

Correspondence

Diagnostic value of examining bronchial secretions in pulmonary cytopathology

An ACP broadsheet (No 140) analyses the diagnostic value of currently available sampling procedures in pulmonary cytopathology.¹ The diagnostic accuracy of sputum, brushings, and transbronchial or percutaneous fine needle aspiration cytology is well described, and is in accordance with other recent reviews.² However, we do not agree with the comments of Dr Young on the poor diagnostic value of bronchial aspirate examination in assessing lung pathology, and we report our current experience in this field.

In the few published series the diagnostic value of bronchial aspirate cytopathology in detecting lung cancer is very high. In a recent study of 100 cases with necropsy confirmation, its diagnostic accuracy reached 80%. The accuracy rate was of 50%, 70%, 90%, and 100% in large cell carcinomas, squamous cell carcinomas, adenocarcinomas, and small cell carcinomas, respectively.³ To our knowledge, other reports focusing on this technique are rare. Large series had been reported before the introduction of the flexible bronchoscope: Koss *et al* reviewed 560 patients with primary bronchial carcinomas in which 288 (40.7%) bronchial aspirate examinations were positive; only 117 (20.9%) biopsy specimens showed evidence of carcinoma.⁴ In 1975 Atay and Brandt reported a sensitivity of 79% in centrally located tumours, and of 45% in peripheral tumours (885 patients).⁵ In 1979 Payne *et al* reported that the diagnostic accuracy of bronchial aspirate examination was only 46% (50 of 109 primary bronchial cancers), but accurate recognition of histological type was achieved in 42 out of 50 (84%) cases. Accurate typing was obtained in 49 out of 61 (80%) cases by bronchial biopsy.⁶

We analysed the combined results of bronchial aspirate examination and biopsy in 875 patients (654 men, 221 women, mean (SD) age 65.03 (14.07) years) demonstrating various clinical and radio-

logical conditions. Among 882 samples obtained, 36 (4.08%) aspirates were "unsatisfactory", and all of the biopsy specimens were adequate for diagnosis. Both examinations were concordant in 87% of cases (table 1). Eleven (1.3%) cases and four (0.4%) cases, respectively, in which cytology or biopsy was "suspicious" were excluded. The diagnosis of cancer was assessed by bronchial aspirate examination alone in 40 (4.72%) cases and by biopsy alone in 54 (6.38%) cases. In cases with concordant positive findings, exact correlation of cytohistological types was 78.5% (117 of 149). The distinction between small cell and non-small cell-type tumours was achieved in 70.4% of cases by cytology (table 2).

Although bronchial mucus often contains inflammatory cells and degenerate debris, as emphasised by Dr Young, many columnar cells and macrophages of bronchial and bronchiolo-alveolar origin may also be seen in well processed samples. Malignant cells are sometimes difficult to detect but are generally well preserved in samples fixed in 50% ethyl alcohol. A correct diagnosis can be given in almost all cases of primary lung cancers with combined aspiration and biopsy, and the rate of cancers detected by cytology or biopsy alone is similar. However, analysis of bronchial aspirates requires at least three slides and a laborious examination by skilled pathologists to provide valuable results. For various reasons, this procedure has not gained wide acceptance in diagnosing lung tumours. Nevertheless, the ACP broadsheet is perhaps too dismissive of the examination of bronchial secretions, the diagnostic yield of which should, perhaps, be considered in greater detail.

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- 1 Young JA. Techniques in pulmonary cytopathology. ACP Broadsheet 140. *J Clin Pathol* 1993;46:589-95.
- 2 Johnston WW, Elson CE. Respiratory tract. In: Bibbo M, ed. *Comprehensive cytopathology*. Philadelphia: WB Saunders, 1991: 320-98.
- 3 DiBonito L, Colautti I, Patriarca S, *et al*. Cytological typing of primary lung cancer: study of 100 cases with autopsy confirmation. *Diagn Cytopathol* 1991;7:7-10.
- 4 Koss LG, Melamed MR, Goodner J. Pulmonary cytology: a brief survey of diagnostic results from July 1, 1952, until December 31, 1960. *Acta Cytol* 1964;8: 104-13.

