Intubation et chirurgie thoracique
Carlens et vidéolaryngoscopie
Intubation difficile et exclusion pulmonaire

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Lyon

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LYON ET RHÔNE-ALPES

Pas de conflit d'intérêt

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Contexte

- Chirurgie thoracique, Chirurgie digestive haute
- Augmentation des procédures vidéo: au US, 80% des lobectomies, pneumonectomies, gestes diagnostiques
- Radiologie interventionnelle?

- Multifocalité des cancers des voies digestives supérieures (bouche pharynx œsophage) et aérienne distale (larynx trachée bronches): 14,5%
- Simultanée: 6,4%
- Successive: 8,1%

Indications d'exclusion pulmonaire

Recommendations for airway control and difficult airway management in thoracic anesthesia and lung separation procedures

G. MERLI, A. GUARINO, G. DELLA ROCCA, G. FROVA, F. PETRINI, M. SORBELLO, C. COCCIA

MINERVA ANESTESIOL 2009;75:59-96

TABLE I.— *Indications for one-lung ventilation: classification according to classes of precedence.*

Absolute: prevention of complications *quoad vitam*

1. Protection of one lung from a contralateral disease
   - massive hemorrhage
   - infections
2. Control of ventilation distribution
   - broncopleural fistula
   - broncopleurocutaneous fistula
   - surgical opening of major airways
   - lung unilateral giant cysts or bulla
   - serious lacerations of tracheobronchial tree
   - severe hypoxemia due to unilateral pneumopathy
3. Broncopulmonary unilateral lavage
   - pulmonary alveolar proteinosis

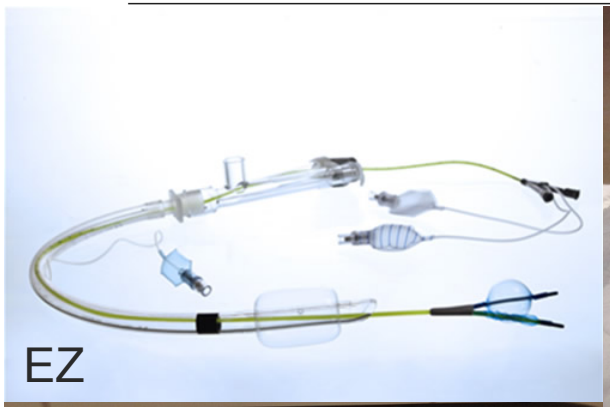
Relative: need of surgical exposure

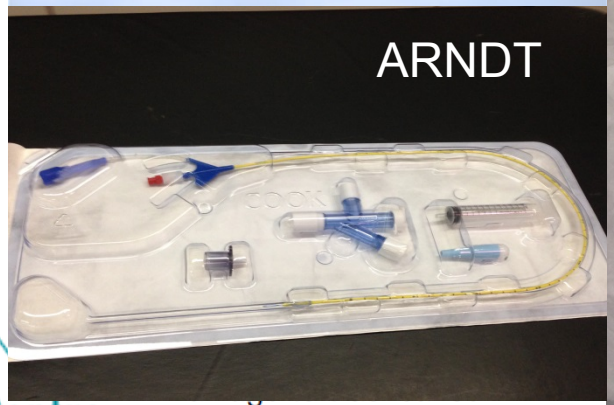
1. Surgical exposure - high priority
   - video-assisted thoracoscopy
   - thoracic aorta aneurysmectomy
   - pneumonectomy
   - right superior lobectomy
   - mediastinal exposure
2. Surgical exposure - low priority
   - medium and inferior lobectomy, sub-segmental resection
   - esophageal surgery
   - surgery of dorsal spine
3. Removal of pulmonary blood clots

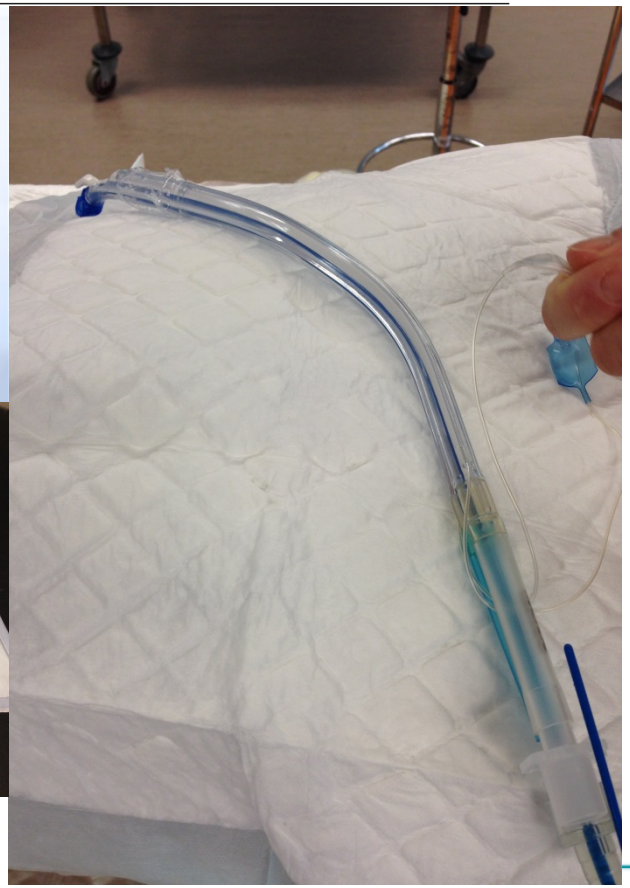
La sonde de Carlens est-elle toujours d'actualité?

2007

Table 2 Advantages and disadvantages of double-lumen endotracheal tubes and bronchial blockers







Major tracheo-bronchial injuries

British Journal of Anaesthesia **103** (BJA/PGA Supplement): i66–i75 (2009)
doi:10.1093/bja/aep262

BJA

Lung separation and the difficult airway

J. B. Brodsky*

Table 1 Advantages of DLTs and BBs

Double lumen tubes
Easier to position
Can be positioned without bronchoscopy; bronchoscopy mandatory with BB
Shorter time required to position than a BB
More rapid lung collapse than with BB
Less likely to be displaced than a BB
Allows either lung to be ventilated, collapsed, and re-expanded
Each lung can be suctioned
Each lung can be inspected with a bronchoscope
Continuous positive airway pressure easily applied to operated lung
Enables split (independent) lung ventilation in ICU
Bronchial blockers
Can be used when a TT is already in place (oral, nasal, tracheostomy)
Not necessary to change TT or Univent tube if postoperative ventilation required
Allows selective lobar blockade
Easier to use in smaller airways; technique of choice in paediatric patients

Which device should be considered the best for lung isolation: double-lumen endotracheal tube versus bronchial blockers

Javier H. Campos

Curr Opin Anaesthesiol 20:27–31.

Table 1 Comparison of the outer and internal diameters of a single-lumen endotracheal tube and the most common adult sizes for a double-lumen endotracheal tube

Single-lumen endotracheal tube		Double-lumen endotracheal tube			
ID	OD	French	OD	Bronchial ID	Tracheal ID
7.5	10.2	35	11.7	4.3	4.5
8.0	10.9	37	12.3	4.5	4.7
8.5	11.5	39	13.0	4.9	4.9
9.0	12.1	41	13.7	5.4	5.4

Sizes are given in millimeters. ID, internal diameter; OD, outer diameter.

Une bonne taille pour la sonde de séparation DLT

Une sonde la + large possible atraumatique:

- Moindre résistance au flux
- Permettre une stabilité de la sonde
- Aspiration + facile
- Fibroscopie + facile
- Pour ne pas avoir à gonfler le ballonnet > 3 ml
- Pour ne pas que la sonde aille trop loin dans la bronche (moins d'obstruction des lobaires sup)

Abaques

Rx Pulmonaire

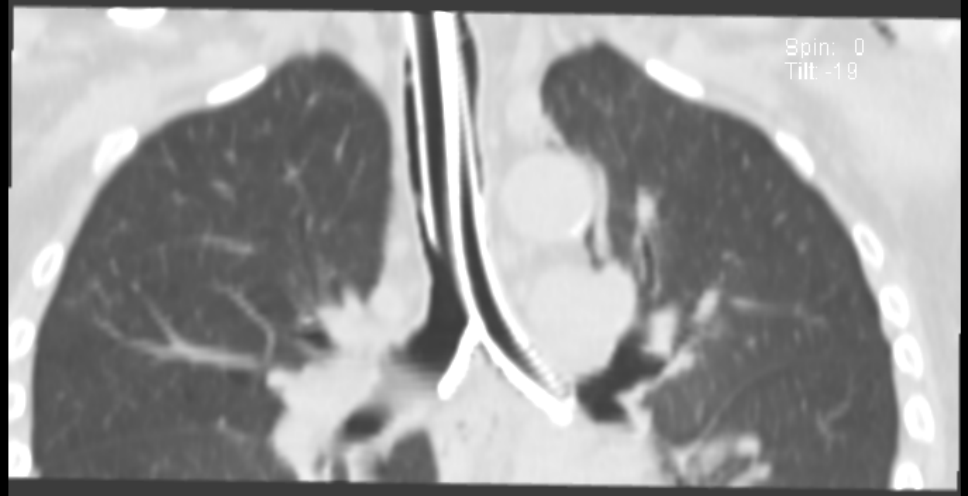
Echographie

Scanner

Se:602
Im:14

MEDCOM RESAMPLED
[HA]

SGAMBATO, GISELE
Study Date:31/03/2015
Study Time:08:59:11
MRN:0803809



[R]

[L]

Controle intubation coro

[FP]

C-600
W1600

Se:602
Im:15

MEDCOM RESAMPLED
[HA]

SGAMBATO, GISELE
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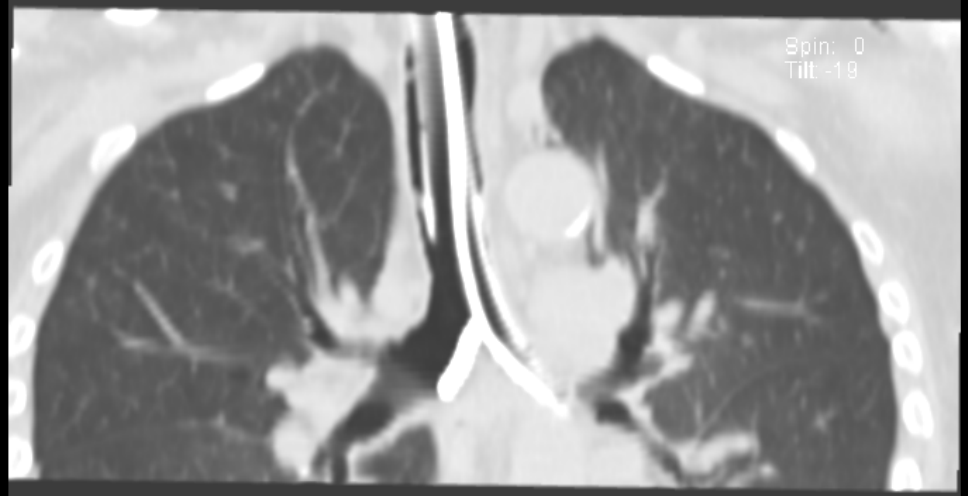

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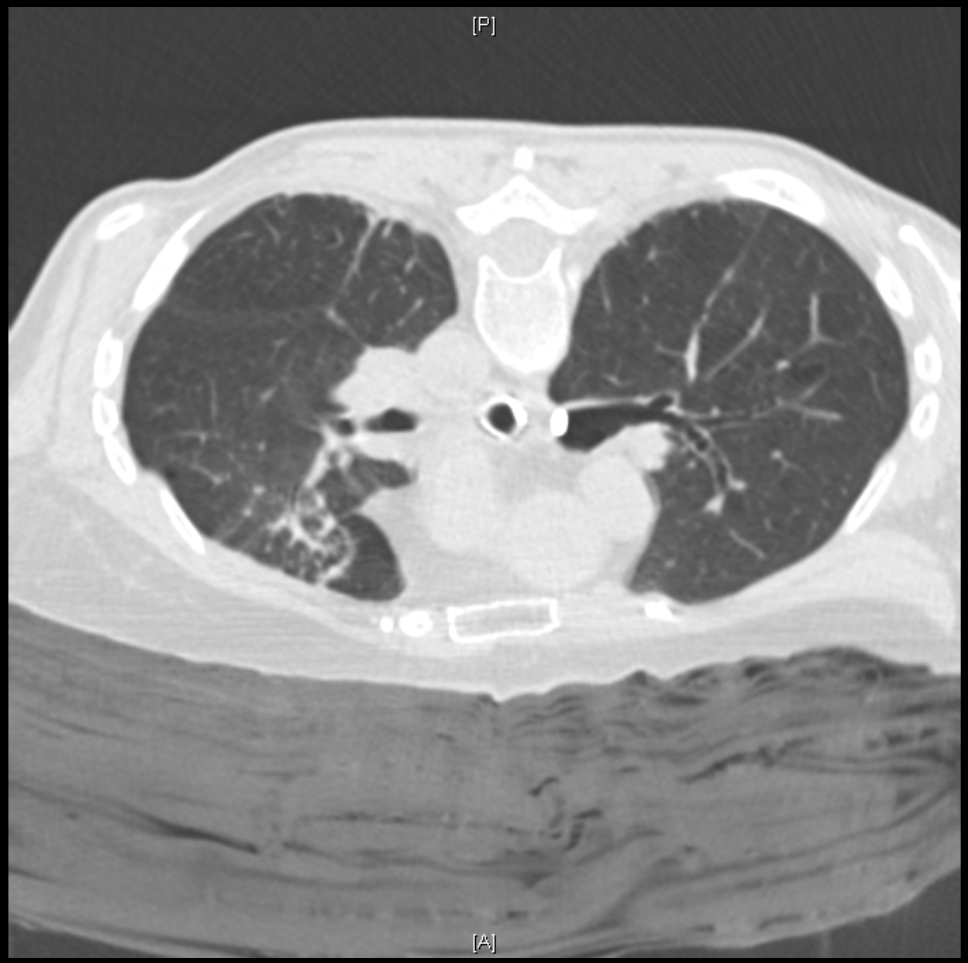

