LETTERS

Thoracic ultrasound in malignant pleural effusion: a real world perspective

Qureshi and colleagues achieved impressive results using thoracic ultrasound (TUS) to predict malignant pleural effusion in their recent study.¹ TUS in their hands compared reasonably well with pleural CT.

However, we suggest that pleural CT still remains the gold standard and cannot be replaced by TUS except in situations where access to pleural CT is difficult. First, even in their expert hands, six out of the seven false-negative TUS examinations were resolved by pleural CT. The priority in the real world is to reduce the time to pleural CT which is the definitive investigation. In our experience, TUS is complementary to pleural CT but more helpful and informative after the CT to aid pleural intervention due to information from two different imaging modalities.

Secondly, this study was performed in a tertiary pleural centre by an extremely experienced internationally renowned thoracic radiologist and another thoracic radiologist with a special interest in pleural ultrasound in a cohort with a high proportion of mesothelioma. In addition, the proportion of pleural tuberculosis (TB) cases was low, but this remains an important differential in TB-prevalent populations. We suggest the results are not generalisable to TUS performed by non-radiologists with Royal College of Radiologists sublevel 3 training.² Although pleural thickening is commonly measured, the exact measurement of diaphragm thickness, resolution of all diaphragmatic layers and evaluation of diaphragmatic/pleural nodules and liver metastases are not performed routinely by sublevel 3 operators. These aspects of TUS are more complex than an "x marks the spot" to aid thoracocentesis that is commonly used by chest physicians.

Finally, pleural CT offers additional benefits. It can detect primary lung cancer, unsuspected primary non-lung cancer and metastatic disease (bone, liver) at the same time. In addition, it can detect TB pulmonary disease such as cavitation and extrapulmonary disease, as well as evaluating asbestos-related disease by examining the mediastinal pleura and looking for contralateral changes. Pleural CT is unlikely to be substituted when radical treatment of mesothelioma is contemplated. Although liver metastases are readily detected at TUS, most of the above changes are not reliably detected.

In conclusion, we suggest the real world priority is to perform pleural CT promptly. TUS is complementary but not a substitute, and more helpful after pleural CT. A simple "x marks the spot" will normally suffice for

most interventions, although knowledge about septation may assist with planning thoracoscopy.

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REFERENCES

1. Qureshi NR, Rahman NM, Gleeson FV. Thoracic ultrasound in the diagnosis of malignant pleural effusion. *Thorax* 2009;64:139–43.
2. Royal College of Radiologists 2005. Ultrasound training recommendations for medical and surgical specialties. Ref No: BFCR (05)2. <http://www.rcr.ac.uk/publications.aspx?PageID=310&PublicationID=209> (accessed Jul 2009).

Authors' reply

We would like to thank Drs Medford and Entwistle for their letter in response to our recent *Thorax* publication.¹ We entirely agree that pleural CT is the gold standard not only in terms of malignant pleural disease but also for intraparenchymal, mediastinal and distant disease. We would suggest that the priority in the "real world" is prompt diagnosis and subsequent management of the pleural effusion, with CT as currently the most useful technique. However, the widespread use of thoracic ultrasound may mean that it is readily available (eg, in the outpatient respiratory clinic) and, given the high diagnostic yield of thoracic ultrasound for malignant pleural disease, may allow patients with clear-cut evidence of malignancy (eg, gross pleural nodularity) to be triaged directly to thoracoscopy or image-guided biopsy. The high proportion of mesothelioma and malignant pleural disease seen in our study is indeed a result of the tertiary nature of our practice, and this will influence the sensitivity and specificity of the test. It is for this reason that we recommended that the diagnostic use of ultrasound for malignant pleural effusion should be assessed in a non-tertiary centre for the results to be more widely applied to practice. The prevalence of tuberculosis (TB) in our area of practice is also low, and ultrasound should be evaluated in this context in a higher prevalence area.

We agree with the authors of the letter that the skill of the operator is an important issue. The results of our study are not intended to apply to level 1 Royal College of Radiology (RCR)-trained chest physicians,² for whom ultrasound is a valuable

technique to diagnose the presence of effusion and aid intervention. However, physicians with increasing experience (eg, level 2) may be able to achieve a reasonable diagnostic sensitivity for malignant pleural effusion using ultrasound—this requires prospective testing and will be an interesting question for future studies. In addition, although we agree that measurements of pleural thickening, diaphragm assessment, etc. are not currently routinely conducted by sublevel 3 RCR operators, this may change with increasing subspecialisation and experience of respiratory physicians with an interest in pleural disease. In these circumstances, our study suggests criteria which may be used for the diagnosis of malignant pleural disease.¹

Once again, we would like to thank the authors of the letter for their interest in our study.

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REFERENCES

1. Qureshi NR, Rahman NM, Gleeson FV. Thoracic ultrasound in the diagnosis of malignant pleural effusion. *Thorax* 2009;64:139–43.
2. Royal College of Radiologists 2005. Ultrasound training recommendations for medical and surgical specialties. Ref No: BFCR (05)2. <http://www.rcr.ac.uk/publications.aspx?PageID=310&PublicationID=209> (accessed Jul 2009).

Longitudinal changes in gastro-oesophageal reflux from 3 months to 6 months after lung transplantation

Gastro-oesophageal reflux (GOR) and micro-aspiration are implicated in the pathophysiology of asthma, chronic obstructive pulmonary disease, interstitial lung disease and chronic lung allograft dysfunction.^{1,2} Aspiration, which is often asymptomatic, has been identified as a treatable allograft injury that may affect mortality.^{1,2}

The potential for thoracic mechanical changes caused by advanced lung disease to predispose to reflux has been highlighted.² Although aspiration could cause lung damage, alternatively reflux might represent a secondary event. Longitudinal data are lacking,² so we have undertaken a prospective study of reflux in lung transplantation.