"FAILED INTUBATION" IN OBSTETRIC ANAESTHESIA

An indication for use of the "Esophageal Gastric Tube Airway"

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SUMMARY

The management of failure to intubate the trachea during emergency Caesarean section in a 116.7-kg woman is described. General anaesthesia was continued with the aid of a Gordon and Don Michael Esophageal Gastric Tube Airway. The forward displacement of the larynx caused by the tube in the oesophagus improved the patency of the airway.

Unexpected difficulties or failure to intubate the trachea continue to be significant causes of anaesthetic maternal mortality (Tomkinson et al., 1983) and these situations require the prompt application of a prepared plan so that oxygenation without aspiration is achieved. An alternative to a "failed intubation drill" (Tunstall, 1980) is the deliberate intubation and tamponade of the oesophagus with a normal endotracheal tube (Boys, 1983).

A case of inability to intubate the trachea is reported. There was additional risk since it was not possible to place the patient in a full lateral posture because of gross obesity, and an already incised abdomen.

CASE REPORT

A 30-year old nullipara, height 1.53 m and weight 116.7 kg, underwent induction of labour at term for mild pre-eclampsia. She received an infusion of 0.8% chloromethiazole i.v. and oxytocin. Continuous extradural analgesia was established. After 19 h in good labour, there was failure to progress and preparations were made for Caesarean section. Apomorphine was administered i.v. and a large volume of gastric contents (pH 7) was vomited. The patient had had 15 ml of Mist. Magnesium Trisilicate B.P.C. 2-hourly by mouth during labour and a preoperative dose of 0.3-molar sodium citrate solution 20 ml. During labour the 1.5th top-up injection of 0.5% bupivacaine plain 8 ml to the extradural space had failed to provide complete pain relief and a further dose of 10 ml was given 35 min later. Seventy-five minutes afterwards, a preoperative "top-up" of 20 ml produced blockade up to the 8th thoracic dermatome (as judged by pin-prick). It was decided to proceed to surgery under extradural analgesia, although the distribution of the blockade was difficult to assess because of maternal sedation.

Maternal co-operation could not be maintained after the incision. Following preoxygenation and cricoid pressure, atropine 0.6 mg was given and general anaesthesia induced with thiopentone 350 mg. Suxamethonium 100 mg was administered i.v., but the trachea could not be intubated. The laryngoscope had been inserted with difficulty. The head would not extend (attributed to rolls of fat behind the neck), the patient's chest obstructed manoeuvres of the laryngoscope handle, and she had a full set of teeth. Because of the delay caused by the difficult laryngoscopy and a fruitless attempt at intubating a larynx where the arytenoids and epiglottis could only just be seen, cyanosis developed. Oxygenation became the primary consideration and a further attempt at intubation with the aid of a bougie or stylet was not undertaken.

The patient was tilted head-down. The gaping abdomen, the patient's considerable obesity and the absence of any strong theatre assistants precluded any attempt to place the patient in a full lateral posture. It was difficult to ventilate the lungs even when cricoid pressure was relaxed. The insertion of a Guedel airway did not help. Cyanosis remained. Because of anxiety about the possibility of the regurgitation of gastric contents a Gordon and Don Michael Esophageal Gastric Tube Airway (EGTA) (Gordon, 1977) was inserted to the oesophagus without special manoeuvre and the anaesthetic circuit was attached to the face-mask. It immediately became easy to move the chest with manual ventilation and the skin colour improved rapidly. The sudden improvement was remarkable. Shortly afterwards,
spontaneous breathing returned and 50% nitrous oxide and 2% halothane in oxygen was administered. When surgical anaesthesia was established, methoxyflurane was substituted gradually for halothane. A baby weighing 3.18 kg and with Apgar scores of 4 and 8 at 1 and 5 min, respectively, was delivered. The remainder of the operation was uneventful. Anaesthesia could be maintained at a very light level as the extradural analgesia was substantially effective. No further gastric contents were obtained by suction through the EGTA. The EGTA was not removed until the patient was practically awake, as it was well tolerated during recovery. A small amount of fluid with a pH of 4 was vomited after withdrawal of the EGTA. Recovery after operation was straightforward.

**DISCUSSION**

The EGTA was designed for cardiopulmonary resuscitation (Don Michael, Lambert and Mehran, 1968; Gordon, 1977), its purpose being to prevent the regurgitation of gastric contents and the insufflation of the stomach during positive pressure artificial ventilation by trained personnel not equipped to intubate the trachea. The use of a similar oesophageal obturator was studied prospectively in 300 cases of cardiac arrest outside hospital. It reduced significantly the frequency of vomit being found in the upper airway on arrival in the emergency room (Donen et al., 1983).

