DAS/OAA obstetric difficult airway guidelines and their implications

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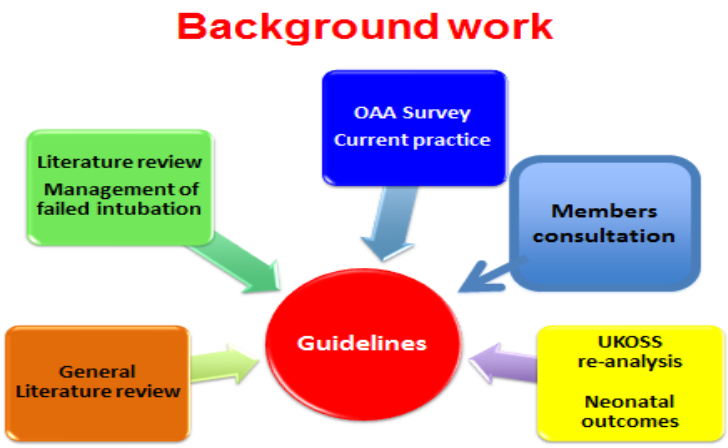
The OAA/DAS obstetric difficult airway guidelines were published in November 2015[i]. The aims of the guidelines were to provide evidence based and consensus based guidance on the obstetric general anaesthetic, management of a failed intubation and decision making whether to proceed or wake the mother should fail intubation occur.

Background work for the guidelines

The OAA/DAS obstetric airway guidelines working group first met in May 2012. Information gathering process is summerised in the figure below:



The literature review of the management of failed intubation looked at all published case reports and case series in order to get some consensus on how failed intubation has been managed in the literature. This resulted in the publication of a review article [ii].

An OAA survey was carried out to gather current UK management of the failed intubation. We also carried out a secondary analysis of UKOSS (UK Obstetric Surveillance System) data on failed intubations to gather information about neonatal outcome after failed intubations. In October 2014, a consultation process was carried out with OAA and DAS members. Drafts of the algorithms were put on the OAA and DAS website and other stakeholders were consulted. Feedback was discussed amongst the group and changes made to the algorithms accordingly.

The obstetric difficult airway guidelines are based around algorithms that deal with induction of general anaesthesia, failed intubation and front-of-the-neck access. They emphasise good practice in planning, preparation and rapid sequence induction technique and outline

how to make a provisional plan prior to the induction of general anaesthesia, on whether to awaken or continue general anaesthesia should failed intubation occur.

Obstetric general anaesthesia

Prior to induction of anaesthesia, a multidisciplinary team briefing should be carried out to discuss the patient issues and planning the management for difficult airway, including whether to wake the patient or to continue with anaesthesia in the event of failed intubation according to guidance in Table 1 of the OAA/DAS guidelines. The table highlights the many factors that need to be considered. The final decision is influenced by factors relating to the woman, fetus, staff and clinical situation and the exact combination will be unique in each individual case.

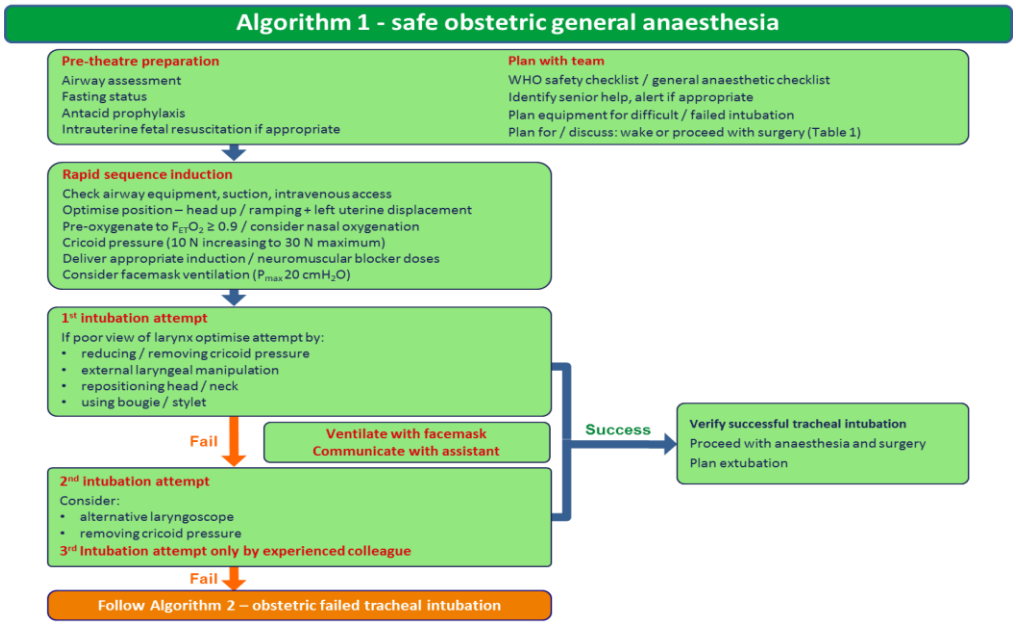


Table 1 - proceed with surgery?

