CASES FROM THE REAL WORLD

MODERATOR: BARBARA GOLD, MD

Basem Abdelmalak, MD
E. Jane Brock, D.O.
Mike Walsh, MD

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CASE 1

63 yo for cysto, bladder biopsy and possible TURBT

2

Preop: 63 yo for cysto, bx, poss TURBT

- Hypertension controlled with metoprolol
  - METS: > 4
- DM II, on metformin
- Obese – BMI 34
  - No formal dx of OSA but STOP BANG score 5
- GERD: rare symptoms if eats late, on regular omeprazole
- H/O low back pain, s/p L_{3-5} laminectomy

3

Exam

- Airway:
  - Mallampati 4 when protruding tongue (Mal 3 with just mouth opening)
  - Thyromental distance 3 FB
  - Slight decrease neck ROM
- Otherwise unremarkable

4

Labs

- Hgb 15 Plt 270K
- Cr 1.0 K^+ 4.0

5

Concerns?

- What concerns do you have?
- What about the airway?
- Probable, untreated OSA?
- Anesthetic management technique and why?
  - Patient refuses SAB: was “talked into it” in the past; it hurt and ”didn’t work”

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Intra op

- GA
  - Propofol induction with fentanyl 50 mcg followed by
  - Propofol infusion at 120 mcg/kg/min + N_2O
  - Fentanyl 25 mcg increments to total fentanyl 150 mcg
- LMA #5 Unique
  - Uneventful placement
  - Some difficultly ventilating initially but improved with return of SV
- Case duration one hour - uneventful

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Emergence

- Patient coughs
- Small amount of bile stained fluid suctioned from oropharynx around the LMA

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PACU

- Coughing initially
- No wheezing
- Maintained on O_2 3l without desaturation
- Weaned from O_2 in 15 minutes

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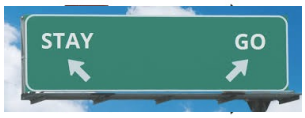

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Aspiration

GERD
Obesity
Supraglottic Airways

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Table 2. Incidence of aspiration.

Reference	Country/Period of assessment	Study size	Patient group	Incidence			Mortality
				Overall rate	Emergency procedures	Elective procedures	
Retrospective study design							
Olsson[20]	Sweden	1967–1970, 1975–1983	185.358	Children/Adults	1: 2.117	Aspiration incidence during emergency procedures was significantly higher	1: 45.454
Hovi-Viander[27]	Finland	1975	338.934	Children/Adults	NR	NR	NR	1: 67.786
Cohen[28]	Canada	1975–1983	112.721	NR	1: 1116	NR	NR	NR
Warner[29]	USA	1985–1991	215.488	Adults	1: 3216	1:895	1:3.886	1: 71.829
Prospective study design							
Harrison[30]	South Africa	1967–1976	240.483	NR	NR	NR	NR	1:240.483
Tiret[31]	France	1978–1982	198.103	Children/Adults	1: 7.335	1-265-1.000	0.4-9.61.000	1: 49.525
Leigh[32]	UK	1984–1988	84.835	Children/Adults	1:14.139	NR	NR	1: 84.835
Mellin-Olsen[33]	Norway	1989–1993	85.594	Children/Adults	1:2.376	1:809	1:3303	No death
Tiret[34]	France	1978–1982	40.240	Children	1:10.060	NR	NR	No death
Warner[35]	USA	1985–1997	63.180	Children	1: 2.632	1:373	1:4.544	No death
Murat[36]	France	2000–2002	24.165	Children	1: 1.272	NR	NR	No death

(NR = Not reported).

Best Pract & Res Clinl Anaesth
Vol. 20, No. 3, pp. 409e427, 2006

- Aspiration pretty rare event
  - Studies are usually retrospective data base inquiries or utilize surrogate endpoints (gastric volume and pH)
- Most morbidity/mortality in sicker/emergent patients!

