A standard definition of difficult airway is taken from ASA practice guideline as “…the clinical situation in which a conventionally trained anaesthesiologist experiences difficulty with face mask ventilation of the upper airway, difficulty with tracheal intubation or both”.

Difficulty with airway management a major concern for anesthesiologists and failed intubation is the single most important cause of major anesthesia-related morbidity and mortality. In order to provide an adequate airway protection and ventilation, anaesthesiologists have to focus their attention on patient history of documented difficulties with general anesthesia, intercurrent diseases or congenital syndromes that influence airway management (1) (table 1).

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<th>Table 1</th>
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<td>Down</td>
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<td>Large tongue, small mouth make laryngoscopy difficult; small subglottic diameter possible</td>
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<td>Laryngospasm frequent</td>
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Goldenhar (oculoauriculo-vertebral anomalies)
- Mandibular hypoplasia and cervical spine abnormality
- Make laryngoscopy difficult

Klippel-Feil
- Neck rigidity because of cervical vertebral fusion

Pierre Robin
- Small mouth, large tongue, mandibular anomaly; awake intubation essential in neonate

Turner
- Laryngoscopy difficult
- High likelihood of difficult intubation

Successful management of a difficult airway begins with recognizing the potential problem and all patients should be examined to anticipate a possible difficult airway. Physical examination allows evaluation of pathological conditions that could adversely affect ventilation.

Four basic problems may occur alone or in combination
- Difficult ventilation
- Difficult intubation
- Difficulty with patient cooperation or consent
- Difficult tracheostomy

The most critical situation occurs after induction of general anaesthesia (GA) when spontaneous ventilation is abolished from administering a muscle relaxant. The life-threatening situation happens when the anesthesiologist “cannot intubate and cannot ventilate”.

The predictive criteria for difficult airway management and difficult intubation are mainly morphometric such as mandibulo-hyoid, thyromental and sternomental distances (2) the flexion-extension mobility of the cervical vertebrae (3) (4) the mobility of the mandible associated with temporo-mandibular joint (5). Mallampati (6) suggested that the size of the base of the tongue is an important factor in determining the degree of difficulty of direct laryngoscopy. He developed a preoperative grading system which involves ability to visualize the faucial pillars, soft palate and base of uvula.

The definition of difficult laryngoscopic tracheal intubation is based on the best laryngoscopic view and the number of laryngoscopy attempts. The view at laryngoscopy was graded in the following manner: grade 1 if part of the vocal cords is visible, grade 2 if only the arytenoids are visible, grade 3 if only the epiglottis is visible, and grade 4 if the epiglottis is not visible (6,7)
Based on current literature laryngoscopic intubation is difficult in 1% - 4% and impossible in 0.05% - 0.35% of patients who have seemingly normal airways (1).

The principal advantage of regional anaesthesia techniques is the possibility of blocking nociception from the surgical field to the central nervous system and hence the phenomenon of the Wind-Up. With long acting local anaesthetics it is possible to abolish post-operative pain. Moreover, we are now able to place catheters providing the possibility of prolonging the surgical block and control of postoperative pain.

The choice of regional anesthesia techniques is based on several factors, such as the site and the kind of surgery, patient acceptance, local infection, and uncorrected hypovolemia. Other issues are pre-existing neurological disease, coagulopathy, bacteremia, pulmonary disease, mental status, postoperative pain management, the anaesthesiologist’s experience, and the anticipated difficulty of the procedure itself (9).

The anticipated technical difficulties and the success rate are other factors that can affect the decision of the anaesthetist to use a regional anaesthesia technique in a patient with a difficult airway. Problems during the procedure include patient dissatisfaction, neurological sequelae, and local or spinal haematoma.

Anaesthesiologists must inform the patient about the risks and the related adverse outcome associated with difficult airway management and general anaesthesia. It is important to explain to the patient that regional anaesthesia may represent a valid alternative, making clear that, in case of unsuccessful block, the regional technique can be converted anyway to general anaesthesia.

Therefore it is mandatory in all cases of anticipated difficult airway management to consider the balance between four different factors.

1) Technique’s success rate
2) Minor or major surgery
3) Patient position during surgery and duration of the operation
4) Intraoperative complications

For minor and intermediate surgical procedures, in patients with anticipated difficult airway it is safer, whenever possible, to choose peripheral nerve blocks. In relation to the site of surgery, upper limb nerves can be blocked with various techniques. A high success rate (95%) has been reported by Carles in 1417 patients undergoing upper limb surgery with a brachial plexus block at the humeral canal (1468 blocks) and by Koscielnik-Nielsen Z (11, 12). To achieve this, it is necessary to perform peripheral nerves blocks with the aid of a nerve stimulator. Of note, interscalene blockade has major complications such as phrenic nerve paralysis (13) or pneumothorax (14).

The lower limb can be completely anaesthetized with multiple peripheral nerve blocks. For these reasons in unilateral procedures the choice ranges from peripheral to central nerve blocks. For bilateral surgery, central block is of course preferred. Central nerve blocks include spinal, epidural and combined spinal-epidural anaesthesia.

Many papers highlight that the percent of success of spinal anaesthesia for the planned surgery, ranges from 97 to 100% of cases, and the density of the block is so deep that it is one of the favourite techniques by the patients (98%) (15,16).

The percent success of epidural anaesthesia ranges from 84-91%, and is affected by several factors, such as patient characteristics, type of surgery, skill of the anaesthetist (17,18,19). In patients with difficult airway for short surgical procedures, one technique is unilateral spinal(14).

For short bilateral surgery the first choice technique is the spinal. In patients with difficult airway it is important to avoid high sensory and sympathetic block, with resulting hypotension and bradycardia. Therefore we must give a dose of local anaesthetic appropriate to the patient’s age and height and avoid patient movement until the local anaesthetic has fixed to the nerve roots.

Regarding peripheral nerve block, several studies support the choice of multiple nerve stimulation with a nerve stimulator, compared with single injection nerve block. It should be pointed out that complete success (i.e., block of all components as opposed to block adequate for surgery) can now be obtained in ≈ 95% of cases (11). Fanelli et al demonstrated in a prospective study in 3994 patients that the use of the multiple nerve stimulation technique allowed a success rate of 93% for axillary block and 94% for sciatic femoral block (20). In regional anaesthesia of the lower limb percent success of the block is spinal > peripheral nerve block > epidural.
The choice of anaesthesia technique is based not only on the percent of success of the technique, but also on patient position during surgery. The use of lateral or prone position requires attention to the airway. These positions are uncomfortable and troublesome for the patient and may become intolerable for the patient. GA may be required, using a laryngeal mask airway. The devices of choice for protection of the airway are the LMA classic, LMA Fastrack, and the LMA-ProSeal. For major surgery with high expected blood losses or requiring lateral and/or prone position, protection of the airway is usually preferred in every case.

In conclusion, an anticipated difficult airway is not a contraindication to the use of regional anaesthesia techniques. Optimum anaesthesia management mandates individualised assessment of the risk/benefit balance.

REFERENCE

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