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REPERAGE 2.0 B30s

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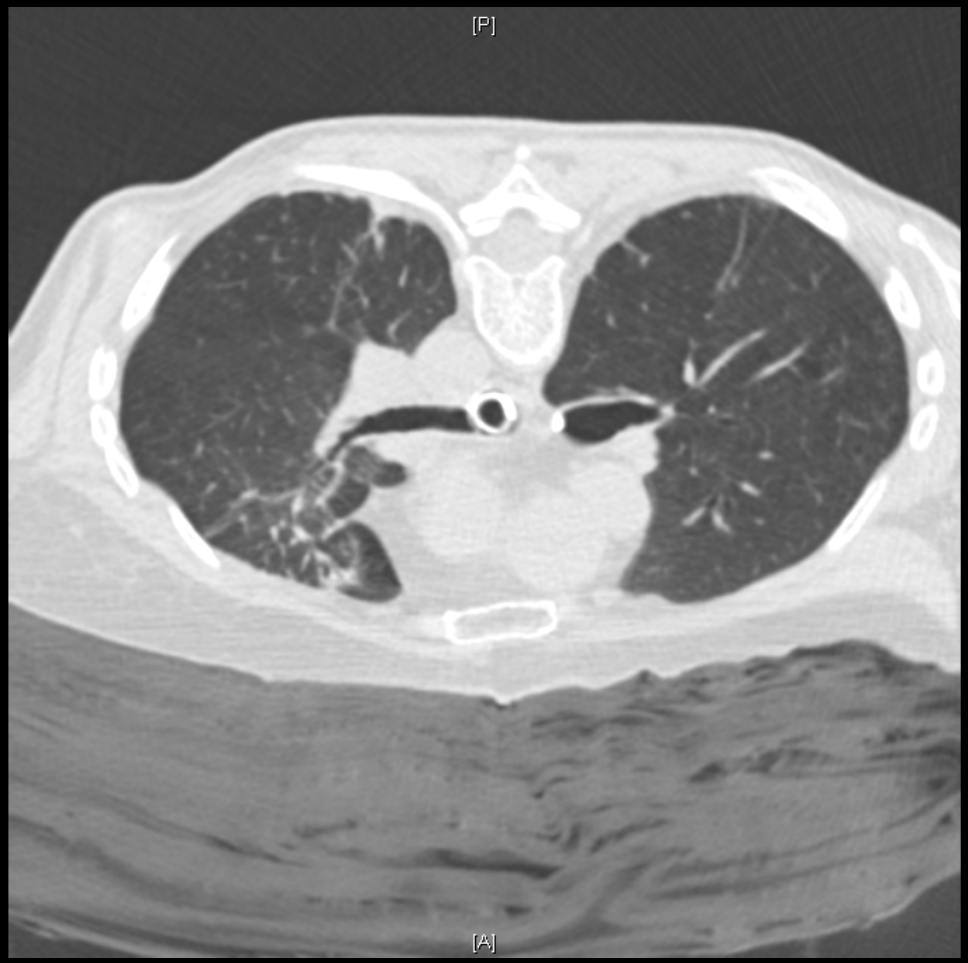

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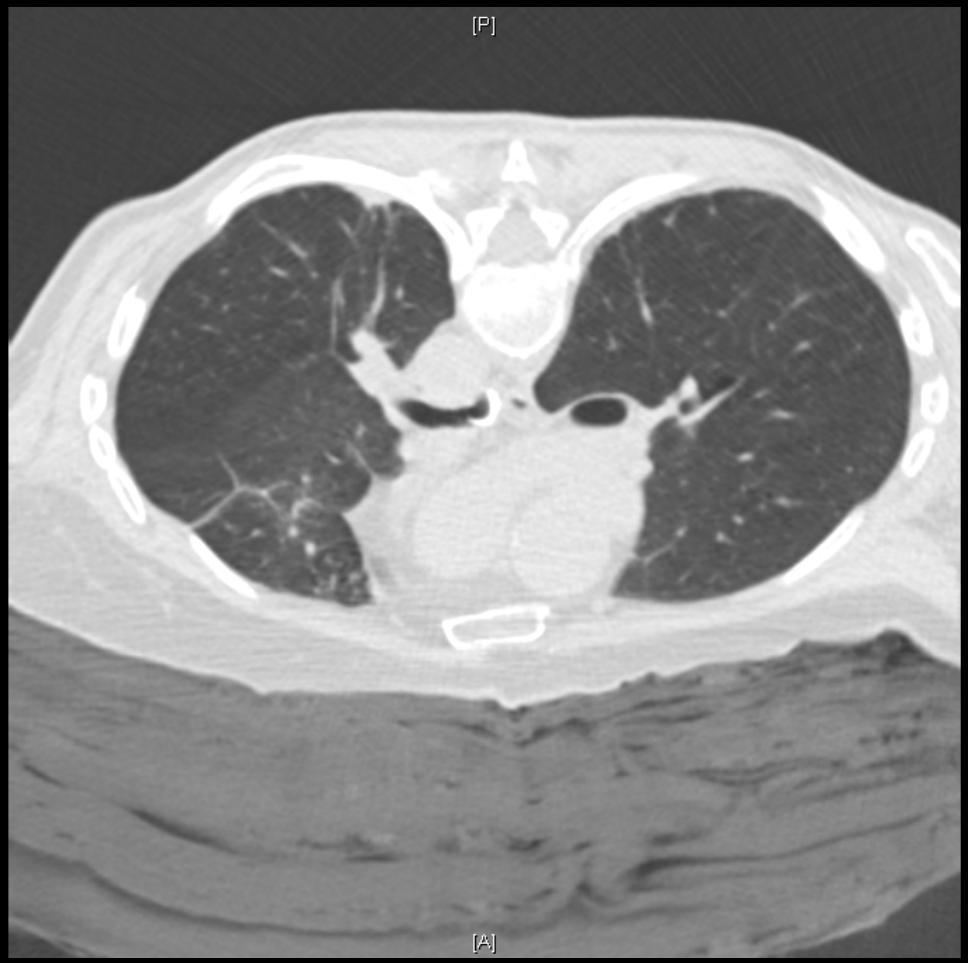
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[R]
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C-600
W1600

Se:4
Im:62

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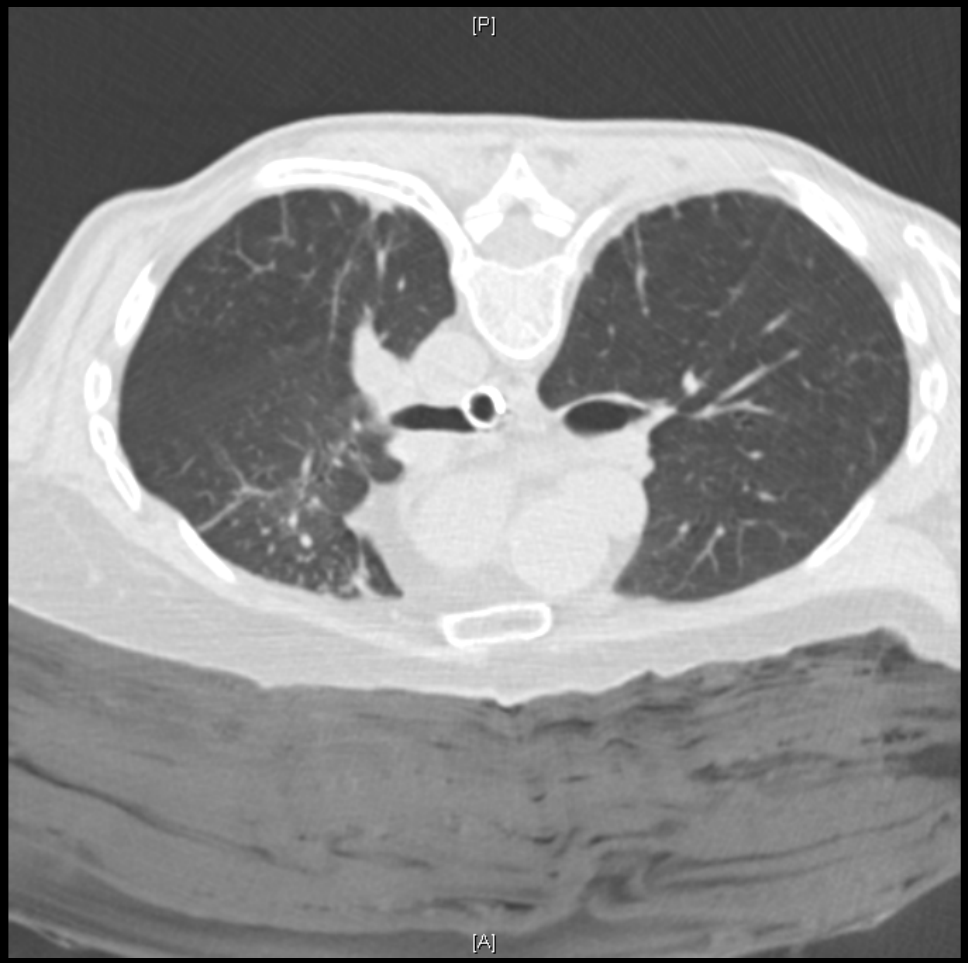

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REPERAGE 2.0 B30s

[A]

C-600
W1600

Rationnel: le vidéo-laryngoscope peut-il aider l'intubation avec sonde séparation?

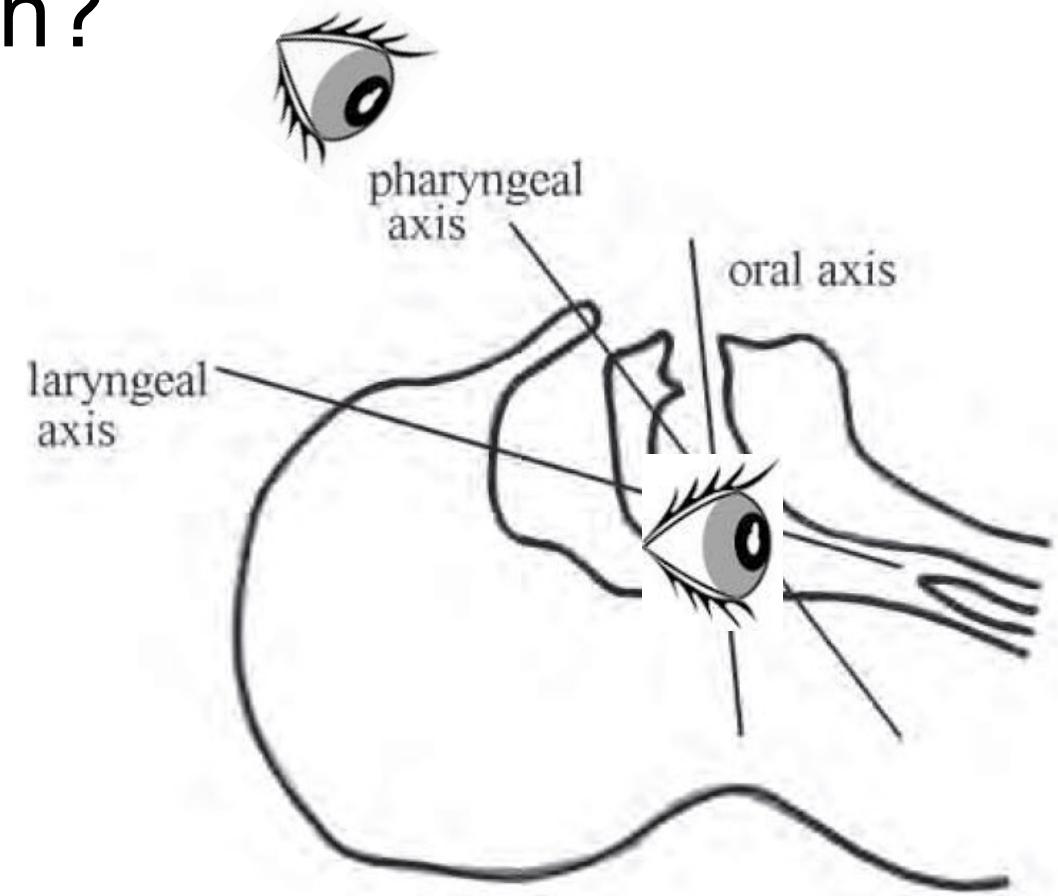

FIGURE 1: Oral-laryngeal-pharyngeal axes not aligned.

Bibliographie

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Using a Glidescope for intubation with a double lumen endotracheal tube

CANADIAN JOURNAL OF ANESTHESIA 2007

Ada A. Hernandez MD
David H. Wong pharmd MD
VA Long Beach Healthcare System, Long Beach, USA

Obèse: BMI 34, Mallampati 3, extension rachis cervical < 35°, flexion rachis cervical 45°.

Succès cormack 1

Faster double-lumen tube intubation with the videolaryngoscope than with a standard laryngoscope

Mustapha Bensghir, MD · Hassan Alaoui, MD · Hicham Azendour, PhD · Mohamed Drissi, MD · Abderhmane Elwali, MD · Mohamed Meziane, MD · Jaafar Salim Lalaoui, PhD · Ali Akhaddar, PhD · Nouredine Drissi Kamili, PhD

Can J Anesth/J Can Anesth (2010) 57:980–984

Etude prospective, comparative

Exclusion séquence rapide, intubation difficile ATCD ou critères, contre indication DLT,

Randomisation: X-lite Rush (VL)vs Macintosch (LS)

DLT mallinckrodt: 35-37 femmes, 37-39 hommes.

