



The BOUGIE Trial

Key Article

Driver BE, et al. *Effect of use of a bougie vs endotracheal tube with stylet on successful intubation on the first attempt among critically ill patients undergoing tracheal intubation. JAMA. 2021. Published online December 8, 2021.*

Background

- Over 1.5 million patients undergo tracheal intubation each year in the US.
- Failure to intubate on the first attempt can occur in up to 20% of intubations in the ED and ICU.
- First attempt failure can increase the risk of severe hypoxemia, peri-intubation arrest, and death.
- Historically, most emergency intubations have been performed with a malleable stylet within the endotracheal tube.
- In recent years, many have used a bougie, though primarily as a rescue device for difficult airways.
- A recent randomized trial found that routinely using a bougie rather than an endotracheal tube with stylet increased first attempt success. However, this was conducted at a single site.

Objective

- To compare the effect of using a bougie vs an endotracheal tube with stylet on outcomes of tracheal intubation in EDs and ICUs across multiple health systems.

Study

- Randomized, pragmatic, parallel-group, unblinded trial
- 15 sites: 7 EDs and 8 ICUs in 11 US hospital
- Patients
 - Included
 - Undergoing tracheal intubation
 - Planned use of sedation and a nonhyperangulated blade
 - Excluded
 - Incarcerated
 - Pregnancy
 - Need for immediate tracheal intubation without time for randomization
 - If clinician determined that use of a bougie or stylet was either required or contraindicated
- Intervention
 - Patients randomized in a 1:1 ratio
 - Bougie Group
 - Operators instructed to use a bougie for the first attempt at intubation

- Pass the bougie into the trachea, have an assistant load the ETT without stylet onto the bougie, advance the tube over the bougie and through the vocal cords, and withdraw the bougie and laryngoscope
 - Stylet Group
 - Use an ETT with a malleable stylet for first attempt at intubation
 - Shape stylet with a distal bend of 25-35 degrees
- Primary Outcome
 - Successful intubation on the first attempt
 - Defined as a single insertion of a laryngoscope blade into the mouth and either:
 - Single insertion of a bougie into the mouth followed by single insertion of an ETT into the mouth OR
 - Single insertion of an ETT with stylet into the mouth
- Secondary Outcomes
 - Incidence of severe hypoxemia between induction and 2 min after intubation
 - Defined as SpO₂ < 80%

Results

- Overall, 1106 patients were enrolled. Four patients were excluded after enrollment, thereby leaving **1102 patients** for the primary analysis
 - Bougie Group: 556 patients
 - Stylet Group: 546 patients
- Baseline characteristics were similar between the groups
 - Mean age: 58 years
 - 41% were women
 - Most common reasons for intubation: altered mental status and acute respiratory failure
- Operators
 - Most common operator was EM (63%)
 - Most operators were resident physicians (62%)
 - Operators had performed a median of 60 total intubations
- Video Laryngoscopy
 - Bougie Group: 76%
 - Stylet Group: 74%
- Primary Outcome – First pass success
 - Bougie Group: 80.4%
 - Stylet Group: 83%
 - No significant difference
 - No significant difference in the adjusted analysis or between any prespecified subgroups
- Secondary Outcome – Severe hypoxemia
 - Bougie Group: 11%
 - Stylet Group: 8.8%
- Exploratory Outcomes
 - Median time from induction to intubation
 - Bougie Group: 124 seconds
 - Stylet Group: 112 seconds
 - Airway complications – post-intubation pneumothorax
 - Bougie Group: 2.5%

- Stylet Group: 2.7%
- Cardiovascular collapse
 - Bougie Group: 12.2%
 - Stylet Group: 16.7%

Limitations

- Excluded patients for whom urgency of intubation precluded randomization
- Excluded use of hyperangulated laryngoscope
- Excluded patients for whom use of a bougie was indicated
- Most operators in the trial had limited experience using a bougie
- Unblinded trial
- Did not evaluate the use of bougie as a rescue device after failed first attempt

Take Home Points

- Among critically ill adults undergoing tracheal intubation, use of a bougie did not significantly increase the incidence of successful intubation on the first attempt compared with ETT with stylet.