Is the Mallampati Score Useful for Emergency Department Airway Management or Procedural Sedation?

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We review the literature in regard to the accuracy, reliability, and feasibility of the Mallampati score as might be pertinent and applicable to emergency department (ED) airway management and procedural sedation. This 4-level pictorial tool was devised to predict difficult preoperative laryngoscopy and intubation, but is now also widely recommended as a routine screening element before procedural sedation. The literature evidence demonstrates that the Mallampati score is inadequately sensitive for the identification of difficult laryngoscopy, difficult intubation, and difficult bag-valve-mask ventilation, with likelihood ratios indicating a small and clinically insignificant effect on outcome prediction. Although it is important to anticipate that patients may have a difficult airway, there is no specific evidence that the Mallampati score augments or improves the baseline clinical judgment of a standard airway evaluation. It generates numerous false-positive warnings for each correct prediction of a difficult airway. The Mallampati score is not reliably assessed because independent observers commonly grade it differently. It cannot be evaluated in many young children and in patients who cannot cooperate because of their underlying medical condition. The Mallampati score lacks the accuracy, reliability, and feasibility required to supplement a standard airway evaluation before ED airway management or procedural sedation. [Ann Emerg Med. 2019;74:251-259.]

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INTRODUCTION

The Mallampati score is a graded 4-level pictorial scale (Figure) created to predict difficult intubation before general anesthesia[1-3] and is now routinely used for this purpose in operating rooms worldwide.[4,5] The score has subsequently been extrapolated outside of the operating room to procedural sedation, with a number of specialty societies recommending it as a routine screening element.[6-11] The American Academy of Pediatrics, for example, whose guidelines are "intended for all venues," including the emergency department (ED), stipulates that the routine presedation health assessment include a Mallampati evaluation.[6] The Mallampati score is widely embedded in electronic medical records (Figure) as a standard assessment step before both general anesthesia and procedural sedation.

This extrapolation of Mallampati scoring to procedural sedation is noteworthy because it applies a tool designed to predict difficult intubation to a different setting in which intubation is never the objective and is essentially never performed. Its proponents assume that the Mallampati score might similarly predict airway and respiratory adverse events during procedural sedation, as well as potential difficulty with bag-valve-mask ventilation, the key rescue intervention for procedural sedation.

The Mallampati score is intended to supplement, but not replace, the baseline clinical judgment of a general multidimensional airway evaluation.[12-15] This standard airway assessment includes a history and physical inspection of the craniofacial structure to identify risk factors such as short neck, obesity, obstructive sleep apnea, long upper incisors or overbite, restricted mouth opening, micrognathia, macroglossia, laryngomalacia, tonsillar hypertrophy, airway edema, blood or vomit in the airway, cervical immobility, and facial or neck trauma. The quality and reliability of this general airway evaluation will at times be hindered or limited by emergency situations, impaired patient cooperation, and unavailable medical history.

Although meta-analyses of Mallampati score accuracy have been published,[5,16-19] we were unable to identify any clinical review article summarizing the accuracy, feasibility, and reliability of this score in the context of ED airway management or procedural sedation. Accordingly, we performed such a narrative review of the Mallampati score literature as might be pertinent and applicable to the ED setting.

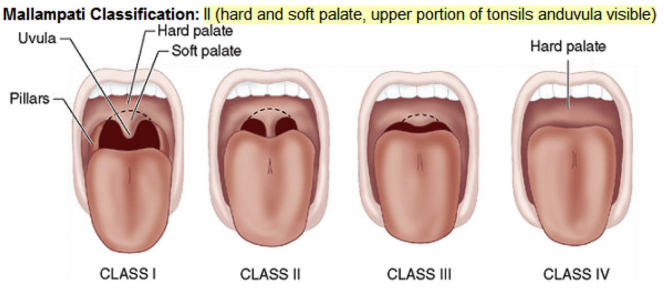

Figure. Mallampati score as displayed in the presedation assessment module of the Epic electronic medical record (Epic, Verona, WI).

