Choice of airway for caesarean delivery - the place of the LMA (SGD)

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Disclosures

I am on a Clinical Advisory Panel for MSD
“Oils ain’t oils Sol”

Elective & emergency CD are a different kettle of fish!

Is a LMA / SGA / EGA suitable for elective CD?

Which SGA has a role in difficult airway management at CD?

Do all pregnant women really need traditional approaches to airway protection?
Does a supraglottic airway (SGA) have a role in elective CD?

MAYBE......in some well-selected cases, because ....

Pregnancy itself may not be a risk factor for aspiration


n=400,000 GA

Aspiration is less common in pregnant women than children, the elderly and high ASA patients

• 52 cases among > 215,000 GAs, 0 obstetric [Warner MA et al]
Aspiration (during CD) is rare

~ 1 in 1,000 at CD with intubation [McDonnell NJ et al IJOA 2009]

0 in 4,767 at elective CD without intubation

Mortality reports:
UK all recent obstetric cases were in labour, intensive care, with seizures and at extubation
McNicol L, ANZCA: Safety of Anaesthesia 2009-11: 5 fatal cases, 0 GA
Most such events are of little consequence.

Complications of anaesthesia like aspiration are responsible for < 1% of severe morbidity.
- < 1 in 10,000 births [10th Report 2014]

Most cases do not cause clinical harm & most are not severe.
- mortality from severe aspiration < 5%
  - 1 death among 7 anaesthetic-related deaths, among 261 maternal deaths [CMACE 2011]
Why pregnancy per se is not a major risk

**GI physiology MYTHS**

- No reduction in gastric emptying during pregnancy
- Gastric content similar to non-pregnancy after delivery [James CF et al. Anesthesiology 1984]
- Epidural analgesia preserves gastric motility in labour [Bataille A et al. BJA 2014]

“The evidence does not support the concept that pregnant patients presenting for elective CD have an increased risk of aspiration” [De Souza DG et al. Anesth Analg 2010]

“ In pregnant women, risk of aspiration may probably not be as high as previously thought” [Devroe S et al Curr Opin Anesth 2015]
Down-sides to intubation & RSI

1. Hypertensive response

Anaesthetists may forget to ablate the (greater) stress response to intubation, especially in preeclampsia, leading to potentially fatal cerebrovascular events.

CEMACH 2003-05 highlighted the failure to obtund the response to intubation.
2. Failed intubation is a risk factor for awareness as anaesthesia may not be maintained

“All obstetric cases involved awareness at induction. Factors contributing include a) rapid sequence induction......”

“This finding requires a fundamental reassessment of what is intended by RSI, since this was a potent risk.”
3. Failed intubation is a risk factor for aspiration

- multiple UK maternal mortality reports
- UKOSS data n=57

Aspiration 8% with difficult intubation vs 1% without
Dogma links intubation and rapid sequence induction ... but there is NO EVIDENCE that RSI REDUCES the risk of ASPIRATION

Cricoid pressure is difficult to teach, often poorly applied & most aspiration doesn’t occur at induction

n=4,891 intubated GA CS, 60% with cricoid pressure

9 aspiration deaths among 2,985 with RSI (0.3%)
2 among 1,906 without cricoid pressure (0.1%)
Let’s erronously assume that RSI is effective in preventing aspiration - what is the NNT?

Aspiration at vaginal delivery under GA without intubation = 1 in 6,000 (study of 31,600 mostly unfasted women in labour; 2 mild aspirations at GA) [Krantz et al Anesthesiology 1973]

A third of those that aspirate develop symptoms (1 in 18,000)

A third occur at induction so 100% effective RSI would reduce symptomatic aspiration to 1 in 24,000

= absolute risk reduction from 0.0555% to 0.0416%

= NNT of 7,143 potentially harmful RSI to prevent one symptomatic aspiration!
Any plus sides to a SGA?

1. Easy, more rapid insertion
2. Less ‘intubation response’
3. Less upper airway trauma
4. Less complicated emergence
5. Some devices offer extra aspiration protection
6. Some suitable for intubation if needed
Where do SGAs have a role in pregnancy?

Women in first & early second trimester having straightforward, elective non-abdominal surgery

- a very low risk population for aspiration
Retrospective; mainly ASA 1 & BMI < 40
No prophylaxis
Propofol 1.5 mg/kg ± fentanyl
Follow-up @ 2-3 weeks

62,000 abortions (to 25 min GA) without intubation
- 11,039 > 13 weeks
- 3,014 > 18 weeks

Aspirations n = 0
Max risk 1 in 20,000
Where do SGAs have a role?

