Avoiding the Clean Kill-Managing the EMS Trauma Airway

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Objectives

At the end of this session participants should be able to:

- Identify common pitfalls inherent to critical airway management in the field
- Define strategies to prevent errors in advanced airway management
- Discuss the importance of establishing an airway plan

PATIENT CASE

38 year old male call into EMS by family who state “he fell down the stairs after eating and drinking too much”

P 132 BP 152/88

GCS is 10 and he has facial trauma and a head laceration

SAO2 85% on 100% NRB

transport is 30 mins

PATIENT CASE

BTW

Patient is 5’8” and weighs 320#

EMS Management

We intubate based on three indications:

#1 Airway protection

#2 Failure to oxygenate/ventilate

#3 Expected clinical course

EMS Management

We intubate based on three indications:

1. Airway protection – GCS 8 and below, able to phonate, cough and swallow

EMS Management

We intubate based on three indications:

2. Failure to oxygenate/ventilate – SAO2 < 90% on 100% NRB, RR < 8

EMS Management

We intubate based on three indications:

3. Expected clinical course – Over the next 30 minutes of transport time - will this patient be less stable or more stable after my resuscitative efforts?

EMS Management

Expected clinical course –

Best guess – means your clinical judgement

Will the patient be better physiologically based on fluids, oxygen and meds in 20-30 mins or worse?

EMS Management

Expected clinical course –

Positive Pressure Ventilation – BVM, BIPAP, endotracheal intubation and ventilation

Creates positive pressure within the thorax

This positive pressure reduces venous return and in a patient with compromised intravascular volume may result in hypotension

Intubating the Critically ill

"I need to intubate the patient…but I know he'll crash when I do."

- 2% risk of cardiac arrest during intubation of critically ill
- Significant hypotension (< 80mmHg) in 30%
- < 70 mmHg in 10%
- Shock Index : Heart rate > Systolic Blood Pressure is a predictor of trouble

EMS Management

Expected clinical course –

Will the patient be better physiologically based on fluids, oxygen and meds in 20-30 mins or worse?

Sepsis – fluids, norepinephrine, oxygenation creates an improved cardiopulmonary reserve. Take the time to resuscitate.

EMS Management

Expected clinical course –

Will the patient be better physiologically based on fluids, oxygen and meds in 20-30 mins or worse?

Hemorrhagic Shock – fluids, and oxygenation may not create an improved cardiopulmonary reserve. If transport time is prolonged may need to intubate.

Intubating the Patient in Shock

Optimize physiology - Perfusion

- Almost all patients need volume
- 40mL/Kg in kids
- 1-2 liters in adults
- May delay intubation if hypotensive, or hypovolemic and O2 OK – perfusion priority
- Combination of Fluids and vasopressors may be required

Considerations

- **Consider Ketamine as a sedative in RSI for patients demonstrating Shock**
- **Consider fluid boluses and/or vasopressors in hemodynamically unstable Shock patients requiring intubation**
- **Timing is everything- consider delayed intubation after perfusion is improved**

PATIENT CASE

A Decision is made to intubate. How best to position my patient?

PATIENT CASE

EVIDENCE??

Intubation Positioning

Head elevated patient positioning decreases complications of emergent tracheal intubation in the ward and intensive care unit. **Anesthesia Analog 2016;122:1101-7.**

Design

- **Retrospective cohort study**
- **2 large academic institutions**
- **Out of OR, excluding ED Anesthesia controlled airways**
- **Back-up head-elevated (BUHE) position > 30 degrees versus supine positioning**
- **Outcomes occurrence of complications among patient intubated in supine versus BUHE positioning**

BUHE Positioning

Intubation Positioning

Anesthesia Analog 2016;122:1101-7.

Results

- **528 patients enrolled**
- **Intubation related complications**
  - **Supine positioning 76/332- 22.6% of patients**
  - **BUHE positioning 18/192-9.3% of patients**

- **Take Home Points- Placing patients in a BUHE position during intubation compared to supine positioning reduced the odds of hypoxemia, aspiration, and esophageal intubation**

When has emesis EVER improved your airway management?

PATIENT CASE

Practice consideration

EMS Management

In the patient with known ingestion of food or drink and airway compromise. Consider the risk benefit of:

#1 BUHE positioning

#2 Zofran 8mg IVP

#3 Reglan 10mg IVP

PATIENT CASE

Caution- No EVIDENCE

Predicting the Difficult Airway

The four dimensions of difficulty

Difficult Bag Mask Ventilation	Difficult Laryngoscopy and Intubation
Difficult Extra-glottic Device	Difficult Cricothyrotomy

Summary

The four dimensions of difficulty

MOANS	LEMON
RODS	SHORT

LEMON

- Look Externally
- Evaluate 3-3-2
- Mallampati
- Obstruction/Obesity*
- Neck Mobility