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"Clinical Significance of Pulmonary Aspiration during the Perioperative Period"

- 215,488 general anesthetics over 6 years
- Aspiration well defined
  - presence of bilious secretions or particulate matter in the tracheobronchial tree
  - presence of an infiltrate on postoperative chest x-ray not identified by preoperative x-ray or physical exam
- Incidence - 1: 3,216
- Mortality - 1:71,829

Warner MA, Warner ME,Weber JG
Anesthesiology 1993;78:56-62

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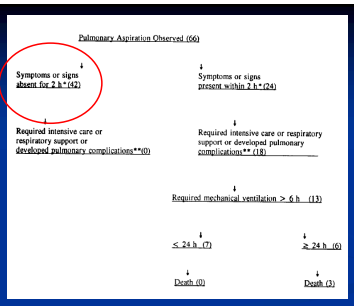

Warner MA, Warner ME,Weber JG
Anesthesiology 1993;78:56-62

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"The Incidence and Outcome of Perioperative Pulmonary Aspiration in a University Hospital: A 4-Year Retrospective Analysis"

- 99,441 anesthetics
  - 14 aspirations (1:7103)
  - 1 death
  - Morbidity – 1:16,573
- "all patients who developed postoperative pulmonary complications showed signs and symptoms within 2 h"
- Sent 1 outpatient home

Anesth Analg 2006;103:941–947

Table 4. Anesthetic Technical/Decision Issues

	No. of cases
General anesthesia	
Esophageal intubation on a patient with severe achalasia	1
Cricoid pressure was not applied When exchanging tracheostomy tubes	1
When changing a double-lumen endotracheal tube (ETT) to a single-lumen ETT	1
At intubation on an ASA PS IV	
Emergency (E) patient	1
At the induction for a patient with surgical history of esophagectomy and gastric pull-up	1
Asleep fiberoptic bronchoscopy intubation by a resident on a patient with status postesophagectomy	1
Total	6
Monitored anesthesia care (MAC)	
Depth of sedation during MAC using a propofol infusion	2
Indication of MAC for	
10-h bilateral blepharoplasty and forehead lift	1
Esophago-gastro-duodenoscopy on a patient with gastrointestinal bleeding with ASA PS IV	1
Total	4
Grand Total	*10*

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Aspiration Risk Factors

- Emergency Surgery
- Inadequate anesthesia
- Abdominal pathology
- Obesity
- Opioid medication
- Neurologic deficit
- Lithotomy position
- Difficult airway
- GERD/hiatal hernia
- Sicker patients
  - ASA physical status
- Inappropriately fasted
  - Delayed gastric emptying
- Pregnancy
- Pediatrics
- Previous esophageal or gastric surgery
- Airway device?

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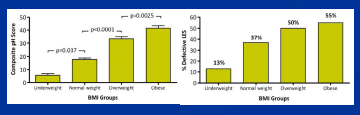
Obesity and Aspiration

- GI literature pretty clear – GERD incidence increased
  - "Meta-analysis: Obesity and the Risk for Gastroesophageal Reflux Disease and its Complications"

Ann Int Med 2005;143:199-211

  - "Body-Mass Index and Symptoms of Gastroesophageal Reflux in Women"

NEJM 2006;354:2340-8



Ayazi S, et.al.
Jnl Gastrointestinal Surg
2009;13:1440-47

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GERD and Aspiration

- Reflux ⟹ Regurgitation ⟹ Aspiration!
- Happens everyday ……..
  - Sleep disordered breathing

Chest 2005; 127:1486–88

N Engl J Med 2009; 360:1551-1553

Table 3—*Respiratory Symptoms and Asthma in Subjects Without and With Reported Nocturnal GER*[a]

Symptoms	No nGER (n = 2,006)	nGER (n = 101)	Adjusted OR (95% CI)
Wheeze	24	47†	2.5 (1.6–3.9)
Nocturnal chest tightness	11	23†	2.3 (1.4–3.8)
Breathlessness at rest	5	14†	2.5 (1.5–3.3)
Breathlessness after effort	15	31†	2.7 (1.7–4.4)
Nocturnal breathlessness	4	13†	2.9 (1.5–5.6)
Current physician-diagnosed asthma	4	9†	2.2 (1.04–4.7)
Nocturnal cough	31	56†	3.0 (1.9–4.9)
Morning cough	12	20†	1.7 (0.96–2.9)
Morning phlegm	13	31†	3.0 (1.9–4.9)

[a]Values given as %, unless otherwise indicated. OR = odds ratio; CI = confidence interval; nGER = nocturnal GER.
†p < 0.001.

Chest 2002; 121:158–163

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GERD: Who's at Risk?