Table 1 Cytohistological correlations obtained in 882 cases

Bronchial aspirate results	Biopsy results		
	Positive	Suspicious	Negative
Positive	149	3	40
Suspicious	8		3
Negative	54	1	588
Unsatisfactory	11		25

Table 2 Correlation of cytological and biopsy typing in 149 primary lung cancers

Bronchial aspirate results (%)	Biopsy typing				
	SC+ADC+PDC	SCC	UC NOS	LCC	C NOS
SC+ADC+PDC	95 (63.7)	1 (0.7)	8 (5.4)	4 (2.7)	2 (1.3)
SCC		19 (12.8)		1 (0.7)	
UC NOS	5 (3.4)	7 (4.7)	2 (1.3)	2 (1.3)	
LCC				1 (0.7)	
C NOS	2 (1.3)				

SC squamous cell carcinoma; ADC adenocarcinoma; PDC poorly differentiated carcinoma; SCC small cell carcinoma; UC NOS undifferentiated carcinoma, none other specified; LCC large cell carcinoma; C NOS carcinoma, none other specified.

- 5 Atay A, Brandt HJ. Ergebnisse zytologischer untersuchungen des bronchialsekrets bei lungentumoren im verhältnis zum tumorstadium (TNM system). *Dtsch Med Wochenschr* 1975;100:1269-74.
- 6 Payne CR, Stovin PGI, Barker V, *et al*. Diagnostic accuracy of cytology and biopsy in primary bronchial carcinoma. *Thorax* 1979;34:294-9.

Dr Young comments:

I was interested to learn details of the unpublished results obtained by Piaton *et al*. As they mention, aspiration of bronchial secretions is seldom performed and published reports of diagnostic accuracy are correspondingly sparse, even if papers which predate the introduction of the flexible bronchoscope are included. Payne *et al* (1981),¹ in a later report to the one cited above,² and one of the very few series to compare cytology of bronchial secretions with other diagnostic methods, studied the sensitivity of sputum, bronchial secretions, bronchial biopsy, and percutaneous needle aspiration and found levels of 42%, 37%, 67%, and 80%, respectively. Sensitivity of 37% is insufficient for clinical use. DiBonito *et al*^{3,4} are the only group, to my knowledge, who have shown a satisfactory result for both overall sensitivity (81%)³ and accuracy of tumour typing⁴ by cytology of bronchial secretion. They comment that the latter should be restricted to the distinction between small cell and non-small cell carcinoma as "bronchial aspirates showing the presence of malignant cells might prove inaccurate in further differentiating tumour type".³

In comparison with bronchial brushings which arrive in the laboratory as pre-fixed slides, or bronchial washings which can be prepared by centrifuge, the "pick and smear" technique required for laboratory processing of bronchial secretions is labour intensive and time consuming and therefore expensive. Because of the proportions of diagnostic cellular material and mucus and degenerate debris, the resulting preparations are also tediously slow to examine microscopically, as acknowledged by Piaton *et al*. These factors, combined with the unreliable results found with personal experience of the technique, have led me to discontinue examination of bronchial secretions in favour of other cytological diagnostic methods.

Nevertheless the figures of DiBonito *et al*^{3,4} and those provided by Piaton *et al* compare well with many published studies on bronchial brushing and washing and show that the best diagnostic methods for any group are those with which they are familiar and can carry out with expertise and dedication.

- 1 Payne CR, Hadfield JW, Stovin PG, Barber V, Heard BE, Stark JE. Diagnostic accuracy of cytology and biopsy in primary bronchial carcinoma. *J Clin Pathol* 1981;34:773-8.
- 2 Payne CF, Stovin PGI, Barker V, McVidie S, Stark JE. Diagnostic accuracy of cytology and biopsy in primary bronchial carcinoma. *Thorax* 1979;34:294-9.
- 3 DiBonito L, Patriarca S, Delendi M, Silvestri F. La diagnosi citologica e biopsica per endoscopica del carcinoma polmonare. Valutazione di 100 casi autoptici. *Acta Oncol* 1987;8:257-62.
- 4 DiBonito L, Colautti U, Patriarca S, Falconceri G, Barbazza R, Vien P. Cytological typing of primary lung cancer: study of 100 cases with autopsy confirmation. *Diagn Cytopathol* 1991;7:7-10.