Pento, Rocuronium, Fenta. Pas de monitorage des curares

Tableau 1 Caractéristiques de la population

Variables	Groupe VL (n = 34)	Groupe LS (n = 34)
Age (ans)	41,8 ± 9	44,6 ± 10
Sexe (H/F) (*n*)	28/6	29/5
IMC ($kg \cdot m^{-2}$)	24 ± 2,9	22,98 ± 2,19
ASA I/II (*n*)	23/11	20/14
Type de chirurgie (*n*)		
Kyste hydatique	12	10
Tumeur	13	17
Thoracoscopie	9	7
DID : > 40 mm/40–35 mm (*n*)	30/4	32/2
DTM : > 65 mm/65–60 mm (*n*)	29/5	31/3
Mallampati: I/II (*n*)	26/8	24/10

Les variables sont exprimés en moyenne ± écart type (m ± ET) ou en nombre (*n*), VL = vidéolaryngoscope; LS = laryngoscope standard; IMC = indice de masse corporelle; ASA = American Society of Anesthesiologists; DID = distance interdentaire; DTM = distance thyro-mentonnière

Tableau 2 Conditions d'intubation

Variables	Groupe VL n = 34)	Groupe LS (*n* = 34)	*P*
Score CL (sans MLE) I/II/III/IV (*n*)	24/8/2/0	13/11/8/2	0,025
MLE (*n*)	2	10	0,011
Score CL (après MLE) I/II/III/IV (*n*)	25/9/0/0	15/12/5/2	0,019
Temps d'intubation (sec)	39,9 ± 4,4	47,9 ± 5,4	<0,001
Tentative (*n*): 1/2/3	32/2/0	23/9/2	0,019
Echec (*n*)	0	2	0,23
Taille TDL: 35/37/39 (*n*)	4/15/15	5/16/13	0,59
TDL : droit /gauche	19/15	16/18	0,46

Les variables sont exprimés en nombre (*n*). VL = vidéolaryngoscope; LS = laryngoscope standard; CL = Cormack et Lehane; MLE = manœuvres laryngés externes; TDL = tube à double lumière

Tableau 3 Incidents et complications relevés dans les deux groupes

Variables	Groupe VL ($n = 34$)	Groupe LS ($n = 34$)	P
Désaturation (n)	2	13	0,001
Tachycardie (n)	5	7	0,52
Hypertension (n)	4	3	0,69
Saignement oropharyngé (n)	1	3	0,3

Les variables sont exprimées en nombre de patients (n). VL = vidéolaryngoscope; LS = laryngoscope standard

Avec vidéolaryngoscopie:

moins de désaturation, moins de temps, meilleure exposition, manipulations externes plus efficaces

A randomised trial comparing the CEL-100 videolaryngoscope™ with the Macintosh laryngoscope blade for insertion of double-lumen tubes

W. Lin,[1] H. Li,[2] W. Liu,[2] L. Cao,[1] H. Tan[1] and Z. Zhong[3]

1 Associate Professor, 2 Resident, 3 Staff Anaesthetist, Department of Anesthesiology, Sun Yat-Sen University Cancer Centre and State Key Laboratory of Oncology of South China, Guangzhou, China

Anaesthesia 2012, 67, 771–776

Etude prospective comparative randomisée

170 patients

ASA<4, Pas ID

AG: Propofol, fentanyl, Cisatracurium

Pas de monitorage de la curarisation

Angulation à 90° à 10 cm de l'extrémité distale

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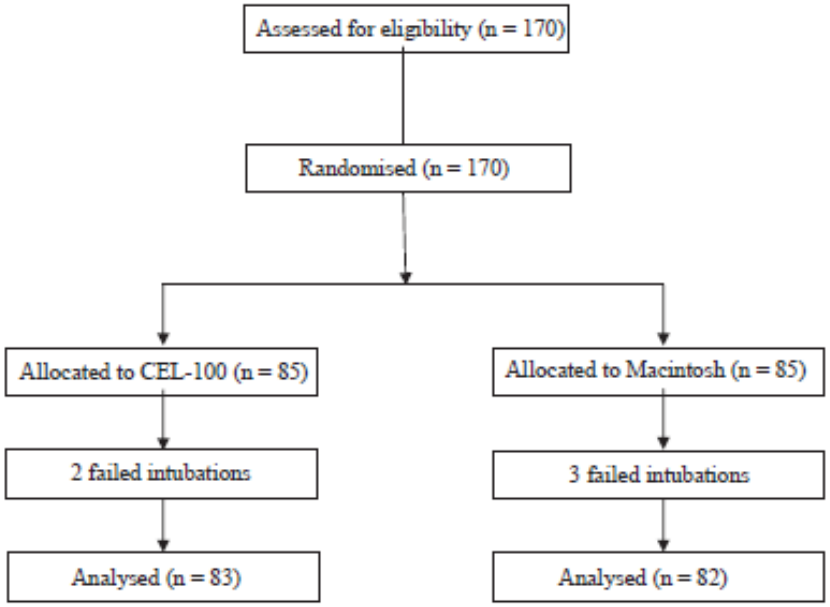


Figure 4 CONSORT flow diagram of the study.

- Objectif principal: temps d'intubation ente les 2 dispositifs
- Manœuvres externes autorisées
- Echec quand > 3 tentatives alors sonde simple
- Objectifs secondaires: score de cormack avec et sans manœuvre
- Complications

Table 1 Patients' characteristics and details of the double-lumen tubes (DLTs) inserted, using the CEL-100 videolaryngoscope or Macintosh laryngoscope blade. Values are mean (SD) or number.

	CEL-100 (n = 83)	Macintosh (n = 82)
Age; years	58.2 (9.6)	57.6 (9.4)
Sex; male/female	55/28	52/30
Weight; kg	60.9 (8.9)	61.2 (8.3)
Height; cm	162.5 (7.5)	163.1 (7.3)
BMI; $kg.cm^{-2}$	22.9 (2.7)	23.1 (2.8)
Mallampati score; 1/2/3/4	40/36/7/0	45/31/6/0
Inter-incisor gap		
< 4 cm	7	3
≥ 4 cm	76	79
Thyromental distance		
< 6.5 cm	3	2
≥ 6.5 cm	80	80
ASA physical status; 1/2/3/4	60/16/7/0	59/17/6/0
DLT; left/right	29/54	31/51
Size of DLT; 35/37 Fr	51/32	43/39

	CEL-100 n = 83	Macintosh n = 82	p value
Intubation time; s	45 (38–55 [22–132])	51 (40–61 [30–160])	0.104
Grade of glottic view			
1	75 (90.4%)	50 (61.0%)	< 0.001
2	7 (8.4%)	27 (32.9%)	
3	1 (1.2%)	5 (6.1%)	
4	0	0	
Intubation attempts			
1	77 (92.8%)	65 (79.3%)	0.012
≥ 2 attempts	6 (7.2%)	17 (20.7%)	
Intubation difficulty score*	0 (0–0 [0–60])	15 (0–30 [0–80])	<0.001
Correct tube position	75 (90.3%)	65 (79.2%)	0.041
External laryngeal pressure	16 (19.3%)	27 (32.9%)	0.046
Complications			
Hypoxaemia	0	0	NS
Oral mucosal bleeding	9 (10.8%)	17 (20.7%)	0.081
Oesophageal intubation	0 (0.0%)	4 (4.9%)	0.122
Tear of the cuff	3 (3.6%)	1 (1.2%)	0.366
Postoperative sore throat	11 (13.2%)	20 (24.4%)	0.073
Postoperative hoarseness	4 (4.8%)	8 (9.8%)	0.230

*0 = easy, 100 = difficult.

Le VideoLaryngoscope est > Lame Macintosh

- Exposition plus facile: plus de cormack 1
- Introduction plus facile de la sonde moins de tentative
- Mois de manipulation externe
- Moins de score d’intubation difficile
- Plus de sondes bien placées

Comparison of the GlideScope® videolaryngoscope and the Macintosh laryngoscope for double-lumen tube intubation

H.-T. Hsu,[1,2] S.-H. Chou,[3] P.-J. Wu,[4] K.-Y. Tseng,[1] Y.-W. Kuo,[1] C.-Y. Chou[5] and K.-I. Cheng[6,7]

Anaesthesia 2012, 67, 411–415

Etude prospective comparative randomisée

60 patients

ASA<3, Pas ID, Pas de régurgitation

AG: Thiamilal, fentanyl, Rocuronium, propofol

Pas de monitorage de la curarisation

Angulation à 90° à 10 cm de l'extrémité distale

2 « Anesthésistes expérimentés » >300 glidescope intubation DL

- Objectif principal: temps d'intubation ente les 2 dispositifs
- Manœuvres externes autorisées
- Echec quand > 3 tentatives alors sonde simple
- Objectifs secondaires: score de Cormack avec et sans manœuvre, maux de gorge
- Complications

Table 1 Characteristics of patients assigned to intubation with the Macintosh laryngoscope or GlideScope videolaryngoscope. Data are mean (SD) or number.

	Macintosh group (n = 30)	Glidescope (n = 30)
Age; years	37.2 (15.4)	40.1 (18.7)
Male/female	11/19	7/23
Weight; kg	62.4 (12.0)	60.1 (9.5)
Height; cm	165.6 (8.4)	168.0 (6.8)
BMI; $kg.m^{-2}$	23.0 (5.6)	21.3 (3.4)
ASA; 1/2	12/18	14/16

BMI, body mass index.

Table 2 Airway characteristics in patients assigned to intubation with the Macintosh laryngoscope or GlideScope videolaryngoscope. Data are mean (SD) or number.

	Macintosh (n = 30)	GlideScope (n = 30)
Modified Mallampati class; 1/2/3	3/27/0	1/27/2
Thyromental distance; cm	8.6 (0.9)	8.7 (1.0)
Mouth opening – active; cm	4.5 (0.8)	4.4 (0.8)
Mouth opening – passive; cm	4.1 (0.8)	3.9 (0.8)

Table 3 Details of intubation with a double-lumen tube using the Macintosh laryngoscope or GlideScope video-laryngoscope. Data are mean (SD) or number.

	Macintos (n = 30)	GlideScope group (n = 30)	p value
BURP manoeuver used	9	0	< 0.001
First intubation attempt successful	26	30	NS
Number of intubation attempts; 1/2/≧3	26/2/2	30/0/0	NS
Duration of intubation; s	62.5 (29.7)	45.6 (10.7)	0.007
Complications			
Blood on the device	0	0	NS
Oral bleeding	2	0	NS
Bronchospasm	0	0	NS
Arrhythmia	5	1	NS
Sore throat			
None/mild/moderate/severe	12/1/5/12	24/2/1/3	0.003
Hoarseness	14	4	0.004

BURP, backwards upwards rightwards pressure

- VideoLaryngoscope glidescope > Lame Macintosh
- Meilleure exposition
- Temps d'intubation <
- Moins de maux de gorge post op

A randomised controlled trial comparing the GlideScope® and the Macintosh laryngoscope for double-lumen endobronchial intubation

T. Russell,[1] P. Slinger,[2] A. Roscoe,[2] K. McRae[2] and A. Van Rensburg[2]

Anaesthesia 2013, 68, 1253–1258

Etude prospective randomisée comparative

80 patients

Pas ID, Pas de régurgitation, pas de BMI>40

AG: avec monitorage de la curarisation

Angulation de l'extrémité distale, à discrétion

Anesthésistes connaissant Glidescope mais seulement avec 3 à 6 utilisations avec une DL

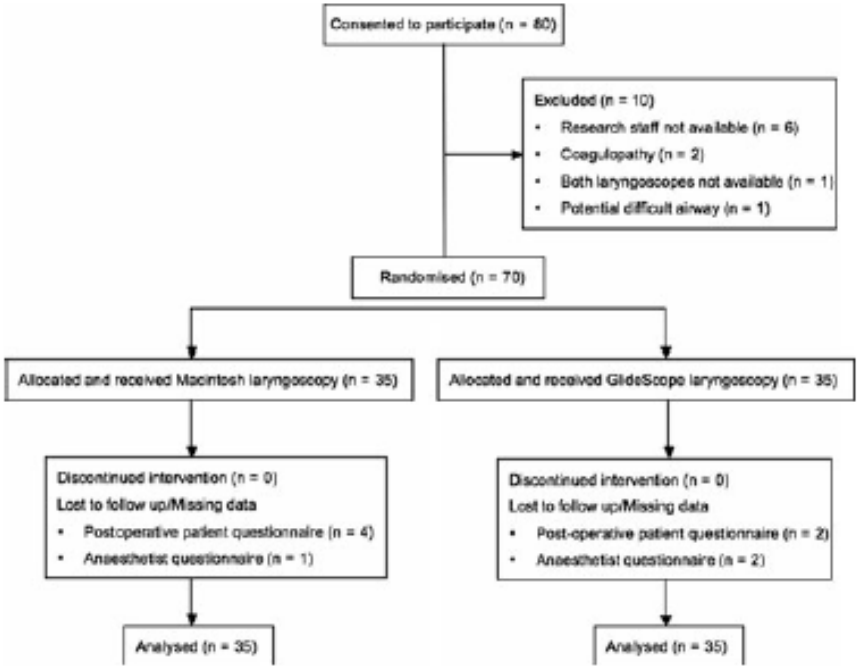
Objectif principal: temps d'intubation ente les 2 dispositifs

Manœuvres externes autorisées

Echec quand temps d'intubation >120 sec ou échec alors alternative à discrétion des anesthésistes

Objectifs secondaires: temps de fibroscopie, tx de succès, Echelle de difficulté: 0-10

Complications: maux de gorge, changement de voix



	Macintosh (n = 35)	GlideScope (n = 35)
Age; years	62 (14)	59 (12)
BMI; $kg.m^{-2}$	26 (4)	26 (5)
Men	18 (51%)	15 (43%)
ASA 2	5 (14%)	8 (23%)
ASA 3	29 (83%)	24 (69%)
ASA 4	1 (3%)	3 (9%)
Mallampati 1	22 (63%)	15 (43%)
Mallampati 2	11 (31%)	13 (37%)
Mallampati 3	2 (6%)	7 (20%)
Inter-incisor distance; cm	5.3 (0.9)	5.2 (0.8)
Thryomental distance; cm	7.3 (1.0)	7.4 (1.7)
Sternomental distance; cm	14.6 (2.0)	15.3 (2.5)
Upper bite test 1	18 (51%)	18 (51%)
Upper bite test 2	16 (46%)	12 (34%)
Upper bite test 3	3 (9%)	5 (14%)

Table 2 Endobronchial intubation data in patients randomly allocated to Macintosh or GlideScope-assisted double-lumen tube insertion. Values are median (IQR [range]) or number (%).