MATERIALS AND METHODS

Search Strategy

A medical librarian conducted a literature search from January 1985 to October 5, 2018, limited to human subjects and the English language. Our search strategy in PubMed was as follows: "mallampati score"[tiab] OR "mallampati scores"[tiab] OR "mallampati test"[tiab] OR "mallampati class"[tiab] OR "mallampati classification"[tiab] AND (("1985/01/01"[PDAT]: "3000/12/31"[PDAT]) AND "humans"[MeSH Terms] AND English[lang]). Our search strategy in Web of Science was as follows: TOPIC: ("mallampati score" OR "mallampati scores" OR "mallampati test" OR "mallampati class" OR "mallampati classification"); Refined by: LANGUAGES: (ENGLISH); Indexes=SCI-EXPANDED, SSCI, ESCI Timespan=1985-2018. Our search strategy for the Cochrane Database of Systematic Reviews was as follows: ("mallampati score" OR "mallampati scores" OR "mallampati test" OR "mallampati class" OR "mallampati classification") Filter: from 1985. Our search strategy for EMBASE was as follows: ('mallampati score'/exp OR 'mallampati score' OR 'mallampati classification'/exp OR 'mallampati classification' OR 'mallampati test'/exp OR 'mallampati test') AND [english]/lim AND [1985-2018]/py.

We searched references of pertinent articles identified by our search strategy for additional relevant articles. We selected publications with an emphasis on the past 10 years, but we did not exclude commonly referenced and influential older publications.

HISTORY AND NOMENCLATURE

In 1983, Mallampati described a patient for whom intubation was extremely difficult, and for whom a postanesthesia oral examination revealed that the tongue obscured visualization of the uvula and faucial pillars.[1] He then prospectively assessed 210 preoperative adults with a 3-level expansion of this evaluation with numeric values—1=normal visualization, 2=obscured uvula but visible faucial pillars, and 3=obscured uvula and faucial pillars—and found that this grading was statistically associated with difficult laryngoscopy.[2]

In 1987, Samsoon and Young[3] expanded this evaluation to the 4-level pictorial classification now in widespread use (Figure), which, when applied after the fact to 13 adults who could not be intubated, was class IV in all except one. In 2001, Ezri et al[20] proposed adding a "class 0"—visualization of the epiglottis—to the score, suggesting it as a reliable predictor of easy laryngoscopy. This modification has not persisted because the primary need driving the scale is the prediction of difficult rather than easy laryngoscopy.

Mallampati,[1] Mallampati et al,[2] and Samsoon and Young[3] performed their evaluations with the patient sitting upright, with the mouth opened widely and tongue protruding. In 1992, Tham et al[21] noted that phonation altered the Mallampati assessment, and it is standard practice to recommend that the patient remain quiet during the evaluation.[20]

Given that the 1985 scale by Mallampati et al[2] had just 3 levels, some authors refer to the Samsoon and Young[3] 4-point adaptation as the "modified Mallampati."[4,5,22] However, given that the 4-level version has achieved widespread use and acceptance as "the Mallampati score," for simplicity we will refer to it in that fashion. The Mallampati airway assessment has variously been referred to as a "grade,"[2] "class,"[2,3,20] "classification,"[7,8] "test,"[23] "sign,"[24] "index,"[25] or "score."[6,9-11] Given that its widespread implementation and coding is as a 1- to 4-point numeric score (Figure), we will refer to it in commonly used fashion as a score with class designations I to IV.

HOW WELL DOES THE MALLAMPATI SCORE PREDICT DIFFICULT LARYNGOSCOPY AND DIFFICULT TRACHEAL INTUBATION?

