Have technological advances decreased our clinical skills?

Dilip Pawar
Department of Anaesthesia, All India Institute of Medical Sciences, New Delhi, India

ABSTRACT

In recent years, we have seen a surge in introduction of newer devices with new technology for management of difficult airway. These devices have made our management procedures easier and safer. In the absence of availability of these devices earlier, anaesthetists had developed specific clinical skills to manage these situations, which have been passed on from one generation to the other as table side teaching. These skills have served us well all these years. Do we still need them when the new devices are available to us? Probably yes! Because the newer devices are not failsafe and may fail to achieve to secure the airway sometimes. They are expensive and may not be affordable for most of our institutions and may not be available in all the hospitals in our country. These devices are new addition to our armamentarium, not as substitute but a complement to our clinical skills. Now, the question is how the usage of these devices has affected our clinical practice pattern and do these devices have any limitations? Let's try to understand.

Key words: Airway skills, difficult airway, video-laryngoscopes

INTRODUCTION

Laryngeal mask airway was introduced by Archie Brain in 1983.[1] It has been considered a revolutionary piece of equipment along with pulse oximeter, which has contributed to safe anaesthesia in the last few decades. It has proven to be a useful device in securing of airway in an emergency and has become a part of the difficult airway management strategy.[2] It is an effective device to maintain ventilation in spontaneous or controlled mode as well as an effective conduit for intubation. It is easily inserted blindly and requires a low level of skill as compared with mask ventilation or endotracheal intubation.[3] So much so that it has practically replaced usage of endotracheal tube in over 70% of routine cases in many hospitals. In the Children's Hospital, Vancouver, it is used in over 90% of their cases. In my recent visit there I was very impressed by this, but my anaesthetist friends however mourned over the dying clinical skills like mask holding and intubation, especially among the new trainees.

Flexible fibreoptic endoscopy has become the gold standard in the management of difficult airway. It has the advantage of providing a direct approach to the nasal and oral cavity to visualise and evaluation of the airway structures including larynx. It is a versatile technique where the flexible equipment conforms to a variety of abnormal airway and does not require extensive head and neck manipulation. It is also well tolerated by spontaneously breathing patients. However, the equipment is fragile and expensive. It needs a high level of skill and training for efficient use. It has limited use in the presence of blood and copious secretions. And, it can fail. Ng et al.[4] reported a case where they failed to visualise the larynx through the fibreoptic bronchoscope for over an hour when they decided to resort to blind nasal intubation and guided the endotracheal tube close to the larynx guided by maximum breath sound produced by airflow. Then, they could visualise the larynx through the endoscope.

With recent advances in video technology, many video-laryngoscopes have been designed[5] either by incorporating a camera to the laryngoscope blade (Glide scope or Storz video laryngoscope) or constructing prisms and mirrors (Airtraq and Trueview). In a
meeting that I recently attended, I heard someone mentioning that there are around 50 devices available! It is an attractive modality for difficult intubation because of its similarity to intubation with a standard laryngoscope.

However, video laryngoscopy is not a panacea for difficult airway management, and several limitations have been noticed. Most of these devices are primarily designed for orotracheal intubation and some mouth opening is required to allow the passage of the device; therefore, these devices have limited use in cases with restricted mouth opening. In the presence of blood and secretions, visualisation becomes poor. Sometimes, there is difficulty with tracheal tube placement despite an excellent view of the glottic opening.

With increasing use of these new technological devices, we tend to use our clinical skills lesser. As a result of this, we gradually lose the art of these techniques, which is detrimental in our day to day clinical practice as well as special situations when these devices fail. The tendency of believing that these devices can provide remedy in all situations is ignorance. They have their limitations and can fail when we have to resort to our good old clinical skills.

What are these clinical skills? We do not often debate about these in academic fora and they are usually passed down from one generation to another during operation theatre table side practical teaching.

(i) Mask holding: In proper mask holding, one has to be extra careful not to displace the submandibular soft tissue with one’s supporting fingers. Otherwise, it would push the tongue up to cause obstruction of the airway.

(ii) Anterior jaw thrust: This is an important anatomical manipulation of the jaw to push forward the tongue away from the oropharynx and thereby relieve airway obstruction. To maintain patient airway, this technique can be used during mask holding at induction as well as recovery.

After extubation, often, infants hold their breath or develop laryngospasm. By using this simple manipulation, respiration can be stimulated to initiate the breath and a laryngospasm can be prevented or even broken with application of deep pressure behind the angle of mandible over the stylet process (laryngospasm notch).

