On examination, the bowel sounds were absent. Ultrasound examination was normal. An arterial blood gas showed respiratory alkalosis with pH 7.51, P_{CO_2} 3.2 kPa, P_{O_2} 20 kPa, and HCO_3 20.4. A repeat brain CT with bone window showed right frontal pneumocephalus and a large defect near the cribiform plate on the right side (Fig. 1c). The pneumocephalus was managed with supportive care and the patient was discharged on post-trauma day 27.

Recurrent pneumocephalus has been reported with positive pressure ventilation strategies like mask ventilation during anaesthetic induction, continuous positive airway pressure, and pressure ventilation strategies like mask ventilation during an-trauma day 27.

It has been advised with simple nasal O_2 cannulae. It has been advised that in patients with the base of skull and facial bone fractures, excessive positive pressure during mask ventilation should not be used. Rapid induction and intubation with intubating LMA in a patient with difficult airway and pneumocephalus has been described. To avoid the above complication, we had planned for the surgery of the forearm under regional anaesthesia. But as the patient was uncooperative, LMA was used with the preservation of spontaneous ventilation. Unfortunately, positive pressure ventilation (PPV) with LMA to check its correct position after insertion seems to have reopened the breach in the duramater. The respiratory embarrassment caused by paralytic ileus may also have aggravated the pneumocephalus. The resulting hypocapnia may have decreased the intracranial pressure, thereby creating subatmospheric pressure and causing indrawing of air into the cranium. Therefore, causes of hyperventilation like respiratory embarrassment, poor analgesia, and anxiety should be treated promptly.

In conclusion, we would like to caution that pneumocephalus can recur during PPV with LMA in patients with recent fracture of the skull base and face. The technique of rapid induction and intubation with fast-acting neuromuscular blocking agents without positive pressure mask ventilation (PPMV) and definitive airway control with the tracheal tube is probably the best way to avoid recurrent pneumocephalus. Any cause of hyperventilation in the postoperative period which may aggravate pneumocephalus should be corrected.

**Declaration of interest**

None declared.

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4 Moon HS, Lee SK, Chung SH, Chung JH, Chang IB. Recurred pneumocephalus in a head trauma patient following positive pressure mask ventilation during induction of anesthesia—a case report. *Korean J Anesthesiol* 2010; 59(Suppl.): S183–6


**Assessment of anaesthetists' ability to predict difficulty of bag-mask ventilation**

Editor—Bag-mask ventilation (BMV) is a vital, life-saving skill for anaesthetists. The importance of BMV is recognized by several Difficult Airway Societies worldwide, and, reflected in difficult airway algorithms. In current literature, the incidence of difficult BMV has ranged between 0.08% and 15% with few studies large enough to report the incidence of impossible BMV, although Kheterpal and colleagues have reported an incidence of 0.16% in 2006. However, currently, there is no objective predictive score for difficult BMV routinely used. Instead, the individual anaesthetist's subjective preoperative assessment is heavily relied upon.

We present a pilot prospective study we conducted at a 350-bed Australian teaching hospital aimed at determining the accuracy of this assessment by the anaesthetist. During the routine preoperative assessment, anaesthetists were asked to predict the difficulty of BMV for each patient on a predetermined scale from 1 to 5 (modification of Han's Mask Ventilation Classification and Description Scale) (Table 1). Intraoperatively, this same scale was used to record the observed difficulty of BMV. The preoperative and intraoperative scores were then matched to assess the accuracy of anaesthetists' predictions. All scores ≥3 were considered ‘difficult’ and scores of <3 were considered ‘easy’.

We collected data on 231 episodes in 231 patients. Difficult BMV was substantially underestimated with 16 (6.9%) predicted difficult BMV vs 36 (15.6%) actually difficult BMV (P<0.001). Of those 215 patients predicted to be easy BMV, 26 (12.3%) were found to be difficult. Similarly, six (37.5%) of the 16 patients predicted to be difficult were actually easy. Anaesthetists' prediction of difficult BMV had a sensitivity of 27.8% and a specificity of 96.9.

The results of this pilot study highlight the need for the development of objective predictors of difficult BMV that may be used routinely in the preoperative assessment. The use of objective data rather than the inaccurate current method could feasibly lead to better planning and therefore better execution of a patient's ventilation intraoperatively. Further study to determine the objective predictors of difficult BMV would be useful. If these predictors were presented in a clinically applicable format, similar to the numerous predictive scores for difficult intubation, this may enhance the preoperative assessment and improve the accuracy of BMV prediction, ultimately improving the safety of anaesthesia for the patient.

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Declaration of interest

None declared.

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None declared.

Statement

Arterial punctures in small children

Editor—We read with interest the article by Cuper and colleagues.1 In 1992, we published a letter regarding the arterial puncture in small children.2 According to our technique, we fill the catheter needle with heparinized saline. Then, and as the cannula enters the artery, a reddish colour appears in the fluid, indicating that the cannula is in place, thus we advance the cannula.

We have tested this technique in hundreds of cases with success, including small children with low arterial pressure.

I understand that ultrasound, a Seldinger technique, or both would be more appropriate, but such equipment is not always available.

This approach can also be used for venous puncture.

Declaration of interest

None declared.

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Simplified measures of postoperative nausea and vomiting do not transfer to other populations

Editor—Myles, Wengritzky and colleagues published papers in the BJA in 2010 and 2012 describing two methods of measuring the intensity and impact of postoperative nausea and vomiting (PONV).1,2 In each paper, they have recommended a different, simplified method of ascertaining the severity of PONV and thus measuring the incidence of when this complication is severe enough to impair patients’ recovery. We have prospectively applied both methods in our annual PONV audit in Aberdeen Royal Infirmary (ARI) and found that they describe two different sets of patients. This suggests that neither method will satisfactorily collect the total incidence of this important problem. In 2010, Wengritzky and colleagues1 proposed a complex nausea and vomiting intensity scale that measured clinically important PONV, for use in research. In the same paper, they suggested that, for audit purposes, a patient who scored 75 mm or more out of 100 mm on a visual analogue scale for severity of nausea could be regarded as having clinically important PONV (VAS75). In 2012, Myles and Wengritzky2 published a reanalysis of the same data describing a simplified PONV impact scale. This summed together points scored for frequency of vomiting plus nausea severe enough to affect activities of daily living. The definition of clinically important PONV was a score 5 or more points (PONVIS).

At ARI, we have conducted near annual audits of PONV among surgical inpatients since 2005, including follow-up on the first postoperative day to ascertain the incidence of PONV. The North of Scotland Local Research Ethics Committee was informed and agreed that ethical approval was not required. For our 2012 audit, we incorporated both a 100 mm VAS scale for measuring severity of nausea and the questions required to score the PONVIS. The results are shown in Table 1.

This particular year, our overall incidence of PONV was disappointingly high but most of it was mild, as has also been found by Myles and Wengritzky. The incidence of clinically important PONV was low but which particular patients could be described

<table>
<thead>
<tr>
<th>Any PONV at all</th>
<th>Clinically important PONV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured by VAS75</td>
<td>Measured by PONVIS</td>
</tr>
<tr>
<td>129 (58%)</td>
<td>12 (5.4%)</td>
</tr>
</tbody>
</table>

Table 1 ARI audit results. Number (%) of patients with PONV amongst 223 in-patients followed up on first postoperative day (November 2012)