

# Anatomical parameters of Neck; Predictors for Laryngoscopy and Intubation.

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## ABSTRACT

One of the common problems encountered by anaesthetists is difficult airway. Proper laryngoscopy and intubation is required by the anaesthetists for securing the airway by endotracheal tube. Anatomic parameters of the neck may prove to be a better predictors of airway particularly in difficult airway scenarios.

**Keywords:** Difficult airway, Laryngoscopy, Intubation.

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## INTRODUCTION

An encounter with the difficult airway is a common problem for an anaesthesiologist. As it may result in airway or oesophageal injury, aspiration, severe hypoxemia and subsequent brain damage or death. Tracheal intubation is considered to be the “Gold standard” of airway management during the administration of general anaesthesia/critical care setting because of its several advantages.

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There are several test available as predictors of difficult laryngoscopy like:

1. Assessment of cervical and atlanto-occipital joint function: Laryngoscopic view becomes easier in sniffing position that is flexion at the neck by 20-30 degree and extension of atlanto-occipital joint by 80-85 degree. For this, one can perform dellikan's test in which head is held in neutral

position, clinician places his index finger of the left hand under the tip of the jaw while the index finger of the right hand is placed on the patient tibial tuberosity, then the patient is made to look at the ceiling if left index finger becomes higher than the right, extension is considered normal.<sup>[1]</sup> However, if both the fingers remain at the same level or lower than it is considered abnormal.

2. Assessment of Temporo-mandibular joint:<sup>[2]</sup> Ask the patient to open his mouth wide open and place his three fingers in the mouth, if the patient is able to do this >5cm of mouth opening is adequate for laryngoscopy.

We can also ask the patient to place index finger in front of tragus and thumb in front of the lower part of the mastoid, when we ask the patient to open his mouth index finger will indented in its space and thumb can feel the sliding of the condyle.

Calders test can also be performed in which patient is asked to protrude the mandible as far as possible, if lower incisors lies anterior to the upper incisors test is normal.<sup>[1]</sup>

3. Assessment of mandibular space: The space anterior to the larynx can be expressed as thyromental or hyomental distance:
  - a) Thyromental distance:<sup>[3]</sup> It is a distance between

the thyroid notch and mental symphysis in the fully extended neck.

- >6.5 cm: it signifies adequate space for laryngoscopy
- 6.0-6.5cm: it signifies that laryngoscopy and intubation can be difficult but possible.
- < 6.0 cm: signifies impossible laryngoscopy.

b) Hyomental distance: It is a distance between the mentum and hyoid bone.

- Grade I: > 6.0 cm
- Grade II: 4.0-6.0 cm
- Grade III: <4.0 cm

However, grade III is associated with difficult laryngoscopy.

4. Test for assessing the adequacy of the oropharynx: It consists of two tests for measuring the adequacy that is:

- Mallampati Grading: This grading basically indicates the amount of space within the oral cavity to accommodate the laryngoscope and ETT. Grading are as follows,

Grade I: Faucial pillars, uvula, soft and hard palate.

Grade II: Uvula, soft and hard palate

Grade III: soft and hard palate

Grade IV: only hard palate.

However, Grade III & IV offer difficulties and impossible viewing of the glottis by conventional laryngoscopy.

5. Assessment of glottis viewing during laryngoscopy: Glottic view assessment is basically done on the basis of Cormack & Lehane and also on POGO scoring.<sup>[4]</sup>

- Cormack & Lehane

Grade I: visualisation of entire vocal cord

Grade II: visualisation of posterior part of laryngeal aperture

Grade III: visualisation of epiglottis

Grade IV: no glottic structures can be seen.

- POGO Scoring:

100%: entire glottis aperture can be seen 33%: lower 1/3<sup>rd</sup> Of the vocal cords and arytenoids are seen

0%: no glottis structures can be seen.

6. Thyroid floor of the mouth distance: larynx is normally placed if the patient can place two fingers between the top of the thyroid cartilage and the floor of the mouth.

7. The ratio of the patient height to the thyromental distance: If the ratio of the patient height to thyromental distance is less than 23.5 cm an easy laryngoscopy may be anticipated.

8. Sternomental distance: A sternomental distance of < 12.5 cm predicts difficult laryngoscopy intubation.

9. Upper lip bite test: It basically test the range and freedom of mandibular movement and the architecture of the teeth.

- Class I: Lower incisors can bite, the upper lip above vermilion lines.

- Class II: lower incisors can bite the upper lip below the vermilion lines.

- Class III: lower incisors cannot bite, the upper lip

## CONCLUSION

All these test can be used as predictors of difficult airway, but only performing single test as predictor for difficult airway will give poor result in comparison with group of test. However the result also depend on co-operation of patient.

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