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Case Series

# Air-Q as an intubating LMA: Insights from a case series

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## Abstract

**Background and Aims:** The Air-Q intubating laryngeal airway (ILA) is a second-generation supraglottic device designed for use as a bridging conduit in both conventional and fiberoptic intubation, particularly in difficult airway scenarios. This case series evaluates the performance of the Air-Q ILA in terms of ease of intubation, success rates, airway morbidity, and hemodynamic responses. While the device offers advantages like reduced hemodynamic stress and minimal airway trauma, limitations such as risks of regurgitation, aspiration, air leaks, and displacement remain considerations. This case series aimed to assess the efficacy of the Air-Q ILA as a conduit for endotracheal intubation, focusing on key performance metrics, including ease of use, success rates, airway morbidity, and hemodynamic responses.

**Methodology:** This case series included 15 patients of ASA I and II status, weighing 50–70 kg, scheduled for elective surgeries under general anesthesia requiring endotracheal intubation. After achieving adequate muscle relaxation, an Air-Q ILA size 3.5 was introduced. Device placement was confirmed by ensuring adequate ventilation and performing fiberoptic visualization using the Brimacombe and Berry scoring system.

A cuffed Portex endotracheal tube was inserted through the Air-Q device, and intubation was confirmed via capnography. The time taken for device placement (Air-Q insertion to ventilation confirmation) and tube insertion (intubation confirmation via capnography) was recorded. Ease of intubation and the number of attempts required were also noted. Standard ASA monitoring protocols were maintained throughout the procedure.

**Results:** Brimacombe and Berry score as per fiberoptic view was 4 in 9 patients and 3 in 2 patients and 1 in 4 patients. Mean Air-Q placement time was 18.04 + 1.39 seconds and tube placement time was 21 + 1.61 seconds. Successful intubation was achieved in 11 of 15 patients (73%), with 9 intubated on the first attempt and 2 on the second attempt.

**Conclusion:** The Air-Q ILA is an effective supraglottic device that provides both ventilation and a reliable conduit for blind intubation using standard endotracheal tubes. It facilitates shorter intubation times and minimizes hemodynamic stress, making it a valuable tool in airway management.

**Keywords:** Air-Q, Intubating laryngeal airway, Endotracheal intubation, Fiberoptic view, Hemodynamic response.

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## 1. Introduction

Managing airway safely is the mainstay of anaesthesia practice.[1] Conventional laryngoscopy for endotracheal intubation though a gold standard, has a crucial role in haemodynamic stress response.[1,2] Using ways that reduce or avoid oropharyngeo-laryngeal stimulation during endotracheal intubation could attenuate this response.[2,3]

Some devices were modified and used as conduits for endotracheal intubation.[1,4] AIR Q a Supraglottic airway devices serves the dual purpose of ventilation and facilitating intubation in difficult airway scenarios.[1,5] In 2005, Deniel Cook introduced 2nd generation ILA airway device a bridging conduit for conventional and fibreoptic intubation in difficult airway cases. (**Figure 1**).

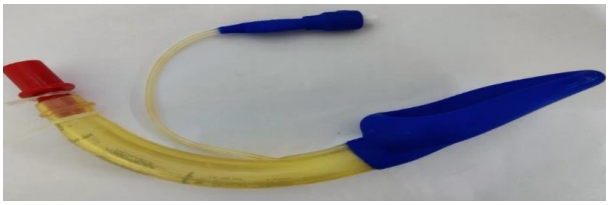

**Figure 1**: Air Q (ILA)

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Air Q has a specific features like Novel tip design to prevent folding of mask, auxiliary hole to improve airflow as well as epiglottic downfolding and easy insertion. They are available in size 0.5, 1, 1.5, 2, 2.5, 3.5 and 4.5.[1,6,7]

This case series aimed to evaluate air-Q ILA in regards to ease of intubation, success rate of intubation, hemodynamic response and identifying any airway morbidity subsequent to its use.

## 2. Case Series

We conducted a case series of 15 patients of either sex (male/female) scheduled for non-emergency surgeries under general anesthesia. After obtaining written informed consent, we included patients aged 18–65 years, with a body weight of 50–70 kg, belonging to ASA (American Society of Anesthesiologists) physical status I and II, and classified as Modified Mallampati Airway Class I or II.

Patients undergoing emergency surgery, pregnant females, those with a mouth opening of less than 2 cm, or with pathologies of the oral cavity, oropharynx, or larynx were excluded. Additionally, patients with uncontrolled hypertension or those with significant cardiac, endocrine, central nervous system (CNS), or pulmonary diseases were not included in this case series.

