doi:10.1093/bja/aeu081

Scissor-like manoeuvre of tracheal tube
Editor—I read the correspondence by Dr Biro describing his ‘Reflective intubation’ method with keen interest and I totally substantiate his method as I personally have been using a manoeuvre, albeit different from the one described by him in accessing many of the difficult airways I had encountered.

I manoeuvre the radius of curvature of the polyvinylchloride tracheal tube at the holding point of the tube during intubation and make a scissor-like manoeuvre with my middle and ring fingers of my right hand, bending the tube to the required degree with my middle finger and holding it in place with my ring finger at the bend and then introduce into a more anteriorly placed laryngeal inlet with ease (Fig. 1).

Similarly, the tube is bent the other way, that is, making it straighter with a similar scissor-like manoeuvre with the middle finger bending the tube away from the concavity and the ring finger holding it in place and then introducing it (Fig. 2). I personally found that these manoeuvres, as the author rightly said, are simple, easy to perform (with a bit of practice), cost-effective, less traumatic, and a faster access to the airway (even without external laryngeal manoeuvre most of the time) is achieved. I have been training my anaesthesia residents too in this simple technique for some years now and it is being practiced successfully by them too.

As Dr Biro has suggested, a thorough scientific investigation is warranted for assessing the efficacy of such manoeuvres, so that they may perhaps play an intermediate role in the airway algorithms before usage of more invasive introducers, stylets, etc.

Declaration of interest
None declared.

V. Sivapurapu
Pondicherry, India
E-mail: prerana10@yahoo.com

1 Biro P. Reflective intubation: a simple and effective method to improve intubation conditions by elevating the tip of the tube without additional equipment. Br J Anaesth 2013; 111: 505–6
doi:10.1093/bja/aeu082

Assessment of anaesthetists’ ability to predict difficulty of bag-mask ventilation
Editor—I read with interest the Correspondence by Roberts and colleagues regarding the anaesthetists’ ability to predict difficult bag-mask ventilation (BMV). Their findings show unreliable preoperative prediction of quality of BMV after induction of anaesthesia. However, the authors do not specify how many patients had received a neuromuscular blocking agent at the time of assessment of BMV. Such information is important because there is considerable evidence that early muscle relaxation will facilitate BMV.

The findings of a prospectively assessed algorithm for difficult airway management including 12 221 BMVs are one example in support of the benefit of early muscle relaxation on the quality of BMV. Patients with indications for awake fibreoptic intubation were excluded. The algorithm required that patients with three and more risk factors for difficult airway management receive succinylcholine right after induction of anaesthesia without prior assessment of quality of BMV. There were 188 patients who qualified for this approach. After administration of succinylcholine, BMV was grade I (ventilation without need for an oral airway) or II (ventilation requiring oropharyngeal airway) in 175 (93%), grade III (difficult and variable ventilation requiring an oral airway and two providers, or an oral airway and one provider using pressure-controlled mechanical ventilation requiring 25 cm H2O) in 12 (6.3%),
and grade IV (ventilation inadequate with no $P_{\text{CO}_2}$ measurement and no perceptible chest wall movement during attempts at positive pressure ventilation) in one patient (0.5%) (grades I and II, and grades III and IV being equivalent to scores <3 and 3 or more, respectively, used by Roberts and colleagues). Thus, of those 188 patients with predicted difficult BMV, barely 7% actually demonstrated difficult BMV. This is less than half the incidence reported by Roberts and colleagues. It is conceivable that the higher incidence in the latter report was caused by the absence of muscle relaxation at the time of assessment of BMV.

In patients with <3 risk factors, the quality of BMV was assessed before administration of a neuromuscular blocking agent. After the administration of succinylcholine in 90 patients with BMV difficulty grade III, the quality of BMV improved by one grade in 56 (62%), and did not worsen in any of the remaining 34 patients. After administration of a non-depolarizing neuromuscular blocking agent in 12 003 patients with BMV difficulty grade I and II, the quality of BMV did not worsen in a single patient. These findings confirm previous ones showing that in patients with unimpaired or with a mix of unimpaired and moderately difficult BMV, the quality of BMV either remained unchanged or improved after the administration of a neuromuscular blocking agent, but never worsened.

During the past 25 yr, in the absence of indication for awake fibreoptic tracheal intubation, I have routinely administered the planned full dose of the neuromuscular blocking agent as soon as the patient went off to sleep. With this practice, I have rarely encountered impossible BMV. In my view, lack of administration of muscle relaxation immediately after induction of anaesthesia should be considered a predictor of difficult BMV. I fully agree with the authors’ statement that BMV is ‘a vital, life-saving skill for anaesthetists’ (although with the advent of supraglottic airway devices, the importance of BMV has somewhat diminished). However, BMV may iatrogenically be made difficult by the reluctance of early muscle relaxation. The authors of the 4th National Audit Project (NAP4) of the Royal College of Anaesthetists and The Difficult Airway Society make this point a couple of times in the context of difficult ventilation.

### Declaration of interest

None declared.

H.-J. Priebe
Freiburg, Germany
E-mail: hans-joachim.priebe@uniklinik-freiburg.de


5 http://www.rcoa.ac.uk/nap4 (accessed 2 October 2013)

doi:10.1093/bja/aeu076

### Are the obese difficult to intubate?

Editor—Evidence is conflicting about whether increasing BMI is a risk factor for difficult intubation. The objective of this study was to apply the commonly accepted definitions of difficult intubation to morbidly obese patients and determine whether increasing BMI was associated with increasing difficulty. For the purpose of the study, patients were divided into two groups—obese (BMI = 30–45 kg m$^{-2}$) and super-obese (BMI >45 kg m$^{-2}$). To the best of our knowledge, this is the first study to compare obese and super-obese patients for the incidence of difficult intubation.

Morbidly obese patients undergoing bariatric surgery at our institute were included in this prospective observational study. The chief bariatric anaesthetist was the operator for all intubations. All patients were in the ramped position and paralysed with standard dose of succinylcholine before intubation. An independent observer evaluated the intubation as per the commonly accepted definitions of difficult intubation. The $\chi^2$ test was used to compare intubation difficulty scale (IDS) score >5 and Cormack grades 3 and 4 between the groups. The Mann–Whitney $U$-test was used to compare time for intubation and incidence of three or more attempts at intubation between the groups.

A total of 147 patients were studied (Table 1). Between the obese and super-obese groups, there was no significant difference in the incidence of IDS >5 ($P$-value 0.88). However, there was a significant increase in the incidence of Cormack grades 3 and 4 in the super-obese group. Between the groups, there was no significant difference in time for intubation and incidence of three or more attempts at intubation between the groups.

Our results indicate that increasing BMI is not associated with increasing intubation difficulty as defined by IDS, time for intubation, and incidence of three or more intubation attempts. There was however an increased incidence of Cormack grades 3 and 4 in the super-obese group. This paradoxical result may be explained by the fact that there exists a lot of confusion over the Cormack grade 3 laryngoscopic view. Studies have shown that the reproducibility of this grading system is limited and that Cormack grade used as a definition for difficult intubation may overestimate the incidence compared with other definitions.1 2

Neligan and colleagues3 studied morbidly obese patients posted for bariatric surgery and found there was no relationship between difficult intubation (as defined by three or more attempts at intubation) and BMI. They reported a 3.3% incidence of difficult intubation. If we used the same definition of

---

770