



### Original Research Article

## Conventional Direct Laryngoscopy needs wind up with the advent of Video laryngoscopes– Comparative Study

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### Abstract

*The macintosh and miller blade are widely used scopes since their invention in 1940's to visualize glottis and tracheal intubation. We in this era of technology are still practicing same conventional methods inspite of being aware, that new technology of video laryngoscopy had already sets in for airway management. The video laryngoscopes are new intubation devices which contain miniature video cameras, enabling the anaesthesiologist to visualize the glottis indirectly, allowing good exposure of the glottis, thus making tracheal intubation easier as compared to conventional laryngoscopy.*

**Keywords:** Video laryngoscopes, Glidoscopes, Difficult airway algorithm, Tracheal intubations.

### Introduction

An anaesthesiologist becomes more and more confident in its specialty, once one is able to intubate the trachea with different airway morphology as well as unpredicted difficult airway. Tracheal intubation is considered as the technique of choice for airway management.<sup>[1]</sup>

Since evolution of anesthesia tracheal intubation is being done using the conventional Macintosh Laryngoscope. But even in best skilled hands at times it turns out to be a failure, thereby increasing morbidity or mortality in patients. Intubation can be difficult in 1-4% of cases and it may fail in 0.05-35% of patient of the general population<sup>[2]</sup>.

For almost 60 year, direct laryngoscopy was the sole method used by anesthesiologist, to insert tracheal tube into the trachea.<sup>[3]</sup> The search for bigger and better angle of view of glottis during difficult intubations led to the development of video assisted devices.<sup>[3]</sup> A varied types of video laryngoscopes are now available to facilitate tracheal intubation.

### Material and Methods

So far flexible bronchoscopes were considered as Gold standard but it needs experience and long learning curve. With the emergence of video laryngoscopes as a leading method of obtaining an improved view of the glottis opening, tracheal

intubation has become easier as compared to conventional laryngoscopy.<sup>[4]</sup>

From the initial direct techniques, laryngoscopy advanced through an era of Flexible fiber-optic video laryngoscopes, followed by the more highly developed transition scopes. The first generation of video laryngoscopes employed technology used in rigid fiberoptic laryngoscopes.<sup>[5]</sup> eg, Bullard scope, Wuscope, Upsherscope.

To overcome the difficulties met with first generation of 2001, a new type of video laryngoscopes arrived in the shape of Glidoscopes, True view scopes offering camera on blade technology as shown in Figure.1...The Glidoscope used a high resolution digital camera placed at the tip of an improved Macintosh Laryngoscopes blade attached to a high- definition screen results in better view of glottis<sup>[4]</sup> Subsequently other types of video laryngoscopes were then developed, all have been shown to improve the view of the vocal cords<sup>[6]</sup>



Figure.1 Showing Glidoscope<sup>[1]</sup>

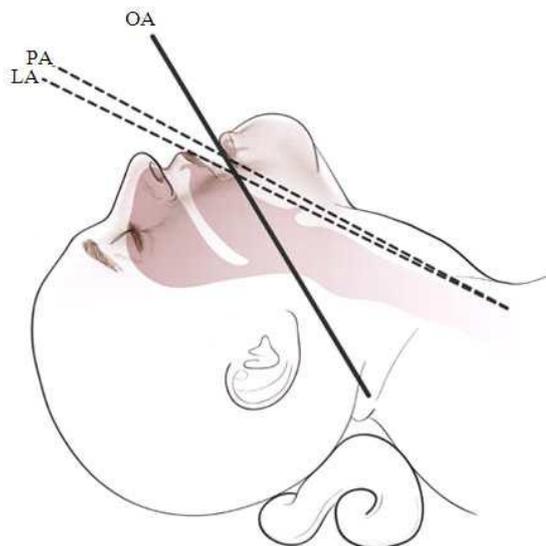


Figure 2 Static complex with in line alignment of all three axis<sup>(9)</sup>

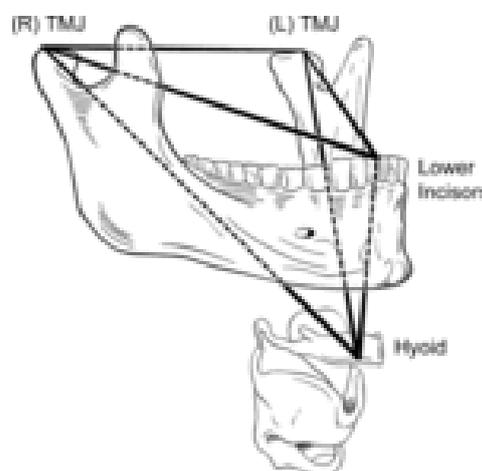


Figure 3 Showing Dynamic complex (TMJ; Right and left Temporomandibular Joint)<sup>(7)</sup>

