DIFFICULT INTUBATION

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Difficult intubation occurs relatively commonly in association with general anaesthesia. Its true incidence is unknown but is estimated to be 1–3%. Approximately half of all cases are not predicted. A difficult intubation can be anticipated in a number of circumstances including a previous history of difficulty with intubation, syndromes known to be associated with difficulty to intubate, and some pathoanatomical states involving the head and neck region. Less reliable are anatomical characteristics which may be sought at preoperative assessment including interincisor distance, Palm print and prayer's signs, head extension degree, thyromental distance and the relative tongue/pharyngeal size (Mallampati test).

Inter-incisor distance

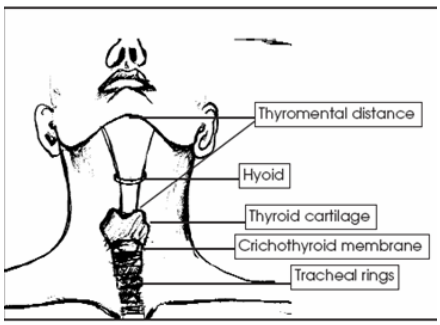
Inter-incisor distance with maximal mouth opening
< 3 cm: difficult laryngoscopy
< 2 cm: difficult LMA insertion

Other ways to anticipate difficult intubation in diabetics and patients with rheumatoid arthritis are the palm print and prayer signs.

Palm Print Test*:* The palm and fingers of the dominant hand of the patient is painted with black writing ink using a brush. The patient then press the hand firmly against a white sheet of paper on a hard surface. Scoring is done as: Grade 0: All phalangeal areas visible. Grade1: Deficiency in the inter-phalangeal areas of 4th and/or 5th digit. Grade2: Deficiency in the inter-phalangeal areas of 2nd to 5th digit. Grade 3:Only the tips of digits seen.

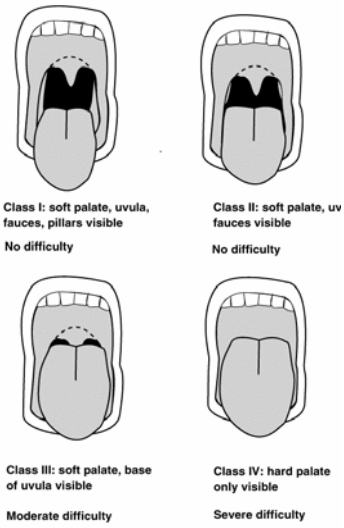
The prayer's sign: Patients with stiff joints syndrome have difficulty in approximating their palms and cannot bend their fingers backwards.

Thyromental distance: The thyromental distance is the inframental distance anterior to the larynx which determines how easily the laryngeal and pharyngeal axes will fall into line with atlanto-occipital extension. A distance of 6 cm (approximately three finger breadths) suggests laryngoscopy may be difficult.



Wilson scoring system: Wilson and colleagues found five useful risk factors, The risk factors identified were as follows: Weight; Head and neck movement; Jaw movement (mandibular protrusion, inter-incisor gap); Prominent maxillary teeth (‘‘buck teeth’’); Receding mandible.

Mallampati test: Mallampati and colleagues described clinical signs to predict difficult intubation: The patient sits upright, head in the neutral position. The mouth is opened as widely as possible and the tongue is maximally protruded, without phonating. The observer sits opposite at eye level and inspects the pharyngeal structures. The airway is classified according to the structures seen. Mallampati described three grades, but the commonly used assessment consists of four grades as modified by Samsoon and Young. The four grades are as follows: (I) soft palate, fauces, uvula, pillars; (II) soft palate, fauces, uvula; (III) soft palate, base of uvula; (IV) soft palate not visible at all. It should be noted that a class I view nearly always predicts easy intubation and a class IV view a difficult intubation. Intermediate classes (II and III) are associated with a wide range of degrees of difficulty with intubation.



If the anaesthetized patient cannot breathe spontaneously or the lungs cannot be otherwise ventilated by mask, then a series of manoeuvres must immediately be undertaken ending if necessary, in gaining direct transtracheal access to the airway.

