2 Karmakar MK, Ho AM, Li X, Kwok WH, Tsang K, Ngan Kee WD. Ultrasound-guided lumbar plexus block through the acoustic window of the lumbar ultrasound trident. *Br J Anaesth* 2008; **100**: 533–7

3 Aksu C, Gurcan Y. Shamrock method may prevent kidney injury. *Br J Anaesth* 2013 e-letter (http://bja.oxfordjournals.org/forum/topic/brjana_el%3B9814)

4 Karmakar MK, Li JW, Kwok WH, Soh E, Hadzic A. Sonoanatomy relevant for lumbar plexus block in volunteers correlated with cross-sectional anatomic and magnetic resonance images. *Reg Anesth Pain Med* 2013; **38**: 391–7

5 Lin JA, Lu HT. A convenient alternative for monitoring opening pressure during multiple needle redirection. *Br J Anaesth* 2014; **112**: 771–2

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Translaryngeal open ventilation for percutaneous endoscopic tracheostomy

Editor—The standard procedure of ventilation during percutaneous endoscopic tracheostomy (PET) is to withdraw tracheal tube (TT) until the cuff lies between the vocal cords.[1] The use of extraglottic airway device as an alternative to the standard TT could overcome many of the problems associated with the procedure.[2] However, the safety during ventilation may be compromised.[3] We routinely use the uninterrupted translaryngeal open ventilation method (TOV)[4] and we currently use the same method also with PercuTwist technique (PT) successfully.

In our general intensive care unit, a retrospective review was performed using data from the last 2 yr. Data from 61 consecutive PET were collected: Ciaglia Blue Rhino (CBR) (n=31) and PT (n=30).

All patients were successfully assisted during PET with TOV. Pressure-controlled ventilation (40 cm H_2O) was maintained through a cuffless 4.5 mm ID tube (TOV) with following variables: $F_{I_{O_2}}$ 1.0, respiratory rate 20 bpm, inspiratory time 1.5 s, and PEEP 0 cm H_2O. Arterial blood gas (ABG) analyses were performed before, during, and after PET. The time of TOV was inclusive of the initial preparation, broncoscopy, and surgical time until placement of the tracheostomy tube. The data collected in each group were compared with Student's t-test; a P-value of <0.05 was considered statistically significant.

The mean (SD) time of TOV was 30 (5) min. No patients needed standard ventilation through a cuffed TT. The main results are given in Table 1. This technique resulted in only a moderate increase in Pa_{CO_2}, similar to the other reports in the literature.[5] In addition, it always guaranteed a continuous oxygen flow at the carina, ensuring adequate oxygenation without a transient decrease in arterial saturation even during the dilation phase. For this reason, TOV is safer even if complications such as bleeding may protract surgical time. The lack of the cuff and the small size of the tube allows a large operating field and a clear visualization, so that the small tube remains in site during the whole procedure also with PT technique and it maintains a continuous ventilation throughout the course of the procedure. The rhino-tracheal videobronchoscopy is fast and facilitated by the leak of the air exhaled through the mouth that opens the collapsed hypopharynx and guides introduction of the endoscope. In this way, the larynx hosts the tube and the endoscope (6.3 mm OD tube+5.0 mm Ø endoscope) without interference.

Moreover, the cuffless 4.5 mm ID tube is placed by tube exchange and left in place throughout the procedure as it allows an easy rotation and placement of the tracheostomy cannula. We believe that the tip of the small tube at the carina level prevents aspiration into the airway; the inspiratory oxygen flow is maintained beyond the tracheal bleeding or regurgitation, while the expiratory flow pushes out any biological fluid through the hypopharynx and the mouth. Finally, we believe that the use of TOV in controlled pressure prevents the emphysema, pneumothorax, and/or pneumomediastinum. These complications were absent in our groups and in earlier studied patients[4] because the high-resistance TT ensures ventilatory assistance during both procedures and TOV prevents hyperinflation and barotrauma.[4]

A negligible increase in Pa_{CO_2} is not associated with significant pH variation and an adequate Pa_{O_2} is maintained throughout the whole procedure. For these reasons, we believe that TOV is safe, effective, and easily applied to every PET technique.

Table 1 Duration of PT technique and CBR, and the maximum change in Pa_{CO_2}, pH, and Pa_{O_2}. The data are mean (SD)

Variables	PT	CBR	*P*-value
Procedure time (min)	4 (2)	3 (1)	<0.05
Time of TOV (min)	31 (5)	30 (4)	NS
ΔPa_{CO_2} (kPa)	0.5 (0.3)	0.6 (0.5)	NS
ΔPa_{O_2} (kPa)	9.3 (4.8)	10.0 (4.2)	NS
ΔpH	0.04 (0.02)	0.08 (0.04)	NS

Declaration of interest

None declared.

