

Greater palatine nerve neuropraxia after laryngeal mask insertion: A rare occurrence

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ABSTRACT

With the more frequent use of the laryngeal mask airway (LMA) over endotracheal tubes for general anaesthesia, various cranial nerve injuries have been reported recently. We report a rare occurrence of greater palatine nerve (GPN) palsy subsequent to the use of LMA Supreme™ in a young female scheduled for hand surgery. Although the exact mechanism of a nerve injury is still a matter of further research, we postulate pressure neuropraxia of GPN as a causative factor in the development of numbness over the hard palate after the removal of LMA in the post operative period.

Key words: Greater palatine nerve, laryngeal mask airway, neuropraxia and general anaesthesia

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INTRODUCTION

The laryngeal mask airway (LMA) was first introduced in 1988. Since then, it has accounted for nearly 30% of the airway management in clinical anaesthesia. In comparison with the endotracheal tubes (ETT), the incidence of airway complications are much fewer and less frequent.^[1] Recently, there have been several cases of cranial nerve injuries being reported involving the branches of trigeminal nerve, vagus nerve, glossopharyngeal nerve and hypoglossal nerve after the LMA use.^[2] To the best of our knowledge, we are reporting the first case of greater palatine nerve (GPN) injury after the use of LMA Supreme™ during general anaesthesia. Informed written consent was obtained from the patient for the publication of this case report.

CASE REPORT

A 40-year-old Chinese female, 150 cm, 52 kg, American Society of Anesthesiologists physical status Grade I, underwent an elective surgery for the left-hand wound debridement. Pre-operative evaluation, physical examination, laboratory results, chest X-ray and electrocardiogram were all unremarkable. Patient opted for general anaesthesia over regional technique. Airway assessment showed a mouth opening of 5 cm, Mallampati class II and a full range of neck movements.

No premedication was given. Anaesthesia was induced with intravenous propofol and fentanyl. After the loss of jaw tone, LMA Supreme™ size 3, lubricated with a lidocaine gel was inserted in a single attempt with ease. The LMA cuff was inflated with 20 ml of air, and cuff pressure was measured and kept below 60 cmH₂O. Adequate care was taken so as to prevent trapping of the tongue between bite block and teeth. The head was maintained in a neutral position on a jelly ring. The correct placement of LMA was confirmed by smooth insertion of the gastric tube. Anaesthesia was maintained on sevoflurane 3% with 50% oxygen and 50% air. The lungs were ventilated with a tidal volume of 6–7 ml/kg and peak airway pressures of <20 cmH₂O using a fresh gas flow of 2 L in a circle breathing system. The patient was kept in the supine position, and there were no adverse events noted during either maintenance or emergence of anaesthesia. The total duration of the surgery was 148 min. The LMA was removed with cuff partially inflated with no

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visible blood on the cuff. In the recovery, the patient complained of a patch of numbness over the right side of the hard palate. On local examination, the mucosa did not reveal any swelling, redness or erosion. She was managed conservatively and reassured about the recovery. She was offered neurology referral for the second opinion but declined. On regular follow-up, she showed significant improvement, but there was still residual numbness 6 months later.

DISCUSSION

The LMA has become the most frequently used airway device during general anaesthesia globally since its introduction nearly 30 years ago. The common complications associated with LMA usage are regurgitation (<2%), sore throat (7%–12%) and failed insertion (0.19%).^[3] Although rare, cranial nerve injuries have been recently reported after LMA insertion. Commonly involved nerves are lingual nerve, recurrent laryngeal nerve, inferior alveolar nerve and hypoglossal nerve.^[2] We do believe that ours is a first case of greater palatine nerve injury reported after the use of LMA.

Cranial nerve injuries usually present either immediately or within 48 h after anaesthesia.^[4] Most of the cases of various cranial nerve injuries reported so far resolved spontaneously over several weeks or months.^[2] Hence, these patients should be reassured and followed up for at least few months to ensure complete recovery. Appropriate and early neurological consultation must be seen for patients with more complex symptoms including neuropathic pain.^[5] Our patient complained of numbness over the right side of the hard palate immediately after the surgery, which started improving after 10 days with a small area of residual numbness still persisted after 6 months.

The greater palatine nerve is the anterior branch of the palatine nerve which is primarily derived from the sphenopalatine branch of the maxillary division of trigeminal nerve. It traverses the inferior surface of the hard palate and innervates the hard palate and the palatal gingiva.^[6] The most common mechanism postulated for majority of cranial nerve injuries is pressure neuropraxia when the cuff pressure exceeds the critical capillary perfusion pressure of the underlying mucosa.^[7] The other potential causes are the compression of a nerve by the shaft of LMA as in the case of lingual nerve and the fixation tab of LMA Supreme™ causing infra-orbital nerve palsy.^[2] We used

20 ml of air to inflate the cuff which is the maximum recommended volume for size 3 LMA. The intra-cuff pressure was maintained below 60 cmH₂O. We wonder if the wider and the fixed curvature shaft, as well as the rigid material of LMA Supreme™ might have rendered the oropharyngeal mucosa more susceptible to compression of neurovascular structures leading to subsequent neuropraxia as compared with the other LMA such as the classic LMA (cLMA).

The potential predisposing factors implicated are the use of inappropriately smaller size LMA, unregulated cuff pressure, nitrous oxide use, lateral patient positioning, extreme of head rotation to one side, difficult insertion of LMA,^[3] lidocaine lubricant^[8] and alternative insertion technique.^[9] In case of our patient, manufacturer's recommended appropriate size was used based on the patient body weight, supine position with head in neutral tilt was maintained throughout, nitrous oxide was not used, LMA was inserted successfully at the first attempt without oropharyngeal trauma and patient had no past medical history. We used lidocaine gel to lubricate the LMA before insertion, which might be a contributing factor; however, we would expect the duration of spontaneous recovery to be shorter which was not evident in our patient. Moreover, there is no definite correlation between weight, height, gender, body mass index and dimensions of the oropharynx. Therefore, individual anatomical oropharyngeal variations should be considered while selecting the appropriate size of LMA.^[10]

Optimal placement of the LMA Supreme™ was confirmed by the presence of oropharyngeal leak at 20 cmH₂O and the smooth gastric tube insertion. Oropharyngeal leak pressure in LMA Supreme™ at intra-cuff pressure of 60 cmH₂O is reported to be approximately 20 cmH₂O.^[11] Hence, we presume that even an optimally placed LMA Supreme™ may occasionally lead to inadvertent nerve damage and may not be completely preventable.

There is evidence from randomised, controlled studies and manufacturer's recommendation to suggest the use of size 5 for men and size 4–5 in women. However, there is a tendency for anaesthesiologists to use a size 4 for men and size 3 for women. When the size of LMA chosen is too small, sub-optimal placement of LMA and over-inflation of the LMA cuff to attain adequate oropharyngeal seal could occur.^[12]

CONCLUSION

We report an original case of pressure neuropraxia of unilateral greater palatine nerve, a branch of maxillary division of trigeminal nerve, with subsequent numbness over the hard palate. Cranial nerve injury after LMA use is a rare occurrence. We report this case for the anaesthetist awareness who uses LMA frequently. Although in our case no other conclusive contributing factor was identified except for the use of lignocaine gel as a lubricant, we concluded manufacturers recommended size and lubricant should be used for LMA insertion.

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Conflicts of interest

There are no conflicts of interest.

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