


**Gestion des voies aériennes en
obstétrique**

Cours de sciences de base
Anesthésiologie - Université de Montréal



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1

Mise en situation

- Parturiente 28 ans, G3P2,
- Pas vue en clinique d'APGARE
- EDTAC, en travail depuis 2h
- Pas encore eu d'épidurale
- Bradycardie fœtale continue
- Césarienne rouge :
 - Pas de discussion avec l'OBGYN car pas de temps
 - Équipe prête pour l'anesthésie générale

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2

Et la patiente arrive...

Accompagnée de l'obstétricien sur le bord de la panique !!

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3



4

Plan

- Incidence
- Facteurs de risque
- Algorithme

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Pas de conflit d'intérêt

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6

Incidence

Failed tracheal intubation during obstetric general anaesthesia: a literature review
 S.M. Kinsella, A.L. Winton, M.C. Muthambi, K. Ramawamy, H. Swales, A.C. Quinn, M. Popul

« Intubation that was not accomplished with a single dose of succinyl-choline. »
 « Inability to intubate during general anaesthesia »

« Unsuccessful attempts using direct laryngoscopy or alternative intubation equipment, the need with surgery with a non-electric unsecured airway (e.g. bag-mask ventilation or laryngeal mask), or the need to abort intubation or awaken the woman prior to surgery »

Study	Proportion (95% CI)
C/S	2.3 (1.7 - 2.9)
A/G	2.6 (2.0 - 3.2)
combined	2.3 (1.7 - 2.9)

proportion (95% confidence interval)

7

Complications

Anesthesia-Related Maternal Mortality in the United States: 1979–2002
 Jay F. Hawkins, MD, Juan Chang, MD, Susan K. Palusz, MD, Charles P. Gilib, MD, and William K. Colquhoun, MD

Table 3. Case Fatality Rates and Rate Ratios of Anesthesia-Related Deaths During Cesarean Delivery by Type of Anesthesia in the United States, 1979–2002

Year of Death	Case Fatality Rates*		Rate Ratios
	General Anesthetic	Regional Anesthetic	
1979–1984	20.0	6.6	2.3 (95% CI 1.9–2.9)
1985–1990	22.3	5.9	16.7 (95% CI 12.9–21.8)
1991–1996	16.8	2.5	6.7 (95% CI 3.0–14.9)
1997–2002	6.5	3.8	1.7 (95% CI 0.6–4.6)

CI, confidence interval.
 * Deaths per million general or regional anesthetics.

8

Facteurs de risques

Facteurs anatomiques et physiologiques

Box 29.1
Anatomic and Physiologic Risk Factors for Airway Complications during Pregnancy

- Airway edema
- Decreased functional residual capacity
- Increased oxygen consumption
- Weight gain
- Breast enlargement
- Full dentition
- Decreased lower esophageal sphincter tone
- Delayed gastric emptying in labor

9

29 The Difficult Airway
Risk, Assessment, Prophylaxis, and Management
Rabin-Russak, WBE, MD, FRCPC

Box 29.1
Anatomic and Physiologic Risk Factors for Airway Complications during Pregnancy

→ Airway anatomy

- Decreased functional residual capacity
- Increased oxygen consumption
- Weight gain
- Breast enlargement
- Full dentition
- Decreased lower esophageal sphincter tone
- Delayed gastric emptying in labor

Facteurs de risques

Facteurs anatomiques et physiologiques

- Rétention Hydrique
- Rétrécissement diamètre voies aériennes
- Diminution compliance cou
- Hypertrophie linguale et oropharyngée
- Friabilité et saignement
- Exacerbation
 - Travail / Oxytocine
 - Pré-éclampsie
 - Décubitus dorsal
 - Réanimation volémique agressive

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10

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Facteurs de risques

Facteurs anatomiques et physiologiques

- ↓ Temps d'apnée sans désaturation
- Exacerbation :
 - Travail
 - Obésité morbide (↑ Prévalence)
 - Sepsis
 - Succinyl-choline