Peripartum women having elective, non-abdominal surgery

- a low risk population for aspiration [Ezri T et al Anaesthesia 2000]

Retrospective
No prophylaxis
1,870 under GA without intubation &
within 30 min of delivery

1 aspiration (mild, no HDU)
Where do SGAs have a role?

Selected women having elective CD?
- a very low risk population for aspiration
n=1,067
Halesah BK et al. Anaesth Intensive Care 2010
Yao WY et al. Can J Anesth 2012

n=700

n=3,000

n=4,767 elective GA CD with LMA

Aspiration n=0

Highest risk 1 in 1,500
Caution: read the detail..........

Technical aspects:

Variable cricoid pressure throughout (Classic)

Inserted during modified pharyngoscopy with laryngoscope (ProSeal)

Fundal pressure was limited (Supreme/ProSeal)

Orogastric tube passed post-insertion (Supreme)

Classic LMA series:

Partial obstruction in 21% but no hypoxia, laryngospasm, bronchospasm, gastric insufflation reported (!)

ProSeal & Supreme series:

No adverse respiratory events (!)

ProSeal series:

1 regurgitation
Am I out of my mind suggesting that not all pregnant women need intubation?

Are French, Swiss and Scandinavian anaesthetists all idiots?

French survey found that tracheal intubation was not considered necessary for peripartum procedures & 20% did not use cricoid pressure for GA for CD
Scandinavian clinical practice guidelines on general anaesthesia for emergency situations


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Table 6

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Grading</th>
</tr>
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<tbody>
<tr>
<td>The use of cricoid pressure cannot be recommended on the basis of scientific evidence</td>
<td>E</td>
</tr>
<tr>
<td>The use of cricoid pressure is therefore not considered mandatory but can be used on individual judgement</td>
<td>E</td>
</tr>
<tr>
<td>If necessary, utilisation of a nasotracheal tube should be commenced</td>
<td>D</td>
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</tbody>
</table>
Does a SGA have a role as a primary airway device in emergency CD?

This is a higher risk cohort

- 1 critical airway event per 22,000
- 4 of 133 were obstetric - complex patients, after hours & no deaths

n=4,891 intubated GA CD

- 30 regurgitations at induction & 103 at extubation or in recovery
Does a SGA have a role as a primary airway device in emergency CD?

I DON'T THINK SO
But in this situation....
The role of the SGA as a secondary airway device

Highly likely to allow oxygenation & ventilation
LMA 98-99% success at first attempt [3 GA CD studies]

Likely to provide some airway protection despite gastric fluid regurgitation [numerous case reports, mainly ProSeal LMA]

Suitable as conduit for intubation if considered necessary after delivery e.g. ILMA Fastrach; i-gel; Classic LMA

Strongly supported in Airway Society Guidelines!
Transition from supraglottic to infraglottic rescue - Cognitive Aid

Airway Assessment & Planning
- If decision to proceed with anesthestist
- Brief own and prepare for SGR and IGR in high risk patients

Optimal Oxygenation

General Anaesthesia or LOC
- SGR Supraglottic Rescue
- FMV
  - Optimize attempts
  - FMV - Facemask ventilation
  - SGA - Supraglottic airway
  - ETT - Intubated tube

SGA ETT

If risk of airway difficulty is high, consider:
- Awake intubation, Alternate or Regional Techniques,
- Posturing or Cancelling Case

SGA FMV
- Optimal head position
- 1 person technique
- Oral/Pharyngeal airway
- Consider maxilla reduction

SGA SGR
- Optimal head position
- Alternative technique
- Consider maxilla reduction

SGA ETT
- Optimal head position
- Dentures out
- Consider maxilla reduction
- Adjacent device - Selective Beige
- Consider alternative tube or size
- Consider midline incision
  - Multiple steps, channelled device or with inserted ETT
- Consider bronchoscope techniques

Establish Documentation & Airway Alert Letter

CORE AIRWAY ASSESSMENT QUESTIONS:
1. History of difficult intubation?
2. How does the surgery affect the airway?
3. Predictions of difficulty with intubation?
4. Predictions of difficult bag mask ventilation?
5. Prediction of difficult supraglottic airway device?
6. Prediction of difficult tracheostomy?
7. Cardiovascular reserve?
8. Aspirin risk?
9. Embolism risk?

