


Difficult Airways

Airway Grading and the Endotracheal Tube Introducer



Use the navigation buttons to move through the program

Determining a Difficult Airway


Step 1

Obtaining the patient's history

Certain conditions in and of themselves can lead to difficulty when trying to obtain an airway. These conditions must be taken into consideration to determine the equipment and technique to be used for obtaining endotracheal intubation.

Step 1

Obtaining the patient's history




Pierre-Robin Syndrome

characterized by **micrognathia** (small lower jaw), cleft palate, and **glossoprosis** (the tongue tends to fall back and downwards). Feeding and breathing difficulties are often present in varying degrees of severity.


Treacher-Collins Syndrome

characterized by **hypoplasia** of the facial bones, especially the zygoma and the mandible. Facial clefting causes a hypoplastic appearance, with possible deformities or deficiencies of the ear, orbital, midface, and lower jaw regions. The clinical appearance is a result of the zygoma (malar bone) failing to fuse with the maxilla, frontal, and temporal bones.



Step 1

Obtaining the patient's history




Goldenhar's Syndrome

Characterized by unilateral or bilateral underdevelopment of the Mandible, **Microtia**, unilateral or Bilateral reduction in size and flattening of the Maxilla (upper jaw), narrowing of the opening of the eye.


Downs Syndrome

Down syndrome the most common and best known chromosomal disorder in humans. Mental retardation, **dysmorphic** facial features, and other distinctive traits characterize the syndrome



Step 1

Obtaining the patient's history




Goiter

Enlargement of the thyroid gland caused by inadequate thyroid hormone production, insufficient iodine in the diet or can be idiopathic. Goiter can lead to compression of the trachea and deviation of the larynx / trachea.


Croup

Croup is a generic term that encompasses a heterogeneous group of relatively acute conditions (mostly infectious) that are characterized by a syndrome of distinctive brassy coughs and laryngeal edema.



Step 1

Obtaining the patient's history




Abscess

Pus surrounding an area of infection. May extend to directly involve the soft palate, the lateral wall of the pharynx, and, occasionally, the base of the tongue leading to airway compromise.


Rheumatoid Arthritis

Rheumatoid arthritis is an autoimmune disease that causes chronic inflammation of the joints causing decreased mobility. Reduction of mobility in the TMJ can cause a difficult intubation scenario.




Step 1 Obtaining the patient's history

Ankylosing Spondylitis
 A form of chronic inflammation of the spine (including the cervical spine). This lack of mobility to the c-spine can lead to difficult intubation.




Facial / Cervical Injury
 Instability of the facial bones, cervical spine, the maxilla and mandible can lead to difficulty accessing the airway to place an endotracheal tube. Localized swelling in the area can also complicate matters.




Step 1 Obtaining the patient's history

Obesity
 The anatomical differences of the obese include a short thick neck and redundant tissue in the oropharynx leading to airway difficulties.



Burns
 Edema of the airway from direct or inhalation injury makes the task of intubation more difficult.



Determining a Difficult Airway

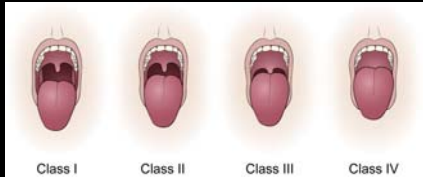
Step 2 Tests for assessment of the airway

Two methods are recommended pre-hospital to evaluate the difficulty of the airway. The Mallampatti test determines the relative size of the tongue to the pharynx and the Cormack and Lehane test measures the size of the glottic opening using direct laryngoscopy.

These tests can predict the difficulty of the intubation and the results should be documented following intubation.

Step 2 Tests for assessment of the airway

Mallampatti

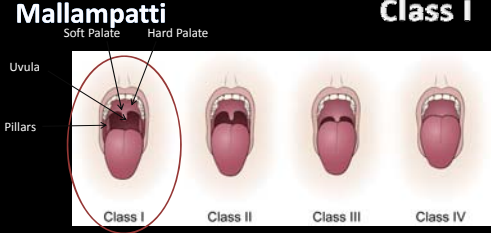


The ideal way to perform the mallampatti test is with the patient in the seated position with their head in a neutral position, but can be adapted to patients in other positions. The tongue is then protruded to the maximum.

Classifications are assigned according to the extent that the base of the tongue is able to mask the visibility of pharyngeal structures.

