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 $\chi^2$ 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 $\chi^2$ test comparison since it was the largest study ($n=1248$). $\chi^2$ 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.

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**Fig 1** Five year data of brachial plexus blocks.
Of these, 69% were performed by a resident under direct faculty supervision, and roughly 31% done by faculty alone. The report of zero incidence by residents-in-training lends further evidence to the efficacy of ultrasound in improving safety in precluding the complication of pneumothorax.

In conclusion, ultrasound-guided SCB can be translated into clinically useful benefits with an extremely low pneumothorax complication rate and should not be overlooked because of previous bias.

Declaration of interest

None declared.

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Academic anaesthesia: the trend in UK publishing in the BJA between 2004 and 2013

Editor—A crisis in UK academic anaesthesia was identified by Pandit in 2005 and confirmed by Feneck and colleagues in 2008, with a decline in UK published research demonstrated across seven anaesthesiology journals, the most striking of which was the BJA. Much has changed since with the creation of the National Institute for Academic Anaesthesia (NIAA) in 2008 and subsequent identification of research priorities in 2012. A further review of BJA UK publishing is therefore justified to evaluate any positive effect of the NIAA, and is particularly relevant, given the recent NIAA HSRC trainee survey.

Data were drawn from the online BJA archive for the monthly journals 2004 to 2013 inclusive. The international origin of each article was identified and assigned to either: UK, other European countries, or rest of the world. All original articles were included (including supplements, special issues, and case reports but excluding review articles, book reviews, abstracts, and correspondence).

A total of 1997 publications were included. There is a near year-on-year decline in UK articles published in the BJA over the last decade, accompanied by a commensurate decline in UK percentage contribution (Table 1). The number of UK articles published in the most recent complete year (18 in 2013) was less than one-third of that published a decade ago (60 in 2004). There is also an increasing trend in annual percentage change (from the 2004 baseline) as the decade progresses with a 70% change demonstrated between 2004 and 2013. No clear relationship exists between contributions from the UK and other regions.

Despite Pandit’s report and the evolution of the NIAA, the decline shown in 2008 has continued dramatically into the next decade. This is not necessarily analogous to a decline in academic anaesthesia across the UK or a reflection of any particular failing of the NIAA however: an optimistic viewpoint is that our most esteemed colleagues are publishing elsewhere in non-anaesthetic journals; articles are being shared across a wider field within anaesthesia through subspecialty journals; a trend unique to the BJA may have been revealed, indeed a bias towards overseas contributions could be responsible, although given the rigorous review process and strong UK editorial representation, this seems unlikely; more realistic is the profoundly negative effect of burgeoning assessments and rigid training structure that has resulted in research being reserved for the privileged few. As Moppett and Hardman demonstrated, more than 50% of UK anaesthesia publications originate from just four academic institutions, supporting this notion and suggesting the current milieu is stifling non-academic departments. Anecdotally (for now, pending the NIAA survey results), and certainly from a full-time clinical trainee’s perspective, meaningful research is largely restricted to those taking time out from clinical training to undertake a PhD, MD, or academic fellowships. The reality for trainees who have an interest in research but remain within full-time training is that the time-consuming nature of an increasing burden of assessments and constant rotation through hospitals on short-term placements mean that undertaking and completing a significant research project is increasingly unrealistic (a contention that is likely to be confirmed by the NIAA survey results, published in May). Pandit acknowledged in 2006 that clinical trainees being marginalized from influential research was a distinct possibility, but argued that increasing their participation was not the solution to the academic crisis. Funding short-term academic attachments for clinical trainees may not be the answer, but a review of current conventional clinical