



# Use of the Video RIFL® (Rigid Flexible Laryngoscope)

## As an Adjunct to Direct Laryngoscopy

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### Introduction

The ASA difficult airway algorithm incorporates different modalities in its progression.<sup>1</sup> It is not uncommon for the user to fail at direct laryngoscopy, thus requiring an alternate method for securing an airway. Frequently, the alternate modalities include supraglottic airways, rigid videolaryngoscopes, or flexible fiber-optic bronchoscopes.

The Video RIFL® was designed to have a dynamically articulating piece that conforms to the patient's anatomy, differentiating it from other rigid devices. The articulation, as shown in Figure 1, also enables correction of the endotracheal tube trajectory in the vertical direction unlike those seen with malleable stylets such as the Shikani®, Levitan®, and Bonfils®. The advantages of incorporating video over fiberoptics include: improved image quality, durability, viewing angle, ability to record the procedure, and decreased fogging due to LED warming of the lens cover. A stylet-based approach enables guided placement of the endotracheal tube so that its trajectory matches the view, in contrast to unguided placement seen with rigid video laryngoscopes such as GlideScope®, McGrath®, and C-MAC®.

With a stylet-based approach the displacement of the patient's tongue to allow visualization of the larynx is very important. One technique to create this space is to use a Macintosh laryngoscope blade along with a stylet. The objective of this retrospective review was to examine the use of the Video RIFL alongside direct laryngoscopy. In a scenario in which the user was unable to obtain a view of the glottis using a Macintosh laryngoscope blade, the Video RIFL could be used to navigate past any obstruction, thus enabling successful intubation. The user would not need to remove the metal blade and insert an additional modality but could use the articulating video stylet to complement the blade.



Figure 1 - video RIFL® extended (L) and flexed (R)

### Methods

After obtaining IRB approval we retrospectively reviewed charts from February 2009 through February 2010 on patients intubated in the operating room using the Video RIFL®. All intubations were performed on patients undergoing general anesthesia with appropriate neuromuscular blockade in the presence of attending anesthesiologists. Twenty patients were identified who were electively intubated using the Video RIFL® in conjunction with a Macintosh laryngoscope. We included all twenty of these patients for chart review.

Chart review criteria included:

- Cormack-Lehane score with the Macintosh blade or equivalent score with the Video RIFL
- Success rate
- Complications (O<sub>2</sub> desaturation, oral trauma)
- Routine vs difficult airway (prior difficult DL, obesity, C-collar)

The following table shows the mean patient preoperative parameters.

Patient Preoperative Characteristics						
Age (yrs)	Ht (cm)	Wt (kg)	BMI (kg/M <sup>2</sup> )	MP	OO (cm)	HMD (FB)
47.04	167.48	83.17	29.65	1.75	2.88	2.94
± 16.38	± 13.58	± 27.77	± 10.01	± 0.68	± 0.34	± 0.22

### Results

Intubations were completed by two anesthesiology resident physicians. No intubation failures were identified using this technique. All cases had Cormack-Lehane Grade I equivalent views on the display of the Video RIFL®. Two intubations required additional suctioning due to inadequate initial suctioning. CL scores from direct laryngoscopy varied from [1..3] with an average of 2.15. No complications were identified. Four patients were preoperatively identified as "difficult" and sixteen were identified as routine.

### Discussion

The results highlight the benefit of having an articulating video device assist with direct laryngoscopy. Having a device complement DL does not require the user to learn a completely new modality. Studies with other rigid video laryngoscopes have demonstrated that DL was an effective rescue method for failed VL attempts.<sup>2</sup>

Figure 2 shows an excerpt from the difficult airway algorithm. With the user attempting intubation with DL as a first-line approach, increasing chances for success with this modality is important. Time would be another factor for using an adjunct to DL, especially since alternate devices may not be readily available to the practitioner when encountering an unexpected difficult airway.

By using the Video RIFL® in tandem with DL the practitioner can still maintain proficiency with the latter. The results show that the Video RIFL® is capable of securing a Grade I equivalent view irrespective of that obtained via DL. Another advantage is that the endotracheal tube advances where the camera is viewing, eliminating the disconnect seen when placing endotracheal tubes with stylets using rigid videolaryngoscopes.<sup>3</sup> Although stylet-based approaches have the aforementioned advantages, the success rate can drop when encountering field debris such as blood and secretions.<sup>4</sup>