REMEMBER, PATIENTS DO NOT DIE FROM FAILED INTUBATION – ONLY FAILED VENTILATION

Always have skilled assistance, preferably another anesthesiologist, when difficulty is expected or the patient's cardiorespiratory reserve is low.

MANAGEMENT

Call for skilled assistance. Call for the difficult intubation trolley. Maintain oxygenation at all times. Have someone feel the pulse and call out the SpO_2. If you can ventilate by face mask, consider waking up the patient OR maintaining anesthesia and trying to intubate.

Try basic maneuvers first: Optimize the head and neck position. Try glottis visualization maneuvers. Try a well-lubricated gum elastic bougie or stylet. Try different laryngoscope blades.

If these fail: Consider inserting laryngeal mask airway (LMA). Consider other techniques: Blind nasal and Retrograde Lighted stylet.

If an LMA is in place, consider whether to proceed and whether steps should be taken to secure endotracheal intubation. Confirm correct placement of endotracheal tube.

Further care: Review the situation. Exclude other complications. There is a risk of awareness. Go and see the patient in the ward. Explain again and reassure them. Advise them to warn future anesthesiologists.

Notes:

Techniques will vary with the experience and familiarity with the techniques of the individual anesthesiologist.

Avoid multiple attempts at laryngoscopy/intubation, as this may cause bleeding and laryngeal oedema, worsening the situation. This may require 2 assistants: one to apply pressure to the larynx and/or the back of the neck, the second to lift the head up.

Glottis visualization can be optimized by laryngeal manipulation which can be performed using three different maneuvers: External Laryngeal Manipulation (ELM), the Backward, Upward, Rightward Pressure (BURP) and cricoid pressure (Sellick) maneuver. Cricoid pressure and BURP are commonly used for airway management but several studies have showed that cricoid pressure or BURP might worsen laryngeal visualization, ELM is designed to improve laryngeal view with the cooperation between the anesthesiologist and the assistant during direct laryngoscopy.

The most common aid to facilitate successful intubation in the AIMS series was the gum elastic bougie (46%), followed by a stylet (23%).

The LMA is easy to insert and works well in about 95% of cases. It does not provide airway protection.

Airway trauma, pulmonary aspiration, post-obstructive pulmonary oedema and cardiovascular signs and symptoms.

Provide written advice and document this in the medical record.

Document the problem in the case notes and give the patient a letter to warn future anesthesiologists. If a particular precipitating event was significant, or a particular action was useful in resolving the crisis, this should be clearly explained and documented.

Pediatric airway is grossly different from adults. They have proportionately large head, the larynx is situated more cephalad, the tongue occupies a proportionately large part of oral cavity, epiglottis is large, floppy and difficult to lift using conventional laryngoscopic technique. The main concern during tracheal intubation in children is to use age-appropriate equipment and position for laryngoscopy in order to obtain good view of the glottis and perform safe and successful intubation. An optimal view of the glottis can be obtained using the anesthesiologist own left little finger for patients in whom the epiglottis could not be visualized with standard laryngoscopy to improve the laryngoscopic view.

Factors contributing to intubation difficulty

Obesity. Limited neck mobility. Limited mouth opening. Inexperience of laryngoscopist. Inadequate assistance. Drug errors. Poor/prominent dentition. Equipment deficiencies. Laryngeal tumour. Recent traumatic intubation. Neck mass

Masseter spasm. Cervical spine instability, facial carcinoma, congenital microsomia, ruptured trachea, and hair in a ‘‘bun’’ were also reported.

Complications of difficult intubation

Arterial desaturation. Esophageal intubation. Central cyanosis. Regurgitation. Bronchospasm. Laryngospasm. Dental damage. Endobronchial intubation. Epistaxis. Pharyngeal trauma. Awareness. lacerated tongue. oesophageal tear. Cardiac arrhythmias and electrocardiographic signs of ischaemia, bigeminy and supraventricular tachycardia. Cardiac arrest.