	Factors to consider	WAKE			PROCEED
Before induction	Maternal condition	• No compromise	• Mild acute compromise	• Haemorrhage responsive to resuscitation	• Hypovolaemia requiring corrective surgery • Critical cardiac or respiratory compromise, cardiac arrest
	Fetal condition	• No compromise	• Compromise corrected with intrauterine resuscitation pH < 7.2 but > 7.15	• Continuing fetal heart rate abnormality despite intrauterine resuscitation pH < 7.15	• Sustained bradycardia • Fetal haemorrhage • Suspected uterine rupture
	Anaesthetist	• Novice	• Junior trainee	• Senior trainee	• Consultant / specialist
	Obesity	• Supermorbid	• Morbid	• Obese	• Normal
	Surgical factors	• Complex surgery or major haemorrhage anticipated	• Multiple uterine scars • Some surgical difficulties expected	• Single uterine scar	• No risk factors
	Aspiration risk	• Recent food	• No recent food • In labour • Opioids given • Antacids not given	• No recent food • In labour • Opioids not given • Antacids given	• Fasted • Not in labour • Antacids given
	Alternative anaesthesia • regional • securing airway awake	• No anticipated difficulty	• Predicted difficulty	• Relatively contraindicated	• Absolutely contraindicated or has failed • Surgery started
After failed intubation	Airway device / ventilation	• Difficult facemask ventilation • Front-of-neck	• Adequate facemask ventilation	• First generation supraglottic airway device	• Second generation supraglottic airway device
	Airway hazards	• Laryngeal oedema • Stridor	• Bleeding • Trauma	• Secretions	• None evident

Criteria to be used in the decision to wake or proceed following failed tracheal intubation. In any individual patient, some factors may suggest waking and others proceeding. The final decision will depend on the anaesthetist's clinical judgement.

Pre-oxygenation

Effective pre-oxygenation to an end-tidal O2 of 0.9 is recommended. However, there is now recommendation to continue to oxygenate the patient during the laryngoscopy . Apnoeic oxygenation is regaining popularity in preventing hypoxia prior to securing the airway and it can be done by insufflation of oxygen using nasal cannulae. The administration of oxygen 5L/min increasing to 15L/min post induction via nasal cannulae has been shown to increases safe apnoea time in obese patients. The current recommendation in obstetrics is that apnoeic oxygenation should be considered in all pregnant women in order to increase safe apnoea time. High flow humidified nasal oxygen (HFHNO) delivery using the Optiflow © is a new system which has been used to prevent hypoxia in non-pregnant patients during prolonged periods of apnoea [iii] and it has potential for use in pre-oxygenation during RSI and in obstetrics. However, there is very limited research of its use in obstetrics.

Position

Proper patient positioning can maximize the chance of successful intubation especially in the cases of morbidly obese parturient. Ramped position using in which patient's upper body and head are elevated to create a horizontal alignment between the external auditory meatus and the sternal notch has been shown to improve laryngoscopic view especially in obese patients.

Induction agents

There is now an argument for using propofol as the induction agent of choice in obstetrics for reasons which include familiarity, ease of drawing up and the reduction of errors arising from

the mix up of thiopentone with antibiotics. An extra syringe of induction agent should be available in case a difficult airway is encountered so that additional agent can be administered to prevent awareness.

Cricoid pressure

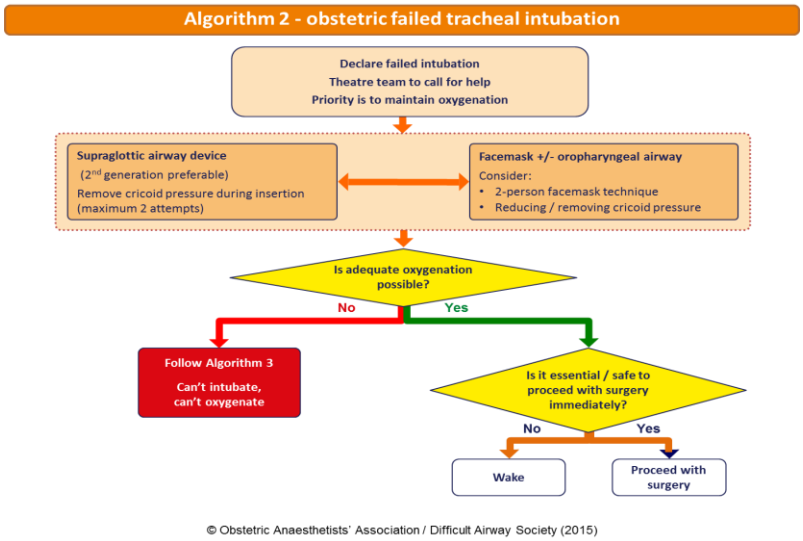
Despite the controversy regarding the benefit, technique, timing and the method of applying cricoid pressure, the guidelines still recommended its use in the UK. However, there is emphasis on correct application and early release should there be any problems with the airway.

