

"INNOVATIVE INDIGENOUS METHOD FOR MANAGING A CASE OF DIFFICULT MASK VENTILATION"

Dr. Bhargavi	Assistant Professor
Dr. Sushmita D Muralidhar*	Post Graduate *Corresponding Author
Dr. Sitara A Y	Post Graduate
Dr. Kiran Prakash	Post Graduate

ABSTRACT

Mask ventilation for preoxygenation is an important step in airway management. Its inadequacy is defined as difficult airway¹ requiring prompt intervention needed for securing definitive airway. A female patient with Squamous cell carcinoma (SCC) of left nasal cavity (4x4cm) was posted for resection and reconstruction. On clinical examination rest of the airway, local, systemic examination and routine investigations were normal. Apnoeic oxygenation was attempted with size 7 (NA) nasopharyngeal airway (standardised to patient's size) followed by 6.5 NA. Both of which were encountered with resistance. Paucity of another size prompted a novel airway using 14F suction catheter cut to size of distance between nose-tip and tragus-inserted². Modified connector consisting of 2ml syringe cap cut on either end was used to connect to oxygen tubing and was followed by Rapid Sequence Induction (RSI) and intubation. Orotracheal intubation for securing airway was gold standard here in background of Modified Mallampatti (MMP)- 2, adequate Mouth opening (MO) vs. other backup options Fiberoptic Intubation (FOI), Supraglottic airway device (SAD)-deferred. Nasopharyngeal airway manoeuvres are important for airway management. This novel technique is simple, easily available in low resource settings and cost effective in Developing Countries.

KEYWORDS : Nasopharyngeal airway, Difficult Mask ventilation, Novel airway, Rapid Sequence Induction

INTRODUCTION

Preoxygenation is the process of denitrogenating the lungs and maximally replacing Functional residual capacity (FRC) with oxygen there by increasing safe apnoeic time and providing ample time to intubate. It is accomplished by either tidal volume ventilation through face mask for 3 minutes or 4 vital capacity breaths to rapidly achieve necessary oxygen levels, wherein 95% gas is exchanged in lungs³.

Mask ventilation for preoxygenation is an important step in airway management and its inadequacy comes to be included in definition of a difficult airway. Difficulties in mask ventilation are commonly encountered in anaesthetic practice. In a limited resource setup, it requires prompt intervention with innovative and impromptu techniques to secure a definitive airway using easily available equipment's. We would like to share our experience of how a case of squamous cell carcinoma of left nasal cavity, posing difficulties in preoxygenation and obtaining air tight seal for mask ventilation was managed.

Case Report

A 74 year-old female patient diagnosed as a case of Squamous cell carcinoma of left nasal cavity- swelling of size 4x4 cm² was posted for craniofacial resection and reconstruction. General physical examination, Systemic Examination and Investigations were normal. Airway examination revealed the following findings:

- Mouth opening-3 fingers
- Modified Mallampati score-2
- Temporomandibular joint- 1 finger
- Thyromental distance-7cm
- Sternomental distance- 13cm
- Edentulous
- No restriction of neck movements.

Since there was a predicted difficulty in mask holding, apnoeic oxygenation was tried after correlating with measurement from patient's earlobe to nosetip² and comparing with diameter of patient's little finger⁴. A size 7 followed by 6.5 NA was passed, both of which encountered resistance due to narrowing of passage along nasal cavity.

Before attempting size 6, a modification was attempted wherein a 14 F suction catheter was used. The distance between tragus and tip of nose was measured and was cut to that size accordingly.



Figure 1: Squamous cell carcinoma of Left Nostril



Figure 2: 14F suction catheter cut to appropriate length

It was then inserted perpendicularly and atraumatically in line with nasal passage. A modified connector- which consisted of a 2ml syringe cap cut on either side for adequate seal and minimal leak was used as a connector to the oxygen supply tubing.

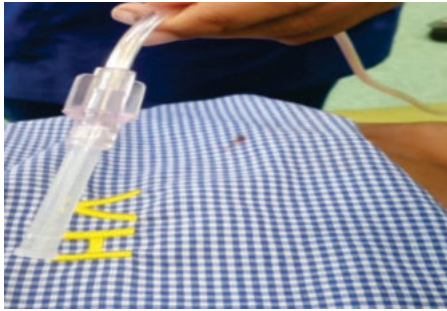


Figure 3: 2ml syringe cap cut and used as connector



Figure 4: Suction catheter used as Nasopharyngeal airway

DISCUSSION

There are many conditions with difficult mask holding like facial abnormalities, receding mandible, burn strictures, full beard, obesity, upper airway obstruction, snorer, obstructive airway disease, fractures involving head and neck region, advanced age, edentulous, hair bun, facial or nasal piercing, pneumothorax large pleural effusions and inappropriate equipment- which can pose a threat to safe intubation⁵.

Prerequisites for successful mask ventilation are an appropriate face mask, oropharyngeal/nasopharyngeal airways, reservoir or self-inflating bag. Absence of any of these, translates to a difficult airway⁵. American Society of Anesthesiologists defines difficult face mask ventilation as inability to provide adequate mask seal, excessive gas leak or excessive resistance to inflow or outflow of air¹. Difficulty in holding face mask is commonly encountered and it has been a challenge to successfully mask ventilate using various innovative techniques^{7,8} and our technique was an humble attempt for the same. Nasopharyngeal airway maneuver preferred because bigger size face mask was not available for adequate seal. Orotracheal intubation was gold standard in this case for securing a safe airway as other options being supraglottic devices-not preferred in view of prolonged surgery, tracheostomy and fiber optic intubation was considered as unnecessary invasive techniques. Since there was no other predicted factor for difficult airway in background of MMP 2, adequate mouth opening, normal neck mobility and no oropharyngeal obstruction we proceeded with orotracheal intubation in this successful surgery.

CONCLUSION

Nasopharyngeal airway maneuvers are an important arsenal for healthcare providers to manage airway. The above mentioned technique is a novel indigenous method and will be useful for anesthesiologists working in developing countries or working in fields/camps or as emergency airway securing equipment as it is simple, easily available and cost effective.

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