	Macintosh (n = 35)	GlideScope (n = 35)	p value
First intubation attempt success	32 (91%)	29 (83%)	0.5
Intubation duration; s	33 (22–52 [11–438])	70 (39–129 [21–242])	0.0013
Fibreoptic duration; s	61 (40–128 [14–349])	65 (30-130 [10–240])	0.99
Blood on device	2 (6%)	6 (17%)	0.3
SpO_2 < 96%	0 (0%)	2 (6%)	0.5
Voice changes	8 (23%)	17 (48%)	0.045
Lip trauma	1 (3%)	3 (8%)	0.6
Dental trauma	0	0	1.0
Sore throat (numeric rating score > 5)	2 (6%)	5 (14%)	0.4

Echec glide scope 17%

30 anesthésistes, pour 70 patients analysés; 2 à 3 intubations
Plus expérimentés avec Macintosh

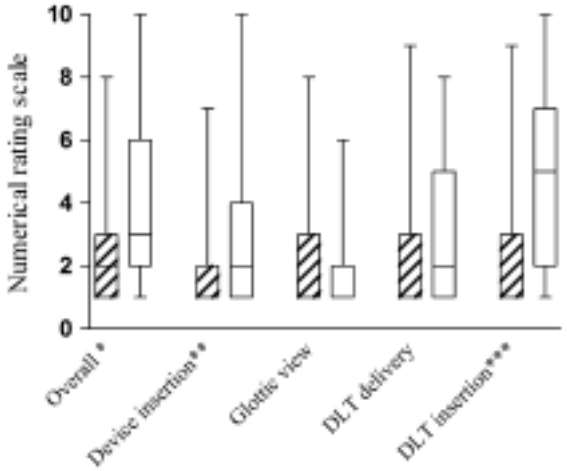


Figure 2 Reported difficulty (1–10) of endobronchial intubation using the Macintosh (▨) or GlideScope (□). The lines within the boxes represent the median, the boxes represent the interquartile range and the whiskers, the range. *p = 0.003, **p = 0.001, ***p < 0.0001. DLT, double-lumen tube.

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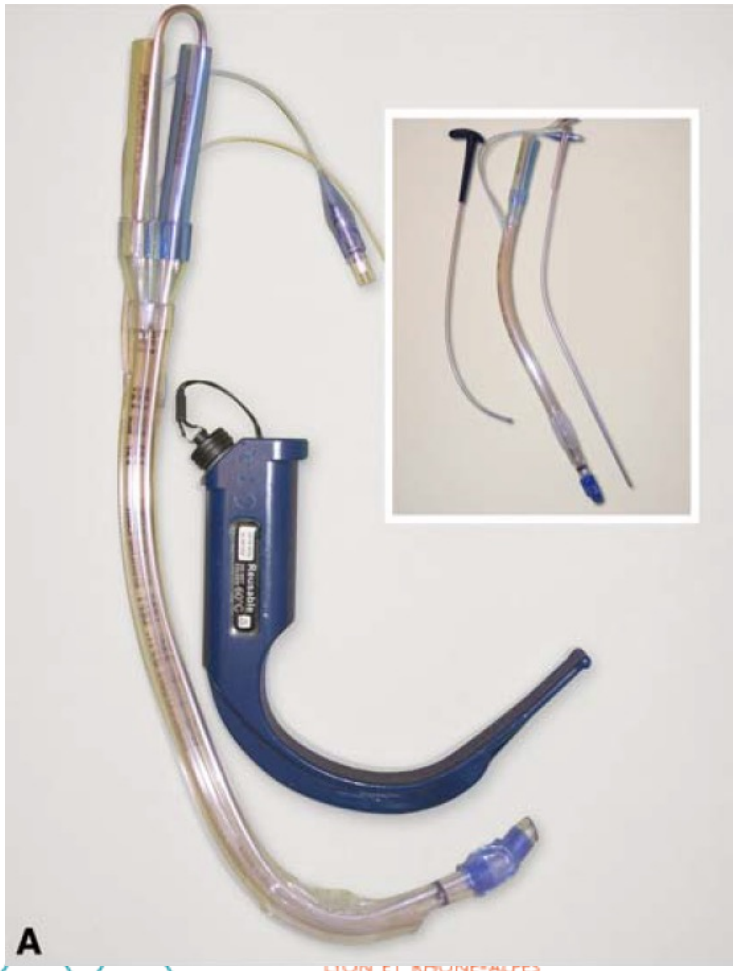
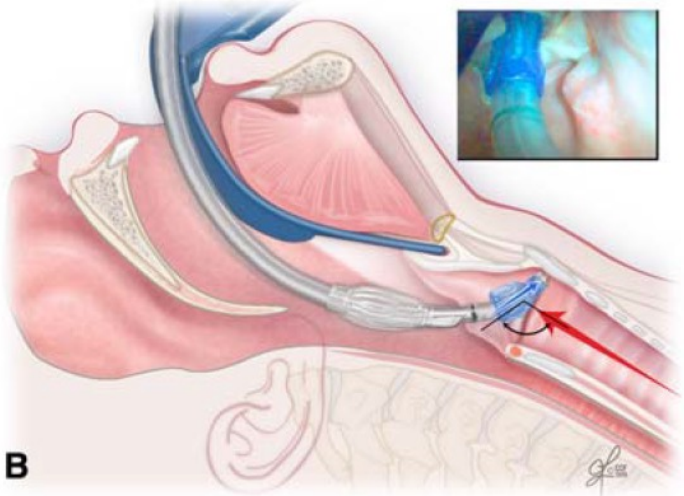
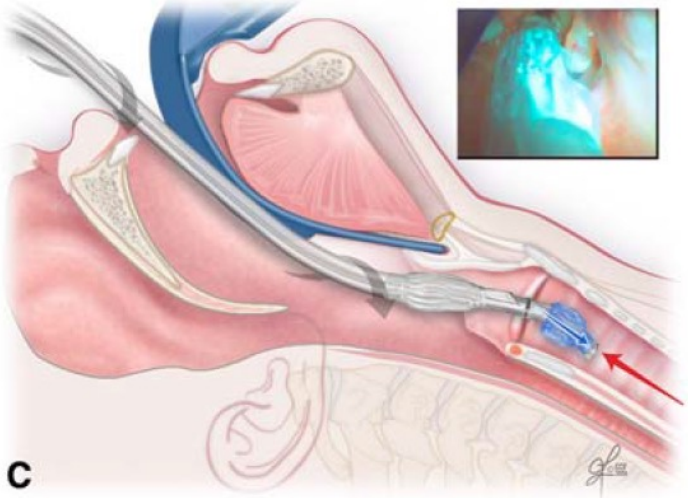
Sequential rotation to insert a left double-lumen endotracheal tube using the GlideScope®

Sergio Bustamante, MD · Iván Parra-Sánchez, MD · John Apostolakis, MD

Can J Anesth/J Can Anesth (2010) 57:282–283







McGrath® series 5 videolaryngoscope evaluation for double-lumen tube intubation

Anaesthesia 2014, 69, 640–652

W. L. Yao
X. R. Wang
H. Xu
Y. Zhang
C. H. Zhang
Tongji Hospital
Tongji Medical College
Huazhong University of Science and Technology
Wuhan, China
Email: chzhang@tjh.tjmu.edu.cn

Etude non comparative

43 patients non ID

Résultats: 88% Cormack 1, 12% Cormack 2

95% de réussite 1^{ier} essai, 100% au 2^{ième}

79% Facile, 16%modérément difficile, 5% très difficile

Vidéolaryngoscopie : intérêt pour la mise en place des sondes à double lumière

Annales Françaises d'Anesthésie et de Réanimation 31 (2012) 972–982

P.-Y. Cordier*, C. Ponchel, P. Ausset
Service d'anesthésie,
hôpital d'instruction des armées Laveran, BP 60149,
13384 Marseille cedex 13, France

Etude rétrospective comparative

35 VL (C MAC Storz) versus 85 macintosh

Succès 88% VL versus78% macintosh

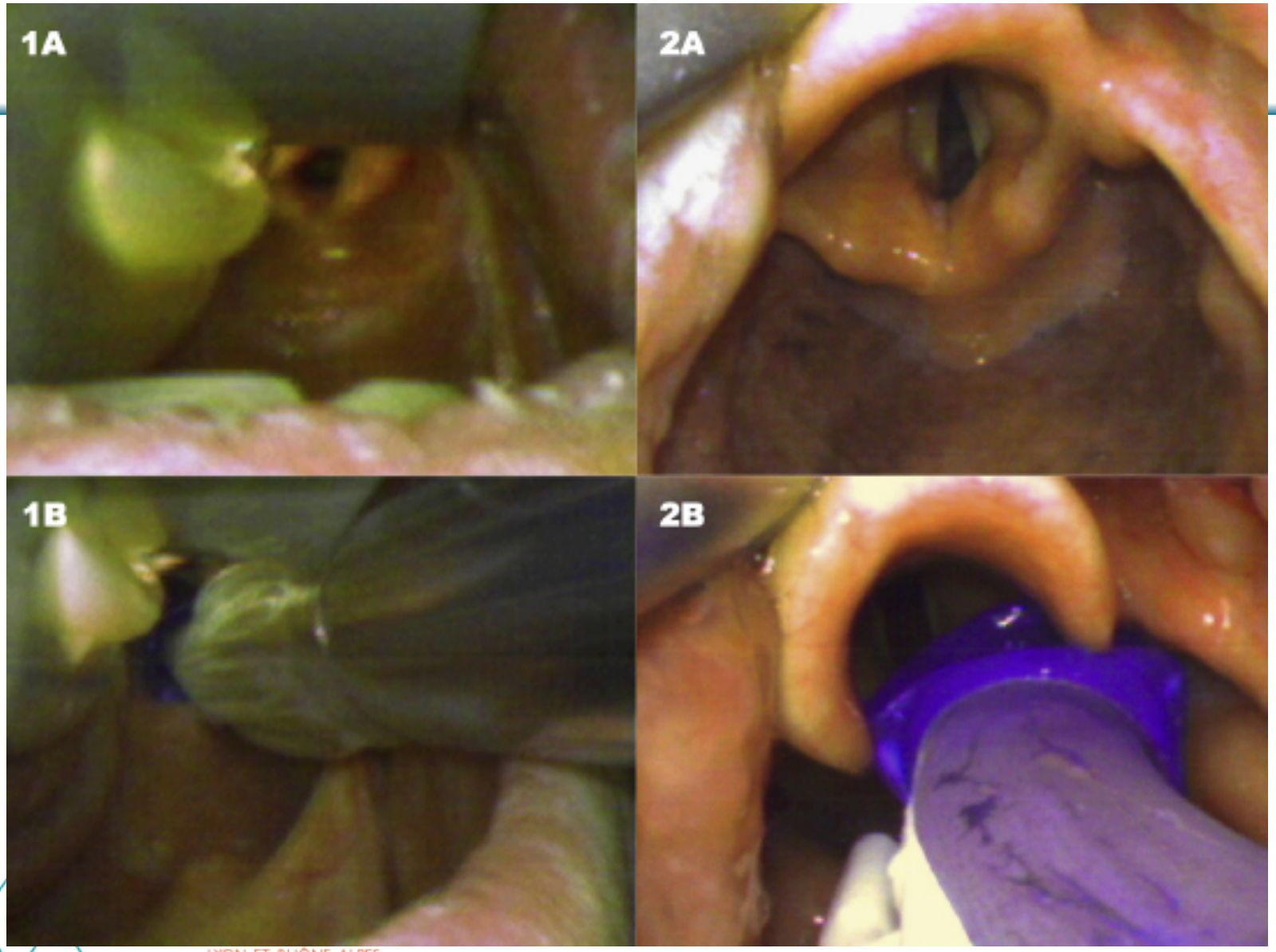
VL permettait l'utilisation de sonde de diamètre + important (40% ch41 38% ch39 vs 22% ch41, 36% ch39)

