



COMPARING TWO FACEMASKS FOR BETTER VENTILATION AND OXYGENATION IN PATIENTS WITH LIP CARCINOMA

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ABSTRACT

The facemask allows gas from breathing circuit to reach the patient and helps in preoxygenation and bag-mask ventilation. This case report compares two masks, the clear laerdal silicone facemask and the anatomical facemask, in patients with lip carcinoma (with mild to moderate visible lip swelling). While comparing the masks, the quality of mask-face seal is a key factor. Three patients, posted for lip carcinoma excision, with a visible external swelling were observed during preoxygenation and bag-mask ventilation. Both the masks were studied regarding the proper seal they could provide. The report confirms that anatomical facemask is better for preoxygenation in patients with mild to moderate lip swelling. If the swelling is bigger, alternative methods of preoxygenation should be considered.

KEYWORDS : Preoxygenation, ventilation, facemasks

INTRODUCTION

Preoxygenation is a simple safety procedure, which can provide an influence on time to desaturation. The aim of preoxygenation is to replace nitrogen in the FRC with 100% oxygen, a process also termed as denitrogenation, and has an important impact on body oxygen store and therefore increase the tolerance to apnoea.[3]

The face mask allows administration of gas to the patient from breathing system. The face mask should form a tight seal on the patient's face for essential preoxygenation and also bag-mask ventilation. A poor mask fit may limit the anaesthesia provider's ability to perform a proper preoxygenation and bag-mask ventilation and can result in air dilution. Correct mask use starts with the selection of appropriate size and shape. After some trial and error, the smallest mask that will provide a proper seal is desirable as it will cause the least increase in dead space, usually be the easiest to hold, and will cause no pressure to eyes.[1]



Figure :1. The two masks under study-silicone transparent facemask(left) and anatomical facemask(right)



Figure :2. The anatomical facemask (left) shows more space and depth than silicone facemask (right)

We have compared two facemasks- silicone facemask and anatomical face mask (Figure 1), as a better means to provide seal in 3 patients with lip carcinoma. The anatomical facemask has more

space and depth compared to silicone facemask (figure 2)

CASE PRESENTATION

Case 1

A fifty five year old man (figure3) presented with upper lip swelling for 2 years which gradually increased in size. He was a chronic tobacco chewer and a smoker with a mouth opening of 5 cm, Mallampatti class1, and thyromental distance of 7cm with normal range of movements of neck. There was an exophytic growth (3x4cm) over his upper lip and he was posted for mass excision and biopsy. During preoxygenation, there was a difficulty in providing a proper seal with the silicone facemask number 4, as the swelling came in between (figure 4). This was solved by using the anatomical facemask number 4, which had an adequate depth and space for including the lesion and hence giving an adequate seal.



Figure:3 –Case 1



Figure:4 showing improper face-mask seal with normal mask

Case 2

The second case was a forty eight year old lady (figure 5) with a

similar mass over the upper lip that protruded out. She was admitted for excision of the lip swelling. Pre- anaesthetic evaluation showed that the patient did not have any comorbidities, but had a mass, 5x4 cm size, protruding from her lip. When the silicone face mask of appropriate size (number 5) was placed for checking the seal, adequate seal was doubtful due to the mass. The anatomical mask of same number, provided good seal around the lip swelling.



Figure 5– Case 2

Case 3

The third patient was a sixty year old man (figure 6) with a lower lip swelling for a year, which had increased in size. He was planned for surgery. On table, the patient was preoxygenated using anatomical facemask number 4, as the silicone facemask number 4 had caused trauma and bleeding to the swelling.

All the 3 cases were given standard general anaesthesia with propofol (2mg/kg), Vecuronium (0.1 mg/kg), midazolam (0.03 mg/kg), fentanyl (2 µg/kg) and intermittent inhalational agent. All were intubated with respective North Pole tube (figure 7) and were successfully reversed with neostigmine (0.05 mg/kg) and atropine (10 µg/kg).



Figure 6–third patient



Figure 7 – nasal intubation

DISCUSSION

Meticulous airway examination in the pre-operative period and proper planning avoids critical events during induction. The swelling lead to the deformity of face that posed difficulty in face mask ventilation. The ability to achieve an adequate seal between face and mask is essential for ensuring face mask ventilation. [1]. Difficult mask ventilation was defined as the inability of an unassisted anaesthesiologist to maintain the measured oxygen saturation as measured by pulse oximetry > 92% or to prevent or reverse signs of inadequate ventilation during positive-pressure mask ventilation under general anaesthesia. [2]

Figure 1 shows both Laerdal silicone and anatomical facemasks of same size. It is shown that the anatomical facemask has enough depth and breadth to cover the lesion whereas the silicone facemask lacks the space, causing bleeding and trauma. The use of anatomical mask helped in achieving a proper seal for proper ventilation of the patients before intubation. The anatomical facemask is so designed that it can be moulded to conform to the anatomy of face. It has slightly malleable rubber body, a sharp notch for the nose and a curved chin section.

The depth of the mask helps in covering the swellings in the above cases. However, if the swelling is too big for anatomical mask, other methods of preoxygenation, like nasal cannula, using paediatric mask around nose, THRIVE and Awake fiberoptic bronchoscopy [6] need to be implemented. Dr Sameer Sethi et al, preoxygenated and ventilated a patient, with nasal tumour, with paediatric mask sealing the mouth and intubated the patient after proper muscle relaxant. [4] As an alternative, in cases of larger swellings, paediatric facemask, sealing nose can be used. Nasal mask ventilation, as compared to combined oronasal ventilation, is more effective as it provides pressure that displaces tongue and palate anteriorly thus reducing the airway obstruction. It provides larger tidal volumes with lower peak inspiratory airway pressures but but is less evaluated in patients with known difficult mask ventilation [5]

Using a Laerdal silicone anaesthetic mask, in a patient with upper lip swelling, there is improper seal (figure 4) as the mask doesn't cover the tumour and can cause bleeding due to injury to the mass, whereas the anatomical face mask, having more depth and space causes less trauma and better seal. This makes anatomical mask preferable in patients with mild to moderate lip swelling.

CONCLUSION

Anatomical facemask is preferred to silicone facemask for oxygenation and ventilation, in patients with mild to moderate lip swelling, causing no trauma.

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