The intubating laryngeal mask airway (ILMA): initial experience in Singapore


Summary
We have evaluated the intubating laryngeal mask airway (ILMA) for ventilation and for blind tracheal intubation. After induction of anaesthesia with fentanyl 1 µg kg\(^{-1}\) and propofol 3 ml kg\(^{-1}\), the ILMA was placed successfully on the first attempt in all 100 patients. After administration of atracurium 0.5 mg kg\(^{-1}\), blind tracheal intubation was successful in 97% of patients—50% on the first attempt, 42% on the second and 5% on the third. Success was improved by pulling the metal handle of the ILMA towards the intubator in an “extension” manoeuvre, if intubation was not possible on the first attempt. These findings confirm the effectiveness of the ILMA in an Asian population. (Br. J. Anaesth. 1998; 81: 610–611).

Keywords: equipment, mask anaesthesia; intubation tracheal; intubation tracheal, technique

The difficult airway is still a significant cause of morbidity and mortality despite a plethora of aids to tracheal intubation. The laryngeal mask airway (LMA) has found a place in this arena and has been developed further as a means of tracheal intubation—the intubating laryngeal mask airway (ILMA). We describe the use of the ILMA and a preliminary assessment of its performance in an Asian group of patients.

Methods and results
After obtaining Ethics Committee approval and informed consent, we studied ASA I and II patients presenting for elective surgery. Exclusion criteria were a history of gastro-oesophageal reflux, severe obesity and inadequate fasting. After preoxygenation, anaesthesia was induced with fentanyl 1 µg kg\(^{-1}\) and propofol 3 mg kg\(^{-1}\). The patients’ lungs were ventilated with 100% oxygen supplemented with 2% isoflurane by face mask until the onset of neuromuscular block produced with atracurium 0.5 mg kg\(^{-1}\) i.v. Direct laryngoscopy was performed and the view of the larynx graded according to Cormack and Lehane. After further manual ventilation, an ILMA was introduced (usually size 3 for women and size 4 for men, given the low weight of our population). Successful placement was judged by the ability to deliver a tidal volume of 8 ml kg\(^{-1}\) at a rate of 10 bpm, without leak, at an airway pressure ≤20 cm H\(_2\)O, and by a satisfactory capnography tracing.

Blind tracheal intubation was attempted using a lubricated silicone tracheal tube (sizes 7 and 8 mm, respectively, for ILMA sizes 3 and 4) inserted into the metal tube of the ILMA. If the first attempt failed, subsequent attempts were performed with the metal handle of the ILMA pulled back towards the intubator. This “extension” manoeuvre had been found previously to be useful in a pilot study in our patients. A maximum number of three attempts were allowed, the last with a “vertical lift” on the ILMA handle. Successful intubation was determined by capnography.

Five consultant anaesthetists studied 20 patients each. Eighty-six patients were Chinese, nine Malay, four Indian and one Caucasian. Eighty-four patients had a grade 1 larynx, 15 grade 2 and one grade 3. The five groups of patients were not significantly different in age, sex, weight or height. The ILMA was placed successfully in all patients on the first attempt. The overall success rate for intubation was 97%—50% on the first attempt, 42% on the second and 5% on the third. The anaesthetists varied in their success rates and the number of intubation attempts before successful intubation was carried out (table 1). The effect of experience on ease of intubation was not evident, as the two patients who’s trachea could not be intubated by anaesthetist A were the seventh and 11th patients, while anaesthetist B failed to intubate the last patient. All three patients had a grade 1 larynx. In the one patient with a grade 3 larynx, intubation was successful on the first attempt. There was no morbidity associated with the ILMA.

Comment
This study was undertaken before the results of other studies were published. The 100% success rate of establishing an effective airway with the ILMA on the first attempt, which supports the inclusion of the LMA in the ASA difficult airway algorithm, was reproduced by our study. The overall 97% success rate for intubation was similar to those reported in two published series: 93% (n = 100) and 100% (n = 150). It is possible that our success rate may be improved by the use of further adjustments. However, the use of the extension manoeuvre significantly improved the success rate, as reported previously. Extension achieves a rotatory movement of the ILMA in the sagittal plane, and coupled with a vertical lift on the
metal handle may improve alignment of the mask with an anterior larynx. We did not try the “flexion” manoeuvre, described by Kapila and colleagues,4 who interestingly described deterioration in the fiberoptic view of the larynx in the majority of patients.

In summary, we have confirmed the value of the ILMA as a primary means of establishing an airway for blind tracheal intubation in a predominantly Chinese group of patients, whose airway characteristics such as smaller size, anterior larynx and retrognathia may differ from other population.6 The variability in performance of individual anaesthetists merits further study in larger numbers of patients.

Acknowledgement

We thank Sister K.L. Beh and other anaesthetic nurses for their help.

### Table 1  Number (%) of patients in whom intubation was successful by each of five anaesthetists (A–E)

<table>
<thead>
<tr>
<th>Anaesthetist</th>
<th>Successful at first attempt</th>
<th>Successful at second attempt</th>
<th>Successful at third attempt</th>
<th>Failed attempts</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6 (30)</td>
<td>11 (55)</td>
<td>1 (5)</td>
<td>2 (10)</td>
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<tr>
<td>B</td>
<td>10 (50)</td>
<td>9 (45)</td>
<td>0</td>
<td>1 (5)</td>
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<tr>
<td>C</td>
<td>14 (70)</td>
<td>4 (20)</td>
<td>2 (10)</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>11 (55)</td>
<td>8 (40)</td>
<td>1 (5)</td>
<td>0</td>
</tr>
<tr>
<td>E</td>
<td>9 (45)</td>
<td>10 (50)</td>
<td>1 (5)</td>
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### References