Editorial

Time to abandon awake fibreoptic intubation?

The older generation of anaesthetists were taught direct laryngoscopy using the Macintosh blade, blind nasal intubation using red rubber tracheal tubes and, latterly, awake fibreoptic intubation in difficult airway situations. Today's generation of anaesthetists have a much broader selection of techniques at their disposal. Advances in regional anaesthetic techniques mean that they may choose not to administer a general anaesthetic at all; if they do choose a general anaesthetic, they may elect not to intubate the trachea, but rely on a supraglottic airway device (SAD) or they may intubate the trachea using the SAD as a conduit or they may intubate the trachea using newer equipment such as a videolarygoscope. However, awake fibreoptic intubation is still widely accepted as the gold standard in the management of the known difficult airway, yet in this month's issue of *Anaesthesia*, Lee et al. present a study that advances current practice for nasotracheal intubation in patients with limited mouth opening [1]. The conventional techniques used in these cases are fibreoptically-guided nasal intubation [2], blind nasal intubation [3], or lightwand-guided nasal intubation [4, 5]. In their study, Lee et al. randomised patients with mouth opening of <3 cm undergoing maxillofacial surgery into two groups; nasotracheal intubation using a fibrescope or a Trachway®-guided technique. The Trachway is a rigid video-intubating stylet with an adjustable distal portion. They concluded that the Trachway-guided technique for nasotracheal intubation is quicker and easier compared with fibreoptic intubation. With an increase in the number of airway devices now available, alternative techniques have recently been advocated in awake and anaesthetised patients [6–8]. Therefore, we propose that it is now time to adopt these newer techniques and reserve the use of the fibrescope for specific airway situations.

Training in fibreoptic intubation

Fibreoptic intubation (FOI) is a challenging technique to learn [9], and, even when mastered, requires regular practice in order to maintain skills [10]. Fitzgerald et al. [11] in a previous issue of this journal suggested that anaesthetists may avoid performing awake FOI in patients who would otherwise be suitable for the procedure for a number of reasons: fear of causing distress to the patient; operator diffidence; the worry of procedural failure; and possible complications such as over-sedation or bleeding.

There is evidence that the initial learning curve for fibreoptic intubation is steep, with the skill being learned after ten tracheal intubations in patients with normal laryngeal anatomy under general anaesthesia [12]. Training programmes for novices have demonstrated that FOI training can be safely accomplished in anaesthetised patients [13], while others have argued [14] that training devices can help novices better appreciate and learn the technical skills required for successful FOI.

In a survey of 132 residency programmes in America, Fellows were reportedly taught FOI in 64% of programmes, however, the average number of FOI procedures performed before graduation was estimated to be less than ten in 65% of trainees [15]. The results from a survey of Canadian anaesthetists (admittedly with a relatively low response rate of 47%), showed that, in a theoretically difficult tracheal intubation scenario, 45% preferred the lighted stylet, with only 26% preferring the fiberscope, which seems to imply that trainees are reluctant to use this technique [16]. Heidegger et al. [17] suggested that FOI is best accomplished by those clinicians who use it in their daily practice, and Difficult Airway Society (DAS) members revealed how they were equally divided

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when it came to choosing between training in an awake FOI technique and training in videolaryngoscope use, despite fibrescopes being much more readily available than videolarygoscopes [18].

NAP4

The 4th National Audit Project (NAP4) [19] reported 18 cases (mostly anaesthetised by consultants) where the expert reviewers thought that an awake FOI might have offered advantages over airway management under general anaesthesia, and 15 cases where awake FOI was unsuccessful. They also reported that fibreoptic intubation under general anaesthesia was attempted in 20 cases, with 13 failures. These findings suggest that even experienced anaesthetists avoid awake FOI when it may be indicated, and choose fibreoptic intubation under general anaesthesia in patients with anticipated difficult airways, but also fail in this. Awake FOI is a procedure that necessitates experience with equipment, an understanding of airway endoscopic anatomy, and requires proficiency in providing effective local anaesthesia and sedation. The threshold for adopting awake FOI relies on the competence and confidence of the anaesthetist performing the procedure. It is likely some anaesthetists do not have the skills or confidence required to perform awake FOI and, for others, it may be difficult to maintain these skills.

Improved imaging techniques

Nørskov et al. [20] demonstrated that 93% of difficult tracheal intubations could not be predicted when routine bedside airway assessments were made. Recently, however, there has been an increase in the use of accurate pre-operative assessment tools such as nasendoscopy, virtual endoscopy and ultrasound [21–23], which contribute to better imaging and assessment of the difficult airway. These techniques help in pre-operative assessment and provide an improved overall picture of the airway, reducing the unknown elements and hence allow for more familiar techniques to be used safely.

