The anatomy of the cricoid pressure unit

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We read with interest the article by Benkhadra et al. [1] describing the relationship of the cricoid cartilage and the esophagus during neck flexion and extension. As the authors correctly point out, the bond between the cricoid ring and esophagus is vital to the clinical efficacy of cricoid pressure performed to prevent regurgitation of stomach contents during the induction of general anesthesia.

Our group recently reported a magnetic resonance imaging (MRI) study investigating the relationship of the cricoid cartilage and the esophagus, with and without cricoid pressure, in the typical anatomic positions for endotracheal intubation [2]. As similarly reported by Schmalfuss et al. [3], we also did not observe the esophagus at the level of the cricoid as is commonly believed, but found the postcricoid hypopharynx. This is more than just a curiosity of nomenclature. The postcricoid hypopharynx is fixed in relationship to the cricoid cartilage in what we have named the cricoid pressure unit [2].

“It is the constant relationship of the cricoid cartilage to the laryngeal cartilages, maintained by their connecting ligaments and muscles, which laterally stabilizes the cricoid relative to the thyroid lamina and cornua. Because the

cricoid cartilage and the postcricoid hypopharynx are constantly related by a subset of these muscular attachments, the cricoid cartilage and postcricoid hypopharynx behave as a unit when they are compressed together posteriorly against the cervical spine or the deep neck muscles. This cricoid pressure unit also has built-in constraints to lateral displacement of the cricoid cartilage relative to the postcricoid hypopharynx with compression [2].”

We agree with Benkhadra et al. [1] that wall thickness must play a role in the efficacy of cricoid pressure. Schmalfuss and colleagues [3] made precise wall thickness measurements, which we used to bolster our case that the alimentary tract lumen was occluded because our observed total antero-posterior diameter of the postcricoid hypopharynx was much less with cricoid pressure than the total of the two walls in the non-occluded state [2].

The final words on the efficacy of cricoid pressure, first described by Dr. Brian Sellick [4], have not yet been written. Continued dialogue between investigators and across disciplines, as Benkhadra et al. have demonstrated, will help us further refine our thinking about the role for and efficacy of cricoid pressure in clinical practice.

References

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