Ultrasound Confirms Tube Position During Cardiopulmonary Resuscitation


In this small study, the positive predictive value of ultrasound to confirm endotracheal tube placement during active compressions was 98.8%.

Confirming correct endotracheal tube (ETT) placement during cardiopulmonary resuscitation (CPR) can be challenging. In a prospective observational study, researchers in Taiwan assessed the accuracy of real-time tracheal ultrasonography in 89 cardiac arrest patients (age range, 24–98 years) receiving emergency intubation during CPR. Patients with severe neck trauma, neck tumors, or history of neck surgery (including tracheotomy) were excluded. The gold standard for correct ETT placement was defined as bilateral auscultated breath sounds with good capnography waveform and exhaled carbon dioxide >4 mm Hg after at least 5 breaths.

Three senior emergency medicine residents supervised by experienced faculty performed tracheal ultrasonography during and immediately after ETT insertion, with most scans taking 10 seconds or less. Observation of a single air-mucosa interface with comet-tail artifact confirmed tracheal placement. Seven patients (7.8%) had esophageal intubations. Sensitivity, specificity, and positive and negative predictive values of tracheal ultrasound for identifying ETT position were 100%, 86%, 99%, and 100%, respectively.

Comment
Aspiration devices are the current standard for confirmation of tracheal tube placement during CPR when end-tidal CO₂ is not detectable. Ultrasound shows promise in this setting, but the failure to identify 1 in 7 esophageal intubations is concerning. The key to establishing the value of ultrasound for tracheal tube confirmation lies in demonstration of its ability to detect 100% of esophageal intubations. We are not there yet.

Citation(s):

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