44603 - CONFIRMATION OF TRACHEAL INTUBATION USING NECK AUSCULTATION

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INTRODUCTION: Anatomical differences between the trachea and esophagus form the basis for neck auscultation. We hypothesize that clinicians will be able to use this technique to differentiate between esophageal and tracheal intubations with a high degree of accuracy.

METHODS: After research ethics board and research review committee approval, patients presenting for elective surgery requiring general anesthesia with endotracheal intubation were recruited to participate in the study. After induction of general anesthesia, the trachea was intubated under direct vision. The endotracheal tube (ETT) was advanced and withdrawn 2-3 cm for 2-3 seconds while sounds were recorded from the lateral neck with an electronic stethoscope. The esophagus was then intubated, and the ETT advanced and withdrawn for 2-3 seconds while sounds were recorded. The esophageal ETT was removed, and the anesthetic continued with no further interference.

The set of recordings were presented, in random order, to 30 clinicians who were asked to identify whether each recording represented a tracheal or esophageal intubation. The results were used to determine an overall accuracy, sensitivity, and specificity for the technique. As secondary outcomes, listeners were compared based on level of training, and the accuracy of the technique was compared based on the BMI and neck circumference of the patients.

RESULTS: A total of 23 patients participated in the study, generating a set of 46 sound clips. Nine sound clips were discarded due to poor sound quality, leaving 37 clips to be analyzed. Overall accuracy of the group of listeners was 73% (CI 59-87%), with a sensitivity of 76% (CI 49-100%) and specificity of 70% (CI 38-100%). There was no difference between groups based on level of training. Although not statistically significant, there was a trend towards greater accuracy in patients who were obese and those with large neck circumferences.

DISCUSSION: The sensitivity and specificity of neck auscultation in this study were lower than expected, although they are suspected to be higher when the technique is used in real time. Listening to isolated sound clips does not afford the same experience as simultaneously moving an ETT, as the listener is unable to correlate sound with activity. In addition, some of the recordings may have been clearer or truer to the original sound than others. Finally, neck auscultation was a novel technique for all participants, and accuracy may improve with experience. Furthermore, the purpose of neck auscultation is not to replace, but to add to the barrage of confirmatory tests available, as multiple tests are required to achieve a sensitivity and specificity of 100% (1). The application of this technique may be greatest during emergency intubation outside the operating room, where its advantages include portability, a lack of need for insufflation, and ease of use by inexperienced intubators.

REFERENCES: 1. J Emerg Med 2001 20: 223-229.