PLEURAL EFFUSIONS AMONG RURAL BANTU

PLEURAL BIOPSY IN THE DIAGNOSIS OF TUBERCULOSIS

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Examination and culture of pleural fluid frequently fails to reveal the cause of a pleural effusion. In these cases it is often assumed, especially among younger patients, that the aetiology is tuberculous. Frequently no evidence of tuberculosis is discovered at thoracotomy.[1-3]

Needle biopsy of the pleura was first used in 1955 in an effort to obtain histological proof of the diagnosis.[4] It has proved useful and free from serious complications.

Pulmonary tuberculosis is particularly prevalent among rural Bantu in this region and it seemed reasonable to assume that most unexplained pleural effusions were tuberculous. In order to obtain further information about the aetiology of pleural effusions in this racial group, a series of pleural biopsies have been performed.

Material and Methods

115 Bantu patients with pleural effusions were investigated over a period of 20 months (May 1961 to December 1962). There was no obvious cause for these effusions. 123 pleural biopsies were performed, with the use of the Harefield needle.[5] (A second biopsy has been done in 8 cases.)

TABLE I. FEATURES OF PLEURAL EFFUSIONS

	Total	Sex		Age			Colour of fluid		Protein content (G. per 100 ml.)			Cell content		
		M	F	Below 30	30-50	Above 50	Straw	Blood	Below 3	3-5	Above 5	L	P	E
I	18	9	9	5	10	3	11	7	1	7	6	6	3	1
II	9	8	1	1	4	4	4	3	0	4	3	—	—	—
III	7	4	3	1	2	4	4	1	1	2	1	3	0	0
IV	80	50	30	24	24	32	50	22	12	24	31	20	8	5

I Tuberculosis diagnosed on pleural biopsy (18)
II Tuberculosis diagnosed by other means (9)
III Carcinoma (7)
IV Pleural biopsy non-specific (80)

L=Lymphocytes predominant
P=Polymorphonuclears predominant
E=Equality in this respect.

Results (Tables I and II)

In 18 patients (16%) the diagnosis of tuberculosis was established by histological examination of the biopsy specimen. Caseation was present in all 18 cases. Their sex distribution was equal. Their ages ranged from 9 to 75. A low-grade pyrexia of up to 100° F. was usual, but 3 were apyrexial and 3 others had temperatures above 100°. The pleural fluid was straw-coloured in 11 and blood-stained in 7. Of the 14 cases (out of the 18) in which the protein content of the pleural fluid was estimated, in all but one it was above 3 G. per 100 ml. In most, but not all, lymphocytes were the predominant cell present in the pleural fluid. (See Table I.)

In 24 instances the biopsy specimen was unsatisfactory, and evidence of neoplasia was present in one other specimen. In the remaining 80 specimens the histology was not specific.

In 9 of the patients in whom the pleural biopsy specimen was non-specific, a tuberculosis aetiology was established: 4 showed radiological evidence of involvement of lung apices and acid-fast bacilli were seen in the sputum; 4 were cases of tuberculous adenopathy; and in 1 the diagnosis of tuberculosis was established at autopsy.

Although carcinoma was only evident in the biopsy specimen from one case, it was found to be the cause of the effusion in 6 other patients. The diagnosis was established either by bronchoscopy or at autopsy. In 5 patients the growth was primary bronchial carcinoma and in the other 2 secondary deposits in the lung.

One other patient in whom the pleural biopsy was non-specific was a case of Hodgkins' disease. Thus, of the series of 115 patients with pleural effusion, the aetiology was established in 35 (tuberculosis 27, neoplasm 7, Hodgkins' disease 1), and not established in 80.

Discussion

In spite of the prevalence of parenchymal lung tuberculosis among rural Bantu in this region, it would appear from these results that only a small percentage of pleural effusions are tuberculous. The true incidence of tuberculosis in cases of pleural effusion is certainly higher than is revealed by biopsy, for only a minute fragment of pleura is obtained. Moreover if the effusion is of recent onset, the characteristic histology may be absent.

In previous series,[6-10] out of a total of 635 pleural effusions tuberculosis was established as the final diagnosis in 230. In 156 of these (68%) tuberculosis was evident on histological examination of the biopsy specimen. Evidence from pleural biopsy thus appears to establish a tuberculous aetiology in two-thirds of the actual number of tuberculous cases. If this is true, then about 24% of the pleural effusions among these rural Bantu are tuberculous. In fact a final diagnosis of tuberculosis was definitely established in 24% of the patients in the present group. The proportion of effusions that are of tuberculous origin therefore appears to be no higher among our rural Bantu than was found in England and the USA, in spite of the greater frequency of tuberculous involvement of the lungs in our Bantu (Table II.)

Pleural biopsy seems safe. One patient died from other causes 24 hours after biopsy and at autopsy there was haemorrhage around the biopsy site. It is not customary to assess the prothrombin index prior to pleural biopsy, but in a community in whom liver function is defective this might be a wise precaution.

The cellular content and biochemistry of the pleural

TABLE II. INCIDENCE OF TUBERCULOSIS IN PLEURAL EFFUSIONS

Number of cases	*Tuberculosis diagnosed by pleural biopsy*	*Tuberculosis diagnosed by pleural biopsy and other means*	*Unsuccessful pleural biopsy*	*Reference number*
200 ..	35%	44%	2%	6
185 ..	28%	47%	20%	7
130 ..	16%	—	19%	11
118 ..	17%	27%	4%	8
115 ..	16%	24%	20%	*
71 ..	7%	21%	17%	2
61 ..	7%	14%	3%	10
42 ..	26%	—	29%	12
26 ..	50%	—	—	13
15 ..	50%	—	—	14

*Present series.
Combining all series of 848 cases, 209 gave 'positive' biopsies, an incidence of 24·6%.

fluid were not strikingly different in four groups, viz. (1) patients in whom the diagnosis of tuberculosis was established by biopsy, (2) those in whom it was established by other means, (3) carcinomatous effusions, and (4) idiopathic effusions (Table I). 40% of tuberculous effusions were blood-stained compared to 30% of the idiopathic group. The remainder were straw-coloured. Lymphocytes were the predominant cell in 60% of the tuberculous effusions and in a similar number in the idiopathic group. The most significant difference between these two groups was in the protein content of the fluid, which was below 3 G. per 100 ml. in only 1 of 14 tuberculous effusions compared to 12 of the 67 in the idiopathic group.

The occurrence of tuberculous effusions among the elderly has been noted previously.[11-13] Seven of the 27 patients with tuberculous effusions were over 50 years of age (25%).

SUMMARY

Positive biopsy evidence of tuberculosis was obtained in 16% of a series of 115 pleural effusions among a rural Bantu population, and tuberculosis was established by other means in a further 8%. In spite of the frequency of parenchymal lung tuberculosis among this group, it would appear that only 24% of pleural effusions were tuberculous—a proportion no higher than among White people in England and the USA.

The colour and the protein and cell content of the pleural fluid did not enable one to differentiate between tuberculous, neoplastic and idiopathic effusions, although a protein content of below 3 G. per 100 ml. was very rare among the tuberculous group.

25% of the patients with tuberculous pleural effusions were over the age of 50.

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