Although the Mallampati has 4 possible scores, it has been customary in clinical practice and in research to dichotomize it into classes I and II (low risk) versus classes III and IV (higher risk). This binary risk assessment is then used to predict a research outcome of either difficult laryngoscopy or of difficult intubation. The commonly used standard for difficult laryngoscopy is a Cormack-Lehane direct laryngeal view classification of grade III or IV,[5,23,25-31] although the percentage of glottic opening score has also been used.[32] When the chosen outcome is instead difficult intubation, this has been coded as either a numeric threshold (eg, 3 or more unsuccessful attempts[26])

or a composite score based on the number of attempts and ultimate intubation failure.[31,33]

Adults receiving general anesthesia

In the largest single study of adults receiving general anesthesia, Heinrich et al[23] evaluated 102,305 preoperative adults and found that patients with a Mallampati score of III or IV were 6.5 times more likely to have difficult laryngoscopy. Despite this statistical association, however, a higher Mallampati score detected less than half of patients with difficult laryngoscopy, with a sensitivity of 45% and a specificity of 89%. There were 5 false-positive warnings for each correct prediction of a difficult airway.[23]

In the second largest study, Lundstrøm et al[33] evaluated 91,297 adults and found that those with a Mallampati score of III or IV were 3.7 times more likely to have difficult intubation. A higher Mallampati score was 20% sensitive and 94% specific. There were 6 false-positive warnings for each correction prediction of a difficult intubation.

Healy et al[26] performed the third largest Mallampati study, with 80,801 anesthetics, and found that a Mallampati score of III or IV was 43% sensitive and 83% specific in predicting difficult laryngoscopy. There were 14 false-positive warnings for each correct prediction of a difficult airway. The Mallampati score was 32% sensitive and 82% specific for predicting difficult intubation (defined as 3 or more attempts), with 52 false-positive warnings for each correct prediction.

Min et al[32] performed a "gray zone" analysis on 263 preoperative adults, in which gray zone results corresponded to a prediction not precise enough for a diagnostic decision. They noted that 72% of Mallampati assessments overall were in this indeterminate gray zone, as were 63% of the subset with difficult laryngoscopy.

Numerous smaller studies reported similar results.[5,16-19] In a 2018 Cochrane meta-analysis, Roth et al[5] identified 80 studies reporting data on the Mallampati score and difficult laryngoscopy, totaling 232,939 participants with 10,545 cases of difficult laryngoscopy. Among the studies, the accuracy varied widely, with a summary sensitivity of 53% (95% confidence interval [CI] 47% to 59%) and specificity of 80% (95% CI 74% to 85%). Overall, there were 8 false-positive warnings for each correct prediction. In this same review, the authors found 24 studies reporting data on the Mallampati score and difficult intubation, totaling 191,849 participants with 6,615 cases of difficult intubation. Among these studies, the accuracy varied widely, with a summary sensitivity of 51% (95% CI 40% to 61%) and a summary specificity of 87% (95% CI 82% to 91%). There were 7 false-positive warnings for each correct prediction.

Roth et al[5] concluded that "[s]creening tests are expected to have high sensitivities. We found that all investigated index tests [including Mallampati score] had relatively low sensitivities with high variability. In contrast, specificities were consistently and markedly higher than sensitivities across all tests. The standard bedside airway examination tests should be interpreted with caution, as they do not appear to be good screening tests."

An earlier meta-analysis by Lundstrøm et al[16] evaluated 55 studies with 177,088 patients that reported Mallampati score and difficult intubation. They found a summary sensitivity of 35% (95% CI 34% to 36%) and summary specificity of 91% (95% CI 91% to 91%) and concluded that "the modified Mallampati score is inadequate as a stand-alone test."

Other earlier systematic reviews and meta-analyses reported similar results.[17-19] An American Society of Anesthesiologists task force concluded in 2013 that "there is insufficient published evidence to evaluate the predictive value of multiple features of the airway physical examination versus single features in predicting the presence of a difficult airway."[15]

Children receiving general anesthesia

We were able to identify 6 studies of Mallampati score in preoperative children. In the largest, Heinrich et al[28] evaluated 7,551 preoperative children for whom a Mallampati score was documented. They did not provide sufficient data to calculate sensitivity or specificity, but reported that difficult laryngoscopy was encountered in just 6.4% of patients with a Mallampati score of III to IV (ie, 16 false-positive warnings for each correct prediction).

Inal et al[27] studied 250 children for whom a Mallampati assessment was possible and found that a Mallampati score of III to IV was 77% sensitive and 96% specific in predicting difficult intubation.

