

Prevention of aspiration by LMA ProSeal in laparoscopic surgery

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Citation

S Saini, S Taxak, S Das. *Prevention of aspiration by LMA ProSeal in laparoscopic surgery*. The Internet Journal of Anesthesiology. 2008 Volume 20 Number 1.

Abstract

Sir:

The ProSeal laryngeal mask airway (PLMA) achieves a more effective seal than the LMA classic (cLMA) and isolates the glottis from the oesophagus when correctly placed.^{1,2,3} We describe a case where a correctly placed PLMA prevented aspiration.

A 22 year old female ASA-I (weight 50Kg, height 160cms) was scheduled for diagnostic laparoscopy for infertility under general anaesthesia. She was fasted overnight and premeditated with tab. alprazolam 0.25mg and tab. ranitidine 150mg at bed time and 2 hours preoperatively. In the operating room an IV line was started and monitors attached. Anaesthesia was induced with injection thiopentone sodium 250mg and injection tramadol 50mg IV and injection atracurium 25mg IV was given to facilitate airway placement. A size 3 PLMA was inserted easily on the first attempt using the introducer tool technique, the cuff inflated with 25ml of air to obtain an intracuff pressure of 60cmH₂O and the lungs were ventilated easily with a tidal volume of 8mlkg⁻¹. Correct placement of the mask was determined by testing absence of gas leak up the drainage tube at an airway pressure of <20 cmH₂O, exhaled tidal volume > 8ml kg⁻¹ and passage of gastric tube of 14FG. Airway seal pressure of 36cmH₂O was recorded. The laparoscopic surgery was done in lithotomy position with a head down tilt.

Half way down the operative procedure a yellowish fluid was noticed in the drain tube of the mask. On suction the fluid was 10-15ml in amount and tested positive for acid. There was no difficulty in ventilation or any evidence of coughing or retching. All other respiratory and hemodynamic parameters remained constant. The PLMA was left in place and the procedure was allowed to continue. At the end of the procedure neuromuscular blockade was

reversed and PLMA was removed when the patient was fully awake. The PLMA was examined for any secretions and both the ventral and dorsal surfaces of the bowl of PLMA were tested with a litmus paper, which had a pH of six thus there was no soiling of the bowl with the gastric contents. The postoperative course was uneventful.

DISCUSSION

Tracheal intubation and controlled ventilation has been the gold standard for anaesthetic management of patients undergoing laparoscopic surgery. With the advent of supraglottic airway devices, we now have an alternative to endotracheal tube.^{4,5} The ProSeal LMA introduced in 2000, having double cuff, reinforced airway tube and an esophageal drainage tube offers several advantages over cLMA. It forms a better seal than the cLMA without an increase in the mucosal pressure.^{6,7,8} When correctly inserted and positioned the PLMA isolates the glottis from the upper esophagus thus protecting the lungs from possible aspiration making it useful for laparoscopic surgery too.^{9,10,11} In our patient also we found that the PLMA is capable of protecting the airway in event of passive regurgitation intraoperatively by allowing the regurgitant fluid to pass up the drain tube and bypass the glottis.

Keller et al performed a study of PLMA in 10 human cadavers (16-24 hours post mortem) and observed mean oesophageal pressure (OP) at which fluid was seen in hypopharynx when viewed with a fiberoptic bronchoscope (FOB). In controls it was 9cmH₂O, while it was always higher (46-49cmH₂O) when airway device i.e. cLMA or PLMA with closed drainage tube was in place. With PLMA unclamped fluid appeared from the drainage tube bypassing the pharynx and mouth. They concluded that cLMA and the PLMA with a closed drainage tube attenuated fluid flow

between oesophagus and the pharynx and PLMA with drainage tube open allows bypassing of the fluid from the oesophagus.¹²

PLMA was assessed in 103 anaesthetized adult patients with and without neuromuscular paralysis in a variety of surgical positions. Pharynx was filled with methylene blue dyed saline introduced down the drainage tube once the mask was in place. Authors concluded that PLMA can isolate the airway from fluid in the hypopharynx.¹³

Evans et al reported intraoperative unexpected passive regurgitation in an anaesthetized non paralyzed patient undergoing lower limb surgery where PLMA protected the airway by allowing the regurgitated fluid to pass up the drainage tube without leaking into the glottis.¹⁴

In a study of 100 adult patients undergoing laparoscopic surgery under general anaesthesia and neuromuscular paralysis authors reported that PLMA is an effective alternative airway for a wide range of laparoscopic surgical procedures. There were 3 cases of oesophageal regurgitation but no incidence of pulmonary aspiration.⁹

The pressure generated during positive gastro esophageal reflux is normally less than 10cmH₂O and rarely exceed 30cmH₂O¹⁵. The PLMA is therefore expected to protect the glottis during passive regurgitation.^{12,13,14}

Our case shows that during laparoscopic surgery passive regurgitation of fluid can occur during the procedure and that the PLMA can protect the airway during such an event.

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