Airway management under general anaesthesia

The administration of oxygen via nasal cannulae during conventional laryngoscopy or videolaryngoscopy extends the duration of safe apnoea [24–26], and is effective even in obese patients. For example, Ramachandran et al. [27] simulated difficult airways in obese patients and found that supplemental oxygen administration was associated with a significant increase in the duration and frequency of oxygen saturations >95% after induction of anaesthesia and neuromuscular blockade. Newer techniques such as THRIVE [28], where apnoeic oxygenation is combined with positive pressure ventilation through the delivery of trans-nasal high-flow warmed and humidified oxygen, have been shown to extend the apnoea times of patients with difficult airways. This has the potential to allow continuous oxygenation of the patient (provided the airway is patent) during airway management, where techniques such as videolaryngoscopy can be more safely employed. Alternative techniques for oxygenation during difficult laryngoscopy have also been suggested [29, 30], that do not require removal of the videolaryngoscope.

The widespread use of sugammadex [31, 32] facilitates almost immediate reversal of neuromuscular blockade following administration of rocuronium (and to a lesser extent, vecuronium). This also contributes to the safety of airway management during general anaesthesia, and allows the patient to regain consciousness with muscle tone.

Second generation supraglottic airway devices (SADs) with a gastric drain tube are recommended as a rescue device during failed tracheal intubation in obstetric patients [33]. They are relatively easy to insert, have higher oropharyngeal seal pressures and possibly reduce the risk of aspiration [34–36]. Cook [37] recently demonstrated that second generation SADs out perform first generation devices in terms of efficacy and are more suited for advanced uses such as rescue devices following failed rapid sequence induction and for tracheal intubation through the SAD. He also suggests that second generation devices should be used in routine practice, as this would enable anaesthetists to become more proficient and experienced and ensure that, when advanced use is required, anaesthetists feel comfortable. Certainly, second generation SADs can be used as rescue devices in failed tracheal intubation situations, either for oxygenation or as a conduit to

aid tracheal intubation [38–40], but we believe that blind tracheal intubation attempts cannot be recommended, and only fiberscope-guided techniques, or in combination with an Aintree Intubation Catheter (Cook Medical Inc, Bloomington, IN, USA) [41], should be attempted.

With the development of these devices and drugs, there is a strong argument that the improved safety they provide during difficult airway management under general anaesthesia reduces the need to rely on an awake FOI technique.

The rise of the videolaryngoscope

The availability and use of videolaryngoscopes (VL) is increasing [18]. Studies that included both novices and experienced anaesthetists have suggested that approximately 20 uses are required in order to gain competence with an individual VL [42]. This can be achieved in a relatively short period of time and the skills can be maintained. NAP4 mentions the theoretical benefit of VLs in converting 'blind' intubations into 'visualised' tracheal intubations [43]. Indeed, there is growing evidence that VLs are more effective than conventional laryngoscopy using a Macintosh blade [44–47].

Awake FOI has also been challenged by videolaryngoscopy. Rosenstock et al. [48] compared FOI with the McGrath VL for awake oral tracheal intubation in adult patients with an anticipated difficult intubation. There was no difference found between the two techniques in time to intubation or success rate. Zaouter et al. [49] have gone so far as to suggest that VLs should be used for all tracheal intubations and replace direct laryngoscopy. However, concerns have been raised, as with the increasing availability of this new technology, there is a risk that trainees will progressively lose their skills in conventional laryngoscopy [50]. In addition, the process of placing a tracheal tube with a VL can take longer than conventional laryngoscopy [51], and is another argument against the use of VL for all intubations. But there is an increasing body of evidence to support the use of VLs in unanticipated, difficult, or failed intubations compared with direct laryngoscopy [52–54]. Provided these devices are readily available, operators are competent in their use and they are shown to be effective in difficult airway scenarios, then they will be used more often compared with the less familiar and more technically complicated technique of awake FOI.

It must be noted that there are a bewildering array of VLs available [55], with different user interfaces, blade shapes and blade and tracheal tube insertion techniques. A trainee may become proficient using one type of VL only to find it unavailable at a subsequent hospital due to local preference or financial constraints. Their shorter working week and reduced training opportunities may also result in a lack of experience with different VLs. However,, we believe that the knowledge and clinical skills required to master videolaryngoscopy can be acquired and embedded.

In conclusion, provided accurate pre-operative imaging has been obtained and a multidisciplinary discussion has taken place, then awake FOI performed by a competent operator still has a role. If an airway is unexpectedly difficult, it is more prudent to use a technique that is more familiar to the anaesthetist, and there is growing evidence that this is more likely to be a videolaryngoscope. We believe that awake FOI is increasingly becoming obsolete in the management of difficult airways and should not now be considered the 'gold standard' for managing the difficult airway.

Competing interests

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