Rafique and Khan[29] evaluated 116 children who could comply with the Mallampati assessment and found that a higher Mallampati score predicted 1 of the 7 children with difficult laryngoscopy (sensitivity 14%). Data to calculate specificity were not provided.

After excluding children with an American Society of Anesthesiologists physical status greater than 1 and those with anatomic malformation, genetic syndromes, or cognitive deficit, Santos et al[30] enrolled children aged 4 to 8 years who agreed to participate in a "game" in which they would open the mouth and show the tongue. They noted a Mallampati score sensitivity of 76% and specificity of 96% for predicting difficult laryngoscopy in 108 children.

Aggarwal et al[31] studied 82 children aged 1 to 5 years for whom the Mallampati score could be assessed and found

that it was not statistically associated with difficult laryngoscopy or difficult intubation. They did not provide data to calculate a sensitivity or specificity.

Mansano et al[25] studied 43 children younger than 4 years for whom a Mallampati score could be assessed and noted a sensitivity of 62% and specificity of 52% in predicting difficult laryngoscopy.

To our knowledge, there are no meta-analyses of the Mallampati score in children.

Adults receiving intensive care unit intubation

De Jong et al[34] described 282 obese adults intubated in an ICU, and Mallampati score was reported for 220. In this subset, a Mallampati score of III to IV was 75% sensitive and 88% specific in predicting the 36 patients with difficult intubation.

Adults receiving ED intubation

Reed et al[35] studied the 86 of 156 adult ED intubations for which Mallampati score could be assessed, and a class III or IV score was 21% sensitive and 67% specific for identifying difficult intubation. There were 6 false-positive warnings for each correct prediction.

Soyuncu et al[36] prospectively studied 366 ED intubations and were unable to evaluate the Mallampati score because its assessment was possible in only 52 instances (14%).

Summary

The test characteristics for the Mallampati score in predicting difficult laryngoscopy and difficult intubation in adults vary widely from study to study, with poor aggregate sensitivities from the largest meta-analysis of 53% and 51%, respectively. False-positive warnings were frequent in the studies providing data to calculate them, ranging from 5 to 52 for each correct prediction of a difficult airway. Results for children appear similar.

HOW WELL DOES THE MALLAMPATI SCORE PREDICT DIFFICULT MASK VENTILATION?

Because intubation is never planned and essentially never occurs with procedural sedation, the presumed value of the Mallampati score in this setting is to instead predict difficult bag-valve-mask ventilation, the key rescue intervention for airway and respiratory adverse events during procedural sedation.

Adults receiving general anesthesia

In a study of 176,679 preoperative adults receiving general anesthesia, Kheterpal et al[37] evaluated the composite outcome of concurrent difficult bag-valve-mask ventilation and difficult laryngoscopy, an outcome that occurred in just 0.4% of their sample. A Mallampati score of III or IV was 44% sensitive and 85% specific, with 86 false-positive warnings for each correct prediction. These authors did not separately report results for difficult bag-valve-mask ventilation and difficult laryngoscopy.

Healy et al[26] evaluated 80,801 adults and found that a Mallampati score of III or IV was 31% sensitive and 83% specific in predicting difficult bag-valve-mask ventilation. There were 24 false-positive warnings for each correct prediction.

In a study of 53,041 adults, Kheterpal et al[38] found that a Mallampati score of III to IV was 30% sensitive and 89% specific in predicting the 77 patients for whom bag-valve-mask ventilation was "impossible." There were 259 false-positive warnings for each correct prediction. The score was less predictive than male sex or a history of sleep apnea.[38] In an earlier study by Kheterpal et al,[39] 350 of 22,660 adults (1.5%) had difficult bag-valve-mask ventilation. A Mallampati score of III to IV was 22% sensitive and 89% specific, with 32 false-positive warnings for each correct prediction.

Leoni et al[40] studied 309 obese preoperative adults and found that difficult bag-valve-mask ventilation was 2.1 times as common when the Mallampati score was III or IV. They did not provide data to calculate sensitivity and specificity.

