

# Predicting Difficult Intubation through Upper Lip Bite Test and Modified Mallampati Classification

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## ABSTRACT

The Upper Lip Bite Test is a new test for forecasting challenging intubation. Preoperative airways are being evaluated using MMT and ULBT for the forecasting of difficult laryngoscopy and intubation in more than a hundred partial patients experiencing elective just as crisis cesarean segment under incessant sedation. The study was conducted to assess the ability of the modified Mallampati test to anticipate difficult intubation in patients while any elective surgery under general anesthesia and to compare it with the Upper Lip Bite Test (ULBT) and With the approval of the Institutional Ethical Committee, 181 cases were remembered for the examination, meeting the consideration measures.

**Keywords:** MMT, Upper Lip Bite Test, Intubation, anesthesiologists

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## INTRODUCTION

Airway management the board the officials is of prime need to the Anaesthesiologist for ensuring about the flight course, and tracheal intubation using direct laryngoscopy remains the method for choice all things considered. No calming is secured aside from if industrious undertakings are made to ensure about and continue with a flawless aeronautics course. Intense laryngoscopic endotracheal intubation despite everything stays a fundamental matter of anesthesiologists. The commonness of troublesome endotracheal intubation were accounted for to be between 1.5% to 13% among patients experiencing medical procedure [1]. American Society of Anaesthesiologists (ASA) team clarifies the troublesome aviation route as, "the clinical circumstance wherein routinely prepared anesthesiologist encounters trouble with face cover ventilation of upper aviation route. Disappointment in executing the aviation route is the most significant reason for death in patients experiencing general sedation. Around 50-75% of heart failures during general sedation are because of troublesome intubation that causes insufficient oxygenation or potentially ventilation, which around 55-93% of them cause demise or mind dead[2][3]. Attention has been given on predicting difficult intubation or poor glottis visualization, to avoid serious consequences during the surgery [2]. Difficult intubation was observed common among cases of anatomical malformations such as the limited temporo-mandibular joint movement, chin protrusion, lower jaw anomalies and excessive maxillary length.

## OBJECTIVE OF THE STUDY

To survey the capacity of Upper Lip Bite Test (ULBT) to finish up troublesome intubation in patients experiencing any elective medical procedure under general sedation.

## REVIEW OF LITERATURE

The thorough review of the literature was done by using appropriate MeSH (Medical Subject Headings) terms and operators. Some of the MeSH terms that were used as follows:

- Human respiratory tract

- Normal respiration
- Anatomy, physiology of the respiratory system
- Difficult airway: Aetiology, Pathophysiology
- Diagnosis
- Classification
- Upper lip bite test
- Modified Mallampatti Score

## Airway assessment is relevant to many common surgeries

Tonsils causing any aviation route bargain demonstrate careful expulsion. Neck injury outside to the aviation route can cause an outer pressure which can bargain the aviation route. This tradeoff is of specific significance in injury and procedure on encompassing arrangement, for example, thyroidectomy [4].

## Clinical Significance

The need of the upper airway assessment appraisal is principal in both crisis and sedative situations. The upper aviation route evaluation can be worked and expanded by the accompanying appraisal tools:[5][6]

The Malampati score which portrays the obvious aviation route and the "3, 3, 2" rule in which three assessed estimations of the between incisor separation. The hyoid-mental separation, hyoid-thyroid ligament separation is estimated, and if these are abbreviated, it suggests a troublesome aviation route. The cricoid ligament is significant both as a clinical milestone and furthermore as the main complete ligament ring inside the upper aviation route utilized during cricoid pressure moves.

## MATERIALS AND METHODS

Study design: It was a solitary visually impaired, Prospective Observational (Analytical) study.

Study duration: This examination was completed over a time of year and a half (December 2016 to July 2018).