Moins de changement de sonde avec le VL

Temps d'intubation moindre avec VL

Moins de désaturation avec SaO2< 95%: 14% VL vs 24%macintosh

VL > macintosh : utilisation systématique du VL pour la mise en place des DL


1A
2A
1B
2B

Synthèse

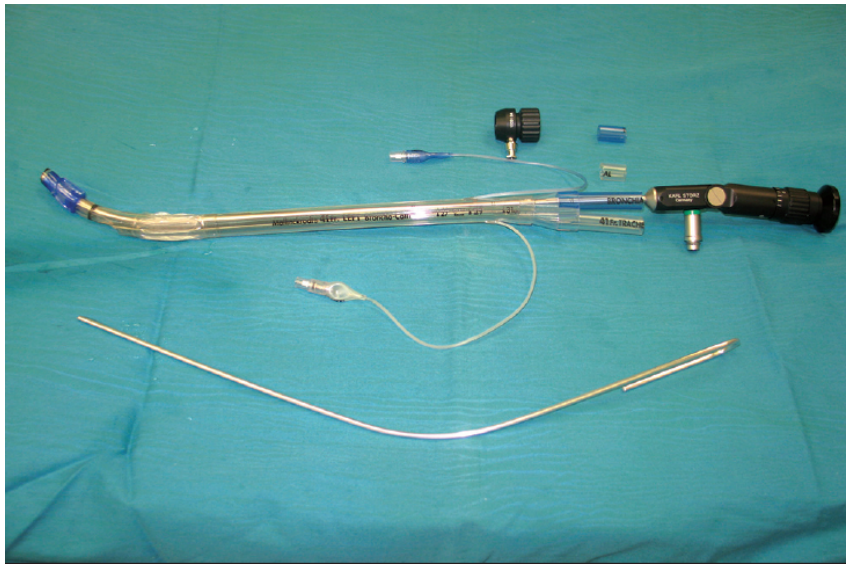
Bensguir 2010	Prospective comparative, 34 vs34	X-lite Rush (VL)vs Macintosch (LS)	Tps d'intubation	ME, désaturation, Cormack, Douleur, Nombre de tentative	VL > LS
Lin 2012	Prospective comparative 85 vs 85	CLE-100(VL) vs Macintosch(LS)	Tps d'intubation	ME, désaturation, Cormack, Douleur, Nombre de tentative	VL > LS
Hsu 2012	Prospective comparative 30 vs 30	Glidescope(VL) vs Macintosch(LS)	Tps d'intubation	ME, désaturation, Cormack, Douleur, Nombre de tentative	VL > LS
Russel 2014	Prospective comparative 30 vs 30	Glidescope(VL) vs Macintosch(LS)	Tps d'intubation	ME, désaturation, Cormack, Douleur, Nombre de tentative Score de difficulté	VL < LS
Yao 2014	Rétrospective 43	Mcgrath		ME, désaturation, Cormack, Nombre de tentative Score de difficulté	
Cordier 2012	Rétrospective Comparative 35 vs 85	CMAC(VL) Vs Macintosch(LS)		ME, désaturation, Cormack, Nombre de tentative Score de difficulté	VL>LS

Laryngoscope de Bonfils et Carlens

Bonfils assisted double lumen endobronchial tube placement in an anticipated difficult airway

Journal of Anaesthesiology Clinical Pharmacology | October-December 2014 | Vol 30 | Issue 4

Sudhakar Subramani, Ruban Poopalalingam[1]



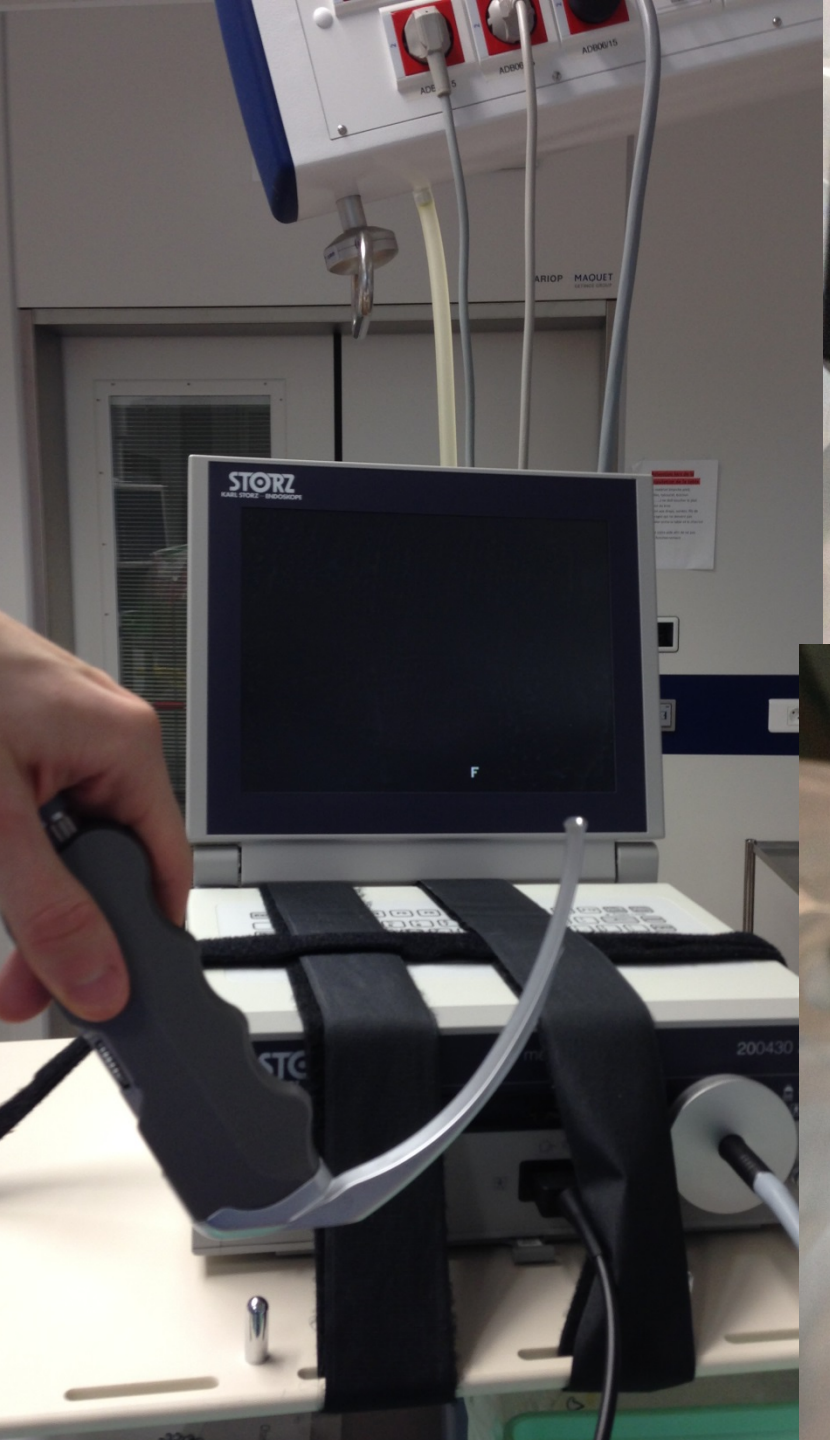
Anesthesiology 2005; 102:1290–1

Using the Bonfils Intubation Fiberscope with a Double-lumen Tracheal Tube

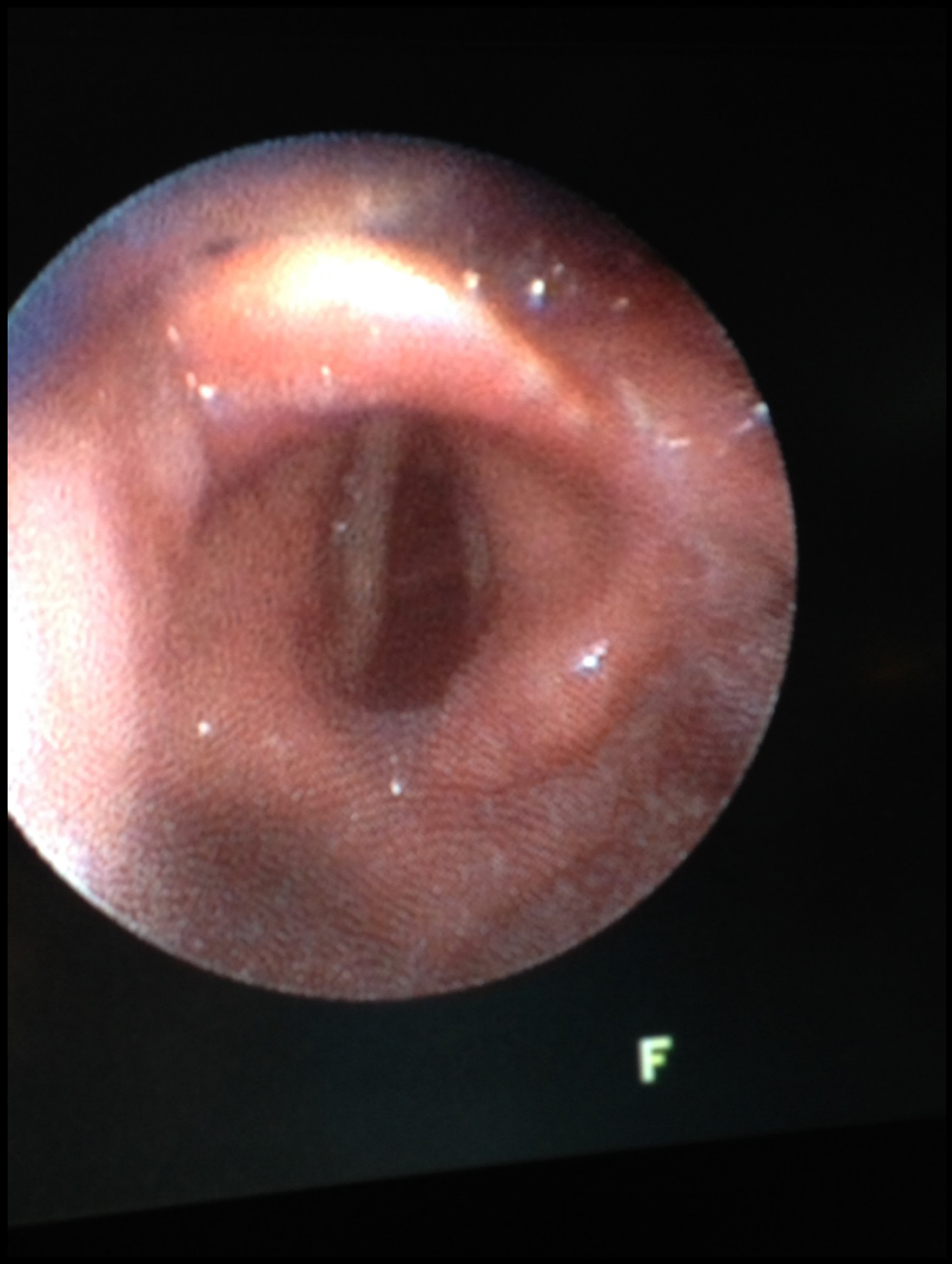
Berthold Bein, M.D.,* Dorothee Caliebe, M.D., Thomas Römer, M.D., Jens Scholz, M.D., Volker Dörges, M.D. * University Hospital Schleswig-Holstein, Campus Kiel, Germany.
bein@anaesthesie.uni-kiel.de

