

# Severe laryngospasm following LMA removal: Questionable role of symptomatic treatment for Upper Respiratory Infection? A case report

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## ABSTRACT

We present a case of life threatening laryngospasm following LMA removal in an asymptomatic infant with past history of watery nasal discharge, relieved of his symptoms by nasal drops. Child was operated for hernia under general anaesthesia with spontaneous ventilation on LMA with an uneventful intra-operative course.

**Key words:** Laryngospasm, Laryngeal Mask Airway, Upper Respiratory Infection

## INTRODUCTION

Laryngospasm is an often encountered paediatric anaesthetic emergency. The incidence is 7.9 to 8.7/1000 anaesthetics in children.<sup>[1,2]</sup> The incidence is much higher in infants especially 1-3 months of age. The important precipitating factors include respiratory tract infections,<sup>[2,3]</sup> presence of a nasogastric tube, oral endoscopy, esophagoscopy and post extubation. Upper airway surgeries especially tonsillectomy and adenoidectomy are associated with higher incidences of 21-26% of laryngospasms.<sup>[4]</sup>

The apparent lack of laryngeal stimulation makes the LMA a potentially attractive alternative for airway management in children with URIS.<sup>[5]</sup> However, during the crisis of severe laryngospasm immediate tracheal intubation is the recommended technique. On the other hand, in failure to intubate situation consider the laryngeal mask airway insertion.<sup>[6,7]</sup> Herein, we present a case of child with past history of watery nasal discharge and relieved of symptoms by nasal drops. Child was operated for herniotomy under laryngeal mask airway insertion and developed life threatening laryngospasm following LMA extubation.

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## CASE REPORT

A one month old infant weighing 4kg presented with the complaint of swelling in the right inguinal region & was diagnosed as a case of inguinal hernia. As per the parents, the patient was apparently well 10 days

back when they noticed a swelling in the right inguinal region, which at times disappeared on its own, to recur when the patient cried. Parents also gave history of sneezing and nasal congestion 1 week back for which nasal drops were used and the infant got relieved. Antenatal history was uneventful with full term normal delivery at a hospital. There was no associated congenital anomaly. There is, however, history of breath holding for seconds since birth. Patient was premedicated with Injection (Inj) Atropine 0.1 mg intravenous (i.v). Induction was achieved with Inj Ketamine 6 mg i.v & inhalation of 2% Sevoflurane. Classic LMA, size 1.5 was placed. Positioning of LMA was confirmed with chest auscultation & square wave pattern in capnography. Anaesthesia was maintained with N<sub>2</sub>O + O<sub>2</sub> and inhalation of Sevoflurane 0.5%. The procedure lasted for about 15 minutes. After completion of the procedure, Sevoflurane & N<sub>2</sub>O were stopped & the patient was then taken on 100% oxygen. LMA was removed after ensuring adequate spontaneous ventilation and good muscle tone. Thereafter, 100% oxygen was administered using by RBS face mask. Within 1 minute, saturation began to fall from 100% to 80%, within seconds child became cyanotic with SpO<sub>2</sub> of 40%. Immediately, neck extension with jaw lift was done and CPAP was applied as mode of ventilation with 100% oxygen. Vigorous forward pull of the mandible was also done but no response. Chest was silent on auscultation; we were failing to maintain bag-and-mask ventilation due to very poor lung compliance.

Child was immediately intubated after giving Inj atropine, propofol and succinylcholine. Still the saturation not improved too much. Inj Hydrocortisone 10 mg i.v and Aminophylline 20 mg i.v slowly was given in low doses to overcome the laryngospasm and bronchospasm. Nebulization was done with adrenaline aerosol. Chest entry improved over 3- 5 minutes. Harsh breath sounds were present along with frequent breath holding. The intermittent

positive pressure ventilation was continued. Patient was ventilated for > 2 hours till respiration became regular with no breath holding. After assuring good tone in limbs, baby was extubated successfully. Following extubation, nebulization with humidified oxygen was continued to decrease laryngeal irritation. Baby was kept under close observation for >2 hours in High Dependency Unit to rule out the development of any pulmonary complications.

## DISCUSSION

Children who presents for elective surgery with upper respiratory tract infection, are usually postponed till they become asymptomatic to prevent respiratory complications. The question arises; is the risk decreased after the child is relieved of the symptoms. Regarding the history, there is no strict guideline about the how long the child should be withheld from surgery following a past episode of mild running nose. Postponement is based on the parent's disclosure about the child's past history and current medical condition. However, there is a window period between relief from symptoms and complete cure of disease. Therefore, parent's revelation about child's condition can be mischievous and lead to unavoidable consequences of severe respiratory complication, morbidity and mortality.

