Journal Club Summary

Article 1

# Background and Overview

Article Title/Citation:

Brian Driver, MD; Kenneth Dodd, Matthew E. Prekker, MD et al. The Bougie and First-Pass Success in the Emergency Department. Ann Emerg Med. 2017;Epub ahead of print. 1-6.

Objective: To determine whether bougie use is associated with increased first-pass success in ED patients undergoing emergency endotracheal intubation.

Purpose: The bougie is infrequently used as an airway rescue tool (3.5% of initial intubation attempts in the ED) and there hasn’t been any literature to evaluate its use as a primary airway tool. With an 85% first pass success rate in ED intubations, there is room to improve.

Hypothesis:

Use of the bougie on the first intubation attempt increases odds of first pass success at endotracheal intubation.

Brief Background/Why Chosen for Journal Club:

Intubation practices vary widely among individuals, institutions, and practice settings. The bougie is infrequently used in our department and could be used more frequently to potentially improve our first pass success rate and our group’s familiarity with the device.

# Methods

Study Design & Methodology:

Single center retrospective observational non-randomized consecutive sampling study of all ED intubations performed in 2013, investigators blinded to the specific aims of the study

Patient Selection & Enrollment:

HCMC has resus rooms outfitted with motion sensor cameras, audio feed, monitor recordings and data were extracted from these videos.

Inclusion criteria: All adults >17 y/o intubated in the ED in 2013, Macintosh blades only

Exclusion criteria: Glidescope/bougie combo, Storz D-BLADE tubes, missing resus room viedo, intubated pre-hospital

Interventions:

None, this was a retrospective observational study.

Outcome Measures/Endpoints:

**Primary outcome:** First pass success of ETT placement defined as confirmed intratracheal placement by the treating physicians without subsequent attempts. Most of the time this was confirmed via waveform capnography. An “attempt” was defined as putting the laryngoscope in the mouth and taking it out again.

**Secondary outcomes:**

Median attempt duration in seconds, hypoxemia, esophageal intubation

Statistical Analysis:

Multivariate logistic regression

# Results

Enrollment & Baseline Characteristics:

Table 1 – some peculiarities

4x the number of bougie vs no bougie

¼ medical, ¼ trauma, 1/3 neurologic

½ obese

1/10 abnormal anatomy

90ish% paralyzed

44-50% ear-to-sternal-notch position

93-97% PGY3 intubators

91-96% C-Mac

Cmac screen viewed 46% in bougie group vs 19% in no bougie group

Little meaningful difference except for VL usage

676 intubations 🡪 593 (88% had video) 🡪 543 (92%) used Mac blade of some kind

N=543

Summary of Primary & Secondary Outcomes:

**Table 2 discussion:**

First pass success with the bougie 95% vs 86% without the bougie

Attempt duration with bougie 40 sec vs 27 sec – not clinically meaningful

Hypoxemia 17% vs 13% (defined as sp02 <90%)

Limited meaning as the monitor was not captured on viedo in 1/5th of the intubations, poor waveform in another ~10%

One esophageal tube in each group

Review of Figures & Tables:

**Table 3 Discussion**

Multivariable logistic regression model for first pass success

The comparison between C-mac used and C-mac screen viewed is useless N=507 vs N=501

LR1 actually between C-mac vs direct, which is a poor model because 96% of tubes in the study were C-macs

LR2 actually between screen viewed vs not viewed

In both cases very similar odds ratios for first pass success

Bougie used OR – 2.8-3

VL used OR – 5 … but very wide confidence interval

Table E1, E2

Strong interobserver agreement, internally consistent.

Baseline variables in Table 1 in the logistic regression model

# Author’s Discussion and Conclusions

Brief Summary of Main Discussion Points:

First high-quality study supporting routine use of the bougie in the ED as a primary airway adjunct

Study simply highlights its utility and did not attempt to discern why the bougie was used in each case

Subset analysis in future studies needed

Even after adjusting for higher VL use in the bougie group, the bougie still was independently associated with higher first pass success

Conclusions:

Bougie was independently associated with higher first pass success

# Your Discussion and Conclusions

Accept/Decline Author’s Conclusions:

Yeah, I buy it but this study needs to be replicated in a department where its use is more in line with national trends. Not quite generalizable as this department culturally uses the bougie almost every time and everyone is very familiar with its use.

Study Strengths:

Consecutive sampling. Intubations were video recorded and independently reviewed which decreases self-reporting bias. First-pass success rate for non-bougie intubations was consistent with national pooled data (85% vs 86% in the study). Impressive first pass success rate at 95%. Largest reported series on bougie use in this setting.

Study Limits:

Unusual setup at this single center study – Mostly PGYIII intubators using almost exclusively C-Macs (96%) at a department with a historical bias towards using the bougie. 80% of tubes had the bougie used on the first pass. These intubators are very familiar with the device and possibly less comfortable without it. Complications of bougie use such as airway trauma, TE tree injury, PTX, were not recorded but these are rare in the literature so not a big deal. No description of the Cormack-Lehane grades on these tubes – were they all grade 1 and 2? The world may never know.

Generalizability/

Implications:

Implications for generalizability are concerning given the unique practice of this one department and their institutional bias towards using the bougie – of course they’re going to be better at it because they use it all the time and it’s the expected course.

Next Thoughts/New Questions:

It would make for an interesting prospective study in a department with relatively infrequent bougie use to require a bougie on the first pass with pre- and post-intervention arms. It would strengthen the results of this study and add to its generalizability.

Q&A/Discussion

1) How do you approach intubation for your uncomplicated airways? Do you use airway adjuncts like OPAs, NPAs every time or just in select cases? Are you using apneic oxygenation? What’s your Plan A, B, C?

2) What’s your approach to intubation for complicated airways – patients with minimal reserve, desatting quickly, or expected difficult intubation (outside the obvious massive neck mass fiberoptic intubation case)?

3) Do these studies motivate you to change your practice? Why or why not?