When Best-Laid Plans Go Awry: Successful Nasal Intubation in a Developmentally Delayed Teenager with Jaw Fracture, Despite Equipment Failure and Copious Nasal Bleeding

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Background

Introduction:

Airway management of developmentally-delayed adolescent patients with oral maxillofacial injuries can be especially challenging when compounded by the surgical requirement for nasal intubation[1]. Unanticipated copious nasal bleeding can make bag-mask ventilation and intubation impossible, potentially leading to airway compromise, aspiration, or even death[2-3]. We present such a case of an unexpected difficult nasal intubation, whereby combining creativity with clinical knowledge, we safely secured an airway when seconds counted.

The Patient:

- 18-year-old male
- PMHx
  - Obesity (BMI 36)
  - Developmental delay
  - Pervasive anxiety disorder
  - Daily poly-substance use (EtOH, tobacco, marijuana)
  - No known bleeding disorders
- Procedure: ORIF left mandible s/p traumatic fracture
- Physical Exam
  - Limited mouth opening from pain
  - Mallampati could not be assessed
  - Large neck circumference
  - Adequate TMD

Case Presentation

Pre-Induction:

- Surgeon requested nasal ETT to facilitate exposure.
- Awake fiberoptic nasal intubation was not feasible due to patient's anxiety & lack of cooperation.
- Initial plan: standard nasal intubation via direct laryngoscopy assisted by Magill forceps.
- Functionality of all equipment was verified during room set-up. Emergency airway equipment was immediately available.

Intubation Details:

- After induction, nares were topicalized with oxymetazoline & serially-dilated with lubricated trumpets.
- Insertion of the nasal ETT instigated profuse nasal bleeding.
- Failed nasal intubation because the laryngoscope light-source died.
- Video-laryngoscopy (VL) failed
  - Fogging of the disposable blade
  - Obstructed view from bloody secretions
- ↓SpO_2 to 70%;bag-mask ventilation splattered bloody secretions everywhere
- Nasal trumpet coated with oxymetazoline was inserted to tamponade the epistaxis
- VL blade used to orally intubate by direct laryngoscopy, SpO_2 returned to 99%
- Surgeon still insisted on nasal intubation.
- Airway-exchange catheter (AEC) was inserted into the nasal trumpet. Under VL, AEC was advanced into the trachea alongside oral ETT. A nasal ETT was threaded over the AEC to the glottis using a Seldinger technique. As nasal ETT slid past the cords, and the oral ETT & AEC were removed.

Outcome:

- Surgery proceeded without complication
- Patient uneventfully extubated

Discussion

Previous case reports of bi-orifice intubation & Seldinger technique with bougie or airway catheter have been published[1-4].

Lessons Learned:

- Despite adequate preparation of nares for nasal intubation, epistaxis can occur and create impossible intubation conditions.
- Consider asleep nasal FOI, but appreciate limitations[1,5] (i.e. fiberopics impaired by secretions, technically difficult)
- "Red-rubber" catheter or a gum-elastic bougie with Seldinger technique can reduce the likelihood of nasal trauma[1-3].
- The small AEC diameter can slide through the glottic opening along the inflated oral ETT. To minimize the risk aspirating bloody secretions, the oral ETT cuff was deflated just enough to allow nasal ETT to pass into the glottis.

Advantages to Bi-orifice Approach[1]:

- Providing time for nasal preparation
- Uninterrupted ventilation and oxygenation
- Reduced risk of airway loss
- Decrease risk of aspiration of blood or other secretions
- Ability to administer non-depolarizing muscle relaxant
- Time to discuss an alternate plan with surgical colleagues.

References

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