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Editorial

Sellick's Maneuver: In practice since 55 years Without Testimony!

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Introduction

Sellick's maneuver or cricoid pressure was first described by Sellick, in 1961 to "prevent regurgitation of gastric contents and thus aspiration until the airway is secured with a cuffed endotracheal tube"[1]. Since then, Sellick's maneuver has become the standard of care in emergency in tubations while doing rapid sequence induction, and is being used widely by emergency physicians, paramedical staff and anesthesiologists all over the world. The Sellick's maneuver is not confined to emergency intubations, but is also practiced in elective settings in patients at high risk of aspiration of gastric contents. Cricoid pressure is achieved by placing the thumb and middle finger on either side of the cricoid cartilage, and the index finger placed above to prevent lateral movement of the cricoid. The proposed mechanism is believed to be compression and occlusion of the esophagus in between cricoid cartilage and cervical vertebra column. The gastric contents which might have refluxed into esophagus during anesthetic induction are prevented to enter the pharynx by this occlusion pressure. The benefits of Sellick's maneuver were further confirmed by Fanning in 1970, who demonstrated in cadavers that regurgitation into the pharynx could be prevented by cricoid pressure at intra-esophageal pressures of at least 50 cm H_2O[2]. Salem et al further demonstrated that application of cricoid pressure during bag mask ventilation in pediatric patients prevents gastric inflation and thus also help in preventing regurgitation and aspiration[3].

The efficacy of cricoid pressure in prevention of aspiration has been doubted in the last 20 years and has been questioned by clinicians, with few suggesting abandoning this maneuver altogether[4,5]. Anecdotal case reports of regurgitation despite cricoid pressure being applied incited the debate whether cricoid pressure is really effective or just a 55 year old ritual[6]. There are no randomized controlled clinical trials to prove the safety and efficacy of cricoid pressure due to ethical concerns. Moreover, the estimated incidence of pulmonary aspiration of regurgitated gastric contents is quite low, ranging from 0.02% to 0.1% of general anesthetic cases[7], requiring a large number of patients to conduct a clinical trial to demonstrate the decrease in incidence of aspiration with cricoid pressure. Various anesthetic surveys and observations by experienced anesthesiologists have been used to analyze the utility of cricoid pressure. In a survey conducted in UK, 50% of the responding anesthesiologists communicated that they had observed regurgitation of gastro-esophageal contents into the pharynx, while cricoid pressure was being applied[8]. Around 10% of the anesthesiologists informed that they observed regurgitation once the cricoid pressure was relieved, implying that cricoid pressure was preventing the regurgitation of gastro-espohageal contents into the pharynx. Neelakantha reported a case wherein gastric fluid was observed in the mouth, once cricoid pressure was released in a patient post-esophageal reconstruction[9]. He concluded that cricoid pressure is effective in preventing aspiration of gastric contents.

Some believe that cricoid pressure does not produce midline esphageal compression since esophagus is not situated posterior to the cricoid cartilage[10]. In a study conducted by Rice et al, magnetic resonance imaging studies demonstrated that although cricoid pressure does not compress the esophagus, the postcricoid hypopharynx is occluded[11]. The authors concluded that "cricoid hypopharynx anatomic unit" compression is the basis of efficacy of Sellick's maneuver.

Another critical issue with regards to trauma patients is the concern of aggravation of unstable cervical spine injury or laryngeal trauma during cricoid pressure application. In a study conducted on cadavers, the effect of cricoid pressure on cervical spine movement while manual in line stabilisation was being applied was observed[12]. The median vertical displacements from the C5 body to 2 other points, A and B (taken as reference points), were measured to be 0.5 mm (0-1.5 mm) and 0.5 mm (range 0-3 mm) respectively. The authors concluded that cricoid pressure does not cause clinically significant movement of cervical spine in a cadaveric model. No conclusive study has been performed in patients with cervical spine injury with application of cricoid pressure.

Application of cricoid pressure of more than 40 N causes distortion of upper airway causing difficulty in visualization of cords which makes laryngoscopy and intubation unsuccessful[13]. The intubator should request to decrease or release the cricoid pressure in such situations since oxygenation takes higher priority.

Esophageal rupture is one of the most dreadful complications of cricoid pressure, if the patient vomits, as cricoid pressure prevents the egress of gastric contents which are under

pressure[14]. Application of cricoid pressure of around 10 N is recommended when the patient is awake, gradually increasing to 40 N when loss of consciousness ensues[15]. In an awake patient, cricoid pressure >20 N causes retching and should be avoided[16]. In support of cricoid pressure, few studies have reported that cricoid pressure does not increase the incidence of failed intubation[17,18].

Undoubtedly, cricoid pressure has proven to be effective, with far more benefits than the reported risks and complications, and should be continued in all patients at risk of aspiration. Cricoid pressure also remains invaluable in rapid sequence induction in emergency trauma situations, where all patients are assumed to be full stomach. Application of cricoid pressure of around 40 N is recommended in rapid sequence induction, and should be released in case of difficulty in laryngeal visualization. Abandoning the cricoid pressure would mean disregard to the great contribution of Sellick. Hence, till further large randomized controlled clinical trials are published, Sellick's maneuver will continue to remain in existence without any testimony.

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