

Comparison of Use of a Shortened air-Q® Self-Pressurizing Intubating Laryngeal Airway versus the Williams Intubating Airway for Single-Operator Flexible Bronchoscopic Intubation: A Randomized Trial

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Introduction: Despite the introduction of videolaryngoscopes, flexible bronchoscopic intubation (FBI) remains a critical method for achieving tracheal intubation in patients with difficult airways.¹ Unfortunately, FBI often requires two operators for success.² The air-Q SP is a supraglottic airway device (SGA), that when used as an intubation conduit, can enable FBI by a single operator. However, this potential performance advantage has not yet been tested. Therefore, the purpose of this study is to compare use of a shortened air-Q SP (AQ) against the Williams Intubating Airway (WIA) for enabling FBI performed by a single operator.

Methods: After IRB approval and written informed consent, subjects presenting for elective surgery under general anesthesia with orotracheal intubation for airway maintenance were randomized to receive an AQ or WIA as a conduit for FBI. Subjects at increased risk for aspiration or poor SGA were excluded. After general anesthesia induction and adequate paralysis, the assigned study device was placed per routine clinical practice. Once in place, a flexible bronchoscope was passed to the end of the conduit, where the glottic view was graded (i.e., complete obstruction, partial obstruction, or clear). Regardless of the view, an FBI attempt was made. If needed, an airway maneuver (e.g., jaw thrust) by a second operator was employed. The primary study endpoint was single-operator FBI success. Secondary endpoints included conduit placement time and success, glottic view, overall intubation time, ease of tracheal tube advancement, and oropharyngeal injury and complaints.

Results: Thirty-two and 28 subjects were randomized to the AQ and WIA groups, respectively. Baseline characteristics (age, gender, height, weight, ASA physical status, and Mallampati score) were similar between the study groups. All subjects were intubated successfully per the study protocol. A single-operator FBI was achieved in 78% and 7% of subjects in the AQ and WIA study groups, respectively ($p < 0.0001$). Conduit placement time was slightly shorter for the WIA versus the AQ (4.3 ± 2.4 vs. 6.9 ± 3.5 sec; $p < 0.0013$), while a second placement attempt was required for one subject in the AQ group (100% vs. 97%; $p > 0.9999$). The AQ provided a view of the vocal cords more frequently than the WIA (75% vs 3%; $p < 0.0001$), while the overall times required for intubation through the assigned conduit and sore throat rates were similar (Intubation Time: 61.7 ± 28.9 (WIA) vs 62.6 ± 37.9 (AQ) sec; $p = 0.9177$; Sore Throat: 39% (WIA) vs 44% (AQ); $p = 0.7964$), while tracheal tube advancement was graded easy more often through the WIA versus the AQ (93% vs 72%; $p = 0.0479$).

Conclusions: Compared to the WIA, use of a shortened air-Q SP affords an improved glottic view and enables single-operator FBI.

References: (1) Apfelbaum et al, *Anesthesiology*. 2013; (2) Durga et al, *Br J Anaesth*. 2001