

PLEUROPULMONARY COMPLICATIONS OF AMEBIASIS IN TAIWAN

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Fifty six patients admitted to the National Taiwan University Hospital during 1964-1971 with pleuropulmonary complications of amebiasis were analyzed. The incidence of pleuropulmonary complications in Taiwan is far more common than is realized.

Most of the complications were pleural effusion alone (71.4%), while pulmonary complication alone was 7.1 percent and the rest (21.4%) with both. There was no characteristic syndrome, however, coughing, right lower chest pain, fever and abdominal pain were predominant.

The diagnosis was made by clinicians keeping a close watch-out for this condition. Detection of the amoebae was frequently impossible, but serological test (IHA test) might help us to determine the etiology.

Specific antiamebic drugs were successful in killing amoebae.

It is well known that *Entameba histolytica* may involve the pleural and pulmonary tissues.⁽¹⁻¹⁰⁾ If thoracic symptoms are the major complaints or sole signs of amebiasis, diagnosis is often delayed, causing disastrous outcomes through lack of awareness of the condition.

Since hepatic involvement of amebiasis is not uncommon in Taiwan pleuropulmonary complications can be expected in a considerable number of cases. This report is a review of 56 cases of amebiasis with pleuropulmonary manifestations experienced at the National Taiwan University Hospital¹

MATERIAL

All 56 patients studied were admitted to the National Taiwan University Hospital from 1964 through 1971. All except one had amebic liver abscesses. One patient had amebic dysentery with pulmonary complications.

The diagnosis of amebic liver

abscess was made by either autopsy, biopsy, demonstration of amebic trophozoite from the liver aspirate, or demonstration of bacteriologically sterile pus accompanied by high titer of ameba indirect haemagglutination test. Diagnosis of amebic dysentery was made by detection of amebic trophozoites in the stool.

RESULTS

(a) Incidence

Pleuropulmonary complications were noted in 56 out of 112 inpatients with proven amebic liver abscesses and or with amebic dysentery in the National Taiwan University Hospital.

The sex incidence in pleuropulmonary complications in the 56 cases studied showed a male-female ratio of 3.3 to 1.

The age distribution revealed that the complication could occur at any age, however the peak occurred in the 30 to 39 year age group.

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(b) Clinical pictures

Of 56 patients, 4 had pulmonary complications only, 40 had pleural effusions and 12 had combined pulmonary and pleural complications representing 7.1 percent, 71.4 percent and 21.4 percent respectively. The high incidence of pleural complications in this series as compare to other reports might be due to the detection of minimal pleural effusion by routine chest X-rays given to every inpatient in the National Taiwan University Hospital regardless of having pulmonary complaints or not.

(c) Symptoms

The manifestation of pulmonary symptoms was noted in most of the cases in the group having pulmonary complications alone, and one-fifth of the cases in the group of combined pulmonary and pleural complications (Table 1). However, pulmonary lesions, such as pneumonic lesions, without any pulmonary symptoms, could be detected by chest X-ray.

Coughing was the most frequent symptom among the group of pulmonary complications alone, it was often non-

productive in the beginning, but becoming productive in nature. However, a case with amebic dysentery and multiple lung abscesses had hemoptysis, and two cases with bronchohepatic fistula had frequent frothy chocolate color sputum.

Dyspnea occurred in one-fifth of the cases with pleural effusions, especially in cases with massive pleural effusion or marked elevation of the diaphragmatic dome.

Intermittant dull pain in the right lower chest was noted in one-eighth of the patients with effusion.

Fever was the most predominant and constant symptom of amebic liver abscesses as well as pleuropulmonary complications. It occurred in more than 90% of the patients with complications. The fever was usually moderate to high and might be accompanied by chills. The fever curve usually showed intermittent to remittent type.

Abdominal pain in the right upper quadrant of the abdomen was noted in two-third of the patients. This might be due to an enlarged liver, and the pain might radiate to the shoulder. Some patients complained of dull epigastralgia.

Table 1. Symptoms

	Pulmonary complication Case (%)	Pleural complication Case (%)	Combined pulmonary and pleural compli. Case (%)
Cough	3(75.0)	11(27.5)	4(33.3)
Hemoptysis	1(25.0)	—	—
Dyspnea	1(25.0)	8(20.0)	4(33.3)
Chest pain, rt. lower	—	5(12.5)	2(16.7)
Fever	3(75.0)	36(90.0)	11(91.7)
Chillness	2(50.0)	28(70.0)	5(41.6)
Abdominal pain			
At rt. upper quad.	1	19(47.5)	5(41.6)
At epigastrium	—	12(30.0)	2(16.7)
Anorexia	1	21(52.4)	6(50.0)
Malaise	1	15(37.5)	4(33.3)
Total cases:	4	40	12

(d) Signs

The majority of the patients, 41 out of 56 or 73%, appeared acutely ill, with palpable liver below the costal margin.

