



COMPARATIVE ANALYSIS OF THE UPPER LIP BITE TEST AND MODIFIED MALLAMPATI TEST FOR PREDICTING DIFFICULT INTUBATION: A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT **Background:** Delayed or failed endotracheal intubation is a significant complication of general anesthesia, with difficult intubation rates of 1.5% to 13%. Accurate preoperative prediction can reduce unanticipated difficult intubation. **Aim:** To compare the accuracy of Upper Lip Bite Test and Modified Mallampati Test in predicting difficult intubation. **Methods:** Single-center, prospective, randomized, single-blind observational study of 300 ASA I-II patients, aged 16-60 years, undergoing elective surgery under general anesthesia. Preoperative ULBT and MMT were performed. Laryngoscopy was graded using Cormack-Lehane classification. **Results:** ULBT showed higher accuracy 92% and sensitivity 88.46% compared to MMT. Specificity was similar for both tests. **Conclusion:** ULBT outperforms MMT as a predictor of difficult intubation with superior accuracy, PPV, NPV, and sensitivity. ULBT should be incorporated into standard airway assessment protocol.

KEYWORDS : Upper Lip Bite Test, Modified Mallampati Test, Difficult intubation, Airway Assessment, Cormack-Lehane

INTRODUCTION

Delayed or failed endotracheal intubation is a significant complication of general anesthesia, with incidence rates ranging from 1.5% to 13% for difficult intubation and 0.05% to 0.3% for failed intubation. Failure to maintain airway patency is a common cause of morbidity and mortality in patients receiving general anesthesia. Accurate preoperative prediction of difficult intubation can help reduce the incidence of unanticipated difficult or failed intubation. However, approximately 17% of claims related to airway mishaps in anesthesia mention a lack of preoperative assessment documentation.

Various factors, such as oropharyngeal anatomy, tongue size, mouth opening, larynx position, neck circumference, neck movement, and teeth alignment, contribute to determining the difficult airway. Clinical evaluation of these structures often involves assessing the atlanto-occipital joint extension, thyromental distance, and performing tests such as the modified Mallampati test. The MMT has been widely used as a gold standard for predicting difficult intubation, but studies have highlighted its limitations in accuracy. In 2002, Khan et al. introduced the upper lip bite test as a new, simple, and accurate method for predicting difficult intubation.

MATERIAL AND METHODS

This single-center, prospective, randomized, single-blind comparative observational study included 300 patients with ASA grade I or II, aged 16-60 years, scheduled for elective surgery under general anesthesia with endotracheal intubation. Patients with high BMI, large neck circumference, restricted mouth opening, and limited neck mobility were excluded.

Preoperative assessments included the Upper Lip Bite Test and Modified Mallampati Test to evaluate predictors of difficult intubation. Patients received standard premedication and induction protocols. Laryngoscopy was performed using a curved Macintosh blade, and Cormack and Lehane classification determined the glottis view. Intubation was carried out using an appropriate endotracheal tube.

The ULBT assessed the patient's ability to bite the upper lip: Class I - lower incisors bite upper lip above vermilion line, Class II - bite below vermilion line, Class III - cannot bite upper lip. The MMT evaluated visibility of the posterior pharynx: Class I - soft palate, fauces, uvula, pillars visible, Class II - soft palate, fauces, uvula visible, Class III - soft palate, base of uvula visible, Class IV - soft palate not visible.

The study aimed to compare the accuracy of ULBT and MMT in predicting difficult intubation.

RESULT

[Insert Table 1: Comparison of Test Results for Prediction of Difficulty in Intubation]

[Insert Table 2: Comparison of ULBT and MMT in Predicting Easy and Difficult Intubations]

ULBT demonstrated higher accuracy 92% and sensitivity 88.46% compared to MMT. Specificity was similar for both tests.

DISCUSSION

Failed tracheal intubation can lead to serious consequences, highlighting the need for predicting difficulty in laryngoscopy and intubation. Various tests are available, but no single test is entirely reliable, emphasizing the value of combining tests to improve predictive value.

The Modified Mallampati Test and Upper Lip Bite Test are commonly used. MMT has faced criticism for its accuracy, while ULBT assesses jaw movement and has shown higher accuracy, sensitivity, positive predictive value, and negative predictive value. Our study supported these findings, with ULBT demonstrating higher accuracy and sensitivity compared to MMT. Specificity was similar for both tests.

Interobserver variation was minimized by involving a single primary investigator. However, limitations include the inability to test uncooperative or mentally challenged patients and the unreliability of results in edentulous patients. Combining tests may enhance predictive value, and further research is warranted.

CONCLUSION

Based on the findings of our study, we can confidently conclude that the ULBT outperforms the MMT as a predictor of difficult intubation cases. The ULBT demonstrates superior accuracy, positive predictive value, negative predictive value, and sensitivity compared to the MMT. Therefore, we strongly recommend incorporating the ULBT into the standard airway assessment protocol, as it provides more reliable and effective predictions for difficult intubations.

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