- Hiatal hernia but no symptoms of reflux
- History of reflux but controlled on meds
- "occasional symptoms if I eat too much"
  - "never on an empty stomach"

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Hiatus Hernia	LM	LMA(P)	TT(N)	TT(M)	TT(R)
Asymptomatic incidental finding	92.7 (62.2)	3.7 (3.7)	1.2 (20.7)	1.2 (8.5)	1.2 (4.9)
Heartburn after meals	73.2 (41.5)	3.7 (2.4)	7.3 (25.6)	12.2 (17.1)	3.7 (13.4)
Reflux after meals	47.6 (22.0)	2.4 (2.4)	14.6 (25.6)	18.3 (30.5)	14.6 19.5)
Reflux lying down	12.2 (8.5)	1.2 (0.0)	12.2 (11.0)	30.5 (43.9)	43.9 (36.6)
Treated symptomatic reflux	69.5 (36.6)	8.5 (1.2)	14.6 (28.0)	4.9 (22.0)	2.4 (12.2)

Table 1 Percentages of the choice of the responders. The first figure is for non-obese patients and the bracketed figure is for obese patients.

Anaesthesia Product News 2010:26–27

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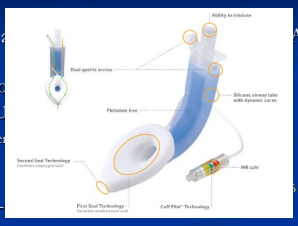
Obesity and Supraglottic Airways

- "gross obesity is usually a … A." *Archie Brain 1993*
- Manufacturer's instructio…
  - LMA, ProSeal, & LMA U…
    - Increased BMI independe…
  - Supreme and Protector –



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Cochrane Library

Cochrane Database of Systematic Reviews

2013 Review

Supraglottic airway devices versus tracheal intubation for airway management during general anaesthesia in obese patients (Review)

Nicholson A, Cook TM, Smith AF, Lewis SR, Reed SS

Identified two eligible studies
Total of 232 subjects

"inadequate information to draw conclusions"

- Studies have reported better sealing pressures as BMI increases

Br Jnl Anaesth 2000;84:650-4

- Evidence that post operative respiratory parameters improved for moderately obese patients (BMI+30) with LMA vs ETT
  - (lung function tests and oxygen saturation)

Acta Anesth Scand 2009;53:436-42

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Aspiration and SGA

- LMA offers no protection from aspiration
  - Multiple case reports of aspiration with LMA

Anaesthesia 1990;45:1039-40
Anesth Analg 2003;97: 1192-4
Br J Anaesth 2001;86: 601-2.
Anesth Int Care 2003;31:123

- Methylene blue dye studies

Anaesthesia 1995;50:1053-5
Br Jnl Anaesth 1992;69:314-5

- pH monitoring studies

Can J Anaesth 2004;51:243-9
Anesth Analg 1995;80:980-4

- ASA Closed Claims: 10 cases as of 2010 report

Principles of Airway Mgt 4th edition

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"Major complications of airway management in the UK: results of the Fourth National Audit Project of the Royal College of Anaesthetists and the Difficult Airway Society. Part 1: Anesthesia"

- Aspiration – primary event in 23 cases (1:124,896)
  - 13 LMA's only one i-gel
  - Most of the patients had risk factors for aspiration
  - 4 cases - judged that the use was likely inappropriate
  - 5 cases - 'light anesthesia' judged as a contributory cause

Br. J. Anaesth 2011;106: 617-631

Table 2 Timing of primary aspiration of gastric contents

Before induction of anaesthesia	
After tracheal tube placed by fibreoptic intubation	1
Before airway management	
Before airway management (LM planned)	2
During airway management	
During LM placement	1
After inserting Guedel before intubation	3
During laryngoscopy	1
RSI at time of laryngoscopy	1
Maintenance	
No airway	1
LM in place	11
i-gel in place	1
Emergence	
During emergence with LM in place	1

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"Periprocedural Pulmonary Aspiration: an Analysis of Medical Malpractice Cases and Alleged Causative Factors"

- 43 claims identified via claims search (*Verdictsearch*)
- Procedure type:
  - General Surgery 39.5%
  - Gastroenterology 13.3%
  - Orthopedics 27.9%
  - OBGYN 7%
- Mean award: $5,460,000
- Defendant won - 44.2%
- Plaintiff won 44.2%
- Anesthesiologist 83.7%
- Proceduralist 34.9%

Jnl Eval Clin Pract 2018;1-5

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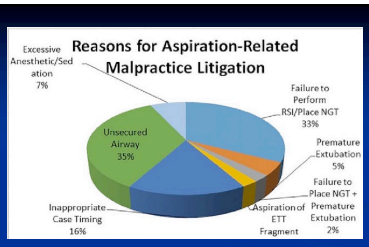
Results