Other smaller studies also noted a low sensitivity for the Mallampati score.[41-43] In a 2018 Cochrane review (which did not include the study by Healy et al[26] discussed above), Roth et al[5] found 6 studies reporting data on the Mallampati score and difficult bag-valve-mask ventilation, totaling 56,232 participants with 493 cases of difficult ventilation. Among the studies, the sensitivity and specificity varied widely, with a summary sensitivity of 17% (95% CI 6% to 39%) and specificity of 90% (95% CI 81% to 95%). There were 66 false-positive warnings for each correct prediction.

Children receiving general anesthesia

Aggarwal et al[31] studied 82 preoperative children aged 1 to 5 years who were receiving general anesthesia and for whom the Mallampati score could be assessed, and found that this score was not statistically associated with difficult bag-valve-mask ventilation. They did not report data sufficient to calculate sensitivity or specificity.

Summary

The test characteristics for the Mallampati score in predicting difficult bag-valve-mask ventilation in adults are extremely poor, with an aggregate sensitivity from the

largest meta-analysis of 17%. False-positive warnings were frequent, ranging from 24 to 259 for each correct prediction of difficult bag-valve-mask ventilation. There are inadequate data to confirm or refute the ability of the Mallampati score to predict difficult bag-valve-mask ventilation for children.

HOW WELL DOES THE MALLAMPATI SCORE PREDICT ADVERSE EVENTS DURING PROCEDURAL SEDATION?

Because adverse events during procedural sedation are often related to partial airway obstruction, it is also plausible that the Mallampati score might predict these overall complications.

Adults

We identified 3 studies pertaining to adults. Khan et al[44] studied 258 obese adults receiving fentanyl-midazolam moderate sedation for bronchoscopy and noted a progressive increase in the frequency of transient hypoxemia with increasing Mallampati score (37%, 45%, 48%, and 62% for the 4 Mallampati scores, respectively). However, they reported no further complications or interference with the procedure.

Hung et al[45] reported an endoscopy and colonoscopy case-control study of 45 adults who received naloxone reversal, flumazenil reversal, or both compared with 90 controls who did not. In a multivariable analysis, they noted that reversal patients were 5.0 times more likely (95% CI 2.1 to 11.7) to have a higher Mallampati score than controls, among multiple other significant predictor variables. Raw Mallampati score data were not provided, and thus it is unclear whether these are comparisons of Mallampati score I versus II or whether patients with scores III or IV were even included.

Agostoni et al[46] reviewed 17,542 gastrointestinal endoscopy procedures facilitated by anesthesiologist-administered propofol ("monitored anesthesia care") and found that the occurrence of overall adverse events was 1.3 times higher (95% CI 1.0 to 1.7) when the Mallampati score was III or IV. The Mallampati score was not an independent predictor of oxygen desaturation or other more serious complications, however. Data were not provided to permit calculations of sensitivity and specificity.

Children

In the only pediatric study, Iyer et al[22] evaluated 458 ED children for whom the Mallampati score could be assessed and found a statistically similar frequency of adverse events between those with higher (III or IV) and lower (I or II) Mallampati scores (24% versus 18%).

Summary

There are inadequate data to confirm or refute an association between the Mallampati score and procedural sedation–related adverse events.

HOW RELIABLE IS THE MALLAMPATI SCORE?

An extremely important attribute for any test or clinical evaluation is reliability (ie, that independent assessments by qualified observers are likely to obtain the same result). Studies of such interrater reliability have noted Mallampati score agreement in between 42% and 89% of preoperative[21,24,47-53] or dental clinic[54] adults (Table). κ Statistics fall well short of strong agreement (Table).

Wilson and John[24] had 9 anesthetists independently assess the Mallampati score for 10 colleagues and found that they concurred for only a single individual. There were 2 different ratings for 5 individuals and 3 different ratings for 3 individuals, and a last individual received each of the 4 Mallampati scoring options from at least 1 anesthetist.

Lopez et al[48] evaluated interrater reliability (Table) and also assessed intrarater reliability by having the Mallampati score assessed at different times by the same physician for 20 adults. Clinicians agreed with themselves 65% of the time, with a κ of 0.42.