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1 Bodenham AR. Percutaneous dilational tracheostomy. Completing the anaesthetist's range of airway techniques. *Anaesthesia* 1993; **48**: 101–2

2 Cattano D, Buzzigoli S, Genovesi M, Zoppi C, Hagberg CA. Percutaneous tracheostomy: prospective practice. *Br J Anaesth* 2011; **106**: 278; author reply 278–9

3 Carron M, Freo U, Michielan F, Ori C. Effects of tracheal intubation on ventilation with LMA Classic for percutaneous dilation tracheostomy. *Minerva Anestesiol* 2010; **76**: 181–7

4 Ferraro F, Capasso A, Troise E, *et al.* Assessment of ventilation during the performance of elective endoscopic guided percutaneous tracheostomy. Clinical evaluation of a new method. *Chest* 2004; **126**: 159–64

5 Reilly PM, Anderson HL III, Sing RF, Schwab CW, Bartlett RH. Occult hypercabia: an unrecognized phenomenon during percutaneous endoscopic tracheostomy. *Chest* 1995; **107**: 1760–3

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In the new era of ultrasound guidance: is pneumothorax from supraclavicular block a rare complication of the past?

Editor—Before the utilization of ultrasound, the complication of pneumothorax was a concern for many anaesthetists performing supraclavicular block (SCB).[1 2] Technological advances have made ultrasound guidance for regional nerve blocks a standard practice,[3] and when coupled with SCB, have rendered pneumothorax an improbable complication. The incidence of clinically significant pneumothorax after an ultrasound-guided SCB has not yet been determined in a large patient study. Therefore, we undertook a 5 yr retrospective study to determine: (i) incidence of pneumothorax as a complication of ultrasound-guided SCB and (ii) the reliability of ultrasound in preventing pneumothoraces in SCB.

After IRB approval, we analysed data from June 2009 to December 2013 on all brachial plexus blocks performed at Harbor-UCLA Medical Center. These data were obtained from our electronic health record database (Fig. 1). All SCB were examined for the presence or absence of ultrasound utilization and the complication of pneumothorax. Recorded pneumothorax incidence was zero. All SCB procedures were performed under ultrasound guidance.

To determine if the difference in pneumothorax incidence with the utilization of ultrasound was statistically significant from the incidence without the utilization of ultrasound, a χ^2 test was performed between our data and the data from the literature. Thompson's report (0.8% incidence)[4] without ultrasound for SCB was chosen for χ^2 test comparison since it was the largest study (n=1248). χ^2 analysis returned a P-value of <0.001. This comparison demonstrates that ultrasound-guided SCB allowed statistically significant reductions in the incidence of pneumothorax. Although these two studies are theoretically incomparable because the groups were not randomized, both featured the largest sample sizes of SCBs and lowest incidence of pneumothorax.

While assumption of variation in technique, needle insertion, method of injection, and operator's experience level were different between these studies, ultrasound guidance was the only constant variable, implying proper use of ultrasound guidance is the largest factor in improving patient safety from a pneumothorax. With our study being the largest to date with 1419 patients without pneumothorax, similar conclusions can be inferred cumulatively from other studies utilizing ultrasound without pneumothorax. On the contrary, isolated case reports of pneumothorax as a complication of ultrasound-guided SCB show that the true incidence of pneumothorax is not zero, despite its zero incidence at our institution.

Although our study and others have been able to obtain a zero rate of occurrence of pneumothorax, this does not imply zero risk of clinically relevant pneumothorax nor does it imply any information about the size of the risk. Hanley's mathematical 'rule of three'[5] provides a method of calculating theoretical maximum long-run risk with a 95% confidence interval, yielding a theoretical risk of 2:1000 of developing pneumothorax with ultrasound-guided SCB.

Our 5 yr study shows that SCB are our preferred technique of regional anaesthesia for upper extremity surgery. SCB accounted for 72% of all brachial plexus blocks (Fig. 1), from which we can infer that the majority of upper extremity blocks are performed without fear of pneumothorax complications. At our teaching institution, ultrasound has been a routine practice since 2007, with faculty involvement in 100% of SCBs.

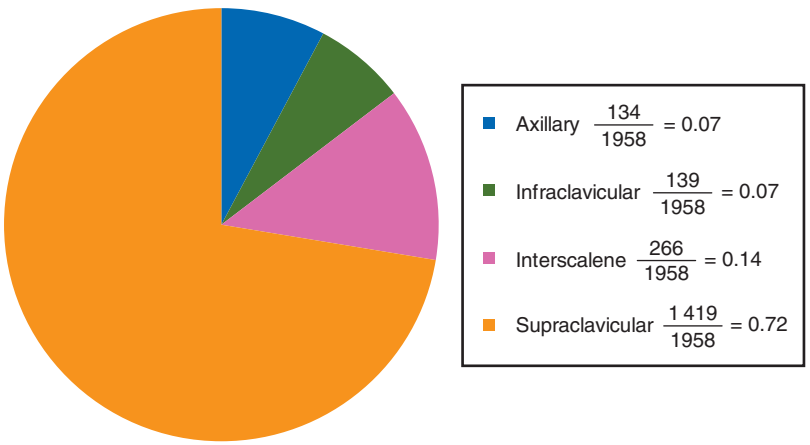

Fig 1 Five year data of brachial plexus blocks.