Step 2 Tests for assessment of the airway

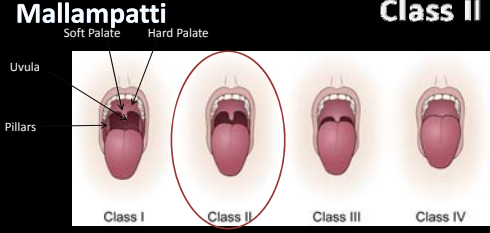
Mallampatti Class I



Visualization of the soft palate, [fauces](#); uvula, anterior and posterior pillars

Step 2 Tests for assessment of the airway

Mallampatti Class II



Visualization of the soft palate, [fauces](#) and uvula

Step 2 Tests for assessment of the airway

Mallampatti Class III

Soft Palate Hard Palate

Uvula

Pillars

Class I Class II Class III Class IV

Visualization of the soft palate and base of the uvula

Step 2 Tests for assessment of the airway

Mallampatti Class IV

Soft Palate Hard Palate

Uvula

Pillars

Class I Class II Class III Class IV

Only the hard palate is visible. The soft palate is not visible at all

Step 2 Tests for assessment of the airway

Mallampatti

Class I Class II Class III Class IV

If the base of the tongue is proportional to the oropharynx, the exposure of the glottic opening will not be difficult

A proportionally larger base of the tongue will overshadow the larynx and make intubation more difficult.

Step 2 Tests for assessment of the airway

Cormack and Lehane

Epiglottis

Vocal cords

I II

III IV

Fig 1 Classification of Laryngoscopy Views

The Cormack and Lehane test is performed during direct laryngoscopy and one of four grades is assigned to the airway based on what is viewed.

Step 2 Tests for assessment of the airway

Cormack and Lehane Grade I

Epiglottis

Vocal cords

I II

III IV

Fig 1 Classification of Laryngoscopy Views

Visualization of entire laryngeal aperture.

Step 2 Tests for assessment of the airway

Cormack and Lehane Grade II

Epiglottis

Vocal cords

I II

III IV

Fig 1 Classification of Laryngoscopy Views

Visualization of only posterior commissure of laryngeal aperture.

Step 2 Tests for assessment of the airway

Cormack and Lehane Grade III

Epiglottis
Vocal cords

Fig 1 Classification of Laryngoscopy Views

Visualization of only epiglottis

Step 2 Tests for assessment of the airway

Cormack and Lehane Grade IV

Epiglottis
Vocal cords

Fig 1 Classification of Laryngoscopy Views

Visualization of just the soft palate

Grade III and IV predict difficult intubation

For that difficult airway.....

The Bougie!

The device is 70 cm in length and designed to be used in lieu of a traditional stylette
 There are graduations along the side of the bougie to indicate total depth
 It is flexible, just like a stylette and can be conformed to the shape of the patients airway
 Can be used for Endotracheal tubes 6.0mm and higher
 The Coude tip is designed to be easily inserted into the trachea

It is a one time use item

Indications

Predicted difficult airways using the airway grading tests

When the laryngeal opening is not fully visible

To control the direction of the endotracheal tube during insertion

Precautions

Soft tissue damage or bronchial rupture due to:
 Blind intubation
 Positioning past the carina
 Undue pressure is exerted
 Endotracheal tube is threaded over the introducer without using a laryngoscope

Technique

The introducer may be lubricated with sterile water or KY jelly prior to insertion.

Place the introducer into the endotracheal tube just as you would with a stylette. The introducers Coude tip should extend past the end of the tube.

Technique

Perform direct laryngoscopy and visualize the tip of the epiglottis at a minimum

Advance the tip of the bougie past the glottic opening



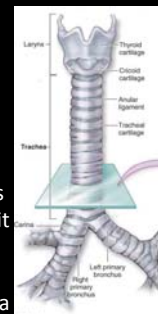
Technique

To confirm that the bougie is in the trachea:

You will feel tracheal clicking as the coude tip passes over the cartilaginous rings

You will feel resistance as the tube is advanced and then "held-up" when it meets the tracheal ring

Without these signs there should be a strong index of suspicion that there is an esophageal placement



Technique

Advance the bougie to approximately 25cm of depth so that the distal end rests 2-3 cm beyond the glottic opening.

With laryngoscopy being maintained, advance the endotracheal tube while securing the bougie device. (This is best achieved with two practitioners)

Once the tube passes the teeth rotate the endotracheal tube ¼ turn to the left to prevent the bevel from causing trauma to the arytenoid cartilage

Technique

Advance the endotracheal tube to the proper depth

Hold the tube securely and remove the bougie



Technique

Confirm the tube placement:

Capnography
End-tidal CO₂ detectors (colormetric)
Esophageal detection devices
Chest / epigastric auscultation



References

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