Expérience CLB

Centre Léon Bérard
LYON ET RHÔNE-ALPES


STORZ
KARL STORZ - ENDOSKOPE
MAQUET


KARL STORZ
Germany
8401 B
CE KE
761191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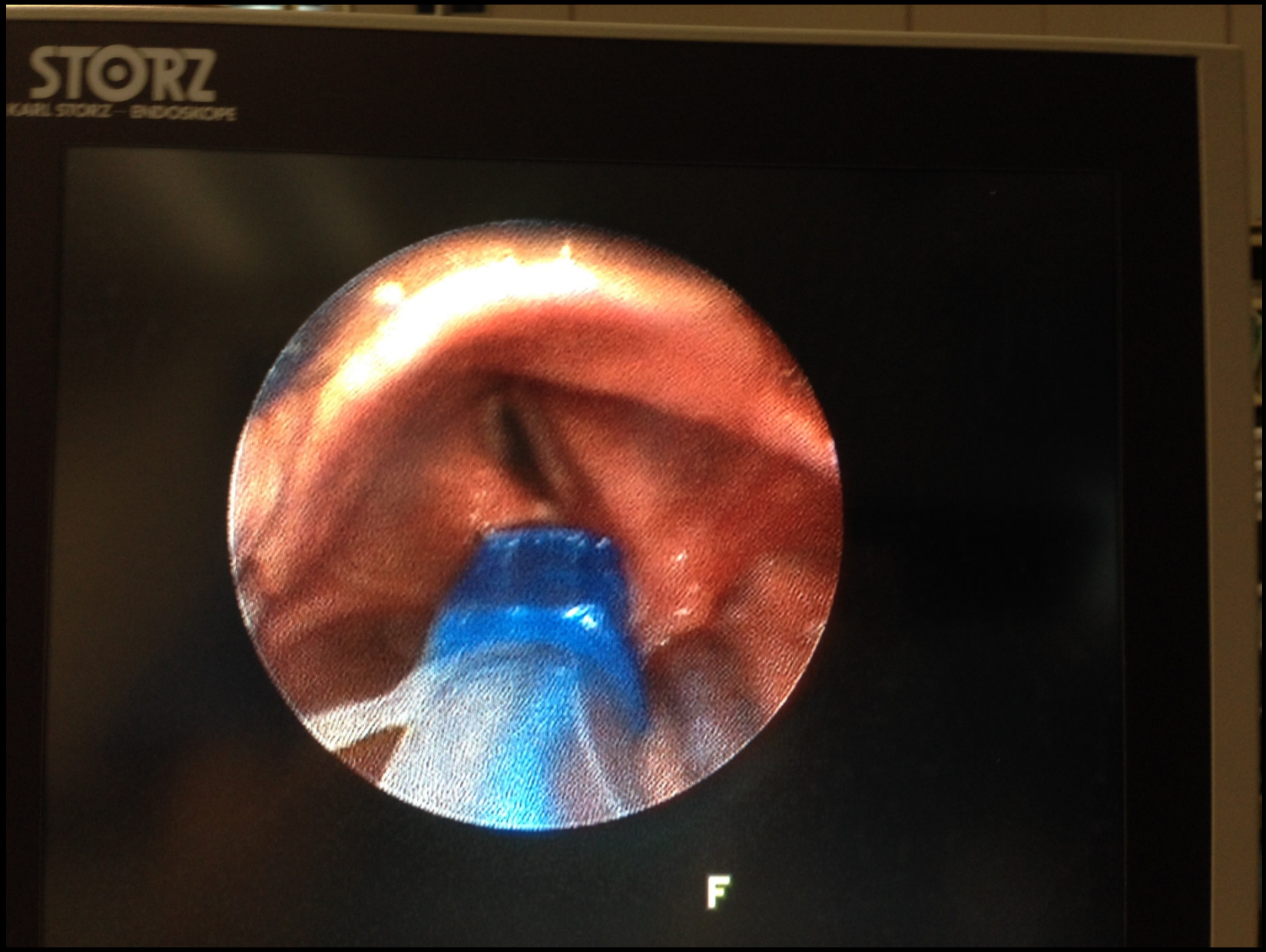
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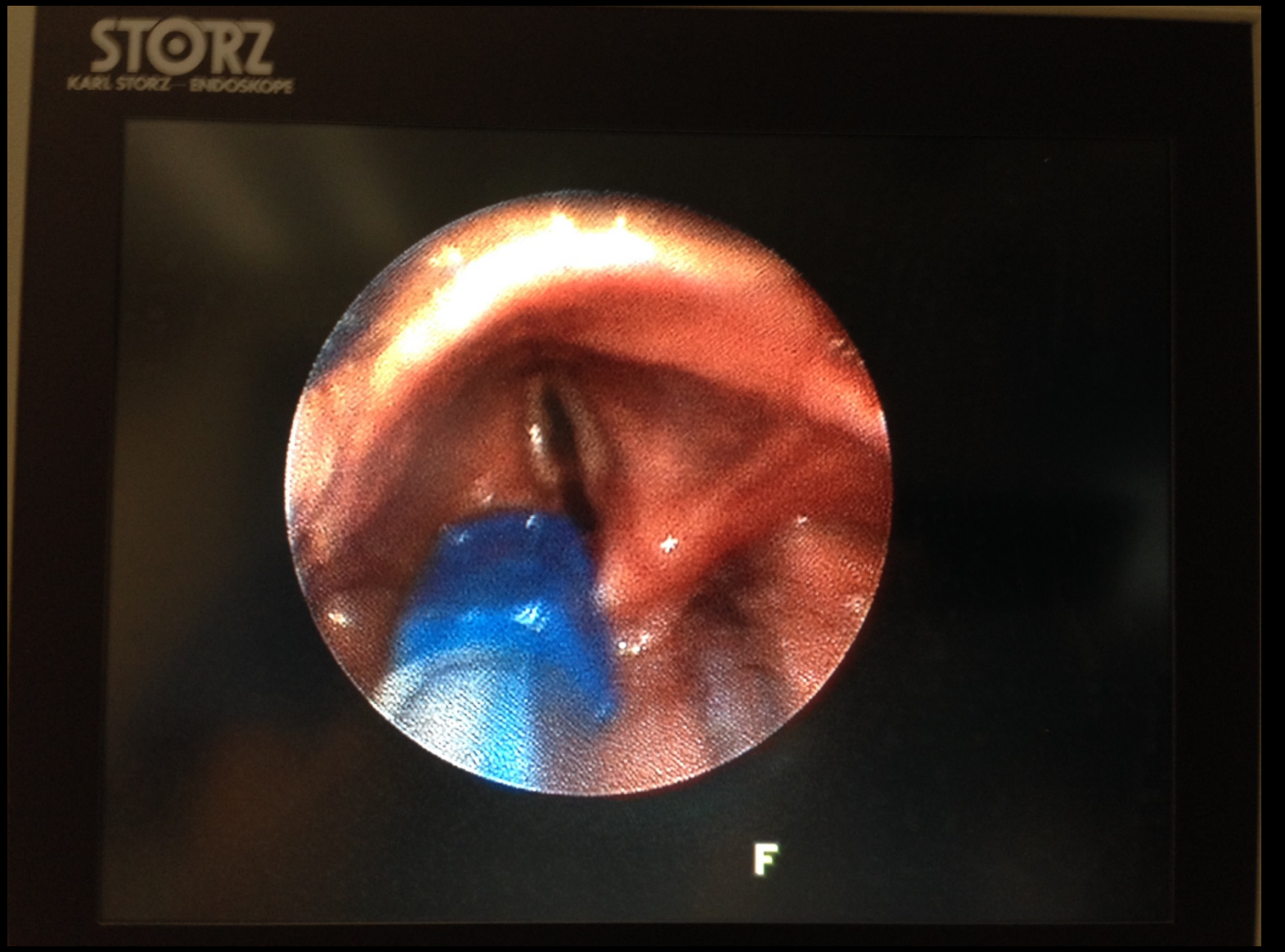
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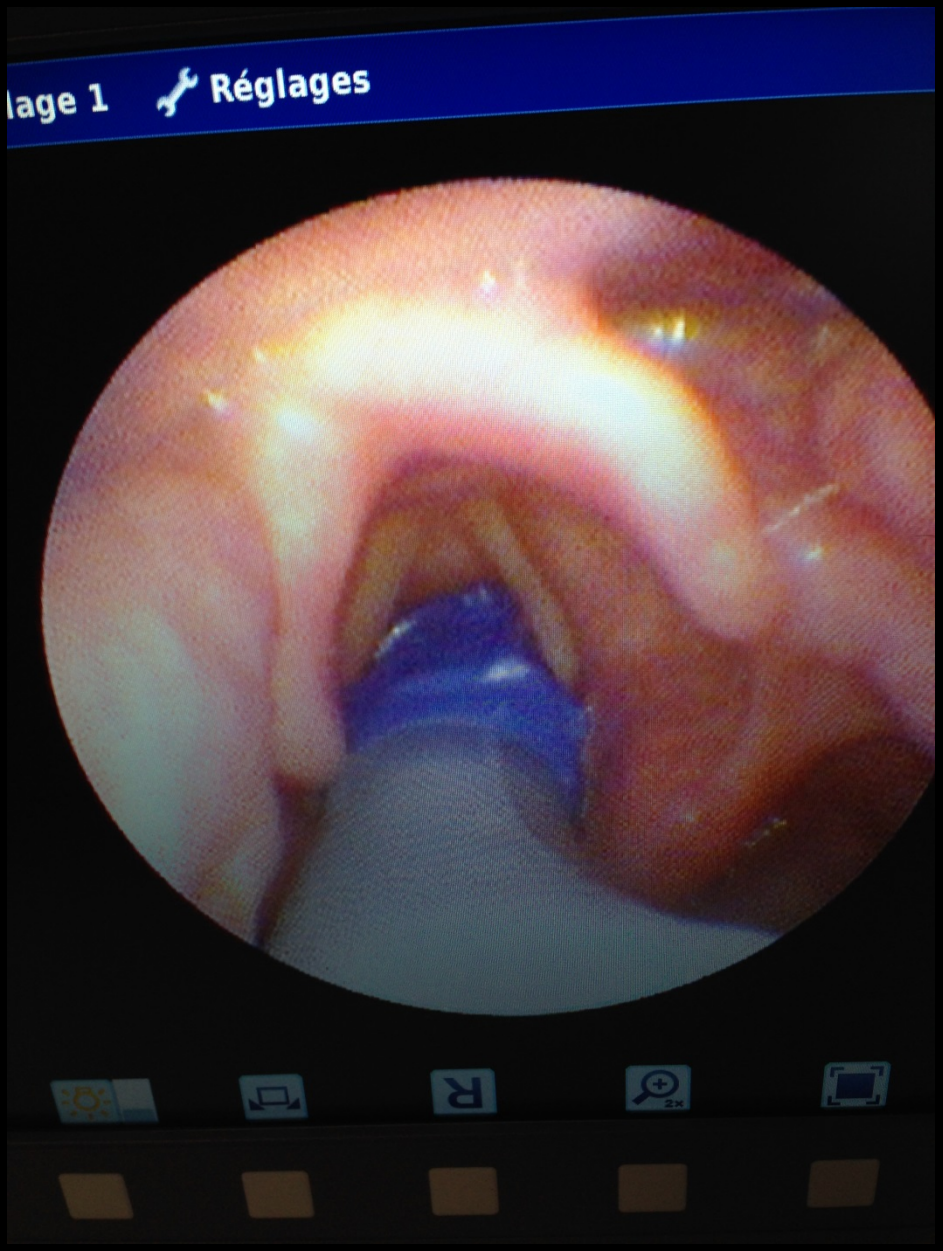
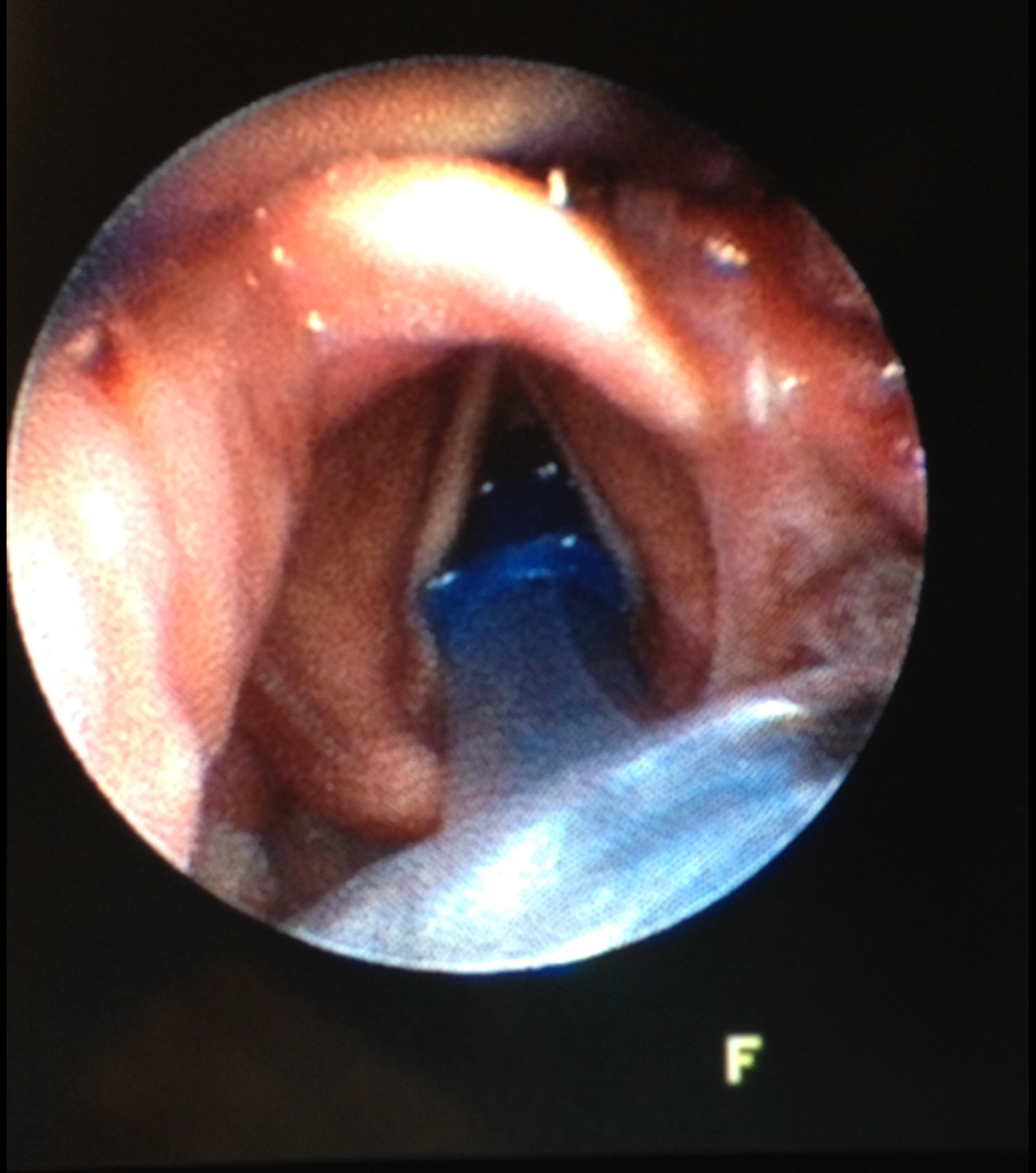