Procedure Type (Total Number of Cases)	Most Common Reason for Litigation (% of Total Cases for Procedure Type)	Second Most Common Reason for Litigation (% of Total Cases for Procedure Type)
General surgery (17)	Failure to perform RSI and/or place NGT (82%)	Unsecured airway (18%)
Orthopaedic surgery (12)	Unsecured airway (33%)	Failure to delay until aspiration risk decreased (25%)
Gastroenterology (7)	Unsecured airway (71%)	Failure to perform RSI and/or place NGT (29%)

Jnl Eval Clin Pract 2018;1-5

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2nd Generation LMAs and Aspiration

Time to abandon the 'vintage' laryngeal mask airway and adopt second-generation supraglottic airway devices as first choice

T. M. Cook* and T. C. Kelly

Br Jnl of Anaesth 2015;115 (4): 497–9

Recommendation: If tracheal intubation is not considered to be indicated but there is some (small) increase or concerns about regurgitation risk a second generation supraglottic airway is a more logical choice than a first generation one.

- 2nd gen SGA have specific design features to reduce risk of aspiration
  - Better seal
  - GI drainage tube

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ProSeal LMA

- Poured blue dyed saline into DT of the PLMA
  - 101/103 no evidence of blue dye in bowel of LMA

Evans NR, et.al. Br Jnl Anaesth 2002;88(4): 584-7.

- "Protection from aspiration with the LMA-ProSeal after vomiting: a case report"
  - Active vomiting during transfer to PACU
  - Vomitus expelled via the drain tube
    - None detected in pharynx

Can J Anesth 2003;50:78–80

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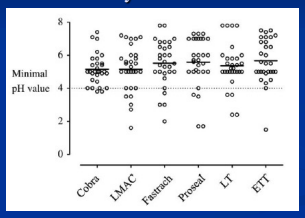
"Gastroesophageal regurgitation during anesthesia and controlled ventilation with six airway devices"



No significant differences

Jnl Clin Anesthesia 2008;20:508–513

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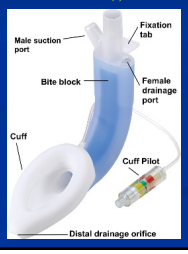
"The LMA Protector in Anaesthetised, Non-Paralysed Patients: a Multicentre Prospective Observational Study"

Anaesthesia 2019;74(3):333-339



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Incidence of Gastric-to-Pulmonary Aspiration in Patients Undergoing Elective Upper Gastrointestinal Endoscopy

J. Kyle Bohman,* Adam K. Jacob,* Kelsey A. Nelsen,* Daniel A. Diedrich,* Nathan Smischney,* Oludare Olatoye,* Rochelle Molitor,* Nicholas R. Oblizajek,‡ Andrew C. Hanson,§ and Navtej S. Buttar‖

Clinical Gastroenterology and Hepatology 2018;16:1163–1164

- Medical records of all patients scanned electronically with a previously validated aspiration sniffer – then reviewed

Table 1. Aspiration During Elective Upper Gastrointestinal Endoscopy

Procedure	Anesthesia type	Total procedures	Definite aspirations, n (n/10,000)	*P* value
Elective upper GI endoscopy procedures	All	60,770	28 (4.6)	<.01[#]
	RN sedation	22,308	2 (0.9)	
	MAC	25,972	18 (6.9)	
	GETA	12,490	8 (6.4)	

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Pulmonary aspiration during procedural sedation: a comprehensive systematic review

S. M. Green[1,*], K. P. Mason[2] and B. S. Krauss[3]

- Reviewed 35 relevant articles – 326 cases
- Aspiration rate was 1/3rd to ½ that of GA
- Majority cases in GI (22 reports – 292 cases)
  - 8 deaths! (4 PEG tube placement, 3 GI bleeds)
- Propofol use often cited (deep sedation?)
- Rarely seen with Ketamine (protective?)

