Pleural Manometry

Our Point of View

To the Editor:

We read with interest the point-counterpoint editorial debate on routine use of pleural manometry during thoracentesis in CHEST (April 2012). Maldonado and Mullon, in their counterpoint argument, write that pleural manometry adds valuable information and they use it, but not on a routine basis. We are interested in knowing how they decide when to and when not to use this technique. They suggest that a better way to show that the lung has expanded is by “maximal fluid removal,” followed by ultrasound imaging. Maximal fluid removal may not necessarily mean complete emptying of the pleural space, as the procedure at times is stopped when an arbitrary cut-off volume is reached or when the patient develops symptoms, such as intractable cough, severe pain, and chest discomfort. In their study, Feller-Kopman et al recommend that attention should be paid to symptoms during thoracentesis, as the development of chest discomfort is associated with a potentially unsafe drop in pleural pressure. We have pleural manometry data on 140 patients and have not seen the same correlation. We agree with the suggestion made by Feller-Kopman et al that one should pay attention to both symptoms and pleural pressures in guiding thoracentesis, but differ by saying that both chest discomfort and chest pain may be of concern, alone or as a combination.

When referring to the study by Lan et al, Maldonado and Mullon wrongly state that a decrease in pleural pressure > 19 cm H₂O after removal of the initial 300 mL was a predictor of unsuccessful pleurodesis; rather, it is an elastance > 19 cm H₂O/L, that predicts unsuccessful pleurodesis. Maldonado and Mullon suggest that instead of elastance, the absolute closing pressure may be a more relevant variable to consider for successful pleurodesis. Lan et al did not report the correlation between successful pleurodesis and closing pressure. Since theirs is the only study done so far looking at the same, it would be difficult to come to that conclusion, even though it seems to be a sound argument. In our series of patients we found that an elastance (opening pressure minus closing pressure)/total volume of pleural fluid removed > 19.3 cm H₂O/L was seen only in patients with either entrapped or trapped lungs.

Maldonado and Mullon strongly recommend that for diagnostic procedures, adequate training, demonstration of competency, and improved outcomes with their use is important before mandating their use. If a simple, easy, low-cost procedure, with insignificant risk to patients, gives enough clinical information that may alter patient management, then in our opinion, one does not need to perform laborious, costly, and time-consuming studies to show outcome benefits. Yes, we agree that adequate training and demonstration of competency should be mandatory. We would like to know from Maldonado and Mullon the outcomes they had in mind that would be considered significant and useful to assess the benefits of pleural manometry.

Finally, we agree with Maldonado and Mullon on the use of ultrasonography during thoracentesis. Its use has been shown to decrease complications, such as pneumothorax, help guide thoracentesis for maximal drainage, and maybe even diagnose recrudescent pulmonary edema. The two techniques, ultrasonography and pleural manometry, can be complementary to each other and provide more information to the physician than one technique alone.

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4. Yasnufuku K, Pierre A, Darling G, et al. Ultrasound during thoracentesis. Its use has been shown to decrease complications, such as pneumothorax, help guide thoracentesis for maximal drainage, and maybe even diagnose recrudescent pulmonary edema. The two techniques, ultrasonography and pleural manometry, can be complementary to each other and provide more information to the physician than one technique alone. 3

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Response

To the Editor:

We thank Drs Khosla and Kistler for their insightful comments and applaud them for analyzing their data on pleural manometry to hopefully contribute to this debate and clarify the role of manometry in the management of patients with pleural effusions. We are pleased to read that they agree with the need for adequate training, demonstration of competency, and the use of pleural ultrasonography. As discussed in our counterpoint editorial, these interventions were shown to significantly reduce the rate of iatrogenic pneumothorax. We would suggest that this patient-centered clinical end point is a good example of what we would consider a meaningful end point. Other outcomes that could be relevant may include discomfort during or after the procedure, dyspnea relief, and re-expansion pulmonary edema. As discussed, pleural manometry has not been shown convincingly to reduce the rate of pneumothorax or reexpansion pulmonary edema. We disagree with the notion that change in patient management should be considered an equivalent end point.

While definitive data on pleural manometry are clearly lacking, we do believe that monitoring pleural pressures has a role during thoracentesis. We use manometry frequently when a diagnosis of unexpandable lung is suspected based on clinical, radiologic, and ultrasonographic data. However, arguing that manometry is mandatory during all thoracenteses does not appear justifiable in the absence of robust data on meaningful outcomes. Manometry has been adopted by a minority of proceduralists. Requesting that it be done systematically by all would, therefore, represent a substandard shift in management that has to be supported by strong evidence, no matter how “easy” or “low-cost” the procedure is. We would rather give priority to other interventions with proven evidence, no matter how “easy” or “low-cost” the procedure is.

We agree that elastance should be expressed in cm H₂O/L. Regardless of the units used, one major limitation of the study by Lan et al is that it fails to take into account “biphasic” elastance curves in which the steepest terminal portion of the pressure-volume curve should be considered for elastance calculations. As such, we suggest that absolute closing pressure may be a more relevant variable to consider.

Studies on manometry to show outcome benefit do not need to be “laborious, costly, and time consuming.” Drs Khosla and Kistler evidently perform manometry frequently. It should be relatively straightforward to explore outcomes relevant to patients and, hopefully, inform the pleural community on the true utility of manometry.

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REFERENCES


Does Cuff Material and Design Help Prevent Ventilator-Associated Pneumonia?

To the Editor:

I read with great interest the clinical review on new technologies with respect to endotracheal tubes by Fernandez et al in CHEST (July 2012). These authors provided a complete overview of the techniques available for the prevention of ventilator-associated pneumonia.

One major objection has to be made concerning the reference to a published study by our group, in which postoperative cardiac surgical patients were intubated with either a polyvinylchloride (PVC) cuffed or a polyurethane (PU) cuffed endotracheal tube. A major difference in the rate of postoperative pneumonia was indeed described. In contrast to what was stated in the review, we compared a barrel-shaped, not a tapered-shaped, cuffed endotracheal tube made of either PVC or PU. This is important because the findings of this study support and extend the data of Lorente et al combining the barrel-shaped PU cuff endotracheal tube with subglottic aspiration. Tapered-shaped PVC cuff endotracheal tubes have been assessed in vitro studies, and they have suggested a slower descent of dye solution, in contrast to barrel-shaped PVC cuffed tubes. To our knowledge, no study has examined the characteristics of a tapered-shaped PU cuff in a clinical setting.

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