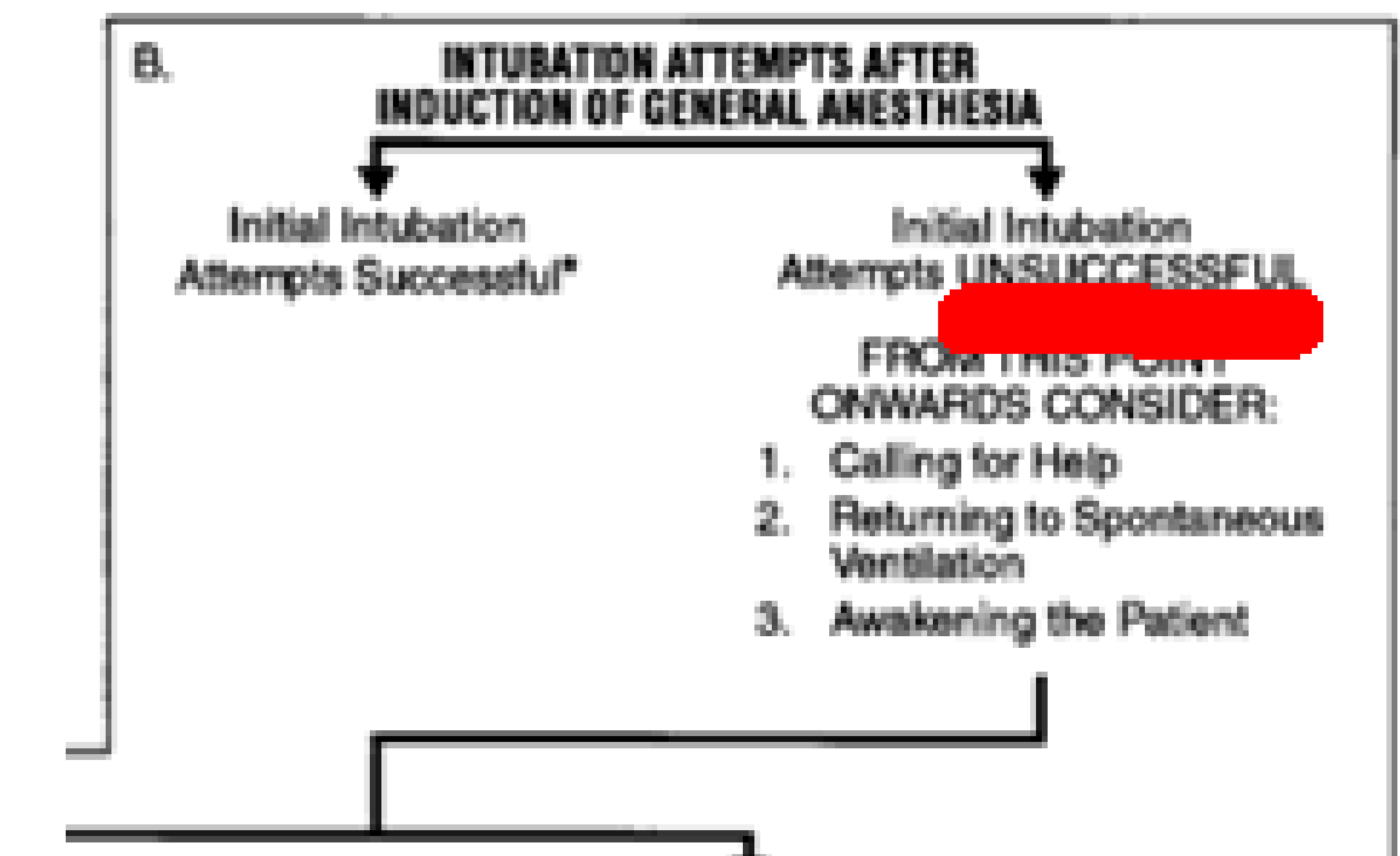


Figure 2: Excerpt of Difficult Airway Algorithm

The key differentiating features of the Video RIFL® relative to most other laryngoscopy adjuncts are the ability to guide placement and to dynamically bend the endotracheal tube. As with all airway management adjuncts, the user needs to displace soft tissue to provide an adequate working cavity, and, as demonstrated above, this can be achieved with direct laryngoscopy.

### Conclusion

The Video RIFL® highlights the benefits of using an articulating video stylet in airway management. Utilizing this device in conjunction with DL can improve success rates, especially when encountering a failed direct laryngoscopy. Though this analysis demonstrates its efficacy, additional prospective studies are warranted to further assess its utility in both routine and difficult airway management.

### References

1. ASA Difficult Airway Algorithm and Practice Guidelines for Difficult Airway Management.
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3. van Zundert A, et al. *A Macintosh laryngoscope blade for videolaryngoscopy reduces stylet use in patients with normal airways.* Anesth Analg 2009;109(3):825-31
4. Komatsu R, et al. *Airway Scope and StyletScope for tracheal intubation in a simulated difficult airway.* Anesth Analg 2009;108(1):273-9