lage 1
Réglages


STORZ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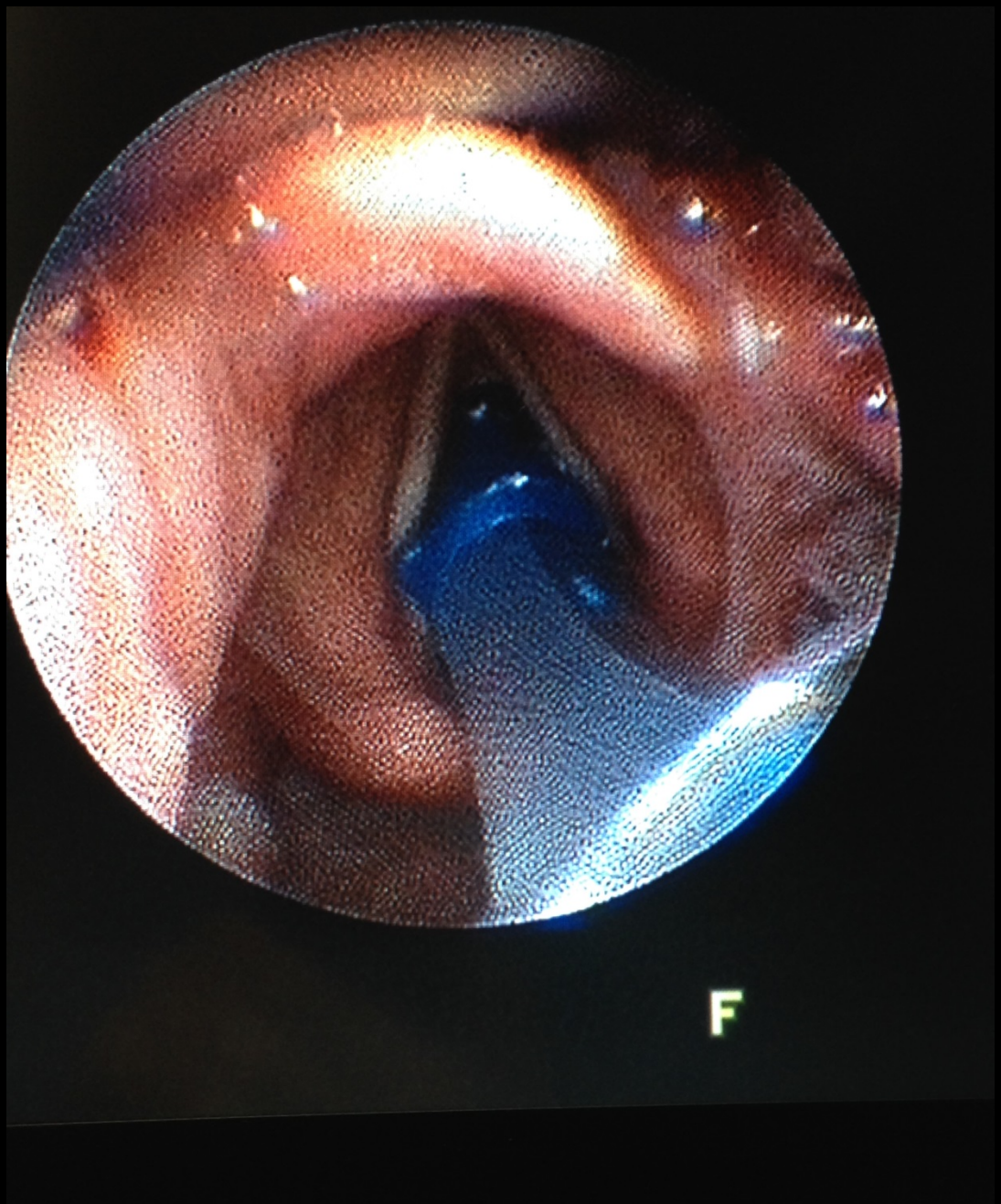
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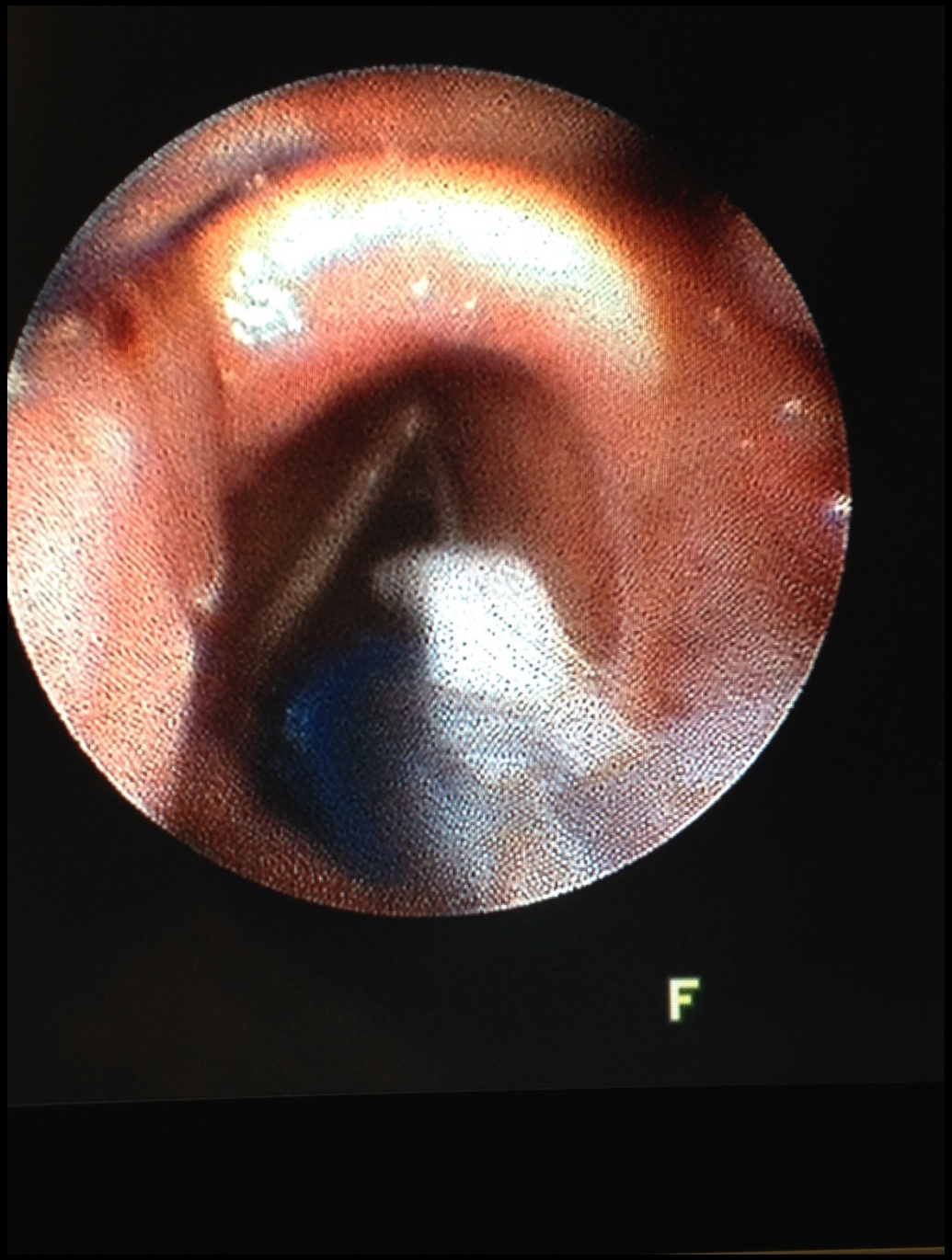
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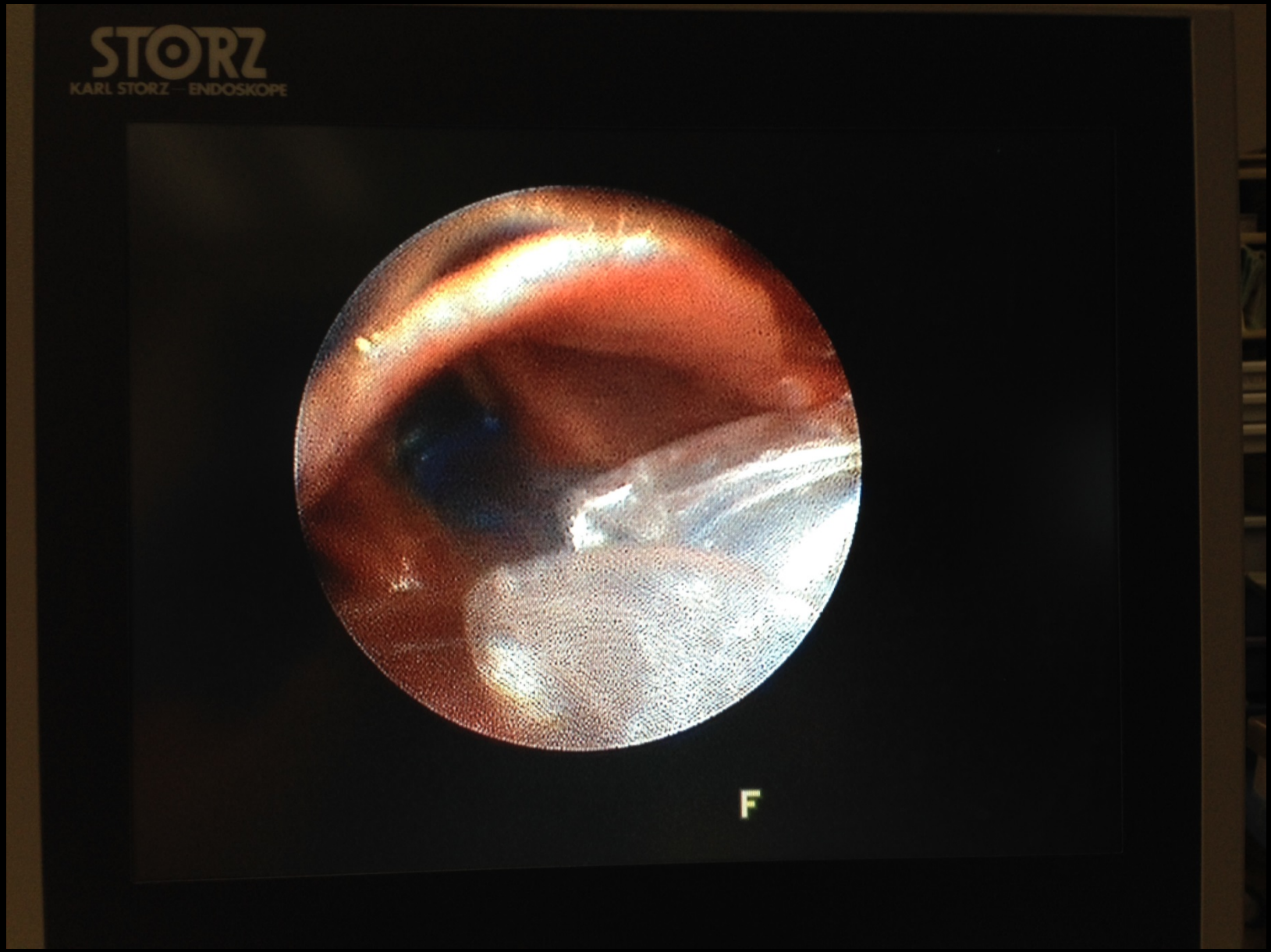
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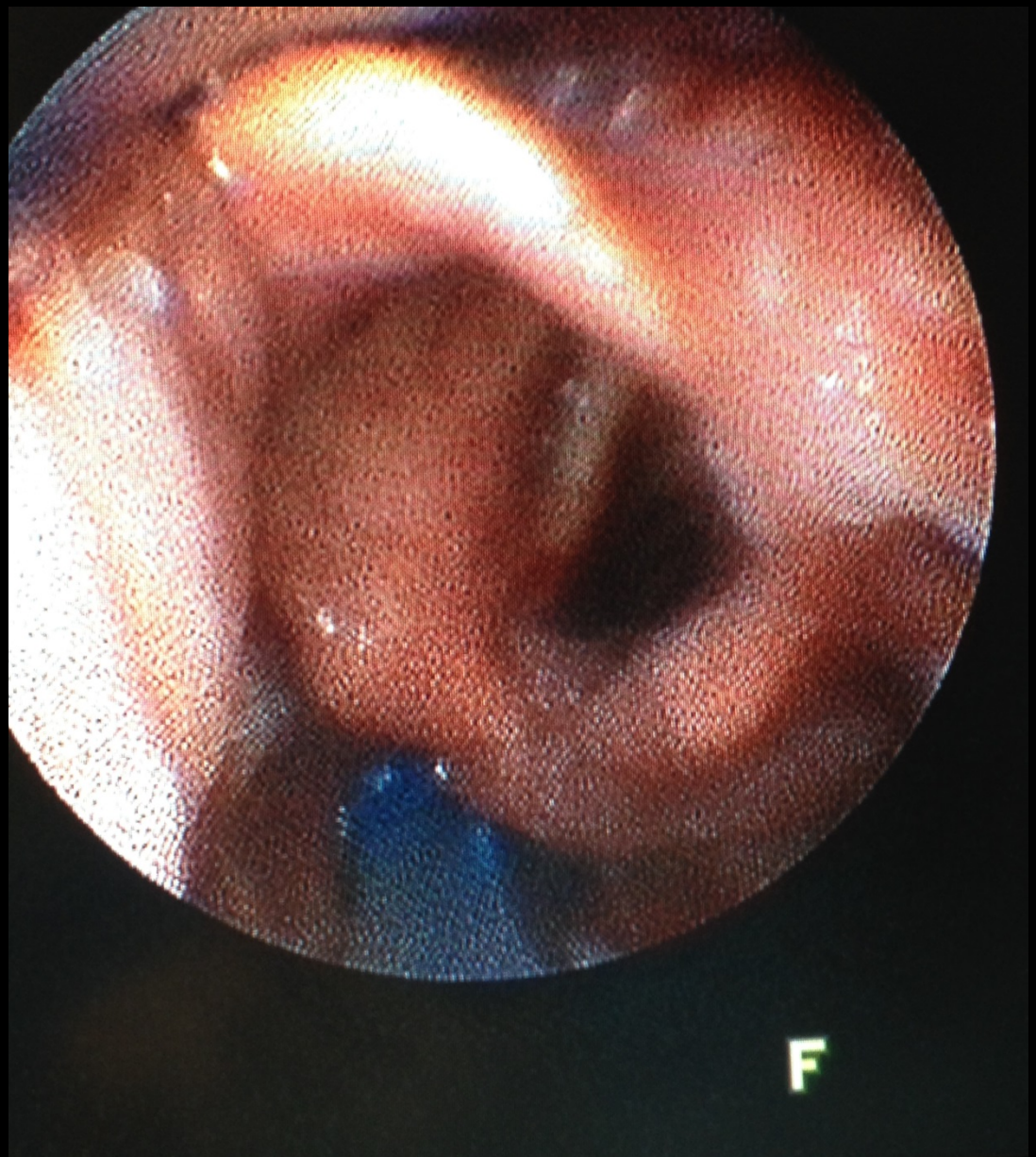
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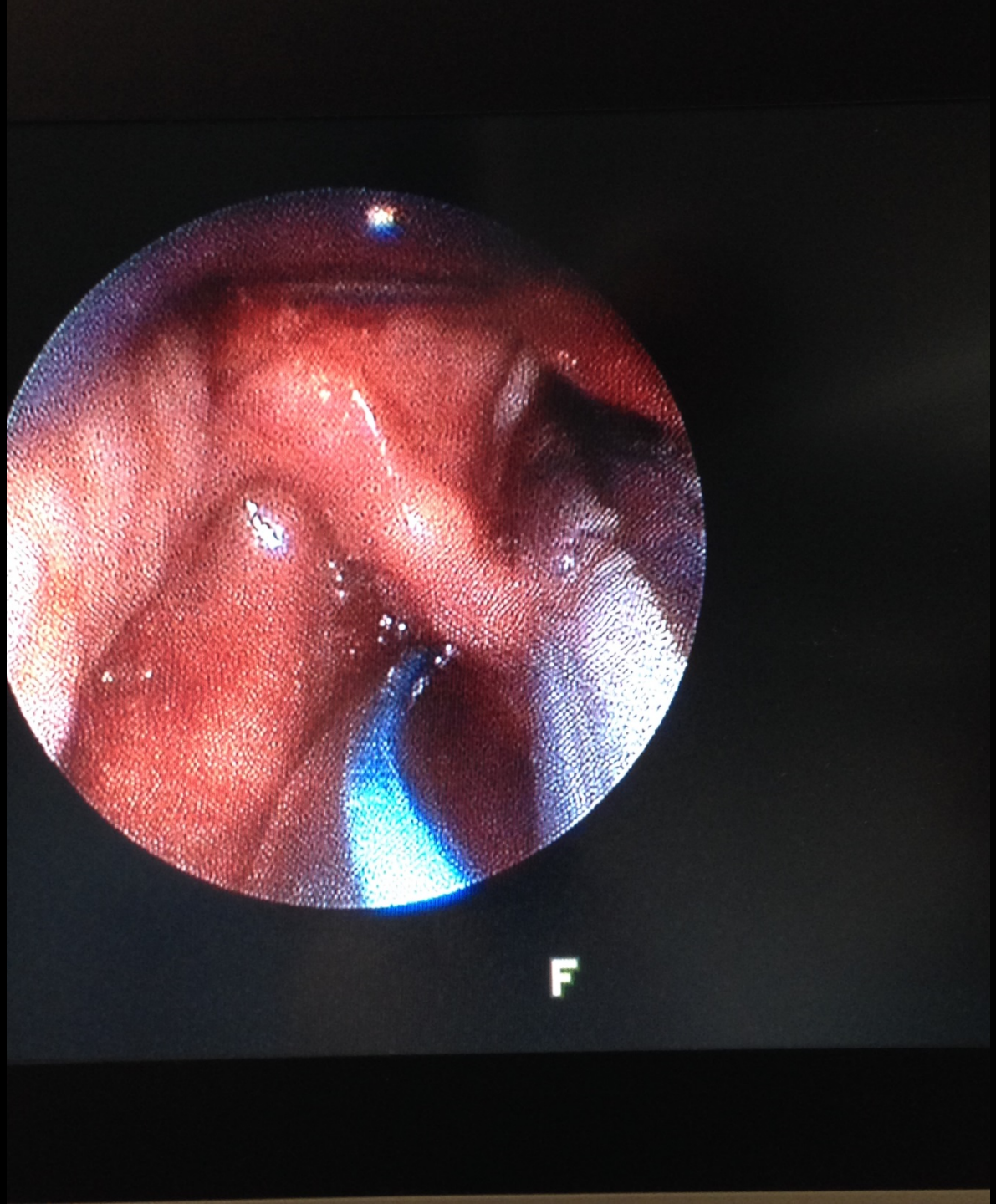
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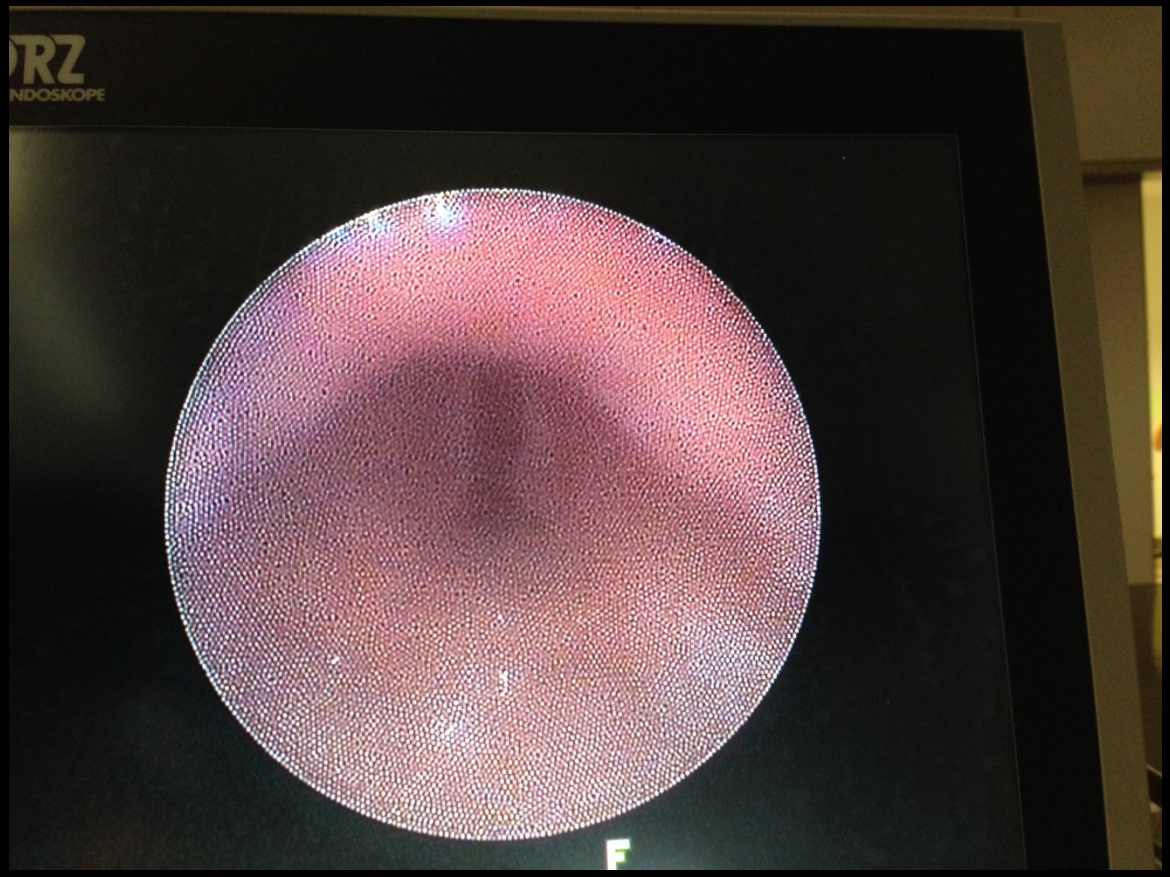
KARL STORZ – ENDOSKOPE
8402 ZX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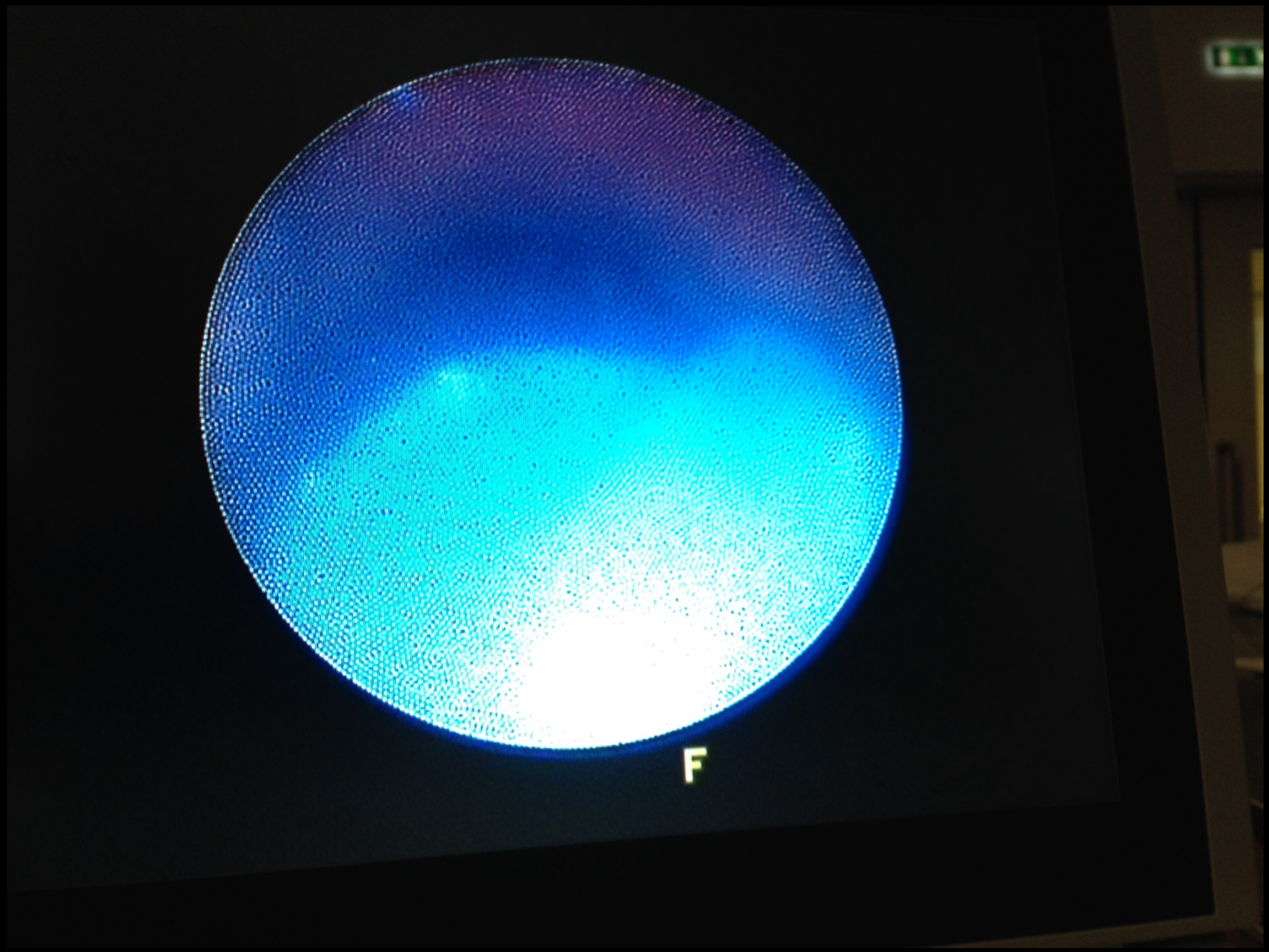
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Seeing is believing: the importance of video laryngoscopy in teaching and in managing the difficult airway

