

## Ongoing quest for a better predictor of difficult airway

Airway management in perioperative period is always challenging for anesthesiologists. The management of predicted difficult airway allows arranging appropriate expertise, equipment and formulating plans for airway management. However, an unanticipated difficult airway is a frightful situation and may lead to catastrophic patient outcome.<sup>[1]</sup> This outcome has always challenged researchers to look for an airway assessment tool or predictor that could predict the difficult airway with regards to bag mask ventilation, laryngoscopy, supraglottic airway device placement etc. In spite of many difficult airway predictors in literature, none has emerged as a robust tool for definite prediction of difficult airway in all patients.<sup>[2]</sup> The conventionally used predictors of difficult airway have poor to moderate discrimination when used alone.<sup>[3]</sup> This may improve further when combination of tools are used. However, its clinical status for prediction still remains limited. It is the right time to have a paradigm shift in our standards for airway assessment tools and prediction models.<sup>[4]</sup>

This issue of the journal includes a prospective observational study in which authors identified a yet another predictor of difficult airway.<sup>[5]</sup> The authors identified a ratio of height to thyromental distance for prediction of difficult laryngoscopy and compared it with certain conventional tools like modified Mallampati test, thyromental distance, and upper lip bite test. The authors have arrived at a useful conclusion that would be beneficial for prediction of the patients with possible difficult laryngoscopy but again not with 100% detection. Another concern for accepting the outcome is related to a wider range of predictability reported by the authors for various baseline parameters. The patients in the lower range would be at risk of missing the difficult airway prediction when this tool is used and thus mandates careful consideration when using such tools in clinical practice. Also, majority of such studies would exclude patients with distorted anatomical features of the difficult airway. Thus the predictors would be valid for patients without any apparent difficult anatomy and its utility remains for the focused group of patients only. Hence there would be restricted usefulness especially for patients requiring airway management in critical care and emergency care units.<sup>[6,7]</sup> Another important concern is the translation of the assessment in the management. In an interesting study, the use of documentation of airway assessment tools among the residents as compared to conventional tools, the difference for prediction of difficult airway was not much different.<sup>[8]</sup>

We need further research in interpretation and its translation to appropriate planning for airway management as well.<sup>[9]</sup>

Generally, the airway assessment tools and prediction models for difficult airway are primarily related to identification of anatomically difficult airway. It is well known that the physiologically difficult airway has an equal impact on the outcome of the patient.<sup>[10]</sup> It is the right time to look for predictors in assessment for physiologically difficult airway. We need to have a comprehensive assessment model that would provide us clues of overall difficulty in airway from all aspects including anatomical, physiological and equipment related for airway management.

More recently, ultrasonography is emerging as an important adjunct not only for airway management but also as an important tool for dynamic airway assessment. The role of virtual endoscopy and 3D computer tomographic reconstruction images are also emerging to provide more visualization and predictors of difficulty in airway management.<sup>[11]</sup> With the availability of these newer imaging tools in airway management, assessment parameters should incorporate them in airway assessment parameters.

Majority of assessment tools relate to tracheal intubation only. It is essential to provide more predictors for assessing difficulty in extubation as well. The recent guidelines of difficult extubation emphasize the need of assessing various aspects related to patient for planning extubation and its management accordingly.<sup>[12]</sup> It is indeed the time to validate the difficult extubation tools as well. We need to have a comprehensive model that would assess for various aspects of a airway management including anatomical, physiological, dynamic vs. static, and aid in prediction of success of various airway equipment and airway management techniques. Is it the time to forego for clinical assessment using demography alone for assessment? Do we need to incorporate other advanced tools like ultrasound, endoscopy, nasoendoscopy, virtual endoscopy, reconstructed images of airway as well? These need further research and evidence to elaborate its importance.

To conclude, identification of anatomically and/or physiologically difficult airway by certain prediction models remains challenging. We yet need to have a fittest predictor model for identifying the difficult airway with complete success. At present, combination of assessment tools using computerized model remains the best options but needs to be complemented with newer imaging tools as well. It is also important to understand the need of learning the expertise of airway management and availability of suitable airway

armamentarium for airway management to prevent any untoward outcome.

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