Intercostal tenderness, especially at the right, was also characteristic (10 out of 56 patients). Sometimes, edematous overlying skin could be noted.

Jaudice could be noted in one-fifth of the cases, but most of the cases were mild.

Digital clubbing was noted in one patient who was also suffering from pulmonary emphysema.

(e) Roentgenological finding

Definite elevation of the diaphragmatic dome either whole or localized was noted in 22 out of 56 patients and no elevation of the diaphragm was noted in 18 patient. Due to pleural effusion the diaphragm was obscure in the remaining 16 cases. Fixation of the diaphragm was noted in the group of elevation of the diaphragms by fluoroscopy.

Of 16 cases of pulmonary lesions, 5 had pneumonia or pneumonic lesions in the lower lung (Fig. 1), 4 had atelectasis or linear shadow in the right lower lung, (Fig. 2, 3) 2 had consolidation (Fig. 6-d) and 2 had multiple abscesses (Fig. 4). There were two cases of atelectasis and pneumonic shadow in the right lower lung and one case of consolidation and pneumonic lesion.

The atelectatic lesion or linear shadow was usually accompanied by elevation of the diaphragm of the affected side.

A representative case with serial chest X-ray findings (Fig. 6-a. to 6-e): The patient (Wen), 29-year-old male, visited the National Taiwan University Hospital on January 8, 1970 complaining of intermittent pain in the right lower chest and mild fever for one month. The routine chest film taken at that time revealed nothing abnormal (Fig.

6-a). Six days after the first film, development of the right lower pleural effusion and elevation of the right diaphragmatic dome were seen (Fig. 6-b). Pulmonary consolidation of the right lower lobe was noted three weeks later (Fig. 6-c). Broncho-hepatic fistula finally developed two and half months after the development of the symptoms (Fig. 6-d, 6-e).

(f) Pleural effusion

Pleural effusion was usually noted on the right side corresponding to the lesion beneath the diaphragm which might or might not be elevated. Left pleural effusion was noted in 4 cases (7 percent) in this study and all were proved to have liver abscesses in the left lobe of the liver (Fig. 5).

Aspiration of the pleural fluid (Table 2) revealed chocolate color pus (7 cases), yellowish pus (3 cases), bile-stained pus (2 cases), cloudy yellowish effusion (1 case), blood stained serous effusion (7 cases) and yellowish serous effusion (8 cases). No attempt was made to aspirate the pleural effusion in 24 cases due to insufficient amounts (group of undetermined fluid).

Except for one case, all the aspirates were bacteriologically sterile.

(g) Laboratory findings

Demonstration of amebae in the sputum, stool or aspirated fluid was made in less than one-fourth of the patients. The white blood cell count was usually elevated to around 10,000 to 30,000; only one-tenth of the patients had no leukocytosis. No eosinophilia was detected in any of the cases studied.

Slight to moderate degree of anemia was noted in three-fourths of the patients.

Indirect haemagglutination tests for amebiasis, using axenic HK-9 strain as antigen, were performed on 12 patients. All revealed high titers for amebiasis.

Table 2. Nature of Pleural Effusions

	Pleural complication	Combined pulmonary and pleural complication
(A) Empyema with		
Chocolate color pus	5	2
Yellowish pus	2	1
Bile-stained pus	2	—
Cloudy yellowish fluid	1*	—
(B) Serous effusion with		
Blood stained fluid	5	2
Yellowish fluid	8	—
(C) Undetermined fluid	17	7
Total cases:	40	12

* Gram negative bacilli were isolated.

DISCUSSION

The incidence of pleuropulmonary complications in amebiasis varies considerably from report to report, from 3 per cent in Strong's series of 100 fatal cases of amebiasis to 58.8 per cent of 170 cases reported by Thierfelder.⁽¹¹⁾ In a series of 2,490 amebic liver abscesses collected by Ochsner and Debaquey, pleural complications occurred in 198 (7.5 per cent), pulmonary complication in 209 (8.3 per cent), while pleuropulmonary complication totaled about 15.8 per cent. Tsai⁽¹⁰⁾ reported 1,946 cases of amebic liver abscesses at Pei-Kang, Taiwan. Among Tsai's cases, obliterated costophrenic angle was noted in 63 per cent, and pleurisy, pyothorax, lung abscess and bronchopleural fistula occurred in 14.7 per cent of the cases.

