Transthoracic Needle Biopsy for Pleural and Peripheral Lung Lesions

Ultrasonography vs CT Scan Guidance

To the Editor:

We read the article by Hallifax et al1 in an issue of CHEST (October 2014) and are very interested in their findings. We appreciate their achievement in ultrasound-guided biopsy for diagnosing pleural lesions, especially for patients who cannot undergo thoracoscopic biopsy. However, we also have some opinions on the issue.

It is well known that imaging-guided biopsy for pulmonary lesions will induce complications such as pneumothorax and bleeding. Preoperative enhanced CT imaging or intraoperative color Doppler ultrasound can be used to evaluate the vessel and avoid or reduce the operation-related bleeding. However, the potential occurrence of pneumothorax makes us avoid performing CT scan-guided biopsies. The occurrence of pneumothorax will result in prolonged operation time, lower oxygen saturation in patients with senility, and even failure of biopsy. We notice that Hallifax et al1 perfectly reduced the incidence of complications including pneumothorax (0 of 50 procedures [0.0%]). In an article by Sconfienza et al,2 the incidence of pneumothorax was six in 103 patients (5.8%) and 25 in 170 patients (14.7%) in ultrasound- and CT scan-guided fine-needle aspiration biopsy procedures for diagnosing pleural/peripheral lung lesions, respectively.

Our imaging center has a 20-year history of performing CT scan-guided transthoracic needle biopsies and has treated a total of 2,400 cases. According to our experiences, the incidence of pneumothorax following CT scan-guided biopsy of pleural and subpleural lesions was about 20%, and pneumothorax occurred more frequently when the lesions were small. The incidence of pneumothorax in our center is slightly higher than that of Hallifax et al,1 but is not unduly high. According to a recent review, the incidence of pneumothorax following CT scan-guided biopsy is 9% to 54%.3 Based on these results, we agree with Sconfienza et al2 that ultrasound guidance should be recommended for biopsy of pleural and peripheral lung lesions.

According to previous research, the presence of emphysema is one major cause that induces pneumothorax.3 However, Hallifax et al1 did not mention this factor in their study, nor did they explain why thoracoscopy failed in 13 cases. In our experience, pneumothorax will commonly occur in patients with apparent emphysema, especially when pulmonary bullae are unavoidable in the focus puncture path. We already listed emphysema as the relative contraindication of this operation, since it may induce life-threatening pneumothorax. Moreover, pneumothorax is very likely to occur when peripheral lesions are close to the pleura, especially when the peripheral lesions do not obviously invade or adhere to the pleura. Thus, Hallifax et al1 should further elaborate the relevant patients’ clinical data.

Moreover, we hold that the 1-h observation after imaging-guided transthoracic needle biopsy may be very short. We prolong the postoperative observation period to 24 h, so as to avoid the occurrence of delayed pneumothorax.

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References

Response

To the Editor:

We thank Dr Liang and colleagues for their comments and concern about the lack of pneumothoraces as complications in our data compared with another published study. We would like to point out that these and previous data report pneumothorax rates after both pulmonary and pleural biopsies. Sconfienza et al do not separate out the pneumothorax rate for ultrasound-guided biopsies of pleural lesions alone. The series reported by Boskovic et al was entirely composed of CT scan-guided lung biopsies. All of our biopsies were performed on the pleura alone in patients with at least small pleural effusions (hence being considered for thoracoscopy). Lung parenchyma was specifically avoided with real-time ultrasound guidance, thereby drastically reducing our pneumothorax rate. The risk of blind pleural biopsy would clearly be higher.

The comment of Dr Liang and colleagues regarding the additional increased risk in emphysematous lung disease would be significant if the lung parenchyma were being biopsied. In our experience, patients with severe COPD are often not considered for medical thoracoscopy, due to increased physical frailty, reduced performance status, and because the raised intrinsic lung pressure may result in difficulty collapsing the lung, which is required for thoracoscopy to be successful.

With respect to why patients “failed thoracoscopy,” the reasons for this were already outlined in our original article and include patient frailty, heavily loculated/septated pleural fluid, or lung adherent to the chest wall. To reduce failure rates, all patients are assessed in clinic prior to their procedure; however, in a small number of cases, these factors change on the day of the procedure. Our work highlights that in this scenario, ultrasound-guided biopsy can provide a high yield of pleural tissue for diagnosis.

The authors know of no robust published evidence to support the practice of admitting the patient overnight for 24 h, as Dr Liang and colleagues suggest, particularly for ultrasound-guided biopsy of the parietal pleura. The 1-h observational period is common practice in day-case procedures performed by both physicians and radiologists in the United Kingdom; in our experience of > 3,000 pleural procedures over the last 8 years, this has proven sufficient to identify complications that might arise.

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FINANCIAL/NONFINANCIAL DISCLOSURES: The authors have reported to CHEST that no potential conflicts of interest exist with any companies/organizations whose products or services may be discussed in this article.

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DOI: 10.1378/chest.14-1728

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