After securing an intravenous line and attaching monitors as per our institutional protocol, general anesthesia was administered with premedication, analgesics, and induction agents. Following this, a depolarizing muscle relaxant was given. An Air-Q size 3.5, with its cuff completely deflated and posterior surface lubricated with 2% lignocaine jelly, was inserted by one of two experienced consultants (each with prior experience of more than 20 Air-Q insertions).

During insertion, the patient's head was maintained in a neutral position, the tongue was gently pushed toward the floor of the mouth, and the tip of the Air-Q was guided with the index finger of the left hand until resistance to advancement was encountered. The cuff was then inflated with 15–20 ml of air, as recommended by the manufacturer. Successful insertion of the Air-Q was confirmed by observing symmetrical, deep chest wall expansion during lung inflation and the presence of a capnographic end-tidal $CO_2$ waveform. Non-depolarizing muscle relaxant (NDMR) was administered afterward. If a second attempt was required, the device was withdrawn by 5–8 cm, a mandibular lift was performed, and the device was reinserted while ensuring adequate ventilation.

Further confirmation of proper placement of the Air-Q was achieved using a fiberoptic scope, with scoring performed as per the Brimacombe and Berry score system[8] (**Table 1**, **Figure 2**, **Figure 3**). A pre-lubricated cuffed Portex endotracheal tube (size 7.5) was then blindly passed through the Air-Q. The total time from Air-Q insertion to successful endotracheal tube placement, confirmed via capnography, was recorded as the insertion time. Ease of passage was assessed using a subjective grading scale ranging from 1 to 4, where 1 indicated no resistance, 2 indicated mild resistance, 3 indicated moderate resistance, and 4 indicated inability to insert the device.[9,10] Standard ASA monitoring was conducted throughout the procedure and continued intraoperatively.

**Table 1:** Fiberoptic score

| **Fiberoptic Score (Brimacombe and Berry)[11]** | |
|---|---|
| **Score** | **Remarks** |
| 4 | Only vocal cords are visible (This is optimal position) |
| 3 | Vocal cords plus posterior epiglottis are seen |
| 2 | Vocal cords plus anterior epiglottis are seen |
| 1 | No vocal cords are visible but function is adequate |
| 0 | Device failure |

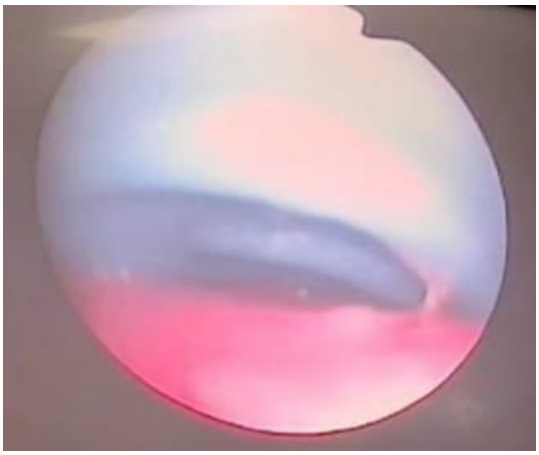

**Figure 2:** Brimacombe and Berry Score 1-No vocal cords are visible but function is good

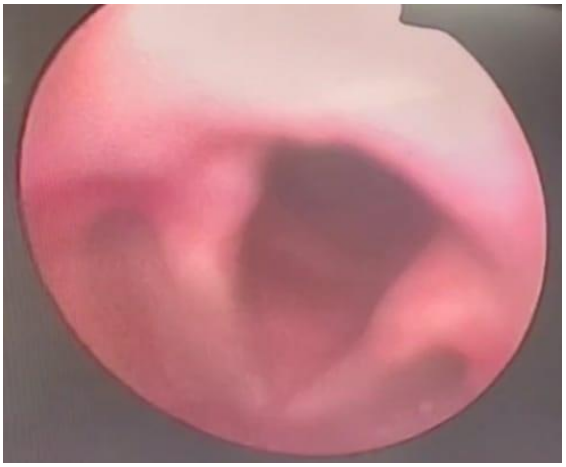

**Figure 3:** Brimacombe and Berry Score 3-Vocal cords plus posterior epiglottis

Among the 15 patients, the male-to-female ratio was 9:6, with a mean age of 36.26 ± 13.02 years and a mean weight of

61.9 ± 4.35 kg. Based on the American Society of Anesthesiologists (ASA) classification, 8 patients were categorized as ASA I, and 7 as ASA II. The Mallampati score showed that 12 patients were classified as Class 1, while 3 were in Class 2. The average thyromental distance was 6.88 ± 0.25 cm, suggesting an adequate airway assessment for most individuals.