Summary

The interrater reliability of the Mallampati score evaluation is moderate at best.

HOW FEASIBLE IS ROUTINE MALLAMPATI ASSESSMENT?

A cooperative patient is required to open the mouth and protrude the tongue, and so the Mallampati assessment can be impossible for patients who cannot or will not comply.

Table. Interobserver agreement in distinguishing Mallampati score I or II versus III or IV.*

Study	Adult Subjects	Agreement, %	κ
Menon, 2017[47]	323	83	0.64
Lopez, 2014[48]	108	42	0.10
Kandray, 2013[54]	234	77	0.54
Adamus, 2011[49]	101	89	0.50
Eberhart, 2005[50]	1,120	Not reported	0.59
Karkouti, 1996[51]	59	68	0.31
Tham, 1992[21]	64	58	Not reported
Oates, 1991[52]	232	84	Not reported
Wilson, 1990[24]	10	60	Not reported

*The Table omits one identified study[39] in which analyses of interobserver agreement are presented for the subsets of patients with known difficult and known easy airways, but omitting an overall analysis.

Critical illness

Soyuncu et al[36] prospectively studied 366 adult ED intubations and found Mallampati assessment possible in only 14%. In a second ED sample, Levitan et al[13] reviewed 838 intubations and found that 68% of patients could not follow simple commands or were in a cervical spine collar, thus rendering a Mallampati evaluation impossible. The Mallampati score could not be assessed in the 3 patients with intubation failure.

Bair et al[14] described 26% of 296 ED adults being urgently intubated as able to comply with the Mallampati evaluation.[14] Reed et al[35] found that the Mallampati score could be assessed in 55% of 156 adult ED intubations overall and for 44% of the 42 patients with a difficult intubation.

In a prospective study of 1,000 adults intubated in an ICU, the Mallampati score could be first assessed in 77%.[55] In a second sample of 282 obese adults intubated in an ICU, 78% could comply with the Mallampati evaluation.[34] A third critical care study of difficult intubation intentionally did not include Mallampati scoring because of its difficulty of assessment in this population.[56]

Children

Studies of pediatric anesthesia frequently note an inability to assess the Mallampati score. Mansano et al[25] found that 29% of children younger than 4 years were able to cooperate sufficiently to permit the Mallampati evaluation.[25] Aggarwal et al[31] successfully evaluated the Mallampati score in 82% of 100 children aged 1 to 5 years, with all failures in children younger than 3 years. In a review of 11,219 general anesthetics in children, the documentation rate for the Mallampati score was greater than 80% for children older than 6 years and less than 50% for those younger than 3 years.[28] A prospective study of 196 "cooperative, non-irritable" children undergoing elective surgery found that the Mallampati evaluation was possible in 59%, with most failures in preschool children.[29] In a study of ED procedural sedation in children, the Mallampati score was requested but not documented in 20% of 575 patients, again primarily in the younger portion of their sample.[22]

Summary

The Mallampati evaluation is frequently impossible to assess in critical illness and for children because of inadequate patient cooperation.

DISCUSSION

We reviewed the literature in regard to the accuracy, reliability, and feasibility of the Mallampati score, outlining evidence as might be pertinent and applicable to ED airway management and procedural sedation. In each of these areas, we identified important challenges and limitations to the Mallampati score. Although it is important to anticipate that patients may have a difficult airway, there is no specific evidence that the Mallampati score augments or improves the baseline clinical judgment of a standard airway evaluation (details of which are outlined in the "Introduction"). ED airway management is urgent, and the routine requirement for an added Mallampati assessment might delay care and distract from other airway preparations.

To be clinically valuable, a tool to predict an uncommon outcome such as a difficult airway must be highly sensitive. According to aggregate data from the largest meta-analysis,[5] the Mallampati score is 53% sensitive for difficult laryngoscopy and 17% sensitive for difficult bag-valve-mask ventilation. Thus, reliance on the Mallampati score as a screening tool would miss approximately half of the occurrences of difficult laryngoscopy and most of those of difficult bag-valve-mask ventilation while generating numerous false-positive warnings. According to these same aggregate data,[5] the positive and negative likelihood ratios for difficult laryngoscopy are 2.7 and 0.59, respectively. For difficult bag-valve-mask ventilation, they are 1.7 and 0.92. Each of these likelihood ratios is consistent with a trivial and clinically unimportant effect on outcome probability.