It is believed that *Entameba histolytica* first produces lesions in the large bowel. While in a small number of cases, the liver is secondarily invaded via the portal blood stream.⁽⁶⁾ Most pleuropulmonary complications might result from the direct extension of the lesion from the liver, usually by intrathoracic rupture of a hepatic abscess: When the enlarged liver abscess nears the diaphragm, it may cause pleural reaction,

leading to adhesions either between the liver and the diaphragm, or later between the diaphragm and lung base. The upward enlarged liver may cause linear atelectasis of the lung just above the elevated dome. After penetration of the diaphragm, three possible pathological situations may develop. These are empyema, lung abscess, and bronchohepatic fistula. A combination of these lesions may occur. In addition, extension of amebic infection from the liver presumably via lymphatics into the thorax may occur in the absence of a hepatic abscess (Huard *et al.* 1933).⁽¹²⁾ This may result in pleural effusion, or pulmonary consolidation and abscess formation. Pneumonic infiltration into the right lower lung was noted in 5 cases with amebic liver abscesses. This might be due to ordinary bacterial infection, rather than a direct invasion of amebae.

The parasites may reach the pulmonary parenchyma by hematogenous routes,⁽¹⁾ the middle and inferior hemorrhoidal veins, the hepatic veins, and then by way of the intestinal lymphatic chain, through the thoracic duct. The resultant pathologies include either solitary or multiple lung abscesses. In two of our cases studied, one with

amebic dysentery and one with amebic liver abscess and dysentery, the pulmonary manifestations could be due to hematogenous spread.

Although no typical picture or syndrome can be described, the diagnosis of pleuropulmonary amebiasis is made by clinicians who are on the alert for these conditions. The expectoration of typical chocolate colored pus may indicate an amebic origin. Pleural effusion, obscure lesions in the lower lung fields, especially on the right side,⁽²⁾ and tender enlarged liver below the costal margin should not be dismissed without a thorough search for amebae and the detection of liver abscesses.

Pleuropulmonary amebiasis may be mistaken for pulmonary tuberculosis, tuberculous pleurisy, pneumonia, tumor or lung abscesses. Therefore, in a population where amebiasis is common, the possibility that a thoracic lesion may be of amebic origin should be borne in mind.⁽⁶⁾

The high specificity of the serum indirect hemagglutination (IHA) test from the patients with amebic liver abscesses⁽¹³⁻¹⁵⁾ or pleuropulmonary amebiasis may help us to determine the diagnosis since the detection of the amebae is frequently impossible.^(4,7) The indirect hemagglutination test for amebiasis could be done on patients having unknown lesions in the right lower lung with enlarged liver, whether or not amebae have been present in the stool or the aspirate.

Patients with pleuropulmonary amebiasis usually responded well to specific antiamebic treatment such as emetine, metronidazole or chloroquine. These specific antiamebic drugs are of primary importance and essential in the treatment of the conditions. Empyema may be treated with repeated aspiration

or drainage. Antibiotics are indicated for possible secondary bacterial infection.

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阿米巴疾病之肺胸膜併發症

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分析自民國53年至民國60年間在臺大醫院住院而患阿米巴疾病和肺胸膜併發症之56病例，其發生率約為住院阿米巴疾病患者之一半。其中只有胸膜積水者佔71.4%。肺和胸膜同時有病變者佔21.4%。而只有肺部之併發症者佔7.1%。肺胸膜併發症以咳嗽，右下胸部疼痛，發燒，和上腹部痛等為主要症狀。

阿米巴性肺胸膜併發症之診斷，主要是靠醫師對這種併發症事先有認識。可是找出阿米巴活動體常是件不容易的事。然對於找不出病源體之病例，阿米巴間接血球凝集試驗，可能對診斷有幫助。

阿米巴性肺胸膜併發症必須用特殊之抗阿米巴藥物治療，且效果頗佳。

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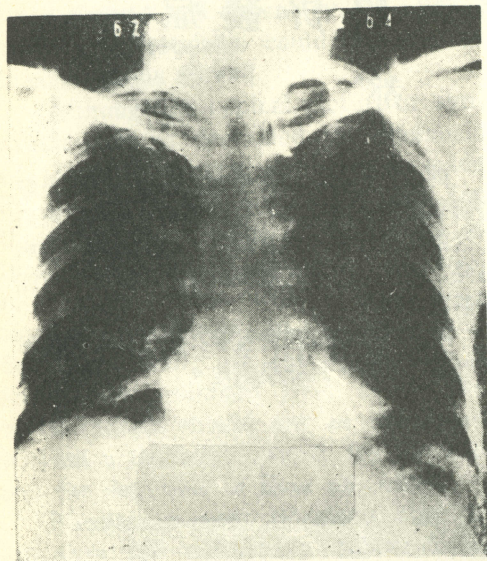


Fig. 1. The patient, 59-year-old male, had pneumonic lesion in the lower right.

