/kg I/V after establishing monitoring. Inj Rantac150 mg I/V were given for aspiration prophylaxis. No narcotics were used to prevent hypoxia by respiratory depression.

Airway anesthesia Techniques

In preoperative room Nebulisation with xylocaine 4% was given in patient of both the groups prior to half an hour and other blocks were given in OT with proper monitoring. Here explanations of various techniques given as below.

Superior laryngeal nerve block:

After identifying the greater cornu of hyoid, depress the carotid artery laterally and posteriorly by index finger of non-dominant hand. With dominant hand, a 24 G needle is 'walked off' the cornu of hyoid bone in an anterior – inferior direction, aiming toward the middle of thyrohyoid membrane. A slight resistance is felt as the needle advanced through the membrane, usually at a depth of 1 to 2 cm. The needle at this point has entered the pre-epiglottic space. Aspiration through this should be negative for air also. If air is coming than needle should be withdrawn as it entered too deep in pharynx. When no air or blood can be aspirated than Inj Xylocaine 2 % 3 ml was used to block superior laryngeal nerve. The block was repeated on other side.

Translaryngeal (Transtracheal) Block

The patient was asked not to talk, swallow or cough until instructed. The midline of cricothyroid membrane was identified, and midline is to be noted. The index and thumb of non-dominant hand was use to stabilize the trachea. A small skin wheal was rise by injecting small volume of Inj Xylocaine 2% by 24 G needle in midline in cricothyroid membrane. A 22G viggo (catheter over needle) was attached to a 5 ml syringe contained 3 ml saline. The viggo was advanced through the skin perpendicularly or slightly downward by continuously aspirating. When air was freely aspirated catheter was advanced over the needle. After removing needle again check the aspiration of air through the catheter. Inj Xylocaine 2% 4ml containing 5 ml syringe was

attached and air aspiration should be confirmed again. The patient was warned to expect vigorous coughing on injection and local anaesthetic was injected rapidly during inspiration. The catheter we left in place until the intubation get complete in case more local anaesthetic is needed to inject and to decrease the chances of surgical emphysema at injection site.

Local anaesthetic toxicity is a real concern. Total dose of Xylocaine was used in such a way that optimum concentration can be achieved and should not increase the maximum recommended dose.

Patient should be kept in position like pillow under shoulder & ring under extended head & portion of head side of table should be slightly elevated 5 degree. In Group A Blind Nasal technique after passing good amount of Lignocaine jelly through nostrils, pass the nasal airway no. 6.0 to 8.5 from each nostril. Airway should be passed gently so that there should not be any bleeding. Patency of nostril can be identified through nasal airway. Now North Pole nasal endotracheal cuff tube with soft ivory material - Portex (Polar performed Tracheal tube, North nasal Profile soft seal cuff ivory) with monitoring of respiratory movement on breathing circuit with oxygen flow of 4 L/min and ETCO2 guided tube is to be passed & asking patient to take deep breadth from nose and keep mouth close. Usually, we can hear a sound of inspiration through the tube, or respiratory movement on bag and ETCO2 wave on monitor. If you are not getting wave, then close the other nostril with cotton plug. If too much jelly or secretary sounds are there, then suction catheter should be introduced through other nostril & secretion is to be removed otherwise it is helpful to observe correct path of tube.

Under the guidance of monitoring advanced the endotracheal tube in inspiration. When monitoring gets lost or diminished than little withdraw the tube and again advance it with minor change in direction. Change in head extension or flexion by adding or removing a support behind the chest or adding support to ring below head. Change in head side to side rotation was also tried for successful intubation. After intubation bilateral air entry checked and tube fixed.

In Group B the fibreoptic scope bronchoscope (Storz fibreoptic bronchoscope) loaded with proper sized flexomettalic tube with tip defogged introduced through the one nostril until glottic aperture seen and then through the vocal cords till carina was visualized. The fibrescope was fixed and tube was advanced. The scope was withdrawn and tube placement confirmed by capnography and fixed.

In both the groups after intubation all induction agent, narcotics and relaxant were given. Inj Fentanyl 100 mcg + Inj. Atracurium 25 mg + Inj Propofol 100 mg were given intravenously. Cuff was checked after giving relaxant and if needed more volume of air was used to inflate the cuff. Then patient was kept on ventilator & routine anaesthesia were conducted. Nasogastric tube was passed from the other nostril.

All patients were intubated by anesthesiologist familial with both intubation techniques.

