Fiberoptic Intubation through an LMA in Chiari Malformation

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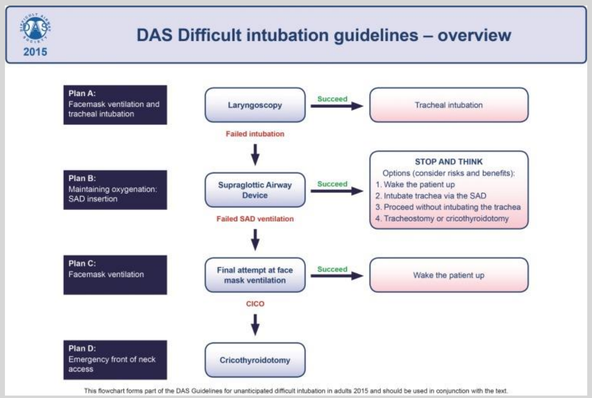
Introduction

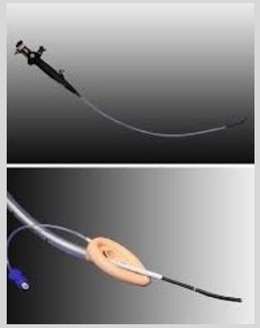
A difficult airway includes difficulty with mask ventilating, laryngoscopy, and/or tracheal intubation. Predictors of a difficult or failed video laryngoscopy include obesity, clinician inexperience, blood/secretions in the oropharynx, and limited mouth opening. Predictors of a difficult or failed supraglottic airway intubation include obesity, a small mouth opening, and limited neck extension. Multiple failed intubation attempts not only have the potential to cause harm and make subsequent attempts more difficult, but also to make mask ventilation more difficult, increasing the likelihood of a CICO (can't intubate, can't ventilate) situation.

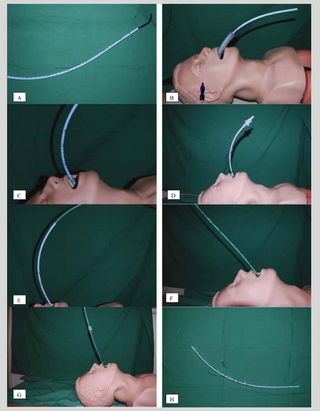


When patients have known difficult airways, it is especially important to design a plan to maximize the chance of success on the first attempt. In this case we examine multiple failed intubation attempts across 2 surgeries followed by a successful first-pass intubation for a patient with limited neck extension due to cervical fusion and a small mouth opening due to skull reconstruction after a history of Chiari malformation. We also examine the successful, first attempt intubation, illustrating the importance of creative, advanced planning using the patient's history and use of the difficult airway algorithm to successfully intubate on the first attempt.

Patient Description

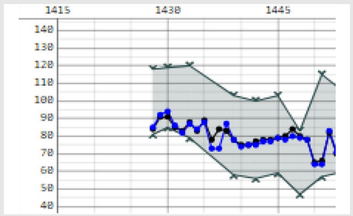
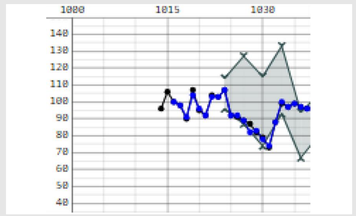
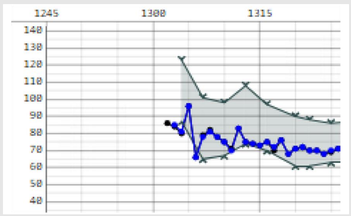
40 yo female status post Chiari Type I decompression presents for fibrin glue injection to correct a CSF leak due to a previously undescribed lymphatic malformation. Her initial surgery for decompression included an occipital-C3 fusion, resulting in extremely limited cervical range of motion. She also had skull reconstructive surgery with a graft of the left zygomatic arch, leading to trismus. Her 1.5" mouth opening and limited range of motion in her neck presented several challenges for intubation, including the inability to achieve the sniffing position as well as difficult visibility in direct laryngoscopy.





Prior intubation attempts illustrate failure of a Glidescope to obtain a view of vocal cords and failure to seat a supraglottic airway. Multiple attempts at intubation resulted in a reduced ability to bag mask ventilate between attempts. Given her history of multiple failed intubation attempts, we describe the use of patient history and human factors to achieve successful intubation on the first attempt.

Case Discussion

Intubation	Procedure #1	Procedure #2	Procedure #3
Attempt #1	• Mask: Easy • Glidescope: 3 blade • Grade II view • **Unable to pass tube**	• Mask: Easy • Glidescope: Hyperangulated 3 blade • Grade III view • **Unable to pass tube**	• Mask: Easy • Placed Classic LMA 3 • FOB with Aintree catheter (AIC) • FOB removed, AIC remains • Intubated over AIC • **ETT placement confirmed with FOB**
Attempt #2	• Mask: Difficult to mask, 8cm oPA placed, 2-handed mask required • Glidescope: 3 blade • Grade III view • Blood & secretions obscure view • **Unable to pass tube or bougie**	• Mask: Easy • Glidescope: Hyperangulated 3 blade • Grade III view • **Unable to pass tube**	--
Attempt #3	• Mask: 8cm OPA exchanged for 9cm OPA. 3 hands on mask/jaw + high airway pressures required • C-Mac D blade • Grade II view • **Tube able to be rotated past cords**	• Mask: Easy • Placed Classic LMA 3 • FOB with Aintree catheter (AIC) • FOB removed, AIC remains • Intubated over AIC • **ETT placement confirmed with FOB**	--
First 15m Anesthetic Record			

Significance/Uniqueness of Case

This patient's history of cervical fusion, limited mouth opening, and previous difficult/failed intubations led the anesthesia team to create a plan based on the failed attempts in the past. The plan included a fiberoptic intubation using an Aintree exchange catheter through an LMA. The plan was communicated clearly and in advance to all team members who would work together on this intubation. Roles were delegated according to team members' experience and training: a student anesthesiologist assistant placed the LMA, the attending anesthesiologist operated the fiberoptic scope and placed the Aintree catheter, and a CAA intubated over the Aintree catheter.

Intubating through an LMA was described in the original difficult airway algorithm in 2004. Despite most often being done blind, the overall success rate was reported to be 95.7%, with higher success using fiberoptic guidance. The method of intubating through an LMA using an Aintree catheter over a fiberoptic scope has previously been described for use in known difficult airways, traumas, and cervical fusions.

Conclusion

In patients with known and unanticipated difficult airways, the ability of the anesthesia provider to make changes after each failed intubation is critical for continued ventilation. This case illustrates the importance of not only being able to work through the difficult airway algorithm, but also the value of using prior failed intubations to create a plan more likely to be successful on the first attempt, ultimately securing patient safety.

References

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