Awake intubation for anaesthesia and the emergency department

Prof. Adam Law

Awake tracheal intubation (ATI) continues to be recommended when significant difficulty is predicted with airway management (1-3). ATI can be defined as tracheal intubation of patients who are maintaining their own gas exchange, airway patency and protection of the lower airway against the aspiration of foreign material during the process. ATI can be thought about in its component parts: patient selection (i.e., who needs it?), topical airway anaesthesia, use of adjunctive systemic medications and the awake intubation itself. Patient selection has been addressed in an earlier talk and its accompanying abstract.

Topical airway anaesthesia for ATI can be effectively applied in many ways. Blocks can also be used. Using more concentrated formulations of lignocaine will help with obtaining good conditions for ATI – e.g., 2% or higher. The DAS ATI guidelines (3) suggest a maximum dose of 9 mg/kg of lignocaine for ATI (importantly, based on lean body weight), but the least amount of drug consistent with good conditions should be used. For orotracheal ATI, I use a 3-step approach, beginning with direct application of 5% lignocaine ointment to the back of the tongue. The second step involves use of an atomizer to deliver lignocaine to the larynx and upper trachea. The atomizer, which delivers large droplets, is powered by 6-8 litres/minute of oxygen. I deliver three instillations orally, each timed with slow, deep patient inspirations, then allow a break. I do this series of 3 instillations twice more, during a total of 9 deep breaths. A third step involves use of Jackson crossover forceps to hold a lignocaine-soaked cotton swab in the piriform recesses, 45 seconds on each side. For the latter two steps, I use 3% lignocaine, concocted myself by mixing equal volumes of commercially available 2% and 4%. This 3-step regimen usually results in very good conditions.

Systemic medications should be judiciously used, and only with specific objectives in mind. Glycopyrrolate can be used to help dry the oropharyngeal mucosa; anxiolysis and sometimes amnesia can be obtained with benzodiazepines such as midazolam, and most importantly, low dose narcotics by bolus or infusion can help attenuate airway reflexes and reactivity to the passage of a bronchoscope and/or tracheal tube. I regard sedation, *per se,* to be a side effect of some of the foregoing medications, and not always a desirable one: having a relatively alert and compliant patient will help with application of topical airway anaesthesia.

Flexible bronchoscopy (FB) is most often used for ATI, although some clinical trials have compared use of hyperangulated blade videolaryngoscopy (VL) with FB for the purpose. These studies have generally concluded that *in their selected study populations*, first attempt success and failure rates are equivalent, but that VL-aided ATI takes less time (4). However, some large-scale retrospective database studies suggest that real-world success rates with VL-aided ATI may be lower than that facilitated by FB (5, 6). Furthermore, many of the most challenging difficult airway anatomic presentations will require a nasotracheal

approach, leaving only the option of FB use. Thus, it is important to retain skills in the use of FB for ATI, meaning that the clinician should seek opportunities to use FB for the purpose, rather than avoiding it, to help maintain competence with the device.

Adverse events can occur during attempted ATI. These were recently studied and listed in a retrospective database study (6). Fortunately, the two most frequently occurring adverse issues are potentially preventable. The first related to cough and laryngeal reactivity during ATI (potentially preventable by use of an effective topical airway anaesthesia regimen) and the second was the need to change to a smaller or different endotracheal tube – again, potentially preventable, e.g., by ensleeving a relatively smaller sized tube over a relatively larger bronchoscope, thus minimizing any gap between the inner aspect of the tube and the outer aspect of the FB.

ATI in the operating theatre has very good published success rates – i.e., a 98-99% ultimate, and 84% first attempt success rate (5-8). However, these success rates may be challenged going forward, as the general use of ATI appears to be dropping (6), perhaps due to increasing use of, and confidence in videolaryngoscopy after the induction of general anaesthesia (my speculation only). In addition, there is wide variability in individual clinicians' use of the technique (5, 8): despite a similar practice profile, some clinicians may be reticent to use ATI, compared with their colleagues. In that ATI continues to be a necessary skill for some presentations of the difficult airway and/or dangerous patient physiology, causes of such reticence must be identified and addressed, and meanwhile, airway managers should be on the lookout for opportunities to perform ATI, to help with skills maintenance.

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Awake tracheal intubation (ATI) in the emergency department is relatively uncommon occurring in approximately 4 in 1000 patients requiring intubation. This data from the NEAR registry reported two thirds of these cases are done because of upper airway pathology (angioedema, infection) with a success rate of 85%. 78% were performed with

a flexible endoscope, of which a majority used a nasal route. Complications included a 10% incidence of non-critical hypoxemia and hypotension in 2.5%. As an uncommon event emergency physicians may have an opportunity to perform ATI once every several years. Skill acquisition and maintenance is therefore a challenge for this high acuity low opportunity event (HALO). Additionally, it is assumed that critically ill patients will be uncooperative and therefore when faced with an anticipated difficult airway, the provider may opt for what they are familiar with and perform an RSI with a double set-up front of neck airway.

The default approach for airway management of critically ill patients in the emergency department has been rapid sequence intubation. Registry datasets report first pass success rates of 85-95%. While these numbers are high compared to similar data from ICUs, the incidence of adverse events including critical hypoxemia (SpO_2<80%) and hypotension (SBP<65mmHg) is significant. Up to 3% of critically ill patients may suffer from a cardiac arrest in the post-intubation period. Some of these adverse events can be mitigated through adequate resuscitation before intubation is attempted. Aggressive pre-oxygenation, volume resuscitation, early initiation of pressors, induction dose reduction, ventilation and apnoeic oxygenation throughout the procedure will reduce adverse events. However, for some critically ill physiologically compromised patients, avoiding sedatives and allowing the patient to maintain spontaneous respiratory effort during an ATI may be the safest strategy. Additionally, this provides clinicians more experience in performing this otherwise rare procedure, potentially improving their chances for success when faced with an anatomically challenging case.

The term awake is perhaps a misnomer particularly for patients presenting in the ED. An awake intubation is one that is performed on a spontaneously breathing patient and facilitated primarily using topical anaesthetics. It can be performed successfully with little to no sedation even in critically ill patients. Ketamine is the agent most used to address the patient's ability to cooperate. It should not be used routinely and may paradoxically create more challenges in performing an ATI. Ketamine facilitated intubation has been described for decades and yet there remains little evidence to support this approach. It may have a niche role where an RSI is relatively contraindicated and a double set-up FONA will not rescue the patient's condition and an awake topical approach has either failed or is not possible. The concern with the resurgence of ketamine as a single agent for facilitating intubation is that it will become a dumping ground for those uncomfortable with performing an RSI and unskilled in performing an awake intubation. Sedation only intubation in general performs poorly when compared with RSI and ATI. A tool-box needs more than one tool to be useful at the jobsite. Get the tools, acquire, and maintain the skills to use them.