Br Jnl of Anaesth, 2017;118 (3): 344–54

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Conclusions

- Aspiration is rare
  - Most patients are emergencies or have risk factors
  - Incidence in healthy elective outpatients ?
  - Clinical sequelae in healthy elective outpatients ?
- Need to identify patients at high risk
  - GI pathology, ? Obese, ? GERD
- Tailor anesthetic to risk stratification
- Treatment algorithms

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CASE 2

78 yo for colonoscopy at free-standing surgery center

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Colonoscopy: Pre Op

- 78 yo woman for colonoscopy due to blood in stools
- Pre op on day of procedure
  - Bicuspid Aortic Valve
  - Aortic Stenosis and may have a TAVR in the future
  - Told by her cardiologist that she is "OK" to have this procedure
  - Only other significant co-morbidity is hypertension
- Exam
  - 50 kg; BP 126/82, HR 72 (regular), SaO2 98%
  - Grade 4/6 systolic murmur
- Medications
  - ASA, lisinopril, metoprolol

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Next steps?

- Called cardiologist
  - Faxed most recent office visit and echo (one month ago)
  - Notes indicate she is relatively asymptomatic and able to perform ADL
  - TAVR will be considered in next 6 months.

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Labs

- Hgb 9.8
- ECG NSR with mild LVH
- Echo
  - LVEF 55%
  - Grade 1 diastolic dysfunction
  - AVA (fused, calcific bicuspid) 0.8 cm^2
  - Mean gradient 35-40 mm Hg

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Preop: Anything else?

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IntraOp

- MAC
- Etomidate
  - 6 mg
- Fentanyl
  - 50 mcg
- Phenylephrine drawn and ready

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Epilogue

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Aortic Stenosis Review

E. Jane Brock, D.O.
Associate Professor of Clinical Anesthesia
Medical Director of Cool Springs Surgery Center and Plastic Surgery Center Brentwood
Vanderbilt University Medical Center

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No Disclosures

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Learning Objectives

- Etiology and Definition of Aortic Stenosis
- Aortic Stenosis Physiology
- Diagnosis and Grading -Severity
- Anesthetic Management
- Treatment: TAVR vs SAVR

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Etiology of AS

- Congenital (bicuspid), rheumatic or degenerative (calcific)- most common
- Near 30 year progression period

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- Aortic Stenosis is obstruction of blood flow across the AV
- Leading to a fixed cardiac output
- LVH due to increased after load, diastolic dysfunction
- Myocardial demand increases, reducing LV compliance, decreasing EF and LV dilation
- Increasing LVEDP leading to pulmonary symptoms

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Effects of LVH

- Decreased LV coronary blood flow
- Increased myocardial workload, oxygen consumption and mortality
- Resulting in insufficient CO and pulmonary venous hypertension
- Dependent on atrial kick to maintain SV and CO (compromised in atrial fibrillation)

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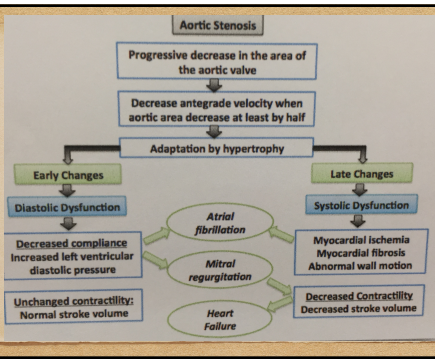

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Diagnosis of AS

- Physical Exam (murmur)
- Echocardiogram (calcification, leaflet motion, aortic jet velocity, mean gradient and AVA calculation
- EKG (LVH or arrhythmias)
- Chest X-Ray (Cardiomegaly)
- Exercise stress test (signs and symptoms)
- CT or Cardiac MRI (valve and aorta size)
- Cardiac Catheterization (CAD, chamber and aortic pressures)

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Grading of AS

- Mild: Vmax 2.6-2.9, Mean gradient 30 mmHg, AVA 1.5 cm2
- Moderate: Vmax 3.0-4.0, Mean gradient 30-50 mmHg, AVA 1.0-1.5 cm2
- Severe: Vmax > 4.0, Mean gradient >50 mmHg, AVA < 1.0 cm2

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Anesthetic Management

- Maintain SVR, preload
- Avoid venodilators (avoid hypotension)
- Vasopressors immediately available (phenylephrine, vasopressin or norepinephrine)
- Maintain SR with slow to medium HR, LA kick accounts for 40% of LV filling, avoid tachycardia (decreases diastolic perfusion)
- Defibrillator available

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Treatment

- Depends on severity and symptoms
- Symptoms may include angina, SOB and syncope
- Medical treatment may include ACE inhibitors, beta blockers
- Balloon valvuloplasty, SAVR/TAVR

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Replace when:

