Editorial

Pneumothorax management—chest drain or needle aspiration?

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Despite pneumothoraces being described in medical literature as far back as 15th century (1), the optimal way the remove air from the pleural cavity has not yet been ascertained, nor indeed have we determine whether it is necessary to do so at all. The well conducted randomised control trial by Thelle *et al.* (2) has added to the evidence base concerning one of the fundamental questions: whether needle aspiration (NA) or chest tube drainages (CTD) is superior in evacuating a pneumothorax.

It is an important question, particularly as expert consensus remains divided, with differing advice from national advisory bodies. The American College of Chest Physicians Delphi consensus [2001] (3) does not advise NA, instead supporting proceeding directly with CTD insertion, whilst the BTS guidelines [2010] (4) suggests NA as 1st line in primary spontaneous pneumothorax (PSP), and as an option in small sub-centimetre secondary spontaneous pneumothorax (SSP). There have been a number of studies (5-10) over the last 25 years, attempting to address this issue, although interpretation has been made difficult with heterogeneous inclusion criteria, methodologies and definitions of success. However, taken together, they suggest that whilst hospital duration is typically shorter for patients treated with NA (5-7,9,10), immediate success rates are generally higher with CTD insertion (5,7,8).

Thelle *et al.* study randomised 127 patients presenting with a spontaneous pneumothorax, both primary and secondary, to either NA or CTD. The primary outcome was length of stay, with secondary outcomes including immediate and one-week success rates. Patients were allowed two aspirations in the NA cohort, before proceeding to CTD insertion if these failed. The study is overall supportive of the use of first line NA in both PSP and SSP, demonstrating hospital length of stay in all patients treated with NA pathway. It also showed immediate success rate with NA that were almost twice that of CTD, and a lower low incidence of adverse events with NA.

Whilst these results are encouraging for the use of NA, there are reasons to be cautious. The success rates in NA arm (68.8%) are not dissimilar to preceding studies, however for CTD cohort, they were dramatically lower than previous studies (32% *vs.* 64–93%) (5,7,8). The high 'immediate' success rate with NA might also be slightly misleading; as it represents a management pathway consisting of a subsequent second aspiration and then chest drain if required, with the success rates of the initial NA less encouraging at 50%.

The success of NA in both PSP and SSP patients provides interesting insight into pneumothorax research. If the success of NA in both PSP and SSP was replicated in other studies, this would amalgamate the management pathway of both conditions. With increasingly evidence that PSP is the consequence of intrinsic lung pathology, PSP and SSP many not represent two distinct, separate entities, but differing ends of the same spectrum (11). If the treatment pathway and underlying pathogenesis is similar then there would be less reason to differentiate between them.

Also with the high success rate of NA in SSP, this may change our thinking on persistent air-leak. With NA associated with twice the immediate success rates of CTD

in both PSP and SSP, this suggest either that persistent air leak is uncommon in both these cohorts, or that formal CTD may contribute to persistent air leaks in a proportion of patients.

There is still uncertainty of how to predict pneumothorax recurrence. Unfortunately, this study did not follow-up patient long-term to determine whether the method of treatment influences recurrence rates. Further studies are required to clarify this.

If the findings of this study, particularly in regards to SSP patients, are verified by further trials, NA, with its associated fewer bed-days and adverse events is an attractive first line option and should be offered to patients with a PSP or SSP. However, patients must be counselled that there have a 50% chance of their initial NA failing, and hence may require more than one intervention.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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