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11

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Facteurs de risques

Facteurs anatomiques et physiologiques

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12

29 The Difficult Airway Risk, Assessment, Prophylaxis, and Management

Facteurs de risques

Facteurs anatomiques et physiologiques

- En faveur de la vidéolaryngoscopie d'emblée
 - (Opinion personnelle)
- Séquence rapide
 - Pression cricoïdienne
- Prophylaxie antiacide et anti-émétique
 - Citrate de Sodium <30 minutes de l'induction
 - Anti-H2 (surtout pour extubation)
 - Métoprolamide (surtout pour extubation)

Box 29.1 Anatomic and Physiologic Risk Factors for Airway Complications during Pregnancy

- Airway anatomy
- Decreased functional residual capacity
- Increased oxygen consumption
- Weight gain
- Blood management
- Full dentition
- Decreased lower esophageal sphincter tone
- Delayed gastric emptying in labor

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13

29 The Difficult Airway Risk, Assessment, Prophylaxis, and Management

Facteurs de risques

Facteurs organisationnels

- Urgence/rapide
- À toute heure du jour ou de la nuit
- Sur la garde (double salle)
- Expérience variable des anesthésistes
- Moins d'occasions d'apprentissage d'AG pour C/S

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14

Anaesthesia 2015, 70, 1236-1306 doi:10.1111/anae.13260

Guidelines

Obstetric Anaesthetists' Association and Difficult Airway Society guidelines for the management of difficult and failed tracheal intubation in obstetrics*

M. C. Mashambi¹, S. M. Kinsella², M. Popat³, H. Swales⁴, K. K. Ramaswamy⁵, A. L. Winton⁶ and A. C. Quinn^{7,8}

¹ Consultant/Chairman of Guidelines Group, Department of Anaesthesia, Leicester Royal Infirmary, Leicester, UK
² Consultant, 6 Specialist Registrar, Department of Anaesthesia, St Michael's Hospital, Bristol, UK
³ Professor, Nightday Department of Anaesthesia, Oxford University Hospital NHS Trust, Oxford, UK
⁴ Consultant, Department of Anaesthesia, University Hospital Southampton Foundation Trust, Southampton, UK
⁵ Consultant, Department of Anaesthesia, Northampton General Hospital, Northampton, UK
⁷ Consultant, Department of Anaesthesia, James Cook University Hospital, Middlesbrough, UK
⁸ Honorary Associate Clinical Professor, Leeds University, Leeds, UK

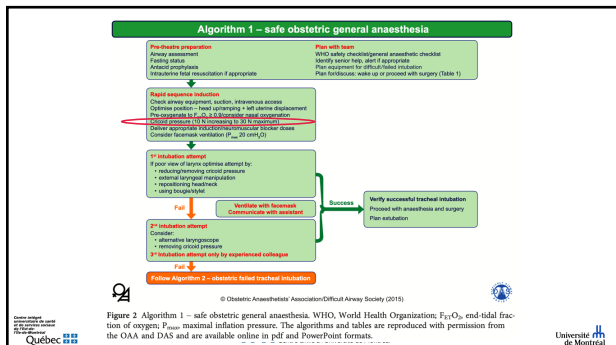
DIFFICULT AIRWAY SOCIETY
 Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults* *British Journal of Anaesthesia*, 113 (8): 827-848 (2015)

SPECIAL ARTICLES
Anesthesiology 2013; 118:251-70

Practice Guidelines for Management of the Difficult Airway
An Updated Report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway

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15



19

Pression cricoïdienne

Cricoid Pressure Results in Compression of the Postcricoid Hypopharynx: The Esophageal Position Is Irrelevant

Mark J. Rice, MD¹
 Anthony A. Mancuso, MD²
 Charles Gibbs, MD³
 Timothy E. Morey, MD⁴
 Nikolaus Gravenstein, MD⁵
 Lori A. Deitte, MD⁶

BACKGROUND: Sellick described cricoid pressure (CP) as pinching the esophagus between the cricoid ring and the cervical spine. A recent report noted that with the application of CP, the esophagus moved laterally more than 90% of the time, questioning the efficacy of this maneuver. We designed this study to accurately define the anatomy of the Sellick maneuver and to investigate its efficacy.

