

Management of an Unanticipated Difficult Airway during Emergency “C” Section—A Novel Approach

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Received December 3, 2013; revised January 3, 2014; accepted January 11, 2014

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ABSTRACT

Introduction: Knowledge, skill and training in addition to quick thinking, come to the rescue of Anesthesiologists when encountering an unanticipated difficult airway during emergency Caesarean section. Ability to react with time to spare will ensure maternal and fetal well being while handling this life threatening emergency. **Case History:** While anesthetizing a 22-year parturient for emergency Caesarean section, the endotracheal tube was inadvertently placed in the esophagus. As the “call for help” was activated, the esophageal tube was delivered thru the endoscopic port of a Patil-Syracuse face mask. After confirming our ability to ventilate the patient without distending the stomach while maintaining the oxygen saturation and end tidal carbon dioxide levels within normal limits, surgery was allowed to proceed under mask anesthesia employing oxygen, nitrous oxide and sevoflurane with rocuronium for muscle relaxation. After a healthy infant was delivered, definitive airway access was obtained with Glidescope[®] assisted fiberoptic intubation. The esophageal tube was then removed. Further surgery proceeded uneventfully. **Discussion:** By choosing to deliver the proximal end of the inadvertently placed esophageal tube thru the endoscopic port of a Patil-Syracuse mask and mask ventilating the patient, we have been able to provide that few precious minutes of oxygenation to the distressed fetus before delivery. By isolating and venting the stomach thru the esophageal tube we provided maternal air way protection during the initial phase of the delivery. Definitive airway access was obtained as soon as additional help and equipment were available. **Conclusion:** Difficult airway algorithm while comprehensive, does not address the question of time management. While dealing with a difficult airway in obstetric anesthesia, time is the single most important factor, which will determine the maternal and fetal well being. We in our case report have attempted to answer that question of “time”.

KEYWORDS

Unanticipated Difficult Airway; Emergency C Section; Glidescope Assisted Fiberoptic Intubation; Difficult Airway Algorithm

1. Introduction

Inability to obtain airway access during emergency Caesarean section (C section) has always been a challenging problem confronting Anesthesiologists. Most anesthetic related maternal deaths still result from complications of airway management during general anesthesia (GA) [1-3]. Emergency situations remain the most common indi-

cation for GA for C section [4]. Patient preference, failed regional techniques or complications during surgery, like massive hemorrhage or hysterectomy require secure airway access either before or during surgery in a parturient. But the declining use of GA in the obstetric population has raised concern that safety standards may be compromised as a result of inadequate exposure to this technique and insufficient training in airway management for the

pregnant women [5]. While a well established difficult airway management algorithm exists, the time spent on going down the steps might be an unaffordable luxury during maternal and fetal emergencies. Our management one such emergency is detailed in this case report.

2. Case History

A 22 year old parturient, 5'3", 245 lbs, gravida 2, para 1 was rushed to the operating room (OR) for emergency C section with a diagnosis of non reassuring fetal heart tracings. Pre operative examination revealed no significant past medical history. Airway was assessed to be Grade 2 Mallampatti oropharyngeal classification. GA was chosen because of patient preference.

After pre oxygenation with 100% oxygen, anesthesia was induced with 2 mg·Kg⁻¹ of thiopental and 0.5 mg·Kg⁻¹ of ketamine followed by succinylcholine 1.5 mg·Kg⁻¹ while cricoid pressure was being applied. Direct laryngoscopy and orotracheal intubation (OTI) was "achieved" in the first attempt with a 7.5 mm ID cuffed orotracheal tube (OTT) {Medline Industries, Mundelein IL, USA}. While confirmation of the OTT placement was sought, it became apparent that the tube was located in the esophagus. As the "call for help" went out, a decision was made not to remove the esophageal tube. The cuff was inflated with 10 ml of air and gently pulled back to "resistance" to lie below the upper esophageal sphincter. The face mask was exchanged for a Patil-Syracuse endoscopic mask {Anesthesia Associates, San Marcos, California}, the proximal end of the esophageal tube was delivered thru the endoscopic port and mask ventilation was attempted with 100% oxygen. Bilateral air entry into the lung fields without discernable insufflation of the stomach was confirmed by auscultation. The oxygen saturation and end tidal carbon dioxide levels were within normal limits. Anesthesia was maintained with 50:50 Nitrous oxide in Oxygen and 0.5 MAC Sevoflurane. Muscle relaxation was provided with 30 mg of Rocuronium and the surgery was allowed to proceed. A healthy male infant was delivered with an Apgar score of six and nine at one and five minutes. Fentanyl 1 mcg·Kg⁻¹ and Midazolam 2 mg were administered after delivery of the infant.