- Severe with symptoms or LV dysfunction, mod-severe when undergoing surgery for other cardiac reasons and if there is an abnormal exercise stress test with decrease BP and Symptomatic AS with low-flow/low gradient severe AS

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Advantages to TAVR over SAVR

- TAVR: recommended for 1) Intermediate to prohibitive surgical risk with severe AS, 2) Valve-in-valve procedure for failed prior bioprosthetic valve.
- Less acute kidney injury and major bleeding, mortality and stroke
- Decreased length of stay

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TAVR Contraindications

- Life expectancy <12 months owing to a non-cardiac issue
- MI within the last 30 days
- Congenital unicuspid, bicuspid or non-calcified valve
- Need for emergency surgery
- HCM, severe MR or LVEF <20%
- Severe pulmonary hypertension with RV dysfunction

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- Intra cardiac mass, thrombus or vegetation
- Native aortic annulus <18 or >25 mm
- CVA within the last 6 months
- ESRD
- Mixed aortic valve disease (AS/AI)
- Significant aortic disease

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TAVR's, where we started and where we're headed

- Started as a multi-center controlled project in the USA approximately 10 years ago, significantly delayed behind Europe (primarily due to FDA)
- US Core Valve Pivotal Trial, PARTNER cohort A and B and PARTNER II
- FDA approval in US for inoperable reasons in 2010 and 2011
- Future benchmarks would extend TAVR to other patient populations, including those being treated with SAVR
- Not curtailed by risk stratification and probable patient preference

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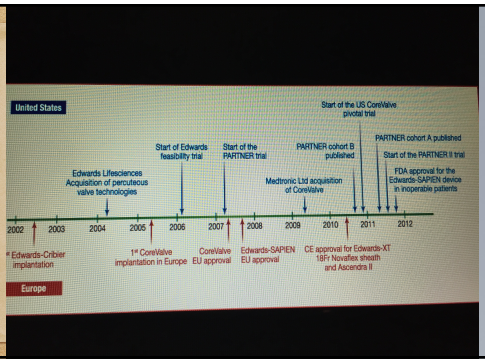

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- Joseph J, Nagvi, SY, Giri J, et al. Aortic stenosis: pathophysiology, diagnosis and therapy. The American Journal of Medicine. March 2017; vol 130, issue 3: 253-263
- ASE Guidelines (http://asecho.org/guidelines/)
- O'Sullivan C, Wenaweser P. Which patients will undergo TAVI or SAVR. e-journal, 15 October 2016; 24: 2

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CASE 3

Adventures in the Bronchoscopy Suite

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Bronchoscopy for staging EBUS

- 58 Y/O F
- Former smoker - 20 pack year
- Controlled hypertension
- CAD, s/p DES 2 months ago
- Current Meds:
  - Norvasc
  - Plavix (was **not** stopped)
  - Albuterol
  - Atrovastatin

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Exam (am of procedure)

- Cough, no hemoptysis
- BMI 20.7 162 cm
- BP 122/78 mmHg | Pulse 94 | Temp 36.2 °C
  Resp 16 | SpO_2 96% RA
- Airway MP2 , Full neck ROM, nl TM, no significant abnormalities
- Lungs/Heart: mild wheeze bilaterally, few bilateral rales, no murmurs, regular HR
- Any lab studies?

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Labs

- Chest CT
  - Lung infiltrate in the anterior segment RUL
  - Nodular densities RLL
  - Emphysema
  - Subcarinal, mediastinal, and hilar adenopathy

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Discussion

- Proceed or delay to stop Plavix?
- Which airway to use?
- Anesthesia technique?
- Monitors?

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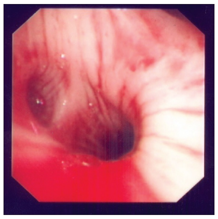
Intra op



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How will you manage this patient?

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When You encounter Bleeding with EBUS!

Basem Abdelmalak, MD
Professor of Anesthesiology
Director, Anesthesia for Bronchoscopic Surgery
Cleveland Clinic

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EBUS and antiplatelet therapy

- EBUS can be performed safely with Plavix on board
- It is reasonable to proceed with EBUS-TBNA or EUS-FNA when both:
  (1) clopidogrel cannot be stopped and
  (2) an important diagnostic question is at stake.