M. B. Kaplan,[1,2] D. Ward,[3] C. A. Hagberg,[4] G. Berci,[1] M. Hagiike[1]

Surg Endosc (2006) 20: S479–S483

Intubation difficile et poumons séparés

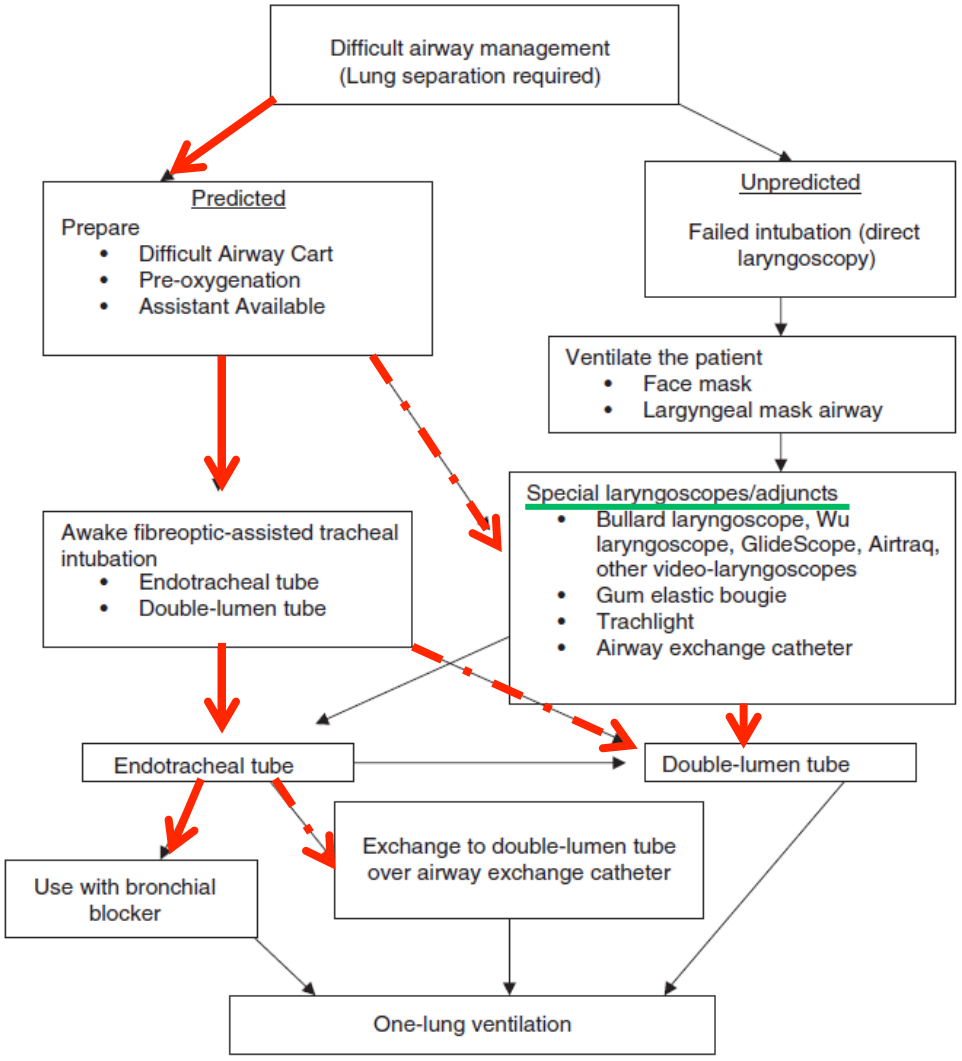

Fig 2 Algorithm for difficult airway management when lung separation is required.

Sonde SL avec fibre embarquée (Vivasight™)

Sonde DL avec fibre embarquée

Take home message

Le vidéolaryngoscope peut aider pour l'intubation trachéale avec sonde de Carlens

Il y a la place pour la poursuite d'évaluations cliniques


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