Failed intubation in obstetrics

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Abstract

Failed intubation in obstetrics remains a topical issue, a rare but potentially devastating complication of obstetric general anaesthesia. Recent guidelines have been produced following several years of collaborative work between the Difficult Airway Society (DAS) and Obstetric Anaesthetist's Association (OAA). Whilst deaths from failed intubation have declined significantly over 30 years, the incidence of failed intubation remains fairly constant at 1:300, with latest studies showing a rate of 1:224. This reflects the significant decline in the use of general anaesthesia for Caesarean section over the last three decades; however, it also highlights a decreased exposure for trainees to tracheal intubation in the obstetric population.

Keywords Airway skills; failed intubation drill; obstetrics; preoperative assessment; simulation

Royal College of Anaesthetists CPD Matrix: 1B02, 1C01, 1C02, 2A01, 2B02, 2B05

Learning objectives

After reading this article, you should be able to:

- describe the factors that contribute to failed intubation in obstetric anaesthesia
- recall the stages required in a safe obstetric general anaesthetic
- discuss the DAS/OAA guidelines on how to manage failed intubation in obstetrics

Incidence

Whilst deaths from failed intubation in the UK have fallen from 16 per triennium (1976–1978) to 2 (2006–2008),[1] the incidence of failed intubation has remained at levels of approximately 1:300, three to six times as common as the general population.

The rate of general anaesthesia (GA) for caesarean section (CS) has fallen from 55% (1989–1990) to 9.4% (2011–2012). In the same time-frame there has been an increase in the overall CS rate from 11.3% to 26.2%.[2] However, despite the rise in CS rate there are approximately 70% fewer obstetric GAs done per year nationally.

There are several possible reasons to explain why there may not have been a fall in failed intubation in obstetrics. A lower incidence of failed intubation has been demonstrated with more senior anaesthetic cover and more frequent use of GA, so it is possible that the decrease in obstetric GAs, combined with less exposure to clinical work caused by the European Working Time Directive (EWTD) has decreased trainee's exposure, leading to less expertise in managing the obstetric airway. The increasing complexity of obstetric patients may be another contributing factor to failed intubation rates not declining.

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Contributing factors

The causes of difficult intubation in obstetrics can be divided into demographic, anaesthetic, pregnancy related and situational factors.

Demographic

The demographics of the obstetric patient group are changing. Levels of obesity, maternal age, and pre-existing maternal morbidity are all increasing.

Anaesthetic

There has been a significant decline in the number of obstetric GAs performed over the last 30 years. Most obstetric GAs are performed by trainee anaesthetists out of hours. Furthermore, trainee anaesthetists may be gaining less exposure to intubation generally, with a combination of factors contributing to this. These include the effect of reduced hours imposed by the EWTD, the advent of the laryngeal mask airway, and, as discussed, the decreasing number of obstetric GAs.

Pregnancy related

Obstetric airways can be challenging due to physiological changes in pregnancy. Venous congestion causes the airway mucosa to become more vascular and oedematous. This increases the risk of bleeding on airway instrumentation, and can also distort normal anatomy making intubation more difficult. This swelling may be exacerbated by pre-eclampsia, IV fluids and oxytocin administered during labour, and Valsalva manoeuvres performed in labour. Desaturation can be rapid due to decreased functional residual capacity (FRC), increased oxygen requirements and difficulties pre-oxygenating in the distressed parturient.

The risk of reflux is increased due to decreased lower oesophageal sphincter tone, and delayed gastric emptying due to pain in labour and opioid medication.

Enlarged breasts can make the insertion of a laryngoscope blade difficult.

Situational factors

Multiple factors may complicate the successful securing of a patent airway. The majority of difficult and failed intubations in obstetric patients occur during emergencies and out of hours.[3]

In an emergency setting, airway assessment may have not been completed satisfactorily. This is associated with failed intubation.

The obstetric theatre can be a different environment to that which the trainee anaesthetist has had previous experience.

Excessive noise levels, a distressed patient, fetal considerations, as well as pressure from surgeons with their potentially different clinical priorities can all act to compound the stress of the situation for the anaesthetist.

Another significant risk factor for failed intubation is failed regional anaesthesia. The UK Obstetric Surveillance System (UKOSS) showed that 17% of failed intubation was preceded by failed regional anaesthesia. Failed regional anaesthesia has been shown to be three times more likely[4] to occur with epidural top up anaesthesia compared with spinal anaesthesia. This highlights the importance of reviewing women with epidurals regularly. Predictors for failure of epidural top up are an increasing number of anaesthetist top ups in labour, and a high urgency for CS.[5]

Management of failed intubation

Failed intubation is a very rare event. In units similar to ours, with 9000 deliveries per year, a failed intubation rate of 1:224 anaesthetics would give rise to 1 incident per 12 months.