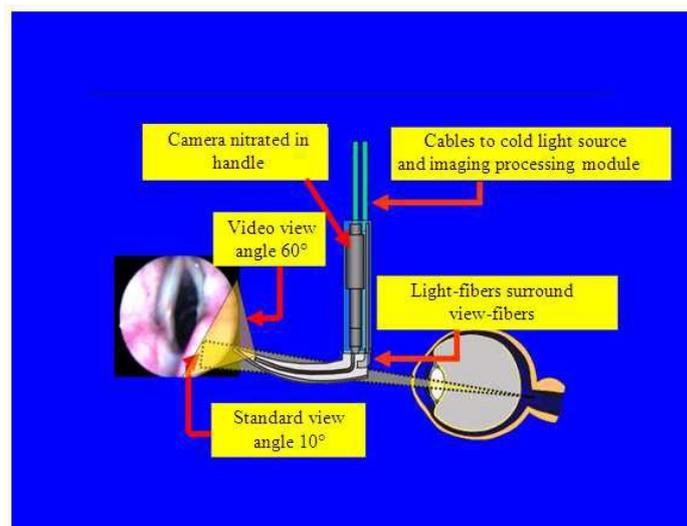
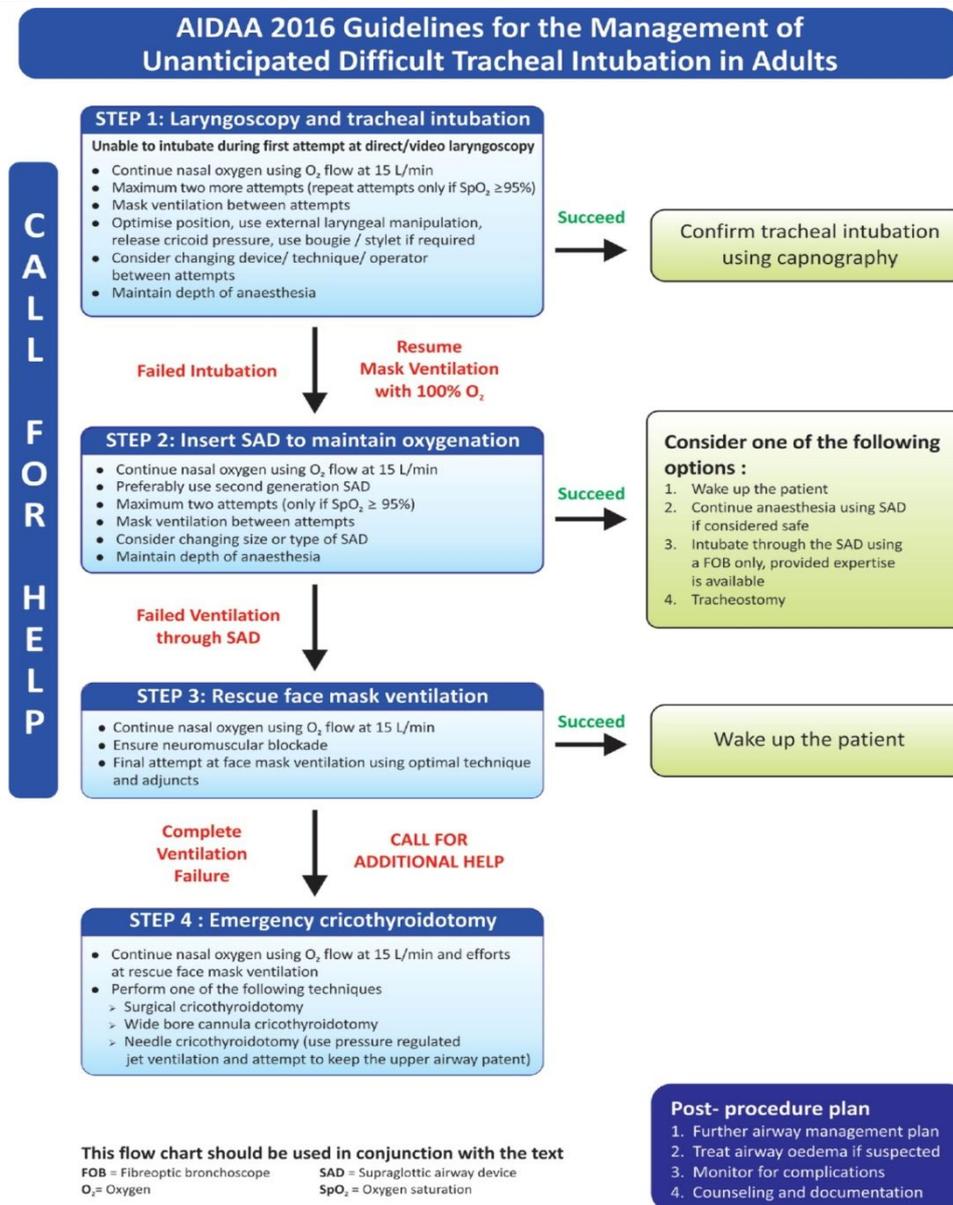


