

Cricoid pressure during rapid sequence induction: using the force or not

Cricoid pressure forms an integral part of a rapid sequence induction, and is endorsed by many national and international organizations in anaesthesia and critical care.

Cricoid pressure was first described by Sellick in 1961 and was subsequently embraced across the anaesthetic community, where it now stands as a cornerstone of practice.

The application, or not, of cricoid pressure has generated significant interest and debate since its introduction. This article discusses whether there is indeed any evidence of its efficacy, and whether we should be looking to engage with or discontinue what is seen by many as 'best practice.'

Cricoid pressure confers no benefit and may be harmful

In Sellick's original study, 26 patients at risk of aspiration received cricoid pressure during induction of anaesthesia. Three aspirated after cricoid pressure was released and the trachea had been intubated, and 23 did not (Sellick, 1961). From this was born the hypothesis that cricoid pressure prevents regurgitation of gastric contents. The trial was non-standardized, non-randomized, and lacking in essential relevant details pertaining to drugs administered, induction technique and key patient information. It also yielded the highest incidence of aspiration recorded in a trial of this nature – greater than 10%. Yet the technique was applauded throughout the much of the anaesthetic world, and its application and practice spread fast.

Cricoid pressure has been shown to have many negative side effects and complications. It has been demonstrated to worsen laryngoscopic view, making tracheal intu-

bation and thus 'securing the airway' more difficult in those patients deemed most at risk of aspiration (Haslam et al, 2005). It has also been shown to impede facemask ventilation (Allman, 1995) which is essential practice in maintaining oxygenation after failed intubation during rapid sequence induction.

This begs the question – how has practice borne out of a single centre, non-randomized, non-controlled, non-blinded, case series of 26 patients, with questionable benefit and some harmful aspects, become 'gold standard'?

Cricoid pressure prevents regurgitation of gastric contents and is safe

Contrary to the findings above, overall time to intubation has, in other trials, been found to be comparable to techniques not using cricoid pressure, and the time to intubation would seem to be the most critical factor. In 2005, Turgeon et al published findings of a randomized, controlled trial of 700 adult, elective surgical patients. Patients were randomized to receive either true cricoid pressure or sham cricoid pressure, with the attending anaesthetist blinded to which. Interestingly, after 30 seconds, failure rate was found to be similar in both groups, as well as grades of laryngoscopy. This suggests that the use of cricoid pressure does not make intubation of the trachea more difficult, and although this does not prove efficacy, it confers at least no harm (Turgeon et al, 2005).

Adding weight to the argument for the use of cricoid pressure is the demonstration that flow of liquid from the stomach to the oropharynx is prevented, albeit in cadavers. Salem et al (1974) placed eight paediatric cadavers in steep head down position, and administered saline into the stomach via a nasogastric tube. With effective cricoid pressure, it was demonstrated that saline did not pass through to the oropharynx of any of the cadavers studied.

The fact that cricoid pressure does not appear to make intubation more difficult, in the largest trial of its kind, combined with the findings that gastric regurgitation appears to be prevented, in cadaveric simulation at least, brings some to conclude that cricoid pressure is both safe and effective.

Conclusions

The use of cricoid pressure during induction of anaesthesia has not been unequivocally proven to be beneficial, but it has not been unequivocally proven to be harmful or ineffective.

The lack of large randomized trials demonstrating that the application of cricoid pressure actually decreases the incidence of aspiration of gastric contents means that this debate will rage on. The fact that this trial would be incredibly difficult to design and execute, with the numbers required, means that this debate will likely be raging for a long time. **BJHM**

Allman KG (1995) The effect of cricoid pressure application on airway patency. *J Clin Anesth* 7: 197–9 (doi: 10.1016/0952-8180(95)90052-7)

Haslam N, Parker L, Duggan JE (2005) Effect of cricoid pressure on the view at laryngoscopy. *Anaesthesia* 60: 41–7 (doi: 10.1111/j.1365-2044.2004.04010.x)

Salem AR, Wong RY, Mani M, Sellick BA (1974) Efficacy of cricoid pressure in preventing gastric inflation during bag-mask ventilation in paediatric patients. *Anesthesiology* 40(1): 96–8 (doi: 10.1097/00000542-197401000-00026)

Sellick BA (1961) Cricoid pressure to control regurgitation of stomach contents during induction of anaesthesia. *Lancet* ii: 404–6 (doi: 10.1016/s0140-6736(61)92485-0)

Turgeon AF, Nicole PC, Trepanier CA, Marcoux S, Lessard MR (2005) Cricoid pressure does not increase the rate of failed intubation by direct laryngoscopy in adults. *Anesthesiology* 102: 315–19 (doi: 10.1097/00000542-200502000-00012)

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