HOT TOPIC

SHOULD VIDEO LARYNGOSCOPY BE THE PRIMARY INTUBATION TECHNIQUE IN ALL PAEDIATRIC CASES?

SUMMARY OF KEY POINTS:

- Video laryngoscopy is now recommended as the first line technique in neonates and infants (Grade 1B, joint ESAIC and BJA guideline 2024[1]).
- In older children with a difficult airway, video laryngoscopy has been shown to increase success rates compared with direct laryngoscopy.
- Multiple laryngoscopy attempts increase the rate of airway complications.

REVIEW OF EVIDENCE

The use of video laryngoscopy over direct laryngoscopy is becoming increasingly popular. It has been shown to reduce rates of failed intubation and increase first pass success in adults[2] resulting in many adopting it as their standard primary technique. The evidence supporting the use of video laryngoscopy in paediatrics has not been as strong, however more recent developments, research and guidelines show the tide could be turning.

Video laryngoscopes come in assorted styles and brands each with their own attributes. They can be categorised as: those having a blade similar to traditional laryngoscopes (e.g. Miller or Macintosh), those with a more angulated blade and those with a conduit for tube delivery. The heterogeneity of these devices makes it difficult, but not impossible, to draw conclusions from the available research. The outcomes found may be generalisable to all types of video laryngoscope or specific to a subgroup.

The paediatric population have a lower average rate of difficult laryngoscopy compared to adults (1%[3] vs 1.9-10%[4] respectively). However, the incidence of difficult laryngoscopy in those < 1 year of age is comparable at 5.4%[5]. This difficulty is unanticipated in approximately ⅕ of paediatric cases but again this rises to ⅔ of cases < 1 year of age[3,4]. See summary of difficult in intubation in table 1.

Table 1 – Summary of difficult intubation incidence

	Difficult laryngoscopy	Unanticipated difficulty
Adults	2-10% *	1 in 4 to 9 in 10*
Paediatrics		
- < 16 years	1%	1 in 5
- <1 years	5.4%	2 in 3

*Depending upon definition of difficult intubation

In the event a difficult airway is identified there are limitations to awake fiberoptic intubation in children. If an airway emergency develops there are shorter apnoea times and management is more complicated than in adults. There are several differing and more truncated algorithms which, in the event of unsuccessful management, end in a variety of front of neck options dependent on age [6]. This makes initial and successful management of paediatric airways important. Video laryngoscopy may help these issues and we will review the evidence and arguments for and against.

A Cochrane review[7] identified that video laryngoscopy increases first pass success and reduces intubation attempts and airway related complications in infants and neonates. It did not find a decreased time to intubation. This, along with other evidence, has led to the BJA and ESAIC recommending (with 1B certainty) video laryngoscopy as first line in this patient cohort [1]. Their clinical statement reads:

'Training is a mandatory and essential prerequisite for correct use of a videolaryngoscope. The use of a videolaryngoscope is warranted in anaesthesia suites, intensive care units, and emergency departments.'

It stands to reason that correct and therefore successful use of any equipment comes with practice and therefore higher utilisation will help clinically translate the benefits found in research.

In children older than one year most of the research favouring video laryngoscopy is found in children with a difficult airway by a variety of definitions. The paediatric difficult airway registry has provided data allowing retrospective analyses which has demonstrated:

- video laryngoscopy increasing first pass and ultimate success comparative to direct laryngoscopy[8]
- standard blade video laryngoscopes being more effective than those with non-standard blades for younger children[9]
- increased airway complications with repeated laryngoscopy attempts (using any device)[8]
- direct laryngoscopy first pass success is 3% in difficult cases.[8]

There are several other perceived benefits of video laryngoscopy such as facilitating teaching, communication and situational awareness of team members. If an intubator is struggling the team has an increased awareness, can see what is happening in real time and respond accordingly. These benefits are hard to measure objectively but are supported by qualitative research [10].

Not all of the evidence supports the use of video larygoscopes and critics will argue many positive studies are of low quality. A Cochrane review from 2017 found that video laryngoscopy led to prolonged intubation times and higher chances of failure when compared to direct laryngoscopy in children older than one year, albeit with very low certainty [11].

There are also situations where video laryngoscopy could theoretically fail when secretions, blood or vomitus obscure the image obtained from any device. This argument is not reflected within available research but it is perhaps difficult to measure in such specific situations. Using video laryngoscopes with standard blades allows direct laryngoscopy to be performed, with minimal adjustment, in the event the visual aids fail.

It is true that despite obtaining good glottic views with a video device it can still be difficult to pass a tube. One meta-analysis found higher failure rates with video laryngoscopy compared to direct laryngoscopy [12].

The use of video laryngoscopy is completely absent from current paediatric DAS guidelines [6]. In the algorithms, which are designed for patients between 1 and 8 years, the use of a different blade e.g miller or macintosh is the only consideration with regard to laryngoscopy. This differs from adult guidelines where video laryngoscopy is considered an alternative to direct laryngoscopy [13].

There are other considerations which may prevent widespread use of video laryngoscopy as a default technique. The first is cost with video laryngoscopes being more expensive to purchase and maintain compared to direct laryngoscopes. Secondly if differing video laryngoscopes are used dependent on department and/or hospital the proficiency of use may be reduced and further cost incurred with the associated re-training of staff.

Conclusions/

Airway management is generally safe but can rapidly deteriorate to a high risk scenario. Laryngoscopy plays a part in the deteriorating airway but more importantly may be a precipitant. In current practice video larygoscopes are certainly a crucial tool for any anaesthetist and proficiency in their use is vital in certain clinical situations, patient groups and can facilitate safe teaching.

The argument for routine use is strongest for video laryngoscopys with standard blades, as this could reduce intubation attempts (and thus complications) whilst retaining the advantages of direct laryngoscopy. Increasing use should also translate into mastery of these devices and could reduce the incidence of failed intubations overall.

Those against routine use would point out that much of the favorable research is limited to specific cohorts e.g neonates and there are even some negative signals. Routine use could also lead to deskilling at a direct laryngoscopy technique jeopardising patient safety in the long run.

It is likely technical developments will result in new devices that will outperform their predecessors and lead to clearer advantages within the paediatric population. It is to be decided if this is in the form video laryngoscopes as we know them today.

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