Olsson *et al.*<sup>[2]</sup> during an 11 year prospective study, found an overall incidence of 7.9/1000 anaesthetics or 8.7/1,000 patients. The incidence was higher (17.4/1,000 patients) in children between 0-9 years of age group. Infants 1-3 months of age had the greatest incidence (more than three times the rate in any other age group). The incidence of laryngospasm in children may be increased to 9.6% in the presence of URTI.<sup>[2]</sup> Therefore, anaesthesiologists usually adopted the policy to postponed the child on active URTI or till became asymptomatic.<sup>[7]</sup> Skolnick *et al.*<sup>[8]</sup> demonstrated that the risk of respiratory complications was greatest in the 3 days after a URI but remained increased for up to 6 wk after the URI. Sometimes the child is taken up due to pressure by the surgeon or patient's family or even on emotional and financial grounds.

Management of URTIs includes an array of drugs, aimed at symptomatic relief only. But again the dilemma arises is the symptomatic therapy is sufficient for URI during the window period? Antibiotic use in childhood URTIs remains contentious since more than 90% of the infections are of viral aetiology. The reasons cited for prescribing antibiotics include diagnostic uncertainty, socio-cultural and economic pressures, concern over malpractice litigation and parental expectations of an antibiotic.<sup>[9]</sup>

The issue of accepting the case is not taken seriously. The reason might be difficulty in

diagnosis of URTI or no clear cut guideline about the infection free interval. The diagnosis of URTI is purely based on symptoms and there is no confirmatory laboratory test or radiographic finding. In paediatric operation theatre, especially during winter, laryngospasm is a major concern for anaesthesiologist. Concerns about patient safety have resulted in cancellation of elective procedures for periods of 2-6 wk. However, because children, especially those under 2 yr of age, develop URIs 5-10 times per year<sup>[1]</sup>, the potential safe time period for the administration of a general anaesthetic is very small. Every episode of URTI lasted for 7-10 days with active symptoms, its associated residual pulmonary effects for 2 to 6 weeks in mild to severe cases. There is a practical problem of reinfection at every 2 weeks especially during winter, and therefore there is no scheduled infection free period for elective surgery.<sup>[9]</sup>

An important thing to note is that no prospective RCTs are available which evaluated various management options and the perioperative morbidity in acutely symptomatic or asymptomatic children who were in resolving phase. Therefore one must rely on Cohort studies for determining the clinical evidence. Evidence has been found to postpone the surgery for 2-6 weeks. Another study by Tait and Knight<sup>[10]</sup> found a threefold increase in bronchospasm and laryngospasm in patients with a recent history of URTI regardless of intubation requirements.

Anaesthesia for patients with uncomplicated upper respiratory tract infection, the LMA provides an acceptable alternative to the ETT, given its ease of use and its apparent reduced propensity for coughing, bronchospasm, and oxygen desaturation.<sup>[11]</sup>

According to recent endoscopic studies, laryngospasm is always complete, thus airway management and intravenous therapy are indicated. Paediatric anaesthesiologist administering anaesthesia has been found to have lower incidence of laryngospasm. Other techniques which lowers the chances of development of laryngospasm are: Intravenous anaesthesia rather than inhalational, use of muscle relaxants during tracheal intubation, deep laryngeal mask airway removal. Succinylcholine can be given by intramuscular, intra-osseous and intralingual routes if no intravenous line is secured.<sup>[1]</sup>

## CONCLUSION

Children presenting for elective procedures with symptoms of an URI require careful preoperative assessment, including a detailed history of fever, dyspnea, productive cough, sputum production, nasal congestion, lethargy, and wheezing and physical examination. A chest radiograph can be

considered if the examination is questionable. Anaesthesiologist should commend checklist protocol to prevent laryngospasm. An experienced anaesthesiologist encounter lower incidence of laryngospasm. Airway management is the most essential part of treatment of laryngospasm along with drugs used as an adjunct. In assessing the suitability of any child with a URI for surgery, it is important to assess the risk/benefit ratio. Decisions regarding cancelling or proceeding with surgery for children with URIs should be made on a case-by-case basis by considering the presence of identified risk factors and bearing in mind the anaesthesiologist's own comfort and experience with anesthetizing children with URIs.

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