Perioperative Airway Management:
Update on Tools and Techniques

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Disclosures

• None

Goals

• Gain a better understanding of the range of tools and techniques utilized by the anesthesiologist for perioperative airway management.

• Recognize how airway management impacts the postoperative care of the patient
History of Airway Management

It's older than you think!

<table>
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<tr>
<th>2000 BCE</th>
<th>1000s</th>
<th>1500s</th>
<th>1940s</th>
<th>1980s</th>
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<td>Egyptian</td>
<td>Macewen</td>
<td>Miller and Macintosh blades</td>
<td>Kirsten's &quot;autoscope&quot;</td>
<td>FOBs</td>
<td>Supraglottic airway devices (LMA)</td>
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History:
- Egyptian tracheostomy
- Macewen: blind oral tracheal intubation
- O'Dwyer: intubates children with diphtheria
- Kirsten's "autoscope": direct visualization (DL)
- Miller and Macintosh blades
- FOBs
- Supraglottic airway devices (LMA)

Timeline:
- 3,600 BC
- 1880's
- 1890's
- 1940's
- 1980's
- 2000's

Anatomy of the Airway

ADULT

PEDIATRIC

Anatomy of the Airway

Adult vs Pediatric
Evaluation of the Airway

- All airway classification is trying to answer 2 questions:
  - 1.) Can I mask ventilate?
  - 2.) Will I be able to intubate?

“NO” to both = difficult airway

Evaluation of the Airway

Do you see what I see?

Modified Mallampati classification

Securing the Airway...

What does that mean?

Most reliable is ETT between the vocal cords
Securing the Airway
“Grade I” view of the larynx

Securing the Airway
Why do we care?
Because we hate to see this

Airway Tools
- Direct Laryngoscopy (DL)
- Flexible Fiberoptic Bronchoscopy
- Airway Wands
- Video Laryngoscopy
- Supraglottic Airways
- MISC: retrograde wire, blind intubation, jet ventilation, cricothyotomy
Direct Laryngoscopy
Over 80 years old

- Described late 1800’s, in clinical use since 1913. Miller and Macintosh blades developed in 1940’s still used in 2012.
- Simplest, most common method of intubation.
- Indications: Placement of ETT when advanced airway support is needed. May be for surgical or medical reasons.
- Limitations: Patient position, oral opening, limited neck mobility, inability to align the airway axis’s
- Nursing implications: sore throat, hoarseness, dysphagia, injury to teeth or soft tissue

Flexible Fiberoptic Bronchoscopy
FOBs

- In medical use since 1966, it wasn’t until the 1980’s for intubation of the airway.
- Light source, insertion cord and handle. Visualization is at distal end of scope and transmitted via fiberoptic bundle to eyepiece. Can be performed awake or asleep, oral or nasal.
- Indications: difficult airway, limited oral opening, limited neck mobility, difficult DL but able to mask ventilate
- Limitations: copious blood and secretions, uncooperative patient
- Nursing implications: difficult airway?, assist with equipment, sore throat, hoarseness, dysphagia
Airway wands

Traditional Light Wand

- Used as early as 1957, light at distal end of the device facilitates blind intubation technique. Neck/larynx is illuminated. ETT is loaded over the stylet.
- Indications: limited oral opening, facial trauma, limited neck mobility, copious blood or secretions
- Limitations: no direct visualization of ETT placement, not used with suspected laryngeal trauma or hypoxic patient, obesity may limit transillumination.
- Nursing implications: difficult airway?, assist with equipment, trauma to airway from blind probing, hoarseness, dysphagia

Indirect visualization for the operator via eyepiece, introduced in 1995

- Indications: limited oral opening, limited neck mobility
- Limitations: laryngeal trauma, hypoxic patient, copious secretions, lens may fog
- Nursing implications: difficult airway?, assist with equipment, sore throat, hoarseness, dysphagia

Optical stylet

Video Laryngoscopy

- Introduced into clinical practice in 2001 combines the tools of DL with optics transmitted to a LCD monitor.
- Permits visualization of airway by others, FOBI now have this capacity
- Indications: difficult airway, limited neck mobility, difficult DL but able to mask ventilate
- Limitations: copious blood and secretions, oral opening less than 2 cm, learning curve
- Nursing implications: difficult airway?, assist with equipment, sore throat, hoarseness, dysphagia
Supraglottic Airway Devices

Does ≠ secure

Laryngeal Mask Airway

LMA

- 1983 Dr. AJ Brain introduced the most innovative advance in airway management since DL. Placement of a mask into the hypopharynx and advanced to cover the laryngeal opening.
- Indications: provide patent airway in lieu of traditional mask ventilation, routine airway in the OR, difficult intubation, airway rescue
- Limitations: severe upper airway obstruction, patient position, full stomach, PPV with high peak airways
- Nursing implications: difficult airway?, airway is not “secure”, nerve injury with resultant vocal cord dysfunction

Laryngeal Mask Airway
Esophageal-Tracheal Combitube

Conceived of in 1960’s, introduced into clinical practice 1980’s. Blind insertion of a double lumen tube to allow airway management
- Indications: primarily used in out of hospital by providers with limited airway training, difficult airway
- Limitations: esophageal, pharyngeal or laryngeal injury, supraglottic obstruction
- Nursing implications: device recognition

Cuffed Oropharyngeal Airway

1990’s saw the development of the COPA. Modified oral airway has a cuff at the distal end and a connector for an anesthesia circuit on the proximal end
- Indications: provide patent airway in lieu of traditional mask ventilation in SV patient
- Limitations: severe upper airway obstruction, patient position, full stomach, need for PPV
- Nursing implications: device recognition, not in common use

Additional Anesthesia Tools

Airway Monitoring
- Oxygenation  Pulse Oximetry
- Ventilation  Capnography
Risk Factors for Hypercapenia

- PMH
- Opioids
- Respiratory Impairment
- Positioning

Additional Anesthesia Tools
Medications

- Sedatives/Narcotics
  - Dexmetatomidine
  - Remifentanly
- Antiemetics
  - Ondansetron
  - Decadron

Emergency Treatment of Laryngospasm

- Recognition
- Airway maneuvers
- Medications
Conclusions
Implications for Perioperative Nurses

- Knowledge of the anesthesia tools used for your patient will enhance your care via anticipation of possible complications.

- Ask appropriate questions relating to the airway management used:
  * Was this a difficult airway?
  * What are the unique post op complications I can anticipate?
  * Does this patient need capnography in the PACU?
  * What is most appropriate unit for this patient post-op?

Final Thoughts

- Nurses are a vital part of the perioperative team. You are charged with caring for the patient as she completes emergence from the anesthetic and therefore are an extension of the anesthesiologist throughout the PACU period.

- Collaboration with the anesthesia provider is mandatory to optimize care of the patient by knowing the airway management used and anticipating possible adverse events.

References


THANKS!

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