Figure 4 Showing wider 60° view by video laryngoscopes<sup>(9)</sup>



**Figure 5** AIDAA 2017 Guidelines, STEP 1.specifies intubation by either director vedio laryngoscope<sup>(16)</sup>

**Discussion**

To understand the technique of video laryngoscopy we need to get well acquainted with Greenland’s new model of two phases of laryngoscopy, i.e

1. Static phase (posterior complex)
2. Dynamic phase (anterior complex)

Static phase is controlled by the posterior anatomical structures of neck i.e positioning in sniffing is governed by the flexion of lower cervical spine and extension of occipito- atlanto axial complex. Which brings in line alignment of Laryngeal axis (LA), Pharyngeal axis (PA), Oral axis (OA) to have proper view of glottis and facilitate intubation as shown in Figure 2

Dynamic phase controls the anterior anatomical structures of the neck as shown in Figure 3, during the dynamic phase, the mandible is drawn forward and bulk of submandibular tissue is compressed anterolaterally to provide a line of vision of glottis. And hyoid is also moved anteriorly and downward. Considering this, it is clear that only positioning is not enough to intubate via direct laryngoscopy<sup>(7)</sup>

Video laryngoscopes can be classified based on optical technology, blade shape, and guiding channels as

1. Non channeled Video laryngoscopes (Glidoscope, McGrath, VMAC, C MAC)

2. Channeled video laryngoscopes (pentax AWS, King vision)
3. Optical Airtraq
4. Fibroptic stylets Benefits

### Benefits of Video laryngoscopy

- 1) In contrast to fiberoptic bronchoscope, it is relatively inexpensive and easy to handle. And better suited for tracheal intubation of patients with pharyngeal secretions or bleeding<sup>[8]</sup>
- 2) Not only make intubation easier with easy learning curve but offer the possibility to record intubation procedure and stored in patients file as 'digital airway footprint' can be seen before next anaesthetic procedure<sup>[3]</sup>
- 3) Visualization of videos of previous patients tracheal intubation should become as standard as regarding a patients laboratory results.<sup>[3]</sup>
- 4) It should be done in all intubations and recorded in AIMS [ANAESTHESIA INFORMATION MANAGEMENT SYSTEM]<sup>[3]</sup>.
- 5) Do not require compulsory alignment of buccopharyngeal axis of the laryngoscope as in direct laryngoscopy<sup>[1]</sup>
- 6) The glottis view by classic direct visualization offers a 10-degree view as compared to a much wider 60-degree view projected by the lens on the video laryngoscopes as shown in Figure 4<sup>[9]</sup>
- 7) It reduces the time required for intubation as well as the risk of dental trauma<sup>[11]</sup>
- 8) Kramer et al. showed that in patients with an anticipated difficult airway, awake nasal intubation using a C-MAC\_ D-BLADE video laryngoscope yielded the same success rate as using a fiberoptic bronchoscope, but in a shorter intubation time<sup>[10]</sup>
- 9) Gordon et al, used the Glidescopes to inspect airway with minimal stimulation following facial reconstructive surgery<sup>[11]</sup>
- 10) video laryngoscope has been used to check the cords after thyroid surgery<sup>[12]</sup>

- 11) Video aryngoscopes can be used to displace excess airway tissue and may proved superior views of the morbidly obese patients larynx, and shown to be useful for awake tracheal intubations.<sup>[13,14]</sup>
- 12) It has found a place in the algorithm of difficult intubation according to international recommendation<sup>[15]</sup> as well as national AIDAA (All India Difficult Airway Association) algorithms, as shown in Figure 4<sup>[16]</sup>
- 13) The video laryngoscope provides an improved view of the glottic opening. Numerous studies have shown that there was an improvement of at least one Cormack-Lehane grade using video laryngoscopy as compared with standard direct laryngoscopy.<sup>[9]</sup>

### Constraints of Direct laryngoscopy

- 1) Failure rate is about 1.5%-8.5% despite experience, adequate positioning and mouth opening.<sup>[17]</sup>
- 2) A need for Optimal line of sight for glottic visualization and greater cervical spine movement during laryngoscopy<sup>[18]</sup>
- 3) Lack of visual feedback for other health care providers.<sup>[18]</sup>

### Conclusion

Need to change from earlier to new concept of video laryngoscopes, change from three axis alignment to anterior and posterior complex. In coming period Video laryngoscopes may replace direct laryngoscopes as smart phones have replaced standard cell phone. So why not to get along with smart way of intubation with video laryngoscopes which is easier and more advanced.

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