The Brimacombe and Berry scores based on fiberoptic evaluation showed optimal positioning of the vocal cords (score 4) in 9 patients, partial glottic views (score 3) in 2 patients, and no visible glottic views but adequate function (score 1) in 4 patients (**Figure 4**). The mean Air-Q placement time was 18.04 ± 1.39 seconds (**Figure 5**), while the mean tube placement time was 21 ± 1.61 seconds (**Table 2**, **Figure 6**).

**Table 2:**

| | **Vital parameters** | |
|---|---|---|
| | **Pulse (bpm)** | **MAP (mm hg)** |
| Baseline | 83 ± 7.6 | 94 ± 8.8 |
| Pre-induction | 86 ± 8.5 | 96 ± 8.9 |
| Post-intubation | 92 ± 9.7 | 97 ± 6.5 |
| 1 min | 91.2 ± 9.8 | 90 ± 7.9 |
| 3 mins | 87.5 ± 9.2 | 85 ± 6.4 |
| 5 mins | 85.3 ± 8.2 | 82 ± 7.2 |

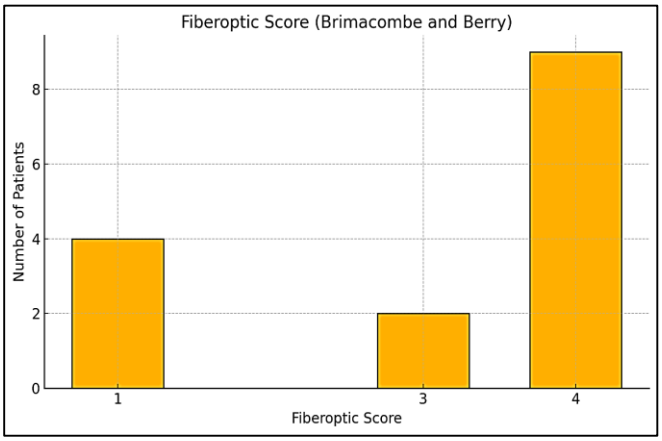


**Figure 4:** Fiberoptic scores (Brimacombe and Berry)

The clinical relevance of the Brimacombe and Berry scoring system lies in its ability to predict intubation success. Scores of 4 indicate optimal vocal cord positioning, scores of 1 indicate that although vocal cords are not visible, function remains adequate, and scores of 0 indicate a failure to function when vocal cords are not visualized fiberoptically. For scores between 4 and 2, vocal cord visibility ensures that function is generally adequate, and any failure to function is unlikely to be due to poor positioning.[8]

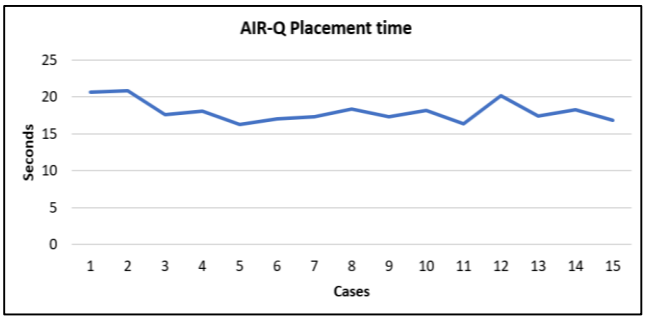


**Figure 5:** Average AIR-Q placement time

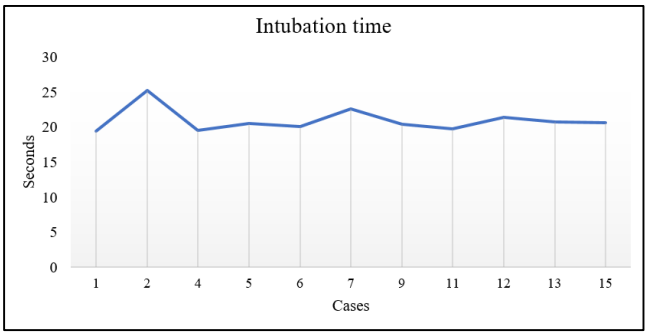


**Figure 6**: Intubation time

Intubation was successful in 11 out of 15 patients (73%), with 9 patients intubated on the first attempt and 2 on the second attempt. In 4 patients, intubation was unsuccessful due to suspected anatomical variations such as an anteriorly placed larynx or improper head positioning. Despite efforts to correct these issues, intubation using the Air-Q device failed, and these patients were subsequently intubated using conventional laryngoscopy.

