Verifying Tracheal Intubation in Cardiac Arrest Patients

Aspiration esophageal detector devices and end-tidal CO₂ detection (ETCD) have both been advocated as methods for verifying placement of an endotracheal tube. Although ETCD is superior, it can falsely indicate esophageal intubation in some cases of prolonged cardiac arrest, because of cessation of gas exchange in the lungs. Investigators in Japan compared a self-inflating-bulb-type (SIB) esophageal detector device and an infrared ETCD monitor in 65 patients with out-of-hospital cardiac arrest who were intubated in the ED.

Intubation was tracheal in 60 patients and esophageal in 5 patients; these 5 patients were reintubated, all tracheally, yielding a total of 70 intubation attempts. Clinical assessment, including direct visualization, was used to identify tube placement. The SIB reinflated in less than 4 seconds in 47 of the 65 tracheal intubations and none of the 5 esophageal intubations. In the remaining 18 tracheal intubations (28 percent), reinflation of the SIB was delayed or absent. ETCD indicated esophageal intubation in all of the esophageal intubations and 26 of the tracheal intubations; however, 7 of these 26 patients had a small end-tidal CO₂ wave form. There was no statistical difference in the accuracy of the two methods. Combined, the 2 methods correctly identified 59 of the 65 tracheal intubations. None of the esophageal intubations tested positive for tracheal intubation with either instrument.

Comment: This study, with only 5 esophageal intubations, is too small to permit any meaningful conclusions, and the gold standard (clinical evaluation) is flawed. The self-inflating bulb performed just as poorly as ETCD. The take-home message is that ETCD is still the superior method for confirming tube placement. In some cases of prolonged cardiac arrest, when intubation is strongly thought to be tracheal despite negative end-tidal CO₂, the self-inflating bulb may be helpful.

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