Should videolaryngoscopes be used in difficult airways?

Videolaryngoscopes resemble traditional laryngoscopes but have a video chip embedded in the blade. This transmits magnified images to a display screen where they can be seen and recorded. The main benefit is that the laryngeal view is generated by a video camera focused at the laryngeal outlet without the need for alignment of the axes.

Is videolaryngoscopy effective?

The first aim in laryngoscopy is to visualize the vocal cords. A better view is assumed to predict easy intubation, however, insertion of an endotracheal tube may be difficult despite the improved view with videolaryngoscopes (Ahmed-Nusrath and Gao-Smith, 2011). Videolaryngoscopes have a sharp anterior deflection which focuses the camera towards the laryngeal inlet. This gives a better view but does not reflect the sharp curve that the endotracheal tube needs to traverse to reach the vocal cords. In addition, since there is little retraction on insertion, air space to manipulate the endotracheal tube is limited. Although videolaryngoscopes with integrated tube channels and preshaped stylets are designed to address this problem, there is no convincing evidence so far that suggests that this has made tube insertion easier.

When are videolaryngoscopes useful?

Videolaryngoscopes are robust, easy to use and have a minimal set up time. These are all advantages when there is an unexpected difficulty in laryngoscopy. It would also be beneficial for managing difficult airways in remote locations where skilled assistance or equipment such as fibrescopes are unavailable.

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Case reports suggest that videolaryngoscopes are useful in rescuing failed direct laryngoscopy in both adults and children. In children, videolaryngoscopy is a useful option as awake intubation is not feasible and fibreoptic endoscopy is more difficult. Rosenstock et al (2012) showed comparable results with McGrath and standard fibreoptic intubation in sedated patients with anticipated difficult airway management. Their results showed that awake intubation is possible using videolaryngoscopes.

Videolaryngoscopes are a useful alternative to fibreoptic intubation in cervical spine disease as consistently better views are seen with cervical immobilization with reduction in movement at most vertebral levels. Theoretically there are advantages in using videolaryngoscopes in the morbidly obese despite limited evidence. The major concern is the risk of desaturation as often multiple attempts are needed to insert the endotracheal tube despite good views.

In patients with upper airway trauma, bleeding and copious secretions will also distort the view, but to a lesser extent than fibreoptic scopes as the camera in videolaryngoscopes is completely enclosed.

When are videolaryngoscopes not useful?

In head and neck cancer the evidence is limited. In a large retrospective study, in patients with predicted difficult airways, the strongest predictors of failure were distorted anatomy from previous surgery, local mass and scarring following radiotherapy (Aziz et al, 2011). This suggests that videolaryngoscopes may not make intubation any easier in severe upper airway distortion caused by malignancy or extensive oropharyngeal infection. Videolaryngoscopy will clearly not be useful if mouth opening is very limited, as an interdental gap of at least 18–20 mm is required to insert even the narrow blades. Theoretically there are advantages in using videolaryngoscopes in the morbidly obese despite limited evidence. The major concern that remains is the risk of desaturation as often multiple attempts are needed to insert the endotracheal tube despite good views.

On analysis of the evidence, one problem becomes clear. There is no specific evaluation system as with traditional laryngoscopy. While a poor view has been validated as a marker for difficult intubation in traditional laryngoscopy, this does not hold in videolaryngoscopy as the primary problem lies in tube insertion. The Cormack-Lehane grade and its modifications cannot be used to evaluate videolaryngoscopes.

Conclusions

Traditional laryngoscopy will remain the core skill with which most patients are intubated. Videolaryngoscopes are useful when unexpected difficulty is encountered in intubation and for managing children with difficult airways. The applications of videolaryngoscopy in varied presentations of difficult airway have not yet been fully explored. Researchers have so far focused on examining the differences from direct laryngoscopy techniques, role in teaching and in normal airways. The next logical step is to move on to the difficult airway with more robust studies to elucidate indications and markers for failure. This would also help establish a place for these laryngoscopes in difficult airway algorithms. BJHM

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