

COMPARISON OF CT AND USG GUIDED CRICOID CARTILAGE DIAMETER FOR DETERMINING THE SIZE OF DOUBLE LUMEN TUBE- A RANDOMISED PROSPECTIVE STUDY

Shefali Gautam, Roshni Mariam Mathew, Rajesh Raman, Vinod Kumar Srivastava, Anurag Rai, Shailendra Kumar

DEPARTMENT of ANESTHESIA King George's Medical University, Lucknow

Introduction

Precise airway management is an important skill in the field of anaesthesiology and it plays an even more vital role in thoracic surgeries like lung resections to ensure patient safety for optimal outcome. Double lumen tubes (DLT) have become the gold standard for one lung ventilation. However, there is still no one best method to determine the size of DLT. Choosing the correct double lumen tube size is challenging, typically relying on height, gender and subjective experience. This study investigates using ultrasound (US) and computed tomography (CT) to measure cricoid cartilage diameter for objective DLT sizing.

Materials and methods

A randomised single centre study with 120 adult patients of either sex requiring single lung ventilation posted for elective thoracic surgery were divided into 3 groups.

Group A (n=40)– DLT size was determined by using transverse diameter of cricoid cartilage by USG

Group B (n=40)– DLT size was determined based on transverse diameter of cricoid cartilage by CT

Group C (n=40)– DLT size was determined by conventional method based on height and gender

Primary objective was to compare appropriateness of tube size whether appropriate or inappropriate from bronchoscopy and auscultation. Secondary objective was to compare the effect of lung collapse based on Verbal rating scale (VRS) by surgeon to evaluate the extent of lung collapse and to compare the severity of sore throat when size selection was done according to USG or CT scan.

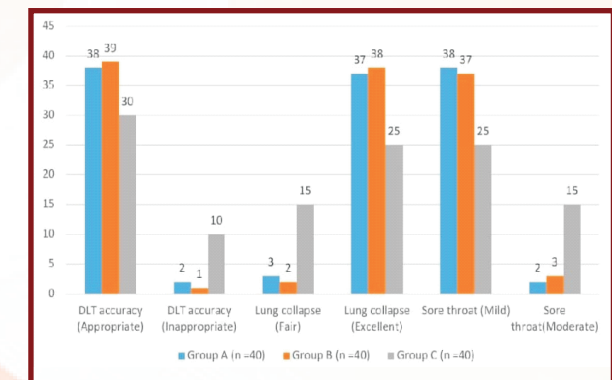
Results

The study was intended to compare the size of double lumen tube as obtained by measuring the cricoid cartilage diameter by means of ultrasound and computed tomography and also by the conventional method of height and gender in patients requiring one lung ventilation. All three group participants were comparable based on demographic and baseline parameters. Among the 120 subjects, the DLT size was inappropriate in 29.5% of the subjects out of which 25% of the DLTs were put by conventional method. On comparison of group A, B and group C based on double lumen tube accuracy and degree of lung collapse, group B DLT accuracy was more appropriate as compared to group A and group C. It was inappropriate in only 2.5% and 5% cases in group B and group A respectively while it was 25% in group C. (P value <0.05) Group B showed a higher percentage of complete collapse to the operative lung (92.5%) in comparison to the conventional group. The incidence of sore throat varied statistically significantly (p value <0.05) among the study groups, with Group C experiencing a greater incidence of moderate sore throat (37.5%) in comparison to the other two groups. (Table 1)

Table 1: Comparison of the groups based on Double Lumen Tube accuracy, degree of lung collapse and Degree of sore throat among three groups.

	Group A (n =40)	Group B (n =40)	Group C (n =40)	Pearson chi ²	P value
DLT accuracy (Appropriate /Inappropriate)	38 (95%)/ 2(5%)	39(97.5%)/ 1(2.5%)	30 (75%)/ 10(25%)	14.71	0.001
Lung collapse (Fair/Excellent)	3 (10%)/ 37(92.5%)	2 (75%)/ 38(95%)	15(30%)/ 25(70%)	18.40	0.001
Sore throat (Mild/Moderate)	38(95%)/ 2(5%)	37(92.5%)/ 3(7.5%)	25(62.5%)/ 15(37.5%)	24.473	0.001

Data expressed as Numbers (percentages), n=Number of patients, Group A =Ultrasound group, Group B = Computed Tomography group, Group C -Conventional group.



Conclusion

The study demonstrates that US and CT guided measurements of cricoid cartilage diameter are reliable and effective methods for determining DLT size in thoracic surgery. Both methods have now been widely used in clinical research and significantly reduce inappropriate DLT sizing, enhance lung collapse and decrease the incidence of sore throat compared to conventional methods.

References

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