

Analysis of Cricoid Pressure Force and Technique Among Anesthesiologists, Nurse Anesthetists, and Registered Nurses

Melissa Lefave, DNP, APRN, CRNA, Brad Harrell, DNP, APRN, ACNP-BC, CCRN, Molly Wright, DNP, APRN, CRNA

Purpose: *The purpose of this project was to assess the ability of anesthesiologists, nurse anesthetists, and registered nurses to correctly identify anatomic landmarks of cricoid pressure and apply the correct amount of force.*

Design: *The project included an educational intervention with one group pretest-post-test design.*

Methods: *Participants demonstrated cricoid pressure on a laryngotracheal model. After an educational intervention video, participants were asked to repeat cricoid pressure on the model.*

Findings: *Participants with a nurse anesthesia background applied more appropriate force pretest than other participants; however, post-test results, while improved, showed no significant difference among providers. Participant identification of the correct anatomy of the cricoid cartilage and application of correct force were significantly improved after education.*

Conclusion: *This study revealed that participants lacked prior knowledge of correct cricoid anatomy and pressure as well as the ability to apply correct force to the laryngotracheal model before an educational intervention. The intervention used in this study proved successful in educating health care providers.*

Key Words: *cricoid pressure, nurse, anesthesiologist, nurse anesthetist, Sellick's maneuver, cricoid anatomy.*

© 2016 by American Society of PeriAnesthesia Nurses

CRICOID PRESSURE, OFTEN termed “Sellick’s maneuver,” is used for the prevention of regurgitation of gastric contents during induction of

Melissa Lefave, DNP, APRN, CRNA, Associate Professor, Nurse Anesthesia Track in the School of Nursing Union University, Jackson, TN; Brad Harrell, DNP, APRN, ACNP-BC, CCRN, Clinical Associate Professor, University of Memphis Loewenberg College of Nursing, Memphis, TN; and Molly Wright, DNP, APRN, CRNA, Chair & Professor, Nurse Anesthesia Track in the School of Nursing Union University, Jackson, TN.

Conflict of interest: None to report.

Address correspondence to Melissa Lefave, 130 Woodland Dr., Brownsville, TN 38012; e-mail address: mlefave@uu.edu.

© 2016 by American Society of PeriAnesthesia Nurses

1089-9472/\$36.00

<http://dx.doi.org/10.1016/j.jopan.2014.09.007>

anesthesia or during positive-pressure ventilation. This technique was described by Sellick^{1(p405)} in 1961 as “backward pressure of the cricoid cartilage against the bodies of the cervical vertebrae.” Sellick, however, was not the first to consider the advantages of such a maneuver. William Cullen^{2(p16)} in 1774 wrote, “whether the blowing in is done by a person’s mouth, or by bellows, Dr. Munroe observes, that the air is ready to pass by the gullet into the stomach; but that this may be prevented, by pressing the lower part of the larynx backwards upon the gullet.” In 1776, Hunter^{3(p419)} described how the larynx could be gently pressed against the esophagus and spine while “blowing air into the lungs” to “prevent the stomach and intestines being too much distended by the air.”

Despite sporadic reports that cricoid pressure may not be as effective as once thought, the “Sellick maneuver” remains an accepted practice that is used worldwide.⁴⁻⁸ One author^{9(p94)} even suggests that the omission of cricoid pressure in patients with known or suspected risk factors of aspiration would be unethical “until there is conclusive evidence to suggest otherwise.”

Patients at Risk for Pulmonary Aspiration

Induction of anesthesia may cause gastroesophageal contents to enter the pharynx and tracheal-bronchial passages, leading to a life-threatening aspiration.¹⁰ Although aspiration of gastric contents accounts for only 3.5% of all anesthesia malpractice suits, it is a major source of anesthesia morbidity.¹¹ When deciding on candidates for cricoid pressure, it is prudent to identify those at a greater risk of regurgitation and pulmonary aspiration because of pathology or physiology (Table 1). Such persons have pre-existing factors that may lead to the presence of gastric contents.

Table 1. Patients at Increased Risk of Regurgitation and Pulmonary Aspiration^{1,2}

Severe trauma
Parturient > 14-wk gestation
Hiatal hernia
Gastroesophageal reflux disease
Diabetes mellitus
Gastroparesis
Extremes of age
Increased intra-abdominal pressure
Obesity
Abdominal ascites
Gastrointestinal obstruction
Ileus
Difficult intubation
Patient who does not meet NPO criteria for anesthesia
< 8 h since heavy meal
< 6 h since light meal
< 2 h since clear liquid intake
Neurologic factors
Glasgow Coma Scale < 8
Parkinson disease
Multiple sclerosis
Bulbar palsy
Myotonia dystrophica
Cerebrovascular accidents
Increased intracranial pressure
Narcotic administration
NPO, nothing by mouth.

Undetermined gastric volume, gastrointestinal dysfunction, and altered lower esophageal sphincter tone are among indications for the utilization of cricoid pressure during rapid sequence induction of anesthesia or during positive-pressure ventilation.¹²

Anatomy

The cricoid cartilage is a complete ring of hyaline cartilage just inferior to the thyroid cartilage (ie, Adam’s apple).¹³ Identification of correct cricoid cartilage anatomy is crucial to the success of cricoid pressure and prevention of pulmonary aspiration. The thyroid prominence should be visualized on the front of the neck. It is the most prominent protuberance midline. During palpation of the thyroid prominence, movement of the finger caudally (toward the patient’s feet) will identify a drop into the cricothyroid notch or membrane. The next horizontal structure is the cricoid cartilage.¹⁴

Although the efficacy of cricoid pressure has been debated, Rice et al¹⁵ confirmed Sellick’s 1961 proposal that “cricoid pressure compresses the conduit between the stomach and the pharynx as intended.” However, the authors further emphasize that cricoid pressure does not occlude the esophagus, as the esophagus does not lie behind the cricoid cartilage. Rice et al¹⁵ state that cricoid pressure compresses the anteroposterior diameter of the hypopharynx.

Force

The degree of cricoid pressure force is an important element to consider. Too little force leaves the airway susceptible to the possibility of regurgitation and ensuing aspiration. Excessive force has been documented to worsen the laryngeal view, causing difficulty with laryngoscopy and even pulmonary ventilation.¹⁶ Furthermore, rupture of the esophagus has been reported after active vomiting during the application of cricoid pressure.⁵

The optimal force of application of cricoid pressure has been debated before it came into common use. Sellick merely suggested that “firm” pressure be applied without obstructing the patient’s airway.¹ Wraight et al¹⁷ recommended the initial force of 44 Newtons (N) from a study of 24 elective

Download English Version:

<https://daneshyari.com/en/article/2665928>

Download Persian Version:

<https://daneshyari.com/article/2665928>

[Daneshyari.com](https://daneshyari.com)