METHODS: Twenty-four nonintubated adult volunteers underwent neck magnetic resonance imaging with and without CP. Measurements were made of the postcricoid hypopharynx, airway compression, and lateral displacement of the cricoid ring during the application of CP. The relevant anatomy was reviewed.

RESULTS: The hypopharynx, not the esophagus, is what lies behind the cricoid ring and is compressed by CP. The distal hypopharynx, the portion of the alimentary tract **caudal to the cricoid level, was fixed with respect to the cricoid ring and not mobile**. With CP, the mean anteroposterior diameter of the hypopharynx was reduced by 33% and the lumen likely obliterated, and this compression was maintained even when the cricoid ring was raised by the vertebral body.

CONCLUSIONS: The location and movement of the esophagus is irrelevant to the efficacy of the Sellick's maneuver (CP) in regard to prevention of gastric regurgitation into the pharynx. The hypopharynx and cricoid ring move together as an anatomic unit. This relationship is essential to the efficacy and reliability of Sellick's maneuver. The magnetic resonance images show that compression of the alimentary tract occurs with midline and lateral displacement of the cricoid cartilage relative to the underlying vertebral body.

Sellick's Maneuver: To Do or Not to Do

Andrew Chong, MD¹
 M. Renee Salton, MD²

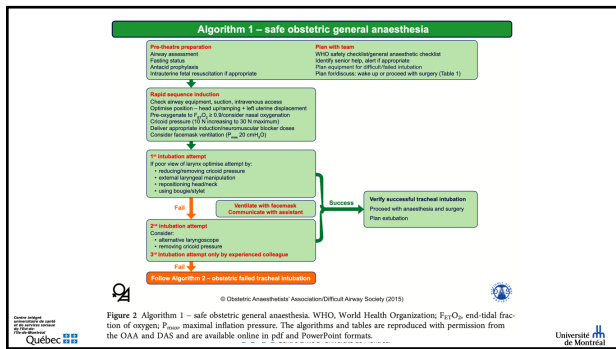
INTRODUCTION: Cricoid pressure (CP) by Sellick in 1961¹ to control regurgitation of gastric contents with orotracheal intubation was one of the "gold" standards for airway management. However, recent evidence suggests that CP may not be as effective as once thought and may actually increase the risk of esophageal intubation.

OBJECTIVE: The authors reviewed the "value" of the CP.

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20



21

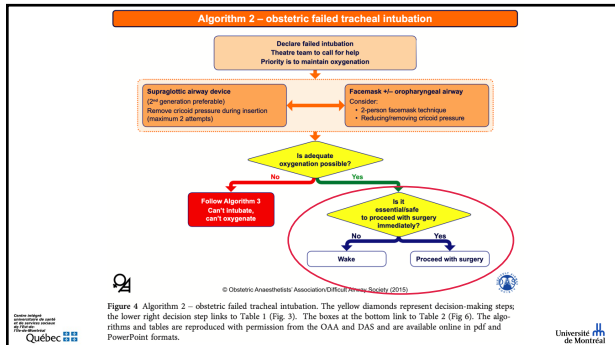


Figure 4 Algorithm 2 – obstetric failed tracheal intubation. The yellow diamonds represent decision-making steps: the lower right decision step links to Table 1 (Fig. 3). The boxes at the bottom link to Table 2 (Fig. 6). The algorithms and tables are reproduced with permission from the OAA and DAS and are available online in pdf and PowerPoint formats.

22

Table 1 – proceed with surgery?

