

LETTER

What size parapneumonic effusions should be sampled?

The indications for operative intervention in parapneumonic effusions (PPEs) are currently based on their anatomical, bacteriological and biochemical features. Because PPEs <10 mm in thickness on the lateral decubitus radiograph usually resolve with antibiotics, both the British Thoracic Society and the American College of Chest Physicians guidelines suggest that only PPEs with pleural fluid thickness (PFT) >10 mm on the lateral decubitus radiograph, ultrasound or CT scan should be sampled.¹⁻³ However, Espana *et al* used a PFT cut-off point of 20 mm on the lateral decubitus radiograph for admitting patients with PPE and reported a significantly low outpatient mortality (0.5%).⁴

We examined the association between PFT and the development of pleural complications in all patients with pneumonia who were admitted to Vanderbilt University Hospital during a 55-month period and had a chest radiograph and CT scan within 24 h of each other, with a pleural effusion and infiltrate on the CT scan. PFT on the CT scan was assessed by measuring the maximal distance between the outside of the lung and the inside of the chest wall in millimetres. A pleural complication was said to occur when the patient underwent tube thoracostomy, thoracoscopy or thoracotomy. Our hypothesis was that PPEs <20 mm in thickness on the CT scan have a very low incidence of pleural complications.

Of 1508 patients with pneumonia, 63 met our inclusion criteria. The incidence of pleural complications in PPEs <20 mm in thickness was only 5.6% compared with 59% for those ≥20 mm in thickness (table 1). Three (23%) of 13 effusions 20–30 mm in thickness were complicated. The ideal PFT cut-off point for pleural fluid sampling should have a high negative predictive value (NPV) so that most of the PPEs with PFT below it are uncomplicated. A PFT of ≥10 mm had the highest NPV (100%) but with a rather low specificity (26%), which means that only one-quarter of the uncomplicated PPEs have a PFT of <10 mm. The NPV for a PFT of >30 mm (91%) was sufficiently low to discourage its use in

Table 1 Pleural fluid thickness-based prediction of pleural complications in parapneumonic effusions

	Pleural fluid thickness (mm)					
	<10	≥10	<20	≥20	<30	≥30
Incidence of pleural complications (n)	0/11	21/52	1/29	20/34	4/42	17/21
Sensitivity		100%		95%		81%
Specificity		26%		67%		91%
PPV		40%		59%		81%
NPV		100%		97%		91%
p Value		0.011		<0.001		<0.001

NPV, negative predictive value; PPV, positive predictive value.

clinical practice as approximately 10% of the non-sampled PPEs would be complicated. A PFT of >20 mm with an NPV of 97% had a specificity of 67%.

The main limitations of this study are its retrospective character and the small number of patients included in the final analysis. The data reported are on a small subset of the 1508 patients with pneumonia, which potentially constitutes a biased sample that could affect the validity of the results. Furthermore, the selection of patients on the existence of a chest CT scan resulted in the inclusion of patients with more severe disease. However, even in this population, PPEs <20 mm in thickness were rarely complicated.

We conclude that a PFT of <20 mm on the CT scan identifies the PPEs that will most probably not require operational intervention and whose sampling will probably not alter their management. However, we do not believe that a chest CT scan should be used routinely in the evaluation of patients with pneumonia, as chest ultrasound presents a comparable performance in the diagnosis of pleural effusions.⁵ Our study provides the background for a prospective study using chest ultrasound in which PPEs <20 mm in thickness will not be sampled unless certain clinical end points are reached.

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Competing interests: None.

Provenance and peer review: Not commissioned; externally peer reviewed.

Accepted 27 July 2009

Thorax 2010;**65**:91. doi:10.1136/thx.2008.112797

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CORRECTION

doi:10.1136/thx.2009.127076f

Jithoo A, Enright P, Vollmer WM, *et al*. Implications of screening for COPD: results from the Burden of Obstructive Lung Disease (BOLD) study from 14 countries. *Thorax* 2009;**64**(Suppl IV):A32. In this abstract, "prebronchial" should have been written as "pre-bronchodilator". The footnote should have read: *Post bronchodilator FEV₁/FVC<LLN and FEV₁<80% predicted. Additionally, FEV₁ should have been expanded as "forced expiratory volume in 1 second".

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