



Discussion

Aristotle, Galileo and Sellick: The unsolved dilemma of cricoid pressure



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To be, or not to be, that is the question:

Whether 'tis Nobler in the mind to suffer

The Slings and Arrows of outrageous Fortune,

Or to take Arms against a Sea of troubles,

And by opposing end them:

W. Shakespeare: Hamlet; Act III, Scene I

For almost one thousand years, the principles and structure of the Universe were studied, reported, understood and believed to be in accordance with Aristotle's theory of the five elements (earth, fire, air, water and ether), with the invisible immobile engine and geocentric depiction of planets, stars and deep space (what he called *cosmos*, Greek word for *order and beauty*). There was no idea of *gravity* and *mass*, as it was time for limited scientific instruments and a generous imagination hypothesis, philosophy being a substitute for science whenever something could not be explained with the sole (limited) available knowledge. At that time religion and science were in some kind of *continuum*, with any physical principle or event, including health and sickness, being explained with the first or latter, or sometimes with both.

As time passed by, and it took almost nine centuries, a curious and obstinate scientist named Galileo started to raise some doubts. It was 1619, and, thanks to being a forerunner of the scientific approach, the Italian scientist was the first to see truth through the mist. His doubts were so big that, at a certain point, despite being sure of his intuition and experiments, not to be considered heretic in the face of such big changes, he had to withdraw and deny everything in front of the Inquisition. In a certain sense, Science had to bow to Religion, the interest of the many in comparison with the reason of one. As a curiosity, we had to wait until October 31st, 1992 when Galileo's *opera omnia* was removed by the Vatican from the *Index of prohibited books*.

And we had to wait for Isaac Newton, and his *general gravity*

theory in 1687 to dismantle completely the known Universe and (finally) see it again in a new (and finally correct) light. The light of Science this time, a light which was all at once spreading illumination in dark corners of knowledge, which had been kept well covered by the cloak of Religion.

The reader might ask himself why all these premises. If he or she is reading *Trends in Anesthesia and Critical Care* or, by mistake, some history, mathematics or philosophy textbook (from which I had inspiration, indeed) [1]. No, dear reader, you are here in the right place!

The point is that history is repeating, and if we look back at what has happened since 1942, the year of the launch of *Intocostrin*, and since 1961, the year when Sellick's cornerstone paper on *Cricoid Pressure* was published [2] (whence named as *Sellick's manoeuvre*), and we scroll through time until today, passing by the 2008 EMEA approval of *sugammadex*, we can't do unless to find some parallels with the great scientists of the past and the heliocentric/geocentric debate we were reading before.

Sellick was like Aristotle: the first to see something more into what everyone else was simply looking at, the first to ask himself what to do and the first to find a solution which seemed to be perfect, despite being built on unclear and not robust scientific research criteria. In the end he succeeded, not purely on a technical point of view, in putting together science and religion, exactly like Aristotle did making gods (and not gravity and universal entropy) as perpetual engines of planet movement.

Because based on limited scientific data (which today would be rejected just like a case report publication for any Anesthesia journal), Brian Sellick became the new shepherd of the *Cricoid Pressure* monotheistic religion. You could not do unless to apply *Cricoid Pressure* during rapid sequence induction (RSI), and standing the really poor scientific argumentation underlying Sellick's study, you could do it only for faith. Or *dogma*, no one could even think to do it differently.

But, once again, time passed by, receptorial pharmacology, compared anatomy, image diagnostic tools were the illuministic and industrial revolution which attempted to dismantle Sellick's dogma, and many heretics started to come out. Some Galileo here and there tried to argue that *Cricoid Pressure* was not the center of the cosmos of aspiration prevention, but in the end they did not have enough courage and proof (or support by scientific

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community) to clearly affirm that religion needed to leave its place to science.

And this is where we are today, in one of the biggest religious-scientific dilemmas in Anesthesia: tradition and poor evidence (both in favor and against) still call for *Cricoid Pressure* application, while medical imaging and physiology not only claim it is not useful, but also argue or hypothesize some detrimental side effects.

The Inquisition tribunal of *Evidence Based Medicine* is still not in a condition to provide definitive answers, and it probably never will: for ethical reasons and for the objective difficulty to adequately fulfill statistical criteria needed to design a large powerful and robust double blind randomized controlled trial to provide definitive scientific answers. The destiny of *Cricoid Pressure* seems for now damned to uncertainty.

Maybe, instead of trying to demonstrate that *Cricoid Pressure* is not useful, it could be worth the effort to focus studies on a different point of view, whether it has some danger or detrimental effect; such as to say that instead of demonstrating that the sun is in center of our solar system, we could work out to demonstrate that it is not the earth in that position! And the conclusion would be obvious.

In the articles published in TACC, the eternal fight is ongoing through excellent papers by Turnbull and Patel [3] for “science” against *Cricoid Pressure* versus Athanassoglou and Pandit [4] for “religion” in favor of it.

Many points are on the side of *Cricoid Pressure*, and if on the one hand there is no evidence of any clear benefit from applying it routinely, on the other hand evidence of a clear detrimental effect is also missing.

On the other side of the barricade, over the last few years, clear proof of *Cricoid Pressure* interference with airway management and ventilation have been claimed, and it is particularly almost well known, and underlined in the same results of National Audit Project 4 [5], that many physicians do not properly apply *Cricoid Pressure*, whereas many of them probably don't even know the exact force requirements for correct application of adequate *Cricoid Pressure*.

Finally, everything is much more complicated because we also probably miss the real numbers for aspiration incidence and we don't know exactly how many aspiration episodes could remain undetected or asymptomatic, and finally we focus attention on RSI and intubation while extubation is also a critical phase for

aspiration [6]. In other words, should we have clear data for the numerator of our risk/benefit fraction, we still miss clear data for the denominator of aspiration morbidity and mortality [7].

In such an uncertainty, probably the best way is the one that looks safest: until clear statements will be given by any guideline, physicians are given two possibilities: either that *Cricoid Pressure* could be applied whenever a full stomach is suspected, trying to do it correctly, and ready to release it whenever trouble with intubation and/or ventilation is encountered.

The second option is not to apply *Cricoid Pressure* at all, but being ready to apply it in really high risk patients or whenever a clue of possible ongoing regurgitation is observed.

In both cases, whatever the chosen approach, other behaviors, which are undoubtedly safe, easy to perform and side effects free, such as the head up position, should be routinely applied so as to obtain maximum safety and benefit.

So a wise conclusion, which is somehow suggested by both papers about *Cricoid Pressure* [3,4], is to keep one foot firmly on the evidence, considering that truth, as in the best tradition, is probably in between. This is probably the only way to come out of hamletic doubt, at least until the day a new Sir Isaac Newton will be born, to give us the final issue by observing the falling apple of aspiration; until that time, as for many planets in the cosmos of Anesthesia, good sense, clear evidence and a little bit of faith are required.

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