Factors to consider	WAKE	PROCEED
Maternal condition	• No complications	• Mild acute complications
Fetal condition	• No complications	• Compromised compared with generally stable obstetric ultrasound
Operational	• Adequate resources	• Limited resources
Obstetric	• Spontaneous	• Elective
Obstetric anaesthesia	• Difficult larynx or face	• Multiple airway devices
Regional block	• No regional block	• Regional block
Alternative anaesthetics	• No induction difficulty	• Difficult induction
Other factors	• Difficult larynx ventilation	• Adequate larynx ventilation
Any factors	• Front of neck	• Bleeding

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Figure 3 Table 1 – wake or proceed with surgery? 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. The algorithms and tables are reproduced with permission from the OAA and DAS and are available online in pdf and PowerPoint formats.

23

Table 2 – management after failed tracheal intubation

Wake	Proceed with surgery
<ul style="list-style-type: none"> Maintain oxygenation Maintain circulatory 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 	<ul style="list-style-type: none"> Maintain anaesthesia Maintain ventilation - consider merits of: <ul style="list-style-type: none"> controlled or spontaneous ventilation paralysis with rocuronium if sugammadex available Anticipate laryngospasm/can't intubate, can't oxygenate Minimise aspiration risk <ul style="list-style-type: none"> maintain circulatory pressure until delivery (if not impeding ventilation) after delivery maintain vigilance and reoxygenate if signs of regurgitation empty stomach with gastric drain tube if using second-generation supraglottic airway device minimise fundal pressure administer H₂ receptor blocker i.v. if not already given Senior obstetrician to operate Inform neonatal team about failed intubation Consider total intravenous anaesthesia
<p>After waking</p> <ul style="list-style-type: none"> Review urgency of surgery with obstetric team Intraoperative fetal re-assessment as appropriate For repeat anaesthesia, manage with two anaesthetists Anaesthetic options <ul style="list-style-type: none"> Regional anaesthesia preferably inserted in lateral position Secure airway awake before repeat general anaesthesia 	

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Figure 6 Table 2 – management after failed tracheal intubation. I.v., intravenous. The algorithms and tables are reproduced with permission from the OAA and DAS and are available online in pdf and PowerPoint formats.

24

C/S sans intuber ?

The use of ProSeal laryngeal mask airway in caesarean section - experience in 3000 cases

R. K. HALASEH¹, Z. F. SUKRI¹, L. HAJ HASSANI¹, A. T. H. SHAI¹, W. A. BUSINAGA², H. AL-ABBIDI³

¹Department of Anaesthesia, Rasheed Hospital, Amman, Jordan

TABLE 1

Airway outcomes

*Successful insertion on first attempt	3000 (100)
Establishment of an 'effective' airway on first attempt	2992 (99.7)
Patients that needed a larger PLMA	8 (0.3)
Regurgitation/spillage of gastric contents into mouth	1 (0.03)
Patients requiring 'rescue' intubation	0 (0)

Values are expressed as n (%). PLMA=ProSeal™ laryngeal mask airway.

25

C/S sans intuber ?

10107
Anaesthesia for caesarian section: is intubation necessary? Review of 1000 cases in a large general hospital in Northern Nigeria

L. Yakasai¹, B. Dikko², S. Bala¹, A. Balalaba³

¹For correspondence (and correspondence): International Journal of Obstetric & Gynaecology 1870 (2008) 931-938

Materials and Methods: The study was conducted over a 4 year period between 2004-2008 1000 case notes of all patients who either had caesarian section or laparotomy for ruptured uterus were retrieved and analysed from the computerised data base. Anaesthesia was induced with thiopentone sodium, and maintained with halothane and this was administered by the anaesthetic nurses. None of the patients was intubated and none had regional anaesthesia. Patients who gave a history of taking native concoction at home usually had nasogastric tube passed before surgery. Demographic data including anaesthetic complications were carefully documented.

Results: Majority of the patients had emergency caesarian section (940), while 60 had laparotomy and repair of the ruptured uterus. An average of 10-15 operations were carried out daily. There was no anaesthetic death, but there were two cases of mendelson syndrome, one case of transient apnoea and one cardiac arrest. The duration of anaesthesia is between 45 to 60 minutes.

