Critical Review Form
Therapy

Oh J, Lim T, Chee Y, Kang H, Cho Y, Lee J, Kim D, Jeong M. Videographic analysis of glottic view with increasing cricoid pressure force. Ann Emerg Med. 2013 Apr;61(4):407-13.

Objectives: **" to determine the effect of cricoid pressure on glottic view by analyzing the glottic view area with videography in the context of rapid sequence induction and intubation.**

Methods: **This cross sectional survey was performed at a university hospital in Korea between September 11 and October 1, 2008. Adult patients aged 18 years or older who were scheduled to undergo elective surgery requiring intubation and neuromuscular blockade were eligible for inclusion. Patients with American Society of Anesthesiologists (ASA) physical status greater than II; those with a history of surgery, trauma, radiation, or soft tissue disease of the neck; pregnant females; and those with known difficult airways were excluded.**

Following induction with fentanyl, neuromuscular blockade with vecuronium, and initiation of sevoflurane, a Pentax-AWS video laryngoscope was inserted to record glottic views. A trained emergency physician then initiated cricoid pressure. Force was measured using a novel sensor, with force applied over a range from 0 N to 50-55 N. The imaging and measurements were later analyzed by software so that the change area of glottic opening could be measured at each level of cricoid pressure force. The change in view (P_F) was expressed as the ratio of the glottic opening area at each force (A_F) versus the glottic opening area when no cricoid pressure was applied (A_0). Subjects were then classified as either no worsening of view ($P_0 - P_F \leq 0\%$) or worsening of view ($P_0 - P_F > 0\%$).

During the study period, 61 or 168 eligible patients were enrolled. Data from 11 of these subjects were excluded due to recorder area (n = 7) or poor image quality (n = 4), leaving 50 subjects in the final analysis. Intubation was completed in less than 10 seconds after recording in all patients, with no desaturations < 96% observed. The median age was 53 years and 48% were male.

Guide		Comments
I.	**Are the results valid?**	
A.	**Did experimental and control groups begin the study with a similar prognosis?**	
1.	Were patients randomized?	No. While this was technically a cross-sectional study, there was an intervention being studied and an outcome measured at various degrees of this intervention. All patients underwent the same intervention (varying cricoid pressure with glottic view

		measurement at each pressure) and hence there was no randomization involved. In a sense, each patient served as his or her own control.
2.	Was allocation concealed? In other words, was it possible to subvert the randomization process to ensure that a patient would be "randomized" to a particular group?	N/A
3.	Were patients analyzed in the groups to which they were randomized?	N/A
4.	Were patients in the treatment and control groups similar with respect to known prognostic factors?	In a sense, yes. While there was technically only a single group of patients, each patient served as his or her own control. Therefore, the only difference was the intervention itself (degree of cricoid pressure).
B.	**Did experimental and control groups retain a similar prognosis after the study started?**	
1.	Were patients aware of group allocation?	N/A
2.	Were clinicians aware of group allocation?	N/A
3.	Were outcome assessors aware of group allocation?	N/A
4.	Was follow-up complete?	No. Out of 61 patients enrolled, 11 (18%) had to be excluded due to recorder error or poor image quality. This loss of outcome data could have a significant impact on the results. The authors provide no comparison between patients without outcome data and those included in the final analysis.
II.	**What are the results ?**	
1.	How large was the treatment effect?	• A decrease in the median area of the glottic view was observed with increasing circoid pressure (Table 2). At a force of 50 N, the median percent drop in glottic area was 47.6% (95% CI 36.0 to 82.7%).

		Table 2. Change in glottic view at 5-N increments in cricoid pressure force. Glottic View (%) Force (N) | Median | IQR | 95% CI 0 | 100 5 | 98.7 | 71.5, 118.5 | 84.5–104.8 10 | 89.5 | 64.2, 117.1 | 79.5–100.8 15 | 85.7 | 50.8, 120.1 | 70.4–106.8 20 | 83.2 | 44.2, 113.7 | 50.3–96.8 25 | 76.8 | 40.2, 112.5 | 51.7–88.7 30 | 76.4 | 34.1, 109.1 | 45.5–86.7 35 | 74.7 | 28.0, 108.8 | 40.2–88.1 40 | 51.0 | 21.8, 104.2 | 36.3–82.6 45 | 53.8 | 18.5, 106.6 | 34.9–82.7 50 | 47.6 | 15.2, 107.4 | 36.0–82.7 *CI*, Confidence interval. • The glottic view was completely occluded in 9 subjects (though the pressure at which this occurred is not reported).
2.	How precise was the estimate of the treatment effect?	See above.
III.	**How can I apply the results to patient care?**	
1.	Were the study patients similar to my patient?	No. This study was conducted in the operating room with patients undergoing elective procedures. Patients were induced with fentanyl, paralyzed with vecuronium, and maintained with inhaled sevoflurane, which is very different from our typical practice pattern. In addition, the authors excluded several at-risk patients that we would still need to intubate under RSI in the emergency department, including those with high ASA physical status grades, those with a history of soft tissue disease of the neck, those status-post trauma, and pregnant women (external validity).
2.	Were all clinically important outcomes considered?	No. This study was limited in that it only assessed the effect of cricoid pressure on the glottic view using a video laryngoscope (surrogate outcome). The authors provide no evidence to support a correlation between glottic view on video laryngoscopy and ease of intubation.
3.	Are the likely treatment benefits worth the potential harm and costs?	Uncertain. This very small, cross-sectional study found that increasing force of cricoid pressure was associated with a sequential decrease in glottic area as seen on video laryngoscopy. These findings, while interesting, provide no definitive evidence regarding the effects of cricoid pressure on the ease or difficulty of intubation.

Limitations:

1. **This was not a randomized, controlled trial, but rather patients served as their own controls.**

2. **Out of 61 patients enrolled, 11 (18%) had to be excluded due to recorder error or poor image quality. This loss of outcome data could have a significant impact on the results. The authors provide no comparison between patients without outcome data and those included in the final analysis.**

3. **The outcome assessed in this study was glottic area which is a surrogate outcome with no documented correlation to ease of intubation (a patient-centered outcome).**

4. **The patients and setting in this study are very different from our practice environment, and it is unclear if these results would be externally valid when considering emergent intubation using RSI in the ED.**

Bottom Line:

This very small, cross-sectional study found that increasing force of cricoid pressure was associated with a sequential decrease in glottic area as seen on video laryngoscopy. These findings, while interesting, provide no definitive evidence regarding the effects of cricoid pressure on the ease or difficulty of intubation.