Sampling technique: Universal sampling

Sample size: The factual force examination according to

## Classification

recipe  $n = 4pq/L^2$  ( $p$ = populace extent of positive character or present commonness,  $q$ = 100- $p$ ,  $L$ = admissible mistake which we taken as 5%) recommended that an example size of 181 patients of both sex, between 20 years and 50 years old, having a place with ASA physical Status I-II, booked to

experience elective medical procedure under general sedation with endotracheal intubation were enrolled for this single-visually impaired, imminent, observational (logical) study.

Table 1: List of Exclusion criteria

Exclusion criteria
1. Facial trauma
2. Edentulous patient
3. Burns patients with neck contracture
4. Intraoral pathology /infections
5. Rheumatoid disease
6. Degenerative spinal disease
7. Inability to open mouth

## METHODS

181 cases satisfying the incorporation models were enrolled in the present study, after the approval of the institutional ethical committee. A detailed history (demographic information, clinical history, past medical history), complete physical and general examination and necessary investigations were done for all patients after the prior informed written consent from, the study subjects. Where in the patients were approached to be in sitting situation with completely open mouth and tongue maximally projected, and patients were approached not to phonate for mallampatti score.

to foresee troublesome intubation in patients experiencing any elective medical procedure under general sedation. 181 cases satisfying the incorporation models were selected the current examination, after the endorsement of the institutional moral advisory group. A detailed history (demographic information, clinical history, past medical history), complete physical and general examination and necessary investigations were done for all patients after the prior informed written consent from the study subjects.

## OBSERVATION AND RESULTS

This investigation was done to assess the capacity of Upper Lip Bite Test (ULBT) and Modified Mallampati Test (MMC)

## DEMOGRAPHIC FEATURES

In the present study, the demographic features were analyzed of the study population in table 2. The age distribution, gender-wise distribution, body mass index were compared.

Table 2: Distribution of study population according to their age

Age distribution	Number	Percentage
20-30	43	23.75%
31-40	97	53.59%
41-50	41	22.65%
Total	181	100%

In this study, we reported the study population according to their age distribution. We reported that the study population belonged to age 20-30 years ( $n=43$ , 23.75%), 31-40 years ( $n=97$ , 53.59%), followed by and 41-50 years ( $n=41$ , 22.65%)

Table 3: Distribution of study population according to their body mass index

BMI	Number	Percentage
<17.5	20	11.04 %
17.5-25	97	53.59 %
25-30	42	23.20 %
30-40	17	9.39 %
>40	5	2.76 %
Total	181	100%

In this study in table 3, we compared the body mass index among study subjects. We observed that the study cases belonged to BMI of the underweight cases ( $n=20$ , 11.04%), normal range ( $n=97$ , 53.59%), followed by overweight individuals ( $n=42$ , 23.20%), obese cases ( $n=17$ , 9.39%), and morbid obese cases ( $n=5$ , 2.76%).

## DIFFICULT INTUBATION

## GRADING OF DIFFICULT INTUBATION

In this study, we assessed the difficult intubation with the help of various grading systems, such as Modified Mallampati Score, Upper lip bite tests and CLG method.

## MODIFIED MALLAMPATI SCORE

**Table 4: Distribution according to Modified Mallampati Score**

MMT class distribution	Number of cases	Percentage
Class 1	91	50.27%
Class 2	57	31.49%
Class 3	21	11.60%
Class 4	12	6.62%
Total	181	100 %

In this study, we classified the study population according to difficulty in intubation into 4 classes: Class 1 to 4. We reported that majority of the study cases (n=91, 50.27%) belonged to class 1, followed by class 2 (n=57, 31.49%), class 3 (n=21, 11.60%) and class 4 (n=12, 6.69%) out of which class

1 and 2 are considered as the parameters of easy intubation and class 3 and 4 are considered as parameters of difficult intubation (Table 4). Hence the percentage of difficult intubation based on MMT was observed to be 18.23%.