Stather DR[1], MacEachern P, Chee A, Tremblay A. **Safety of endobronchial ultrasound-guided transbronchial needle aspiration for patients taking clopidogrel: a report of 12 consecutive cases.** Respiration. 2012;83(4):330-4.
Meena N[1], Abouzgheib W, Patolia S, Rosenheck J, Boujaoude Z, Bartter T **EBUS-TBNA and EUS-FNA: Risk Assessment for Patients Receiving Clopidogrel.** J Bronchology Interv Pulmonol. 2016 Oct;23(4):303-307.

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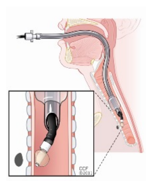
Choice Of The Airway

- Lower tracheal and bronchial lesions and /or defects:
  - Use as large of a tube as possible to allow room for the bronchoscope and ventilation



Abdelmalak B, Gildea T, Doyle J. Anesthesia For Bronchoscopy. Current Pharmaceutical Design, 2012, 18, 6314-6324

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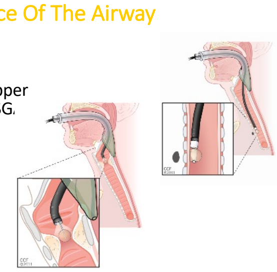
Choice Of The Airway

- Sub-glottic and upper tracheal lesions: SGA



Abdelmalak B, Gildea T, Doyle J. Anesthesia For Bronchoscopy. Current Pharmaceutical Design, 2012, 18, 6314-6324

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Options to Manage Bleeding

- Suction; endotracheal application of cold saline/sympathomimetics
- Not controlled:
  - Fogarty's catheter to isolate bleeding side
  - Or; Arndt Blocker
  - Or selective ET intubation of non bleeding side
  - Consider starting another IV ?
  - Consider A line?
  - IR for selective embolization of bleeding vessel
  - Consider checking coags

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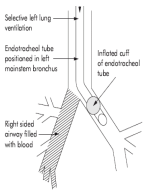
REVIEW SERIES

The pulmonary physician in critical care • Illustrative case 7: Assessment and management of massive haemoptysis

J L Lordan, A Gascoigne, P A Corris

Thorax 2003;58:814–819



Selective Intubation of Non Bleeding Side

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REVIEW SERIES

The pulmonary physician in critical care • Illustrative case 7: Assessment and management of massive haemoptysis

J L Lordan, A Gascoigne, P A Corris

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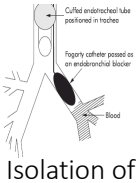

Fogarty Catheter Isolation of Bleeding Side

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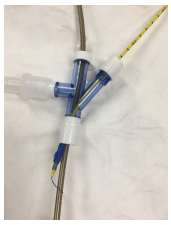
Arndt Blocker



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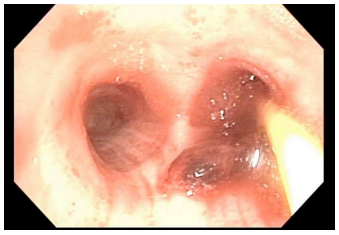

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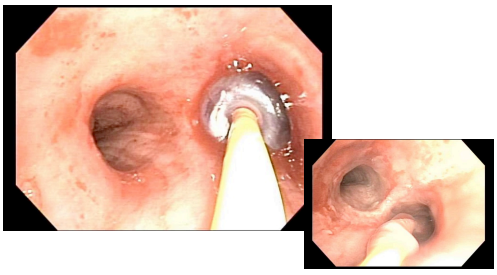

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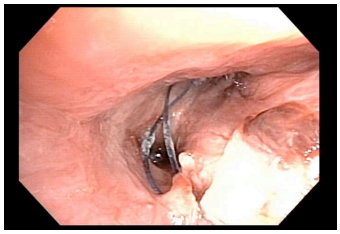

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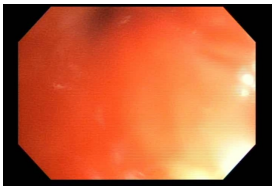
Caveats

Often difficult to recognize bleed.

Change to Therapeutic Scope & Assess



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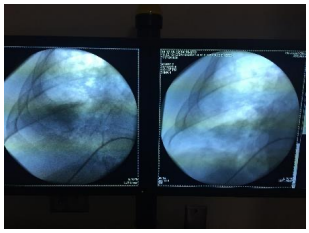
Intrapulmonary Hemorrhage



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Post Control of Bleeding Management

Coroner's Clot!

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THANK YOU!

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