

The Use of a LMA for Emergent Airway Management in a Prone Child.

R. Scott Dingeman, MD; Susan M. Goobie, MD, FRCPC

Department of Anesthesia, Children's Hospital Boston, Harvard Medical School, 300 Longwood Ave., Boston, MA 02115

Introduction: Accidental extubation is not uncommon in the prone position during neurosurgical procedures. It presents a challenge in airway management and may require urgently turning the patient supine which has major implications to the surgery and sterile field. In this case report, a laryngeal mask airway was inserted with the patient remaining prone after the accidental displacement of the endotracheal tube. There are no reports in the literature demonstrating the use of an LMA for an airway emergency in the prone patient.

Case Report: A 37 kg 5 year-old female was scheduled for a decompressive cervical laminectomy. She presented with a history of headaches and absence seizures. A MRI revealed an Arnold-Chiari malformation, type 1. The patient had a nonproductive cough and clear rhinitis on the day of surgery. She was premedicated with PO midazolam and taken to the operating room. An inhalational induction with sevoflurane and nitrous oxide was performed. Intravenous access was obtained and thiopental, pancuronium, and fentanyl were given intravenously. Nasotracheal intubation with a 5.0 cuffed ETT was performed without difficulty under direct laryngoscopy. The cuff was not inflated, and a leak was noted at 14cmH₂O. After applying benzoin periorally and along the nasal bridge, the nasotracheal tube was secured with cloth tape at 21cm at the right nare. Tegaderms were applied over the tape to prevent secretions from penetrating the cloth tape. A soft bite block, temperature probe, and orogastric tube were placed. The patient was positioned prone in a Mayfield brace. The nasotracheal tube remained in good position. Just prior to closure of the dura mater, 127 minutes into the operation, the patient's end-tidal CO₂ tracing disappeared suddenly. The patient was visualized under the drapes, and the nasotracheal tube was noted to be at 13cm at the nare. A sterile towel was placed over the patient's open dura, and the drapes were removed. The nasotracheal tube, OGT and esophageal temperature probe were also removed to facilitate mask ventilation. Two person mask ventilation was attempted by the attending and fellow anesthesiologists with the patient remaining in the prone position, but this was difficult. Preparations were simultaneously made to return the patient to the supine position for direct laryngoscopy. The SpO₂ fluctuated between 89 and 96% during mask ventilation. A #3 LMA was placed by the fellow anesthesiologist while the patient remained prone without difficulty. End-tidal CO₂ was noted on the capnograph, and the patient had bilateral breath sounds with assisted ventilation. The LMA was secured, and the patient was re-prepped and draped. The operation continued without complications. The computerized record noted that the LMA was placed and an airway re-established less than 6 minutes after the accidental extubation occurred. At the conclusion of surgery, the patient was placed supine. The Mayfield brace was removed by the neurosurgeon. The inhalational anesthetic was turned off, the patient's muscle paralysis was reversed, and her spontaneous respirations returned. Once the patient was awake, breathing regularly, and following commands, the LMA was removed in the operating room. The patient was transported to the PACU with oxygen via facemask. Postoperatively, the patient suffered no neurological or respiratory sequelae.

Discussion: There are two recent reports inserting the LMA in prone patients under elective surgical conditions. Ng et al reported successful elective placement of a laryngeal mask airway in the prone position in 73 patients presenting for minor surgery.¹ Osborn et al also showed successful LMA placement and removal in six patients while prone during ERCP.² We demonstrated in this case report that the laryngeal mask airway can be successfully inserted during an airway emergency while the patient remains prone. Although direct or fiberoptic laryngoscopy can be attempted with the patient prone, the position of the patient is not optimal for these techniques and may take too much time to perform. Placing the patient supine to attempt reintubation with the dura mater open, exposing the brain to the environment, also places the patient at significant risk for infection and neuronal damage. With the patient prone however, the soft tissues of the oropharynx are displaced facilitating the placement of the LMA. Although proper LMA insertion may take practice, the LMA in experienced hands has shown in this case to be a useful adjunct in securing an airway emergently in a prone child.

Refs:

1. Ng A. et al., *Anesth Analg*, 2002
2. Osborn I. et al., *Gastrointest Endosc*, 2002