Time taken to intubate the trachea was measured in seconds from the moment of tube or scope insertion in nosril until correct placement was confirmed by ETCO2. Number of attempts were recorded in both the groups. Hemodynamic parameters like Heart Rate, MABP, SPO2, were recorded at baseline, five mins after airway block and immediately after intubation. If during the procedures of intubation if oxygen saturation goes below 90% or if Heart rate or ECG changes deviate more than 25% baseline the patient was excluded from the study .and nasal intubation performed under General anesthesia. Any adverse events such as soft tissue bleeding, oxygen desaturation, severe patient discomfort or trauma recorded

Data were collected, tabulated. Numerical values were presented as mean and SD. The statistical software named SPSS was used. A difference with significant level ($p<0.05$) was considered significant.

III. Observation

Table 1 - Demographic data

Data	**Group A**	Group B	P value
Age	48 ± 15.3	46 ±13.2	0.658
M:F	27:3	28;2	
Wt (kg)	62.90 ± 6.23	60.73 ± 5.43	0.48
Ht (cm)	147 ± 5.94	150 ± 5.42	0.19

There were no significant differences as regards demographic data in the two studied groups.

Table 2 - Number of attempts

No of attempts	**Group A**	Group B
1	16(80)	17(85)
2	3(15)	3(15)
3	1(5)	0

The number of intubation attempts, were statistically insignificant between both groups

Table 3 - Time for intubation

Time (sec)	Group A (%)	Group B (%)	P value
Mean time	86 ± 12.5	95.5±17.1	0.08

The mean time required for successful intubation was significantly less in group (A).

Table 4 - Hemodynamic variables

Parameters	Group A	Group B	P value
Pre op HR	82±10.3	84±11.63	0.57
Post Intubation HR	94±16.3	97±14.43	0.61
Pre intubation MBP	90.50± 8.63	90.08±8.20	0.87
Post intubation Mean BP	100.5±9.65	102.86±8.77	0.81
Pre op SpO_2	98±3.6	97±3.6	0.76
Post Intubation SpO_2	100 ±0	100 ±0	1

There was no significant difference in arterial oxygen saturation, heart rate and blood-pressure in both groups at baseline and at 5 minutes recordings after airway block. While, HR and BP were significantly increased immediately after successful intubation in both groups with insignificant differences between each group.

Table 5 - Complication during Intubation

Complications	Group A (%)	Group B (%)
Cough	3(15)	1(5)
Bleeding	1(20)	2(10)

Complications like coughing when tube enters in trachea was noted in some patients more than routine may be due to improper local anesthesia. Bleeding occurred in patients where more than 1 trial occurred and mostly due to passage of tube through nasal cavity. But in both the groups it was not significant.

Table 6 - Post operative complications

Post-operative complications	Group A (%)	Group B (%)
Mild sore throat	4(20)	2 (10)
Hoarseness of voice	2 (10)	1 (5)

In some patients, mild sore throat and hoarseness was noted but not significant.

IV. Discussion

Airway security is the main concern when doing induction of oral surgeries. As many challenges are there like patient may have restricted mouth opening due to submucous fibrosis, tumour, previous mandibulectomy, revision surgeries with flap, deviated mouth opening or pain due to fracture. In such cases we first think about ability of ventilation and then intubation. When there is doubt about it we should go towards awake intubation. As in oral surgery nasal intubation is comfortable and tolerable should be preferred

Wherever facility of fibreoptic scope available, intubation with a conscious sedation is considered one of the safest choices to secure a difficult airway. Proper expertise in this technique should be there, required proper training. We chose expert person in fibreoptic intubation in our study. Causes of failure of fibreoptic intubation are mainly the presence of secretions and blood, inadequate anaesthetized local airway, decreased space between the tip of the epiglottis and the posterior pharyngeal wall, inability to advance the endotracheal tube over the fibroscope, distorted airway anatomy and the occurrence of a complication. Major complications encountered during fibreoptic intubation that might cause a failure to intubate the trachea are laryngospasm, gagging and/or vomiting, epistaxis, regurgitation and respiratory depression with hypoxemia [6]

On other side in case of unavailability of fibreoptic scope or it damaged (which we faced at our institute it gone for repair for long time so we went towards blind nasal intubation technique), .blind nasal intubation is another technique, learned only by practice and easily mastered psychomotor skill with a low complication rate [7-8].

Our study saws high rate of successful intubation in both blind nasal and fibreoptic technique. In group A 80% and in group B 75% have successful intubation in first attempt. In addition no significant differences observed

between both groups in the number of attempts required for successful intubation as 15% and 5% of patients intubated at second and third attempt in blind nasal group while 20% at second and 5% at third attempt in fibroscopic group respectively

Alain et al [9] in a study including 20 anaesthetized patients wearing a rigid cervical spine collar and breathing spontaneously, found that blind nasal intubation using a cuff inflation technique, was successful in 19 of 20 patients (95%), of them 14 patients was successful in the first attempt (70%), and in the same study fiberoptic intubation was successful in 19 of 20 patients (95%).

