

## Sellick's manoeuvre - An old song with new lyrics

Submitted: 26-Mar-2024

Accepted: 26-Mar-2024

Published: 12-Apr-2024

**Srinivasan Parthasarathy, J. Edward Johnson<sup>1</sup>, Kaushic A. Theerth<sup>2</sup>**

Department of Anaesthesiology, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, <sup>1</sup>Department of Anaesthesiology, Kanyakumari Government Medical College, Nagercoil, Tamil Nadu, <sup>2</sup>Department of Anaesthesia and Critical Care, Medical Trust Hospital, Ernakulam, Kerala, India

**Address for correspondence:** Dr. Kaushic A. Theerth,  
Third Floor NICU, Medical Trust Hospital, Ernakulam, Kochi - 682 016, Kerala, India.  
E-mail: kaushik\_taurus@yahoo.com

Access this article online
Website: <a href="https://journals.lww.com/ijaweb">https://journals.lww.com/ijaweb</a>
DOI: 10.4103/ija.ija_334_24
Quick response code


Aspiration pneumonia is a leading cause of mortality, particularly among various causes for pneumonia. Brian Arthur Sellick proposed oesophageal compression in 1961 by applying backward pressure on the cricoid cartilage to prevent gastric content aspiration during tracheal intubation. Sellick observed that compression at this level obstructs the oesophagus against the C5 vertebra.<sup>[1]</sup> While later studies leveraging advanced imaging<sup>[2]</sup> suggest the post-cricoid hypopharynx as the probable target, the efficacy of cricoid pressure in mitigating aspiration is yet to be scientifically validated. Nevertheless, this technique has gained widespread acceptance and thorough investigation. It has notably become a crucial component of rapid sequence intubation. Its integration into anaesthesia protocols and difficult airway guidelines underscores its importance in ensuring patient safety during tracheal intubation.<sup>[3]</sup>

Cricoid pressure is commonly used in emergency surgery for patients who have had food recently or suffer from conditions like gastroparesis, pregnancy, nausea, vomiting, hiatal hernia or incompetent oesophageal sphincter(s), elevated intraabdominal pressure, intoxication or impaired reflexes.<sup>[4]</sup> With the advent of gastric ultrasound in identifying the nature and volume of the gastric contents, the indications of cricoid pressure are extending beyond the routine.

The initial enthusiasm and fascination with Sellick's manoeuvre in the late 20<sup>th</sup> century gradually faded

with the dawn of problems and controversies. The major drawback of the manoeuvre was the reported challenges in laryngoscopy and laryngeal structure visualisation. Cricoid pressure may make intubation more difficult due to the prevalence of a considerably longer intubation time and higher Lehane and Cormack scores. Improper pressure application may hinder ventilation, compromising the airway patency when the pressure is more than 40 N, potentially worsening the situation in cases with poor oxygenation. Even when applied correctly, cricoid pressure can reduce the lower oesophageal sphincter tone from 24 to 15 mmHg at 20 N, further decreasing to 12 mmHg at 40 N, potentially increasing gastric content regurgitation risk.<sup>[5]</sup> Boet *et al.*<sup>[6]</sup> observed that cricoid pressure often causes lateral oesophageal deviation and incomplete lumen occlusion. Vanner and Pryle demonstrated through computerised tomography scans that when cricoid cartilage and cervical vertebral bodies are pressed, only partial compression of the pharyngeal lumen occurs, with lateral movement aiding compression against the longus colli muscle.<sup>[7]</sup> Adding to the woes, applying 10 N of cricoid pressure while the patient is conscious and increasing it to 30 N in adults and 20 N in paediatric cases as consciousness diminishes<sup>[8]</sup> may be clinically impractical. Recent evidence questions the feasibility of fixed pressure and its usefulness to different types of patients. Despite support from the UK's 1994 survey, lack of randomised trials, attributed to challenges like improper application and ethical

constraints, hinders widespread acceptance of cricoid pressure.<sup>[8,9]</sup>

Originally, Sellick's manoeuvre relied on an assistant's hand, but adequate technique and pressure can be achieved using just fingers. However, new devices aim to enhance effectiveness. One such device, employing tactile feedback with finger placement as Sellick prescribed, consistently applies the correct pressure and reduces upward force bias. Another device illuminates when proper pressure is reached, offering ease of use and reliability over manual methods.<sup>[10,11]</sup> In the last couple of decades, video laryngoscopes have been employed to mitigate the difficult glottic views during cricoid pressure. Many studies demonstrated no change or improvement in the glottic views with the use of video laryngoscopes during cricoid pressure.<sup>[12,13]</sup> In addition, with the advent of airway ultrasound, a novel paralaryngeal pressure was advocated and had been found to occlude the oesophageal lumen.<sup>[14]</sup> Applying pressure directly with the ultrasound probe has also been evaluated and found to be effective.<sup>[15]</sup> The utility of ultrasound in providing appropriate oesophageal occlusion has also been demonstrated in a paediatric study.<sup>[16]</sup> Yet, cricoid pressure proved more efficacious than paratracheal pressure in upper oesophagus occlusion during video laryngoscopy, despite both methods narrowing the oesophageal diameter in a recent study.<sup>[13]</sup>

Clinical decisions regarding cricoid pressure usage should weigh its demonstrated benefits against rare complications, often due to incorrect application, which can be mitigated through proper training.<sup>[17]</sup> Upholding Sellick's contribution requires ensuring its safe and proper implementation. Correct technique and the appropriate level of unconsciousness can mitigate most issues associated with cricoid pressure. With no good alternatives in sight, Sellick's manoeuvre seems quite difficult to be replaced!!