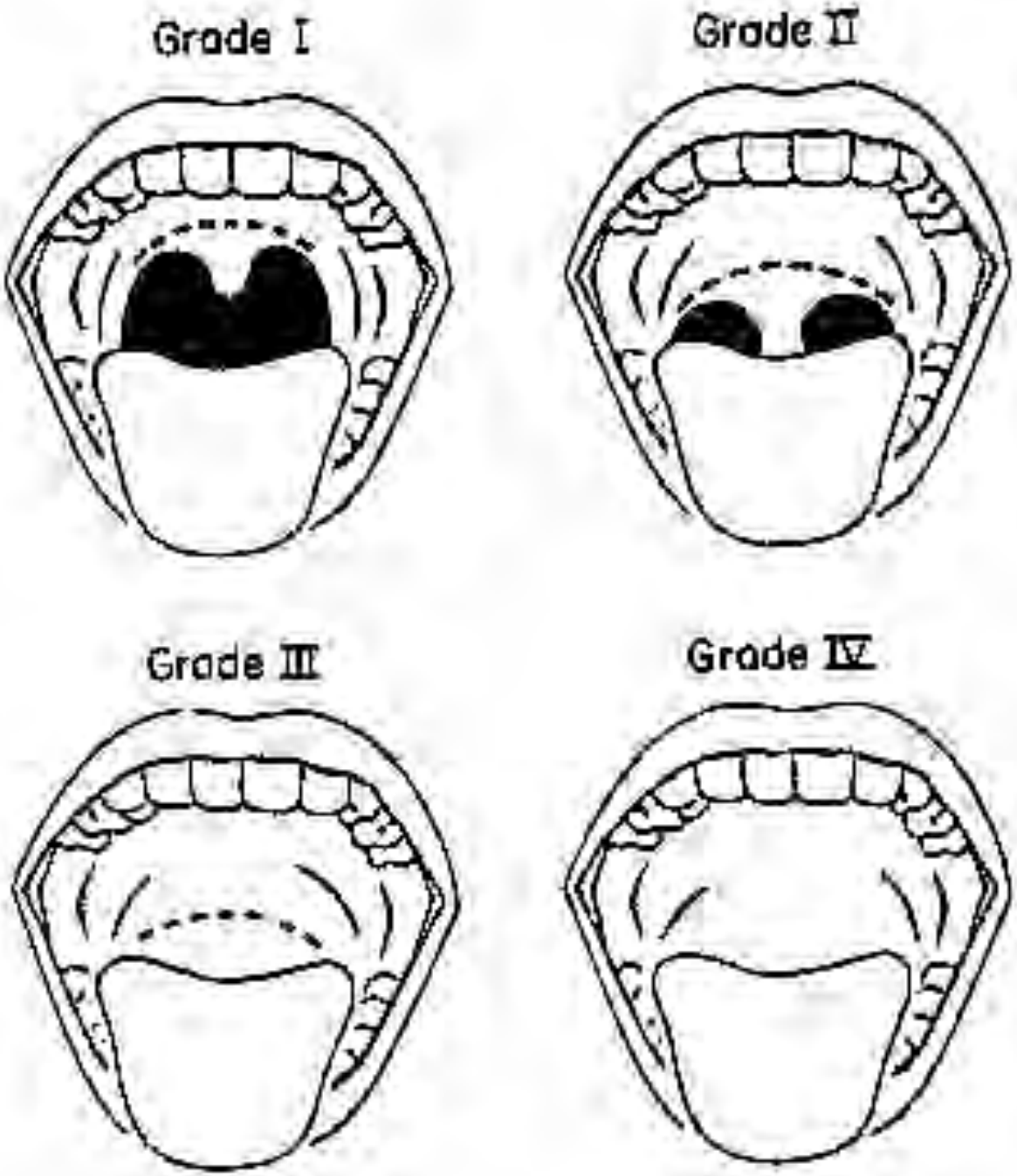
Difficult Direct Laryngoscopy LEMON

Evaluate 3-3-2

Difficult Direct Laryngoscopy LEMON

Mallampati

- Sitting up
- Head in sniffing position
- Open mouth, extrude tongue


Grade I
Grade II
Grade III
Grade IV

Difficult Direct Laryngoscopy LEMON

Obstruction/Obesity

Difficult Direct Laryngoscopy LEMON

Neck Mobility

Testing The **LEMON Law**

Prospective study the LEMON Law in **156 ED patients**. Three features were highly predictive of a poor glottic view:

Big Teeth	
Small Mouth	**<3 finger breaths**
Short Neck	**<2 finger breaths**

Reed JM. ***Emerg Med Journal*** 2005; 22:102-107.

Difficult Bag Mask Ventilation MOANS

- Mask Seal
- Obstruction/Obesity*
- Age
- No Teeth
- Stiff

Difficult EGD

RODS

- Restricted Mouth Opening
- Obstruction
- Distorted Anatomy
- Stiff lungs or C-spine

Difficult Cricothyrotomy SHORT

- Surgery or disrupted airway
- Hematoma (or infection/abscess)
- Obesity
- Radiation
- Tumor

Predicting the Difficult Airway

The four dimensions of difficulty

Difficult Bag Mask Ventilation	Difficult Laryngoscopy and Intubation
Difficult Extra-glottic Device	Difficult Cricothyrotomy

PATIENT CASE

Back to the EVIDENCE

Intubation Bougie

JAMA 2018;319(21):2179-2189

Results

- **757 patients enrolled**
- **Intubation using bougie led to higher first-attempt intubation success compared to endotracheal tube stylet 96% vs 82% for those with difficult airway characteristics.**

- **Take Home Point- Use a Bougie for any patient with difficult airway characteristics**