If anyone is concerned, speak up

Wake patient up if possible

PREPARE

IGR Infraglottic Rescue

Algorithm 2 – obstetric failed tracheal intubation

Declare failed intubation
Theatre team to call for help
Priority is to maintain oxygenation

Supraglottic airway device
(2nd generation preferable)
Remove cricoid pressure during insertion
(maximum 2 attempts)

Facemask +/- oropharyngeal airway
Consider:
- 2-person facemask technique
- Reducing/removing cricoid pressure

Is adequate oxygenation possible?

Follow Algorithm 3
Can’t intubate, can’t oxygenate

Is it essential/safe to proceed with surgery immediately?

Wake

Proceed with surgery
Which SGD to choose?

- Easy rapid insertion
- High sealing pressure
- Oesophageal drain
- Suitable for fibroscope or Aintree catheter aided intubation
- Narrow profile (eg. Laryngeal Tube] useful if oropharyngeal oedema?

No clear evidence
Tailor to circumstance and familiarity
What do others use for rescue at failed intubation?

Classic n=2; ProSeal n=1; ILMA n=1

**UK**
2004 airway trolley survey [Bullough AS et al IJOA 2009]
- ILMA > Combitube > ProSeal

2008-10 UKOSS n=69 failed intubations
- SGA used in 86%

<table>
<thead>
<tr>
<th>Rescue</th>
<th>Number of cases (n=57)</th>
</tr>
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<tbody>
<tr>
<td>Classical LMA</td>
<td>39</td>
</tr>
<tr>
<td>Intubating LMA</td>
<td>4</td>
</tr>
<tr>
<td>PROSEAL</td>
<td>3</td>
</tr>
<tr>
<td>IGEL</td>
<td>3</td>
</tr>
<tr>
<td>Bag and mask</td>
<td>2</td>
</tr>
<tr>
<td>Smaller tracheal tube</td>
<td>1</td>
</tr>
<tr>
<td>Re-intubation attempt</td>
<td>3</td>
</tr>
<tr>
<td>Second-dose succinylcholine and TT</td>
<td>1</td>
</tr>
<tr>
<td>Tracheostomy</td>
<td>1</td>
</tr>
<tr>
<td>Patients woken up</td>
<td>4</td>
</tr>
<tr>
<td>Sedation+LA</td>
<td>1 (urgency grade 1)</td>
</tr>
<tr>
<td>Intrathecal block</td>
<td>3 (urgency grade 1, 2, 4)</td>
</tr>
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Is adequate oxygenation possible?

Follow Algorithm 3
Can’t intubate, can’t oxygenate

Is it essential/safe to proceed with surgery immediately?

No

Wake

Yes

Proceed with surgery
New kids on the block?

**Laryngeal tube**
[VBM Medizintechnik, Germany]

**TotalTrack®**
[MedComflow Spain]
Conclusion:
What is the role of the LMA (SGA)?

SGA devices, esp. those with an oesophageal drain tube or facilitating intubation, have a role as the primary airway device in many pregnant women having suitable surgery, if

- fasted
- healthy, not actively refluxing
- BMI < 35-40?

“In certain fasted...pregnant women, for whom the specific hazards associated with RSI override the advantages, the case for the use of a laryngeal mask is strong” [Paech MJ. Anaesth Intensive Care 2010]
Conclusion: What is the role of the LMA (SGA) at CD?

“Supraglottic airway devices may safely be used in fasted, non-obese elective caesarean delivery.”

“The LMA is invaluable in obstetric anaesthesia as a rescue airway device or in selected cases in which maternal comorbidity necessitates meticulous haemodynamic stability.”

[Devroe S et al. Curr Opin Anesthesiol 2015]
Conclusion:
What is the role of the LMA (SGA) in a crisis?

SGAs have a life-saving role to play in cases of failed intubation & during resuscitation.

With fetal compromise, most experienced (UK) OB anaesthetists would proceed with GA CD using a SGA (if airway deemed adequate, weighing risks like obesity, fasting status, co-morbidities, quality of seal).

[Soltanifar D et al Anesthesiol Res Prac 2015; Rucklidge MWM Anaesthesia 2015]
THANKS