Mask ventilation during RSI

Historically, the teaching has been to avoid bag mask ventilation during RSI due to the fear of gastric insufflation and hence aspiration. There is no evidence to support the avoidance of careful bag mask ventilation to reduce the risk of aspiration based on a meta- analysis. Hence, the OAA/DAS obstetric airway guidelines, in keeping with the new DAS guidelines, now recommend gentle mask ventilation with Pmax not exceeding 20cms of H20 and correctly applied cricoid pressure after induction.

Failed intubation

In addition to the safe obstetric general anaesthetic algorithm, the new OAA/DAS obstetric guidelines outline management of failed intubation, the Can't Intubate, Can't Oxygenate (CICO) scenario as well as management after failed intubation. Failed intubation should be declared if correct placement of tracheal tube cannot be confirmed after two attempts. The guidelines specify the immediate use of the supraglottic airway device (SAD) or face mask ventilation to maintain oxygenation when failed intubation has been declared. A second generation SAD with a drainage port is recommended.



Can't Intubate and Can't oxygenate scenario

If attempts to oxygenate using either a SAD or face mask fail and a CICO situation occurs, muscle paralysis should be ensured before performing a front-of-the-neck access procedure.

There are different techniques available to achieve this but the new DAS guidelines now recommend the scalpel – bougie crico-thyroidotomy techinique [iv].

Management after failed intubation

The guidelines give some recommendations on the management after failed intubation during waking of the mother or proceeding with anaesthesia and surgery. Additional muscle relaxant is recommended if surgery is continued to help to facilitate airway management and surgery. Fundal pressure should be reduced at delivery with an unprotected airway.

Table 2 - management after failed tracheal intubation

Wake

- Maintain oxygenation
- Maintain cricoid pressure if not impeding ventilation
- Either maintain head-up position or turn left lateral recumbent
- If rocuronium used, reverse with sugammadex
- Assess neuromuscular blockade and manage awareness if paralysis is prolonged
- Anticipate laryngospasm / can't intubate, can't oxygenate

After waking

- Review urgency of surgery with obstetric team
- Intrauterine fetal resuscitation as appropriate
- For repeat anaesthesia, manage with two anaesthetists
- Anaesthetic options:
  - Regional anaesthesia preferably inserted in lateral position
  - Secure airway awake before repeat general anaesthesia

Proceed with surgery

- Maintain anaesthesia
- Maintain ventilation - consider merits of:
  - controlled or spontaneous ventilation
  - paralysis with rocuronium if sugammadex available
- Anticipate laryngospasm / can't intubate, can't oxygenate
- Minimise aspiration risk:
  - Maintain cricoid pressure until delivery (if not impeding ventilation)
  - after delivery maintain vigilance and reapply cricoid pressure if signs of regurgitation
  - empty stomach with gastric drain tube if using second-generation supraglottic airway device
  - minimise fundal pressure
  - administer H_2 receptor blocker i.v. if not already given
- Senior obstetrician to operate
- Inform neonatal team about failed intubation
- Consider total intravenous anaesthesia

[i] Mushambi MC, Kinsella SM, Popat M, et al. Obstetric Anaesthetists' Association and Difficult Airway Society guidelines for the management of difficult and failed tracheal intubation in obstetrics. Anaesthesia 2015; 70:1286-306.

[ii] Kinsella SM, Winton AL, Mushambi MC et al Failed tracheal intubation during obstetric general anaesthesia: a literature review. Int J Obstet Anesth 2015; 24:356–374.

[iii] Patel A, Nouraei SA. Transnasal Humidified Rapid-Insufflation Ventilatory Exchange (THRIVE): a physiological method of increasing apnoea time in patients with difficult airways. Anaesthesia 2015;70(3):323-329

[iv] Frerk C, Mitchell VS, McNarry AF et al. Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults. Brit J Anaesth 2015; 115: 827-48.