Conclusion: We were able to report a very low anaesthetic complication rate without necessarily intubating the patients for our emergency operative procedures. Despite this success we still recommend training of more anaesthetic doctors in the tropics to standardised administration of anaesthetia in the developing countries.

26

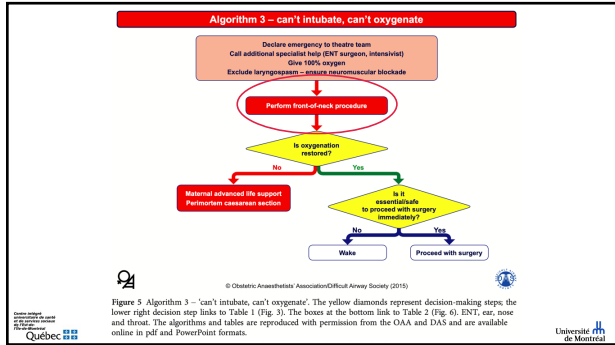
C/S sans intuber ?

Failed tracheal intubation during obstetric general anaesthesia: a literature review

S.M. Kinnella¹, A.L. Winton², M.C. Mathambaki³, K. Ramarao⁴, H. Swales⁵, A.C. Quinn⁶, M. Popat⁷

Fig. 3 Graph of proportion of cases in which general anaesthesia was continued after failed tracheal intubation at caesarean section; reports pooled into 5-year epochs. Error bars=95% confidence interval

27



28

Original Article

Accuracy of conventional digital palpation and ultrasound of the cricothyroid membrane in obese women in labour

K. E. Yao-Tan¹, B. Sima¹, T. Panchang², and N. Subbar¹

Table 3 Accuracy of digital palpation of the cricothyroid membrane. Values are median (IQR [range]), number (proportion) or number (95% CI).

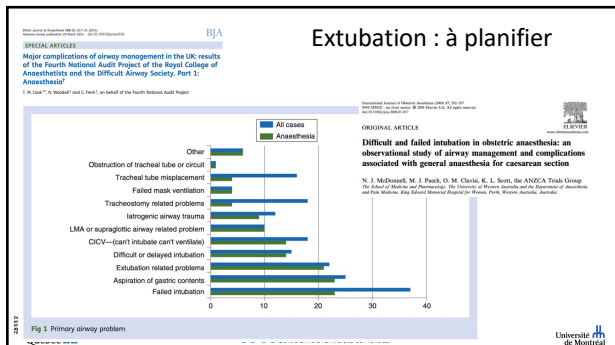
	Obese (n = 28)	Non-obese (n = 28)	p value
Time taken to palpate cricothyroid membrane, s	23 (13-25 [10-75])	12 (9-22 [3-71])	0.01
Total no. of attempts			
1	20 (71%)	22 (79%)	0.76
2	8 (29%)	6 (21%)	
US-DP distance, mm			
Accuracy of digital palpation	11 (39%)	20 (71%)	0.03
Odds ratio for accuracy	3.9 (1.3-11.8)		0.02

Table 4 Grading of the cricothyroid membrane with palpation. Values are number (proportion).

	Obese (n = 28)	Non-obese (n = 28)	p value
Ease of palpation*			
Easy-moderate	24 (86%)	28 (100%)	0.11
Difficult-impossible	4 (14%)	0	

Non-obese BMI < 30 kg m⁻²; Obese BMI ≥ 30 kg m⁻²
 *Easy-moderate defined as visible to light palpation of neck landmarks; difficult-impossible defined as deep palpation to non palpable neck landmarks.

30



32

Guidelines

Extubation : à planifier

Difficult Airway Society Guidelines for the management of tracheal extubation

Membership of the Difficult Airway Society Tracheal Extubation Guidelines Group: M. Pope (Chairman), V. Mitchell, R. Davies, A. Patel, C. Sneyd, and A. Riggs

Figure 1 DAS extubation guidelines basic algorithm. Figure 2 DAS extubation guidelines 'at-risk' algorithm.

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33

Gardez votre sang-froid

ET DEMANDEZ DE L'AIDE

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34

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35
