Videolaryngoscopy: a help or a hindrance?

Airway management is fundamental to anaesthesia, and technology may help with the safety of this procedure. Videolaryngoscopy is a developing area, which is becoming commonplace in anaesthesia practice.

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The role of videolaryngoscopy

Safe airway management is fundamental to anaesthesia, with complications of airway management having serious consequences. The 4th National Audit Project (NAP4) reported that endotracheal intubation occurred in 38.4% of general anaesthesia cases in the UK, approximately 1.1 million procedures a year. Further, one death per 180 000 anaesthetics was attributable to complications of airway management, with 'room for improvement' noted in the majority of these complications (Woodall and Cook, 2011).

Direct laryngoscopy has long been the sole method used for endotracheal intubation, but the search for a better airway view lead to the first commercial videolaryngoscope being launched in 2001. Videolaryngoscopy uses a lighted miniature video camera at the tip of the blade to indirectly visualise the anatomy of the airway (Jaber et al, 2019). But is videolaryngoscopy a help or a hindrance?

Advantages of videolaryngoscopy

Evidence shows that videolaryngoscopy improves laryngeal views and, when compared with direct laryngoscopy, is associated with reduced difficulty of intubation and incidence of failed intubation (Chemsian et al, 2014).

Videolaryngoscopy eliminates the need for a direct line of sight, reducing the force applied to the base of the tongue (5–14 N during videolaryngoscopy vs 35–50 N during direct laryngoscopy). This reduces haemodynamic disturbance and soft tissue injury, while improving cervical stability (Thong and Lim, 2009).

Videolaryngoscopy is also useful for teaching. Stroumpoulis et al (2009) reported that inexperienced operators using videolaryngoscopy needed fewer than ten intubations to achieve proficiency. Videolaryngoscopy displays and magnifies the anatomy of the airway, allowing real-time feedback on the process of intubation from the surrounding team or supervisor (Chemsian et al, 2014).

Disadvantages of videolaryngoscopy

Passage of the endotracheal tube can still be difficult despite airway visualisation with videolaryngoscopy, because indirect laryngoscopy does not require alignment of the airway axis, thus the endotracheal tube needs to be passed 'around the corner' (Cooper et al, 2005).

Videolaryngoscopy can be more expensive, has a variable learning curve, weakens development or maintenance of the skill set required for direct laryngoscopy and gives a false sense of security with a potential lack of preparation for unanticipated difficulties or when a lens is obscured by fogging or secretions (Chemsian et al, 2014).

How to cite this article:
Stokes V, Dearden L, Martin A. Videolaryngoscopy: a help or a hindrance? Br J Hosp Med. 2021. https://doi.org/10.12968/hmed.2021.0363

Videolaryngoscopy outside of theatre

Currently, there is limited evidence to promote the use of videolaryngoscopy in the emergency department, intensive care unit or pre-hospital setting. However, NAP4 reported difficult intubation rates as high as 9% outside of theatre, with at least a quarter of major airway complications occurring in the intensive care unit or emergency department with poorer outcomes (Woodall and Cook, 2011).

Trials of videolaryngoscopy in intensive care units suggest that its use for every intubation cannot yet be recommended, with no improvement in first-attempt intubation rate or time. Nevertheless, it is recommended that videolaryngoscopy should be available in all intensive care units and should be considered as an option to rescue a difficult intubation or unsuccessful first pass laryngoscopy (Jaber et al, 2019).

Videolaryngoscopy in COVID-19

Airway management during the COVID-19 pandemic has raised many concerns, with tracheal intubation flagged as being high risk for aerosol production and hence transmission of the virus. Videolaryngoscopy is recommended for endotracheal intubation of patients infected with COVID-19 by the Royal College of Anaesthetists and Intensive Care Society (Cook et al, 2020), as it increases the distance between the operator's face and the patient's, provides a better view of the glottis and facilitates a quick-pass first-attempt intubation (Wax and Christian, 2020).

Conclusions

Videolaryngoscopy has quickly gained popularity as a device to assist intubation, although there is limited evidence to support its routine use outside of theatres. It has gained recognition in national airway management algorithms, but it remains necessary to maintain skills in both direct laryngoscopy and videolaryngoscopy.

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