**Table 5: Distribution according to Upper Lip Bite Test**

ULBT class distribution	Number of cases	Percentage
Class 1	73	40.33%
Class 2	74	40.88%
Class 3	34	18.78%
Total	181	100 %

In this study, we classified the study population according to difficulty in intubation into 3 classes: Class 1 to 3. We analysed that the study cases (n=73, 40.33%) in class 1, followed by (n=74, 40.88%) in class 2, and class 3 (n=34, 18.78%).

Out of which class 1 and 2 are considered as the parameters of easy intubation and class 3 is considered as parameters of difficult intubation (Table 5). Hence the percentage of difficult intubation based on ULBT was observed to be 18.78%.

## DISCUSSION

It is the challenge to assess and manage the airway in the general practice of anaesthesia when difficulty with intubation or difficult intubation is anticipated prior to induction of anaesthesia. In spite of the fact that in writing, there are numerous preoperative tests to foresee troublesome aviation route, still there are numerous difficulties while marking any of them as perfect. Some are anything but difficult to perform, profoundly touchy, exceptionally explicit and which high positive prescient incentive with scarcely any bogus positive forecasts. This investigation was done to evaluate affectability and positive prescient estimation of Upper Lip Bite Test (ULBT), Modified Mallampatti grouping (MMT) alone and with blend of both to foresee troublesome intubation in patients experiencing any elective medical procedure under general sedation.

## DEMOGRAPHIC FEATURES

In this study, we reported the demographic features of the study population. The age distribution, gender-wise distribution, body mass index etc are compared. In this study, the maximum subjects were females (n=126, 69.61%), followed by males (n=55, 30.38%). We evaluated the study population according to their age distribution. We observed that maximum study population belonged to age group of 31-40 years (n=97, 53.59%), followed by 20-30 years (n=43, 23.75%) and 41-50 years (n=41, 22.65%).

## PREVALENCE OF DIFFICULT INTUBATION

In this study, we evaluated the difficult intubation with the help of various grading systems, such as Modified Mallampati Score, Upper lip bite tests and CLG method. Using various methods, we observed the rate of difficult intubation was observed to be 9.39 % ( 17 out of 181 patients). Bhat et al [7] incidence was 7.8% (39 out of 500 patients). Modified Mallampati Score (MMT) has been in use since many years, though it has many limitations in it, such as absence of definite demarcation between the class II, class III and IV groups and the leads to higher interobserver variability due to effect of phonation and decreased reliability, and does not evaluate neck mobility which is an important factor in predicting difficult intubation. According to MMT, we analyzed that most of the study cases (n=91, 50.27%) belonged to class 1, followed by class 2 (n=57, 31.49%), class 3 (n=21, 11.60%) and class 4 (n=12, 6.6%) out of which class 1 and 2 are considered as the parameters of easy intubation and class 3 and 4 are considered as parameters of difficult intubation.

## MODIFIED MALLAMPATI SCORE

We compared MMT with CLG, in order to find out its accuracy. We observed that MMT has a sensitivity of 88.23%, Specificity of 89.02%, the Positive predictive value of 45.45% and Negative predictive value of 98.64%.

## UPPER LIP BITE TEST

In this study, we classified the study population according to difficulty in intubation into 3 classes: Class 1 to 3. We reported that most of the cases (n=74, 40.88%) belonged to class 2, followed by class 1 (n=73, 40.33%), class 3 (18.78%). Out of which class 1 and 2 are considered as the parameters of easy intubation and class 3 is considered as parameters of difficult intubation. Khan et al[8] analysed a sensitivity of 76.5% in their study, in our study; we got a sensitivity of 76.47%. Bhat et al[7] in their study observed that in ULBT, the

observations according to the classes of difficult intubation were 76%, 21%, 3%.

### CONCLUSION

ULBT has a more elevated level of affectability, particularity, exactness, and positive prescient incentive than MMC. As a moderately new test, ULBT requires further assessment and examination with other screening tests, for example, sternomental, thyromental separation, and MMC to accurately decide its conclusive job in foreseeing troublesome obstetric intubation.

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