Additional airway armamentarium was available by this time. While the rest of the surgery was proceeding as planned, the anesthesia team decided to secure the airway via an OTT. After ventilating the lungs with 100% Oxygen, the Patil-Syracuse mask was carefully removed without dislodging the oropharyngeal tube, which was then digitally positioned in the left oral sulcus to enable the unhindered introduction of a Glidescope® {Video laryngoscope, Vita aid Airway Management, Williams-ville, NY}. The first anesthesiologist obtained the best possible view of the glottis while the second anesthesi-

ologist introduced a fiberoptic bronchoscope {OD 5-1 mm, Olympus LF-DP, Tokyo, Japan} with an OTT (7 mm ID) threaded over it along the right side of the Glidescope® blade. Using the Glidescope® display as the guide, the fiberscope tip was directed into the larynx and the trachea. The OTT was then advanced over the fiberscope. After confirming bilateral air entry delivered thru the OTT, the esophageal tube cuff was deflated and removed. Further anesthetic management with Nitrous oxide, Oxygen and Sevoflurane delivered thru the OTT and intravenous (IV) Fentanyl continued. An orogastric tube (OGT) {18 F, Argyle Salem Sump} was placed and residual gastric contents suctioned out. The patient was extubated uneventfully at the end of the surgery after reversing the residual neuromuscular block with Glycopyrrolate and Neostigmine.

3. Discussion

The incidence of difficulty with endotracheal intubation (ETI) has been reported to range between 1% and 3% [6]. It is higher in obstetric patients than in surgical patients [7] and the incidence in parturients may approach 1 in 500 [8]. Screening tests as Mallampatti oropharyngeal classification, thyromental distance, mouth opening and Wilson risk score yield possible sensitivity (20% - 62%) and moderate specificity (82% - 97%) [9,10]. One can encounter unanticipated difficult airway with direct laryngoscopy despite the availability of predictive tests [11].

Ever-present danger of aspiration of gastric contents, possible fetal compromise and adverse maternal outcome mandate prompt airway access in a parturient undergoing emergency C section. We could be faulted for not establishing the definitive airway access as soon as failure to do so became apparent. As long as our ability to ventilate the patient without distending the stomach, to oxygenate and maintain the end tidal carbon dioxide level within normal limits were not questionable, we felt it safe to proceed with the surgery in the face of impending fetal compromise.

Positive pressure ventilation in adult paralyzed patients delivered thru Patil-Syracuse mask has been successfully employed to achieve fiberoptic guided tracheal intubation [12]. The authors found a VE of about 10 ml·Kg⁻¹ obtained at about 15 cm H₂O airway pressure was sufficient to ventilate the patients during the procedure without gastric insufflations.

Supraglottic airways have been used in parturients for airway maintenance during emergency C sections after failed tracheal intubation [13,14]. Complications like injury to the pharyngeal mucosa, dysphagia, piriform sinus rupture and esophageal perforation, associated with the use of supraglottic devices can also be found in the literature [15,16].

As a result of a number of factors, including the likely influence of recommendations made over 20 years ago in the UK Confidential Enquiries into Maternal Deaths; there has been a widespread shift away from GA and towards regional anesthesia (RA) for C section [4,17,18]. However GA will remain an important part of obstetric anesthesia practice as there will always be situations where RA techniques fail or contra indicated [17]. As long as GA is administered, there will always be instances where inability to secure the airway access can turn into a life threatening emergency with devastating consequences.

Our methodology of management offers several advantages over conventional difficult airway algorithm. Even when inadvertently placed, the esophageal tube is placed under vision, thus minimizing the chances of device related injuries associated with the blind introduction and placement of the supraglottic devices. The high volume, low pressure cuff of the tracheal tube and the relatively short duration it is left in place before a definitive airway access could be obtained, would be a plus over the esophageal-tracheal, Combitube® which can generate high cuff pressure exceeding the mucosal perfusion pressure, on the esophageal mucosa [19]. Supraglottic devices often require repositioning to achieve satisfactory ventilation and they do not offer reliable protection against aspiration of gastric contents. By leaving the esophageal tube in place, we believe we provide an unhindered outlet for the gastric contents, which can be easily visualized and removed while preventing gastric insufflations during mask ventilation. While definitive airway access is being obtained, the esophageal tube can still remain in place, offering continuous isolation of gastric contents from the airway. By employing Glide-scope® and the fibroscope we have enhanced our chances of successful airway access in the shortest possible time.

4. Conclusion

By isolating and venting the gastric contents, oxygenating an apnoeic patient, maintaining anesthesia without interruption, avoiding pulmonary aspiration and improving the outcome, our case report in our opinion, is a small step towards the question of time management during unanticipated difficult airway access, especially in a parturient.

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