In contrast, Gold and colleagues[10], found that 40% of their patients required 4-12 attempts for successful blind nasal intubation

A success rate of 65% of blind nasal intubation was reported from a group of emergency room physicians who had at least 1-year prior training in emergency medicine[11] and were experienced in airway management techniques with a mean number of attempts of 3.7 per patient and mean time to intubate of 276s. Danzl and Thomas[8], reported a success rate of 92% in emergency room patients requiring nasal intubation. The physicians examined had at least 3 months' experience in emergency medicine, but the time taken to intubate, and incidence of hypoxia were not recorded.

The high success rate in the present study could be related to ETT selection and proper patient position and communication. Selecting a thin walled, pro-per curved and slight smaller size ETT, while patient in morning sniff position, be asked to protrude his or her tongue and take deep breath during advancing ETT through airway passages could overcome these difficulties. Proper anesthetised airway is also the main thing for successful intubation in both the groups.

In our study, the mean time taken to intubate the trachea using blind nasal technique was (83.1± 12.5) seconds less than that with fibroscopic technique (97.5±17.1) seconds . This could be due to extra time needed for fibroscope to be threaded through the ETT lumen and to be adjusted by the operator to get the best vision in every step. Alain VE et al[9], recorded 20.8±23 seconds for intubation using blind nasal when the ETT cuff was inflated in the pharynx and 60.1±56 seconds when using nasal fibreoptic laryngoscopy. Ashok SK et al[12] recorded 81±63 seconds for fibreoptic nasal intubation with mean attempts 1.06 ± 0.08 in awake patients with cervical spine disease.

There was no significant difference between the two groups regarding haemodynamic parameters. Heart rate and mean arterial blood pressure increased significantly immediately after intubation in both groups which could be attributed to the pressor response of intubation itself, however these changes were within the acceptable clinical range. One or two patients of both groups reported mild coughing when tube passed through vocal cord this happened probably when topical anesthesia of airway was inadequate. Mild bleeding in nasal passage and post-operative sore throat were found in 2-3 patients which is not significant and cured.

V. Conclusion

of our study is that, both blind nasal and fibreoptic tracheal intubation are valuable in awake sedated patients, with no significant difference between the success rates of both techniques. Awake blind nasal intubation under topical anesthesia may provide an alternative safe technique in cases of anticipated difficult intubation, particularly if the fibreoptic bronchoscope is not available or in a single hand anaesthesiologist or available but failed to pass through the glottis as the view is obscured by blood or massive secretions. Proper anesthetised airway and training of anesthetist bare two main factors behind the success of the technique.

References

[1]. Benumof JL. Management of the difficult adult airway. Anesthesiology 1991; 75:1087–110
[2]. Ovassapian A: The flexible bron-choscope:A tool for anaesthesiologests.Cli Chest Med 2001; 22: 281-299
[3]. Macewan W. Clinical observations on the introduction of tracheal tubes by the mouth instead of performing tracheotomy or laryngotomy. Br Med J 1880;2:122-5, 163-5
[4]. Gillespie N. *Endotracheal Anesthesia.* 2nd ed. Maddison, Wiscionsin: University of Wisconsin Press; 1948. [Google Scholar]
[5]. Lloyd EL: Fibreoptic laryngoscopy for difficult intubation. Anaesthesia 1980;35:719
[6]. Ovassapian A: Fibreoptic intubation in adults. In: Ovassapian A (Ed).Airway, 2nd Ed. New York: Lippincott-Raven 1996; 71-102.
[7]. Lee JA, Atkinson RS: A Synopsis of Anaesthesia, 7th Edn. Bristol: John Wright and Sons Ltd, 1973
[8]. Danzl DF, Thomas DM: Nasotracheal intubations in the emergency depart-ment.Critical Care Medicine 1980; 8:677-682.
[9]. Alain VE, Jean Claude M, Hossein M: Nasotracheal Intubation in Patients with Immobilized Cervical Spine: A Com-parison of Tracheal Tube Cuff Inflation and Fiberoptic Bronchoscopy. Anesth Analg 1998; 87:400–2.
[10]. Gold MI, Buechel DR: A method of blind nasal intubation for the consc-ious patients. Anaesth. Analg.1960; 39:257.
[11]. Dronen SC, Merigian KS, Hedges JR, Hoekstra JW, Borron SW: A compare-ison of blind nasotracheal and succinyl-cholineassisted intubation in the poiso-ned patient. Annals of Emergency Medicine 1987; 16:650-65
[12]. Ashok SK, Michael H, Garry W, Ahmad B, Lawrence B: Comparison AwakeEndotracheal Intubation in Patients with Cervical Spine Disease: The Lighted Intubating Stylet Versus the Fiberoptic Bronchoscope. Anesth Analg 1998;87:477–9.