Letter to the Editor

Needle aspiration should be considered as primary intervention option for stable patients with spontaneous pneumothorax

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Provenance: This is an invited Letter to the Editor commissioned by Section Editor Dr. Feichao Bao (Department of Thoracic Surgery, The First Affiliated Hospital, Zhejiang University, Hangzhou, China).

Response to: Walker SP, Maskell N. Pneumothorax management—chest drain or needle aspiration? J Thorac Dis 2017;9:3463-4.
Elsayed HH. Is chest tube drainage losing ground in management of patients with spontaneous pneumothorax? J Thorac Dis 2017;9:3518-22.

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Patients with spontaneous pneumothorax are treated by clinicians of different medical specialties worldwide with slightly different approaches. Handling of patients ideally should be based on best evidence in guidelines, but practice is still to a large extent variable and depending on local clinical experience. Clinical studies are small and few on the subject. This is reflected on guidelines made of expert consensus panels such as the 2001 American College of Chest Physicians (ACCP) guidelines (1). The more recent 2010 British Thoracic Society (BTS) and 2015 European Respiratory Society (ERS) taskforce guidelines (2,3) are updated on the latest studies up to that point in time, however again forced to give advice on issues with scarce documentation such as for secondary pneumothorax. The use of chest tube drainage (CTD) or needle aspiration (NA) as primary intervention for stable spontaneous pneumothorax is an example of one of several important debated issues. A small number of studies have been published (4-9), all showed safety and efficacy of NA for patients with spontaneous pneumothorax.

In April 2017, we published the main results from the Norwegian Pneumothorax Study in *The European Respiratory Journal* (10). We randomized 127 stable patients with spontaneous pneumothorax to CDT or NA. We showed that NA as primary intervention resulted in significantly shorter hospital stay than CTD. This finding also applied to the 48 patients with secondary pneumothorax. Our results has gained attention, first in an instant editorial in *The European Respiratory Journal* by Tschopp and Marquette (11), further with interesting comments in the present issue of the *Journal of Thoracic Disease* by Walker and Maskell (12) from Bristol's expertise on pleural disease, UK , and from a surgeons point of view, Dr. Elsayed (13), Kairo, Egypt.

Both editorials comment on the criteria of immediate response for NA or CTD. Elsayed (13) questions the validity and difference between NA and CTD of the definition of success criteria. By nature these two different treatment approaches cannot possibly have the same definition; simple NA implies immediate withdrawal of equipment, *whilst CTD entails* continuous drainage over a period of time. So even if the lung may be re expanded, treatment can't be defined as over until equipment (chest tube) is removed. Our definitions correspond to those used by Noppen (6) and Ayed (7).

We agree that the immediate response parameter is a less compelling argument in favour for higher usage of NA. Reduced hospital stay, safety of treatment with less discomfort for the patient is more important. For the patient, even two aspirations may be a relief compared to days and nights with chest drain.

Walker and Maskell on the other hand, comment on lower immediate success rates for both CTD and first aspiration than in previous studies. There might be several possible explanations for this finding. First, our study is not on a selected subgroup, but comprised a heterogeneous assortment of patients, including a higher number of secondary pneumothorax than previous studies. Second, the interventions in our study were carried out not only by highly trained specialists, but also by junior doctors on call

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in the late hours. At last, satisfactory result of NA had to be followed by persistent stable condition on subsequent chest radiographs to be assessed as adequate response. An addition of 10 patients had apparent instant satisfactory results of first aspiration (5 following 2nd aspiration), but deteriorated or relapsed later (1.5–71 hours), thus labelled as failures. A less conservative definition of success would give rates of more comparable 66% (42/64) and 67% (16/24).Our results suggest that the occurrence of persistent air leak for patients with secondary pneumothorax is less common than suspected. One might speculate if CTD treatment might influence the lungs' dynamics and capacity to heal the visceral pleural rupture.

There are still several unanswered questions related to pneumothorax treatment. Should choice of intervention method be influenced by the size of the pneumothorax or the time passed from the first symptom to intervention? It would be interesting to look closer into the NA-failure group: Does the subsequent treatment with CTD have unacceptable risk of failure? If these cases could be recognized early, these individuals might profit on early surgical intervention.

CTD remains the best way to secure unstable patients, or those with tension or bilateral pneumothorax, as well as those on non-invasive ventilation or respirator. Nevertheless, Elsayed in his editorial, raises an important issue: to look into methods to optimize and secure safe CTD treatment, and compliance to time limits for conversion to surgery.

Increased usage of NA may contribute to less invasive approaches to stable patients with spontaneous pneumothorax.

As always, more studies are needed.

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None.

Footnote

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

References

1. Baumann MH, Strange C, Heffner JE, et al. Management of spontaneous pneumothorax: an American College of Chest Physicians Delphi consensus statement. Chest 2001;119:590-602.
2. MacDuff A, Arnold A, Harvey J, et al. Management of spontaneous pneumothorax: British Thoracic Society Pleural Disease Guideline 2010. Thorax 2010;65 Suppl 2:ii18-31.
3. Tschopp JM, Bintcliffe O, Astoul P, et al. ERS task force statement: diagnosis and treatment of primary spontaneous pneumothorax. Eur Respir J 2015;46:321-35.
4. Harvey J, Prescott RJ. Simple aspiration versus intercostal tube drainage for spontaneous pneumothorax in patients with normal lungs. British Thoracic Society Research Committee. BMJ 1994;309:1338-9.
5. Andrivet P, Djedaini K, Teboul JL, et al. Spontaneous pneumothorax. Comparison of thoracic drainage vs immediate or delayed needle aspiration. Chest 1995;108:335-9.
6. Noppen M, Alexander P, Driesen P, et al. Manual aspiration versus chest tube drainage in first episodes of primary spontaneous pneumothorax: a multicenter, prospective, randomized pilot study. Am J Respir Crit Care Med 2002;165:1240-4.
7. Ayed AK, Chandrasekaran C, Sukumar M. Aspiration versus tube drainage in primary spontaneous pneumothorax: a randomised study. Eur Respir J 2006;27:477-82.
8. Korczyński P, Górska K, Nasiłowski J, et al. Comparison of Small Bore Catheter Aspiration and Chest Tube Drainage in the Management of Spontaneous Pneumothorax. Adv Exp Med Biol 2015;866:15-23.
9. Parlak M, Uil SM, van den Berg JW. A prospective, randomised trial of pneumothorax therapy: manual aspiration versus conventional chest tube drainage. Respir Med 2012;106:1600-5.
10. Thelle A, Gjerdevik M, SueChu M, et al. Randomised comparison of needle aspiration and chest tube drainage in spontaneous pneumothorax. Eur Respir J 2017;49. pii: 1601296.
11. Tschopp JM, Marquette CH. Spontaneous pneumothorax: stop chest tube as first-line therapy. Eur Respir J 2017;49. pii: 1700306.
12. Walker SP, Maskell N. Pneumothorax management—chest drain or needle aspiration? J Thorac Dis 2017;9:3463-4.
13. Elsayed HH. Is chest tube drainage losing ground in management of patients with spontaneous pneumothorax? J Thorac Dis 2017;9:3518-22.

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