The EGTA is an oesophageal tube passing through a holder in the lower half of the shell of a face-mask (fig. 1). Above this a second aperture accommodates the taper of standard breathing systems. The tube is inserted down the oesophagus until the mask makes a seal on the face. The cuff of the oesophageal tube is inflated with 35 ml of air before intermittent positive pressure breathing is applied. The hollow oesophageal tube accommodates a lubricated stomach tube.

Following unsuccessful attempts at intubation of the trachea, it is often difficult to maintain an airway and ventilate the lungs. This may be a result of laryngeal displacement by cricoid pressure, application of the laryngeal opening against the posterior pharyngeal wall, or an artificial oro-pharyngeal

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**Fig. 1.** The Esophageal Gastric Tube Airway (EGTA). Inspired air reaches the pharynx via the nose and mouth and enters the larynx by flowing around the outside of the tube of the EGTA. The inside of the tube will accommodate the passage of a smaller lubricated tube for gastric aspiration.
Failed Intubation

airway inappropriate in size or position. Other causes are partial recovery from neuromuscular blockade, a light level of unconsciousness, laryngeal oedema, bronchospasm or tension pneumothorax. Probably the most important cause of obstructed ventilation is difficulty in displacing the opening of the larynx away from the posterior pharyngeal wall. The EGTA (or endo-oesophageal intubation (Boys, 1983)) uniquely solves this problem by displacing the larynx forward as well as creating an adjacent track for the respired gas. The experiences of the dramatic ease of ventilation in this case, and that of Boys (1983), support this view.

The limitations of the EGTA should be recognized. It should be used only on a flaccid or surgically anaesthetized subject. Its withdrawal can lead to a flood of vomit in the pharynx. Its presence in a semi-conscious struggling patient could be hazardous. It may lacerate the oesophagus. Its cuff is designed for an average oesophagus. It may pass inadvertently into the trachea. It may not be helpful if there is supraglottic oedema, which is always a possibility in the toxaemic mother with a traumatized larynx.

The EGTA differs from the Esophageal Obturator Airway (EOA) (Gordon, 1977) in that inspired oxygen has to reach the oro-pharynx either via the nose or via the mouth outside the oesophageal tube. A previously prepared and shortened 7-mm endotracheal tube with a connector, inserted beside the EGTA, acts as a suitable oro-pharyngeal airway without interfering with the fit of the face-mask.

In the operating room of a maternity hospital, apparatus for securing the airway should include two laryngoscopes with Macintosh blades, a laryngoscope with a Magill blade, a Macintosh polio blade, gum elastic bougies, malleable stylets, Magill's forceps, an EGTA, and an emergency trans-cricothyroid ventilation set (Tunstall, 1980).

The first move in "failed intubation drill" is to place the patient in a head-down position in the complete left lateral position, since these minimize the chance of aspiration and should eliminate the hazard of aorto-caval compression. Subsequent difficulty in maintaining a clear airway and ventilating the lungs may be relieved by the use of an EGTA since it seems that, when in position, the EGTA displaces the larynx away from the posterior pharyngeal wall. (The EGTA (Esophageal Gastric Tube Airway) is obtainable in the U.K. from Eschmann Ltd, Peter Road, Lancing, Sussex, BN15 8TJ.)

References


"ECHEC DE L'INTUBATION" EN ANESTHESIE OBSTETRICA
Una indicación de la sonde oeso-gástrica de ventilación

RESUME
Nous décrivons l'attitude adaptée devant un échec de l'intubation endotrachéale, au cours d'une césarienne en urgence chez une femme de 116,7 kg. L'anesthésie générale a été poursuivie à l'aide d'une sonde oesogastrique de ventilation de Gordon et Don Michael. Le déplacement vers l'avant du larynx, provoqué par la mise en place de la sonde dans l'oesophage a amélioré la perméabilité des voies aériennes.

"MITGLUNGENE INTUBATION" IN DER GEBURTSHILFE-ANÄSTHESIE
Eine Indikation für die Anwendung des Luftweges mit ösophageal - gastrischen Tubus

ZUSAMMENFASSUNG

INTUBACION FALLADA EN ANESTESIA OBSTETRICA
Una indicación para uso de la "Vía respiratoria por el tubo gástrico esofágico"

SUMARIO
Se describe la gestión de la falla en la intubación de la tráquea durante una operación cesárea en una mujer de 116,7 kg de peso. Se prosiguió con la anestesia general con la ayuda de una Vía respiratoria por tubo gástrico esofágico de Gordon y Don Michael. El desplazamiento para adelante de la laringe causado por el tubo en el esófago mejoró la abertura de la vía respiratoria.