(iii) External laryngeal manipulation: This is a technique by which pressure is applied over the larynx to maneuver it so that it comes in line with the operators view while visualising the larynx. This maneuver has special importance in visualisation of larynx in infants as their larynx is placed superiorly and anteriorly, and it can be achieved by the little finger of the anaesthetist or an assistant. In a difficult situation, when the larynx needs gross manipulation for clear view, it is better for the person viewing the larynx to manipulate and a second person advances the endotracheal tube. This simple two-person technique of intubation can manage to secure the airway in so many difficult situations.

(iv) Blind nasal intubation: With the availability of fibreoptic bronchoscope and other new technological devices for management of difficult airway, we have forgotten the art and science of blind nasal intubation. However, these devices have their own limitations, and blind nasal intubation may come to the rescue as in the case reported by Ng et al.

The technique requires vasoconstriction of the nasal passage and topical analgesia of the airway, mild sedation in adults and general anaesthesia in children. Patient’s spontaneous respiration is maintained till the airway is secured. In children and uncooperative adults, anaesthesia is maintained on spontaneous breathing by insufflation through a nasal airway. Head is positioned as for rigid laryngoscopy. The endotracheal tube is advanced by guidance of listening to maximum breathing sound produced by air flow, fogging of the tube or end tidal carbon dioxide tracing. Manipulation of the larynx with two fingers over the thyroid cartilage maintains its midline position and renders it less mobile. The fingers can also feel the tip of the tube when advanced to either of the vallecula and maneuver the tube, neck and head to bring it to midline to align with the laryngeal position. A rigid tube like red rubber or polyvinyl chloride (PVC) tube (when dipped in iced water or kept in the ice box for a while) ensures successful placement.

Is blind nasal a blind procedure? Yes, we do not see the progress of the endotracheal tube while advancing. If the operator can visualise a three-dimensional mental picture of the nasal and oral cavity, can appreciate the resistance offered by various tissue of the nasal and oral
cavity, it is possible to appreciate the exact position of the endotracheal tube (ETT) in relation to the oral cavity and larynx.

(v) Retromolar/paraglossal intubation: The open space behind the molars has been effectively utilised to facilitate passage of endotracheal tube in this technique. When the classic rigid laryngoscopy fails to view the larynx, this technique might allow the view. When mouth opening is not restricted but the space availability is limited, say with a growth in the oral cavity or tongue, or the mandible is small, this technique could be useful.

In this technique, the laryngoscope blade is advanced in the space between the tongue and the lateral pharyngeal wall. Hence, the tongue is bypassed and there is no need to displace the tongue laterally and into the submandibular space. The blade is advanced till the epiglottis and/or larynx is visualised. If the larynx is not visualised, the head can be rotated to the opposite side and the blade kept lateral to improve the view. An assistant might pull the corner of the mouth to increase space for endotracheal tube maneuvering. Use of a stylet with a hockey stick-like configuration helps in tube manipulation as, often, the laryngeal view is not the frontal view but a lateral view. A gum elastic bougie can be used if only the epiglottis is in view. A straight blade is helpful in that it does reduce the need of soft tissue displacement and compression. Bonfil endoscope initially developed for the Pierre Robin syndrome children uses this approach. Sen et al. have shown that it can be used in routine practice in cleft palate cases with an equally good outcome.\(^6\)

These skills have stood the test of time and have served us well all these years. New technology is posing a challenge to their survival. In spite of availability of newer technology, one must appreciate that no technique is 100% effective. One must acquire and master many skills to manage airway so that in a difficult airway situation, one can choose or move from one technique to the other. To continue to persist with one technique rigidly is not in the best interest of the patients. One should have the ability to adopt based on one's clinical experience. For the benefit of our patients, while we adopt the best of new technology, we should try to preserve the best of clinical skills.

REFERENCES

1. Brain AI. The laryngeal mask airway: A new concept in airway management. Br J Anaesth 1983;55:801-4.
2. Benumof JL. Laryngeal mask airway and the ASA difficult airway algorithm. Anesthesiology 1996;84:686-99.
3. Brimacombe J. The advantages of the LMA over the tracheal tube or facemask: A meta-analysis. Can J Anaesth 1995;42:1017-23.
4. Ng A, Vas L, Goel S. Difficult paediatric intubation when fibreoptic laryngoscopy fails. Pediatr Anesth 2002;12:801-5.
5. Holm-Knudsen R. The difficult pediatric airway: A review of new devices for indirect laryngoscopy in children younger than two years of age. Pediatr Anesth 2011;21:98-103.
6. Sen I, Kumar S, Bhardwaj N, Wig J. A Left paraglossal approach for oral intubation in children scheduled for bilateral orofacial cleft reconstruction surgery: A prospective observational study. Pediatr Anesth 2009;2:159-63.

Source of Support: Nil, Conflict of Interest: None declared