The expected frequencies of C&L grade ≥3 in Groups A–D were as follows:

(A) Unselected population 5.6% (95% CI 4.5–7.5).
(B) Immobilized with MILS 21.4% (18.4–24.7%).
(C) Immobilized with a stiff neck collar 64% (49–77%).
(D) Mallampati score ≥3: 20.7% (CI 16.8–25.8). Conservative upper limit used 34.5% (Shiga T, personal communication, 2011)

We then compared these ‘expected’ frequencies with those reported in the control groups of VL studies in the same patient populations. Control group incidence of C&L ≥3 was judged to be significantly elevated when it was higher than expected and the control group CI did not overlap with the benchmark CI.

In 10 Group A VL studies, six had a control group rate of C&L ≥3 higher than expected and in four this was significantly elevated. In Group B three VL studies all had lower than expected control group rates of C&L ≥3. In Group C three VL studies had significantly higher than expected control group rates of C&L ≥3. In Group D, all seven studies had a control group C&L ≥3 rate higher than expected and in three this was significantly elevated. Overall 10 of 23 studies reported significantly higher than expected rates of intubation difficulty in their control group. All references are available from authors on request.

The overall results are mixed but suggest that in an important proportion of papers comparing VL and DL the control group shows unexpectedly high rates of intubation difficulty. We are not suggesting that this is attributable to intentional misleading or poor quality research, but an inherent weakness of ‘non-blinded’ studies, which it is accepted may overestimate treatment effect by ≈17%.

Readers and reviewers of such studies should pay as much attention to the control group as to the study group when interpreting these data.

Declaration of interest

T.C. has been paid by Intavent orthofix and the LMA company many years ago for lecturing. His (and J.N.’s) department has received airway equipment at cost or free for evaluation. No other financial or academic conflicts.

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Use of transabdominal ultrasound to enhance safety during oesophageal dilatation

Editor—Oesophageal neoplasia is particularly common in Southern Africa;1 unfortunately, diagnosis is frequently late and curative therapy seldom possible.2 3 Palliative care with recurrent oesophagoscopy and dilatation is a frequent undertaking,2 3 but is not without risks.4 Oesophageal perforation during dilatation occurs in 10–15% of cases3 4 and is often not recognized at the time of the procedure,6 with attendant poor outcomes. No conclusive advantage or reduction in risk has been shown with the use of different types of dilators (Maloney, Savary-Gillard, or pressure balloon) nor with the use of fluoroscopic guidance.4 Trans-abdominal ultrasound has the potential to detect correct placement—or absence—of a guide wire or dilator within the stomach, thus guiding therapy and helping avoid perforation of the oesophagus, or at least aid in early detection. We document a case in which ultrasound performed by the anaesthetist detected perforation and aided in prompt further management.

A cachectic 54-yr-old female patient presented with infiltrating obstructive oesophageal squamous cell carcinoma for oesophagoscopy and dilatation. After obtaining i.v. access, establishing routine monitoring and pre-oxygenation, anaesthesia was induced with propofol and maintained with intermittent mandatory ventilation with isoflurane in oxygen and air. Muscle relaxation was initiated with succinylcholine for tracheal intubation and later maintained with vecuronium. No anaesthetic problems occurred; the patient was stable throughout the procedure.

Oesophagoscopy was performed by the cardiothoracic surgery registrar and consultant surgeon. Significant
difficulty with passage of the guide wire was encountered. During these attempts, we established a good view of the stomach by subcostal transabdominal ultrasonography using a 12–3 MHz linear array probe (Phillips HD11 L12-3) (Fig. 1). Identification of the gastric folds and a small amount of intraluminal fluid was achieved without difficulty. However, when the surgeon was able to advance the guide wire to an adequate depth it could not be demonstrated on the ultrasound image. Despite this, the decision was taken to continue with dilatation. Neither the dilator nor appropriate movement of the stomach could be detected sonographically. As a result, the surgeon became concerned that a perforation may have occurred, and elected to perform an operative gastrostomy and placement of percutaneous feeding tube. The dilator was left in position for the duration of the operation; absence thereof in the stomach was confirmed on direct inspection. Prophylactic antibiotics were administered and the patient kept nil per os after operation.

In our experience, sonography of the stomach during oesophageal dilatation is not technically difficult, aided by the low body mass of many of these patients. Ultrasound in cardiothoracic operating theatres is becoming increasingly common and carries minimal risk. Image acquisition does not delay the procedure and can be achieved simultaneously with oesophagoscopy without obstructing the surgeon. An anterior subcostal transverse view of the stomach is obtained with a curvilinear or linear array probe; placement is confirmed by identification of the typical appearance of the gastric folds. The guide wire is readily visible on entry into the stomach as a mobile hyperdense structure with significant acoustic shadow. Soft dilators appear as opaque structures which cause direct movement of the gastric mucosa. Absence of a guide wire implies coiling in the oesophagus or extra-alimentary placement.

This simple, non-invasive technique has not yet been documented in the literature and may improve patient safety during oesophageal dilatation. Further study into the feasibility of routine use, sensitivity, and specificity is warranted.

**Declaration of interest**

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**Internal leaks into anaesthesia machines: an unaddressed problem**

Editor—The Association of Anaesthetists of Great Britain and Ireland (AAGBI) 2012 machine check out recommendations has gained wide acceptability as it can be applied to a wide range of anaesthesia machines. Even after adhering to the guidelines, we failed to identify a problem on two occasions in GE Healthcare Datex Ohmeda 9100C workstations. In both instances, the oxygen concentration was high and the concentration of inhalation agent and nitrous oxide were less than the actual set percentage, as measured by the anaesthesia gas monitor. High circuit oxygen concentration because of malfunction of oxygen flush has been reported previously.

Internal leakage through a tear in ventilator bellows can allow the driving gas (oxygen) to enter the breathing system and \( F_{\text{IO2}} \) may increase. Internal leakage of oxygen into the circuit because of malfunction of the oxygen flush valve was the cause in our case.