A transient pulse and mean arterial pressure rise was observed immediately after intubation, followed by a gradual decline at 1, 3, and 5 minutes post-intubation. This response was due to sympathetic nervous system activation, triggered by the stress of intubation, which gradually declined over 1–5 minutes as the body adapted and the initial stress response subsided. No airway morbidity, such as blood-stained devices, hoarseness of voice, or sore throat, was observed either on the Air-Q device or after the removal of the endotracheal tube.

## 3. Discussion

The Air-Q is considered an ideal supraglottic airway device, serving as a conduit for endotracheal intubation and maintaining the airway without the need for conventional laryngoscopy techniques. It is well-known that laryngoscopy can trigger a stress response, leading to tachycardia and hypertension, which can be hazardous in patients with myocardial insufficiency or cardiovascular conditions.[1,11] Similar results were reported by Kahl and colleagues in their study.[12] In our case series, we observed a minimal initial post-intubation surge of 3% and 9% in mean arterial pressure

(MAP) and pulse, respectively, followed by a gradual decline in both pulse and MAP from 1 to 5 minutes post-intubation.

We used a PVC endotracheal tube (size 7.5) through the Air-Q, consistent with the approach by Gada et al.[2] A key advantage of the Air-Q is its ability to allow the passage of standard PVC endotracheal tubes (up to 7.5 mm and 8.5 mm internal diameter through Air-Q sizes 3.5 and 4.5, respectively), without requiring laryngoscopy. This makes it a more accessible, cost-effective, and disposable alternative to the silicon tracheal tubes typically used with ILMA devices.[1,2] Furthermore, the Air-Q is available in sizes suitable for pediatric patients weighing less than 30 kg.[2,13]

Our study showed a 73% success rate for blind intubation using the Air-Q. In comparison, Badawi et al.[1] reported a success rate of 94.12%. The difference in these results may be attributed to several factors, such as head positioning, repositioning of the Air-Q, and lubrication of the endotracheal tube. One significant advantage of the Air-Q is its ability to aid intubation in remote settings where a fiberoptic scope may not be available.

In our study, the first-pass success rate for intubation using the Air-Q LMA as a conduit was approximately 60%, which closely aligns with the 58% first-pass success rate reported by Attarde et al.[4,15] Additionally, 13% of patients required a second attempt for successful intubation.

Badawi R et al. noted an insertion time of 27.6 ± 9.5 seconds for the Air-Q and 29.7 ± 12 seconds for the endotracheal tube, while in our study, the Air-Q placement time was 18.04 ± 1.39 seconds and the intubation time was 21 ± 1.61 seconds.[1] In our case series, we used a fiberoptic bronchoscope to visualize the vocal cord opening through the Air-Q, which provided the advantage of predicting difficult intubation in unanticipated cases. The use of the fiberoptic device helped confirm the proper placement of the Air-Q and facilitated intubation in cases that could have been difficult otherwise.

El-Ganzouri et al. demonstrated that the Air-Q can be used as a conduit for endotracheal intubation, either blindly or with the assistance of a fiberoptic bronchoscope, using a standard endotracheal tube. It also serves as an excellent ventilatory device, as observed in our case series.[16] We encountered difficulty in intubation through the Air-Q in 2 patients and insertion failure in 4 patients. We were able to overcome the challenges in 2 patients by applying head extension and cricoid pressure, but in 4 patients, intubation was unsuccessful, consistent with the findings of Badawi et al.

The limitations of blind intubation using the Air-Q include the absence of visual feedback, which increases the risk of misplacement of the endotracheal tube, such as oesophageal intubation. It also raises the potential for airway trauma, soft tissue injury, and longer intubation time. These issues can be reduced by using fiberoptic guidance during the insertion of the Air-Q.

## 4. Conclusion

The Air-Q supraglottic device is an effective tool for both ventilation and as a conduit for blind endotracheal intubation, providing shorter intubation times with minimal hemodynamic stress Fiberoptic-guided intubation using the Air-Q results in a higher success rate. Further studies are needed to confirm these outcomes and assess the device's broader clinical applicability.

## 5. Source of Funding

None.

## 6. Conflict of Interest

None.

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