## ORCID

Srinivasan Parthasarathy: <https://orcid.org/0000-0002-3808-6722>

J Edward Johnson: <https://orcid.org/0000-0002-9493-6330>

Kaushic A Theerth: <https://orcid.org/0000-0002-8347-0336>

## REFERENCES

- Mandell LA, Niederman MS. Aspiration pneumonia. *N Engl J Med* 2019;380:651-63.
- Salem MR, Khorasani A, Zeidan A, Crystal GJ. Cricoid pressure controversies: Narrative review. *Anesthesiology* 2017;126:738-52.
- Mushambi MC, Kinsella SM, Popat M, Swales H, Ramaswamy KK, Winton AL, et al. Obstetric Anaesthetists' Association and Difficult Airway Society guidelines for the management of difficult and failed tracheal intubation in obstetrics. *Anaesthesia* 2015;70:1286-306.
- Landsman I. Cricoid pressure: Indications and complications. *Paediatr Anaesth* 2004;14:43-7.
- Stewart JC, Bhananker S, Ramaiah R. Rapid-sequence intubation and cricoid pressure. *Int J Crit Illn Inj Sci* 2014;4:42-9.
- Boet S, Duttchen K, Chan J, Chan AW, Morrish W, Ferland A, et al. Cricoid pressure provides incomplete esophageal occlusion associated with lateral deviation: A magnetic resonance imaging study. *J Emerg Med* 2012;42:606-11.
- Vanner RG, Pryle BJ. Nasogastric tubes and cricoid pressure. *Anaesthesia* 1993;48:1112-3.
- Birenbaum A, Hajage D, Roche S, Ntoubia A, Eurin M, Cuvillon P, et al. Effect of cricoid pressure compared with a sham procedure in the rapid sequence induction of anesthesia: The IRIS randomized clinical trial. *JAMA Surg* 2019;154:9-17.
- Rice MJ, Mancuso AA, Gibbs C, Morey TE, Gravenstein N, Deitte LA. Cricoid pressure results in compression of the postcricoid hypopharynx: The esophageal position is irrelevant. *Anesth Analg* 2009;109:1546-52.
- Taylor RJ, Smurthwaite G, Mehmood I, Kitchen GB, Baker RD. A cricoid cartilage compression device for the accurate and reproducible application of cricoid pressure. *Anaesthesia* 2015;70:18-25.
- Lawes EG. Cricoid pressure with or without the "cricoid yoke". *Br J Anaesth* 1986;58:1376-9.
- Arslan ZI, Solak M. Effect of cricoid pressure on laryngeal view during Macintosh, McGrath MAC X-Blade and GlideScope video laryngoscopies. *Turk J Anaesthesiol Reanim* 2017;45:361-6.
- Kim H, Chang JE, Won D, Lee JM, Kim TK, Kim MJ, et al. Effectiveness of cricoid and paratracheal pressures in occluding the upper esophagus through induction of anesthesia and videolaryngoscopy: A randomized, crossover study. *Anesth Analg* 2022;135:1064-72.
- Andruszkiewicz P, Wojtczak J, Wroblewski L, Kaczor M, Sobczyk D, Kowalik I. Ultrasound evaluation of the impact of cricoid pressure versus novel 'paralaryngeal pressure' on anteroposterior oesophageal diameter. *Anaesthesia* 2016;71:1024-9.
- Bermude O, Meço BC, Baytaş V, Dilken O, Yıldırım Güçlü Ç, Karadağ Erkoç S, et al. What about compressing the oesophagus with an ultrasound probe for a modified sellick maneuver? *Turk J Anaesthesiol Reanim* 2022;50:13-7.
- Kim EH, Cho SA, Kang P, Song IS, Ji SH, Jang YE, et al. Ultrasound-guided esophageal compression during mask ventilation in small children: A prospective observational study. *BMC Anesthesiol* 2022;22:257. doi: 10.1186/s12871-022-01803-5
- Beckford L, Holly C, Kirkley R. Systematic review and meta-analysis of cricoid pressure training and education efficacy. *AORN J* 2018;107:716-25.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

**How to cite this article:** Parthasarathy S, Johnson JE, Theerth KA. Sellick's manoeuvre – An old song with new lyrics. *Indian J Anaesth* 2024;68:407-8.