



Predicting Difficult Intubation

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Summary

The major concern of the anesthetist is an unexpected difficult intubation. Difficult intubation requires the manipulation of external laryngeal. The difficult intubation requires more than three attempts at intubation. The difficult intubation means the inability to intubate using all the available methods. In this study the patients were divided into intubation group and normal group depending upon the IDS score. Along with the 7 assessment factors and total airway score, that I was going to be the sum of all the factors, were compared between two groups to see which method effectively predicts the difficult endotracheal intubation before it could provide.

Introduction

The major concern of the anesthetist is an unexpected difficult intubation. Difficult intubation requires the manipulation of external laryngeal. The difficult intubation requires more than three attempts at intubation. The difficult intubation means the inability to intubate using all the available methods. The risk of repeated unsuccessful intubation, leads to the increased mortality and morbidity. When one method seems to be not working the specialists move towards the algorithm rather than wasting time on futile attempts (Dhillon, 2018). There have been many studies on the various criteria for the assessment of airway to predict difficult intubation before the anesthesia. In this regard, there are many definitions on difficult intubation. Benumof has reported that in about 1- 4 percent cases, the difficult has occurred and in about 0.05 – 0.035 are the number of the cases where intubation failure has occurred. According to the American

Society of Anesthesiologists (ASA), the difficult intubation is where three attempts at the endotracheal intubation are required when an average laryngoscopy is used or when the endotracheal intubation takes 10 minutes or more than 10 minutes. In normal circumstances to predict the difficult intubation before anesthesia, the criteria that has been used as an assessment of airway are the Wilson score and Lemon method. The aim of this study was that patients were divided into intubation group and normal group depending upon the IDS score. Along with the 7 assessment factors and total airway score, that I was going to be the sum of all the factors, were compared between two groups to see which method effectively predicts the difficult endotracheal intubation before it could provide.

Method

The study was done on the patients of age group from 19 to 70 years old patients who were booked

to go for the surgery under the general anesthesia. There were certain limitations; the patients who did not have the complete teeth, or who had the joint pain, the patients who had neck movement or oral and laryngeal tumor were removed from the study. The consent of the patients was the first priority, so we explained them the procedure of airway assessment. The anesthesiologists visited the patients before the surgery, evaluated their

airway assessment, and noted down on the piece of paper. The following factors were the seven airway assessment factors: Mallampati classification, the head and neck movement, BMI, the thyromental distance, the severity of buckteeth, the ULBT and the interincisor gap. Each factor was given the score of the 0,1 and 2 points and the score was recorded (Suk-Hwan Seo, Kim, Ryu, & Kim, 2012).

Airway factor	score		
	0	1	2
Mallampati classification	Class I	Class II	Class III – IV
Thyromental distance (cm)	>6.5	6 – 6.5	<6
Head & neck movement degree	>90	90	<90
BMI (kg/m ²)	<25	≥25	-
Buck teeth	No	Mild	Severe
Inter-incisor gap (cm)	>5	4-5	<4
ULBT	Class I	Class II	Class III

Figure 1 Rules for the Evaluation of airway assessment score

The methodology of the study for the assessment of the factors was like this: first the Mallampati classification that was provided up to the class three III. The level four was taken from the Samssoon and Young’s classification. The patient used to stick out his or her tongue only if possible. The observer used the torch pen to observe the structure of pharynx. The thyromental distance was measured when the patient extended his or neck, the distance from thyroid notch to the chin was measured. The head and neck movement was observed by asking the patient to move the neck as much as possible. If the IBM was more than 25 Kgs, 1 point was allotted and if the IBM was less than 25 Kgs, 0 point was allocated. Fifth, the severity of the buckle teeth was observed by asking the patient to close his/ her teeth and observe if there is space between the upper and lower teeth.

The interincisor gap was measured by measuring the distance between the upper and lower teeth when they were wide closed. The ULBT was done by allowing the patient to sit in the upright position when the jaw protruded. The ability of the lower teeth to bite upper lip was put in the class III. The class 1 was the class in which the

lower teeth were able to bite the upper vermilion line. Class II was the class in which the lower teeth were able to bite below the vermilion line so that some of the part of the membrane was covered. In addition to that, the factors of diabetes and hypertension were studied to observe the effects of the chronic ailment on the airway assessment. The whole intubation process was scored by using the all seven variables.

Results

Among the all patients, there were 36 patients 11.8 percent, in the difficult intubation group who had intubation more than 5. In the normal group, there were 269 patients’ 88.6 percent patients who had intubation less than 5. In this study, there were no failures of intubation. There was a significant and noticeable difference between the two groups. The difficult intubation group had significantly greater number of patients.

	N (IDS = 5)	DI (IDS>5)	P value
Number of patients (%)	269 (88.2)	36 (11.8)	-
Age (yr)	47.1 ± 15.7	53.2 ± 10.6	0.004
Gender (M/F)	126/143	22/14	0.108
Patients of hypertension (%)	60 (22.3)	11 (30.6)	0.271
Patients of diabetes (%)	40 (14.9)	9 (25.0)	0.120
Intubation duration (sec)	40.65 ± 12.20	72.08 ± 10.03	<0.001
Lowest SaO ₂ level (%)	99.55 ± 1.17	95.17 ± 3.72	<0.001
TAS (I-11)	2.50 ± 1.89	6.47 ± 1.26	<0.001

Figure 2 Characteristics of the Patients of both Groups Difficult Intubation and Normal Group

Discussion

In the result of the study, if the airway assessment factor was more than the point 6 or if the ULBT was in the class III, the difficulty of the endotracheal intubation was possible. The Wilson score has given the score of the total five physical characteristics, which include the weight, head and neck movement, jaw movement, protruding interior teeth and receding mandible. The lemon method can be used in the emergency situations in the simple and prompt difficult intubation and when the measures have to be taken with the hands instead of special or specific instruments.

On the basis of biting the upper lip with the lower teeth, the ULBT is divided into three groups. The ULBT was high, if the patient could not bite open his or her mouth very well, or if the patients had buck teeth and if the patient had a receding mandible (Admasu, 2019).

The Mallampati classification has been such a great help in this regard. It has been reported that the Mallampati class of III and IV had a significant relationship with predicting difficult endotracheal intubation. The thyromental distance between the groups was not that much different. Along with that, the severity of the buckle teeth was not that much different between the two groups. However, the author observed that the patients with the short body frame in comparison with the patients of large body frames had relatively thyromental distance.

To elucidate, it can be said that airway assessment factor is a better and useful method instead of relying on one factor method to predict difficult intubation. In addition, the ULBT is also a

significant method to predict the difficult endotracheal intubation.

References

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