The Obstetrics Anaesthetist's Association (OAA) and Difficult Airway Society (DAS) formed a Guidelines Group in May 2012, and have recently published difficult and failed intubation guidelines.[6] These should now be considered the gold standard for management of failed intubation in obstetrics in the UK, and should be circulated amongst all anaesthetic staff undertaking obstetric work. There should also be simulation drills using the new guidelines in order to ensure familiarity with them amongst all health professionals working on delivery suite. The guidelines will be summarized below. Figure 1 is a composite of three specific algorithms (Figures 2–4) to be discussed below.

Safe obstetric general anaesthesia (Algorithm 1, Figure 2)

Pre-theatre preparation

Airway assessment: all women undergoing obstetric anaesthesia should have an assessment to predict difficult intubation, difficult mask ventilation, supraglottic airway device (SAD) placement and front of neck access.

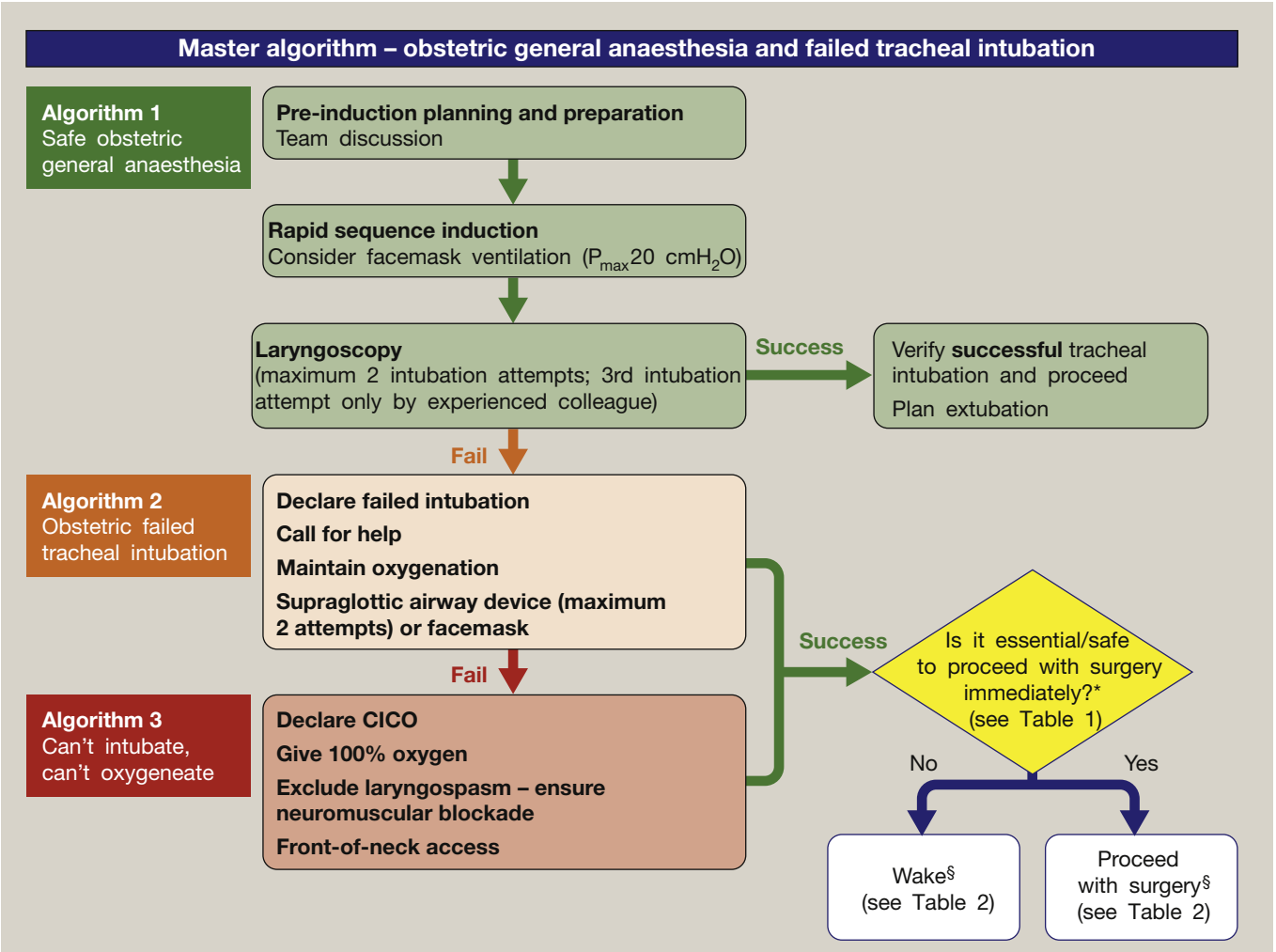

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Figure 1