Given this weak test performance, it is surprising that the Mallampati score has found such widespread application within modern anesthesia practice. Indeed, the conclusions of meta-analyses[5,16,18,19] and other reviews[4,15] are consistently negative. Although frequent false-positive warnings may not be viewed as detrimental to safe care, their prevalence further supports our conclusion that when treating individual patients, clinicians must be equally concerned and prepared for a difficult airway regardless of the Mallampati score.

The accuracy calculations above consider the Mallampati score as a stand-alone test, rather than its actual clinical use as an adjunct to the standard general airway evaluation. The purpose of any scoring system or clinical decision rule is to augment and improve clinical judgment, not to replace it.[57-60] We were unable to identify any studies of such actual combined application. Any apparent predictive value of the Mallampati score may have already been captured in the standard general airway assessment.[57-60] There is thus no literature evidence to directly support the contention that Mallampati score augments or improves the standard clinical judgment of the general airway evaluation alone.

There is also no evidence that the Mallampati score—a tool designed for predicting difficult intubation—has any

role for the separate indication of procedural sedation. The key rescue intervention for rare airway and ventilatory adverse events resulting from procedural sedation is bag-valve-mask ventilation, for which, as noted above, the Mallampati score exhibits a weak aggregate positive likelihood ratio of 1.7. The few existing studies of Mallampati score for procedural sedation are inadequate and inconclusive.[22,44-46] In their most recent procedural sedation policy, the American College of Emergency Physicians (ACEP) concluded that "[t]here is no evidence that the addition of the Mallampati score to a standard general evaluation of the anatomic or physiologic variants…has any impact on clinical outcomes during sedation, and thus it cannot be recommended."[61]

In conclusion, the literature evidence demonstrates that the Mallampati score is inadequately sensitive for the identification of difficult laryngoscopy, difficult intubation, and difficult bag-valve-mask ventilation, with likelihood ratios indicating a small and clinically insignificant effect on outcome prediction. Although it is important to anticipate that patients may have a difficult airway, there is no specific evidence that the Mallampati score augments or improves the baseline clinical judgment of a standard airway evaluation. It generates numerous false-positive warnings for each correct prediction. The score is not reliably assessed because independent observers commonly grade it differently. It cannot be evaluated in many young children and in patients who cannot cooperate because of their underlying medical condition. We conclude that the Mallampati score lacks the accuracy, reliability, and feasibility required to supplement a standard airway evaluation before ED airway management or procedural sedation.

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(continued from p. 186)

DIAGNOSIS:

Left ventricular noncompaction. Figure 1 shows an apical 4-chamber view of the left ventricle, demonstrating prominent trabeculation at the apical and lateral walls and severely depressed systolic function (Video E1, available online at http://www.annemergmed.com). Blood flow in between trabeculae is visible on color flow imaging (Figure 2). The ratio of compacted to noncompacted myocardium measured 1:3, consistent with left ventricle noncompaction, a rare cardiomyopathy that is being increasingly recognized.[1] Mutations in sarcomere genes underlie approximately 30% of cases.[2] It is believed to arise from failure of myocardial sinusoids in the developing embryo to compact, which normally progresses from base to apex. Consequently, noncompaction preferentially affects apical, inferior, and lateral walls. Hypertrabeculation of the left ventricle serves as a nidus for thrombus formation that merits prophylactic anticoagulation. The left ventricle ejection fraction is the major determinant of sudden cardiac death risk.[3] Treatment is according to guidelines for heart failure; disease-specific therapy is unavailable. Despite variable penetrance, family screening is advisable.

The patient improved with diuretics, bisoprolol, lisinopril, and spironolactone. She was anticoagulated but declined implantable cardioverter defibrillator. Family screening result with echocardiography was negative.

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