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# Comparison Of Various Scoring System In Predicting Difficult Airway

Author

***Abstract:***
*Background: Anticipating a difficult airway is crucial for safe anaesthetic practice. Various clinical scoring systems exist, but their predictive accuracies vary. This study aims to compare multiple airway assessment scores and determine their sensitivity, specificity, and overall predictive value.*
*Methods: In this prospective observational study, 200 adult patients undergoing elective surgeries under general anaesthesia were assessed preoperatively using Modified Mallampati Classification (MMC), Upper Lip Bite Test (ULBT), Thyromental Distance (TMD), Sternomental Distance (SMD), Ratio of Height to Thyromental Distance (RHTMD), and LEMON score. Cormack-Lehane (CL) grade during laryngoscopy was used as the gold standard.*
*Results: ULBT showed the highest sensitivity (88.6%) while RHTMD had the highest specificity (90.2%). LEMON score demonstrated balanced sensitivity and specificity (81.3% and 85.5%, respectively). Combining multiple scores improved diagnostic accuracy significantly.*
*Conclusion: No single score is entirely reliable for predicting difficult airway. A combination of assessments—particularly LEMON and ULBT—enhances prediction. Routine use of composite airway assessment tools is recommended in pre-anesthetic evaluation.*
***Keywords:*** *difficult airway, LEMON, ULBT, Mallampati, thyromental distance, airway assessment, prediction*

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## I. Introduction

Securing the airway is the most critical responsibility of an anesthesiologist. Failure to predict a difficult airway may lead to adverse outcomes, including hypoxia, aspiration, and cardiac arrest. Several bedside screening tests and scoring systems have been proposed. However, these vary in their ease of application and predictive accuracy. This study aims to compare the diagnostic performance of commonly used clinical airway scores and determine the most reliable tool or combination thereof for predicting difficult laryngoscopy.

## II. Materials And Methods

Study Design: Prospective observational study

Study Setting: Tertiary care academic hospital

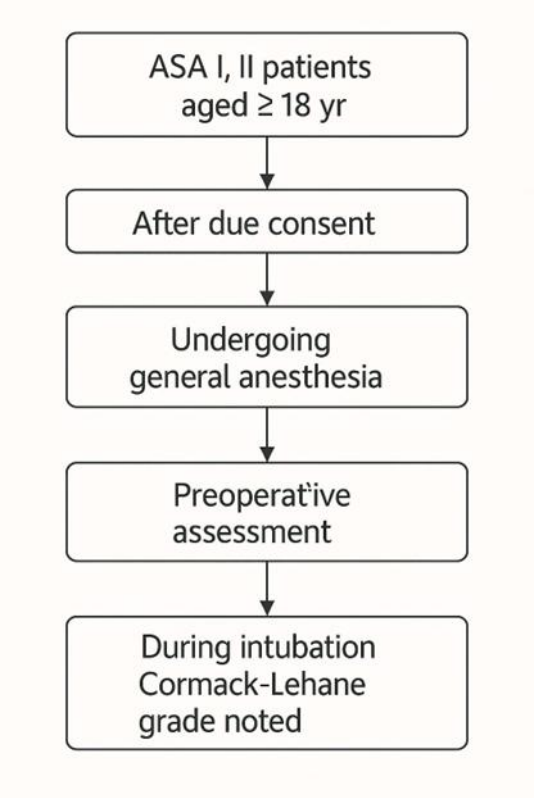
PARTICIPANTS: 200 ASA I–II patients >18 years, scheduled for elective surgery requiring endotracheal intubation

EXCLUSION CRITERIA: Emergency cases, patients with facial anomalies, cervical spine instability

PREOPERATIVE ASSESSMENT:
Modified Mallampati Classification (MMC)
Upper Lip Bite Test (ULBT)
Thyromental Distance (TMD)
Sternomental Distance (SMD)
Ratio of Height to TMD (RHTMD)
LEMON score

Intraoperative Assessment:

Cormack-Lehane (CL) grading during direct laryngoscopy under standard technique and adequate muscle relaxation

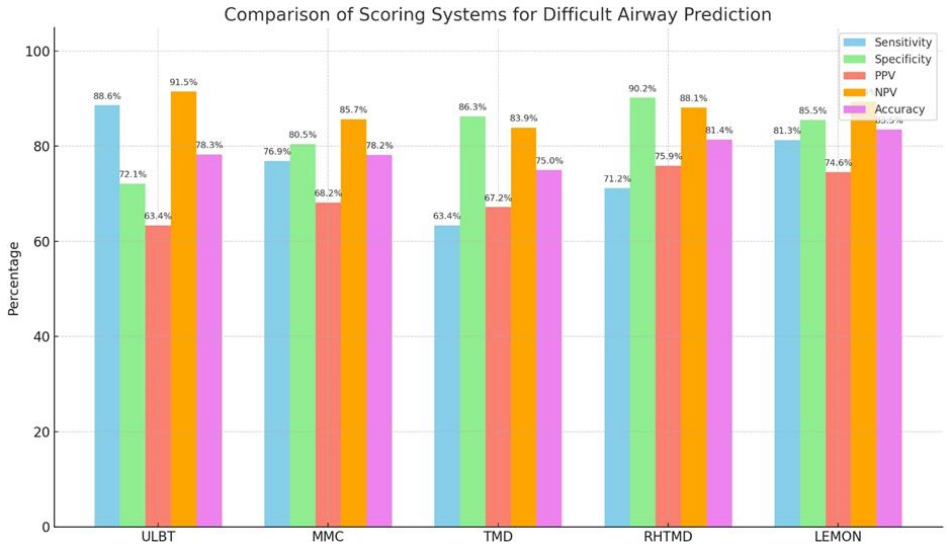



STATISTICAL ANALYSIS: Sensitivity, specificity, PPV, NPV, accuracy, and ROC-AUC were calculated using SPSS.

## III. Results

| Scoring System | Sensitivity (%) | Specificity (%) | PPV (%) | NPV (%) | Accuracy (%) | AUC | AUC | |---|---|---|---|---|---|---|
| ULBT | 88.6 | 72.1 | 63.4 | 91.5 | 78.3 | 0.82 | |
| MMC | 76.9 | 80.5 | 68.2 | 85.7 | 78.2 | 0.79 | |
| TMD | 63.4 | 86.3 | 67.2 | 83.9 | 75.0 | 0.74 | |
| RHTMD | 71.2 | 90.2 | 75.9 | 88.1 | 81.4 | 0.83 | |
| LEMON | 81.3 | 85.5 | 74.6 | 89.4 | 83.5 | 0.86 | |

Combined scoring showed improved prediction compared to individual scores (AUC: 0.89)



## IV. Discussion

While each airway score has utility, no single test can universally predict difficult laryngoscopy. LEMON, with its multi-parameter approach, offers consistent performance across metrics. The ULBT, being simple and quick, is also highly sensitive. RHTMD offers high specificity, particularly valuable when minimizing false positives. A composite approach integrating multiple scores is thus most effective in clinical practice.

## V. Conclusion

The combination of LEMON score and ULBT provides the best predictive value for difficult airway identification. Implementation of a structured airway assessment protocol incorporating multiple scores is recommended for routine pre-anesthetic evaluation.

Limitations:
Single-center study; observer bias possible; laryngoscopy performed by experienced anesthesiologists only.

Future Recommendations:

Multicenter studies with larger samples and inclusion of video laryngoscopy outcomes to validate and refine predictive models.

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