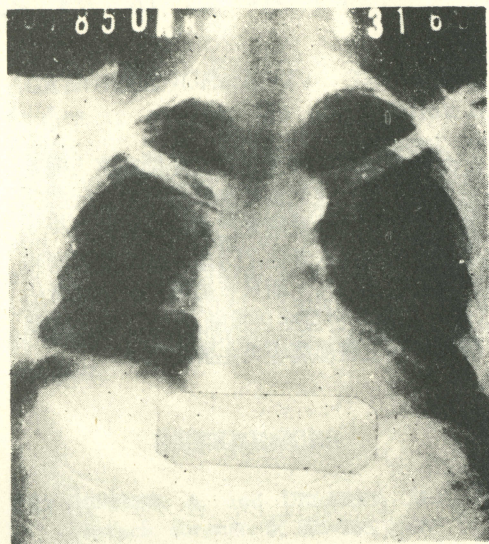


Fig. 2. A 55-year-old male had atelectatic lesion in the lower right.

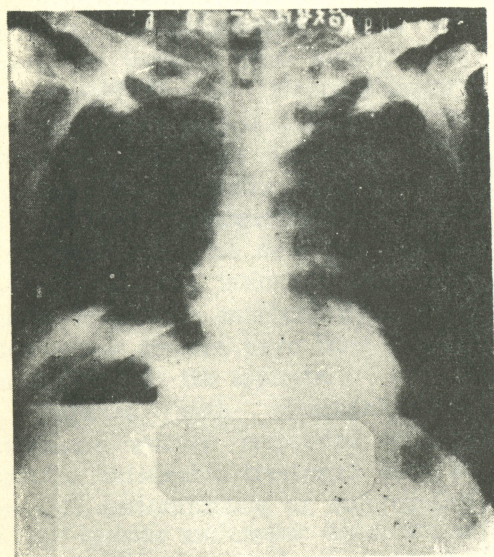


Fig. 3. A 39-year-old male had atelectatic lesions in the lower right. The cavity of liver abscess was clearly seen after aspiration.

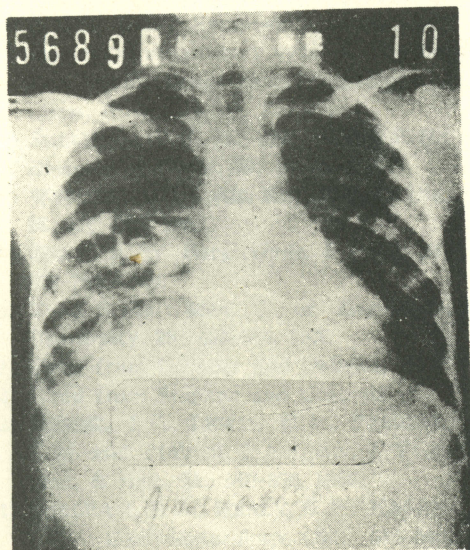


Fig. 4. A 10-year-old male had multiple cavitations.

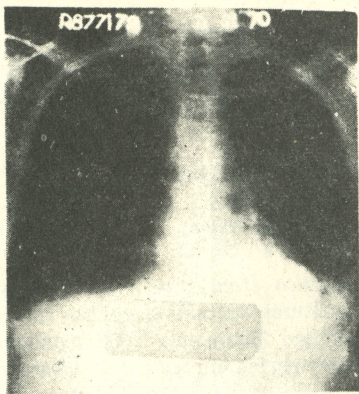


Fig. 5. A 29-year-old male with amebic liver abscess of the left lobe had pleural effusion at the left.

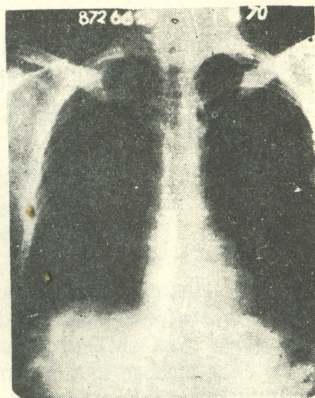


Fig. 6-a. The patient, 29-year-old male, had history of right lower chest pain and mild fever for one month. The chest film was normal (Jan. 8, 1970).

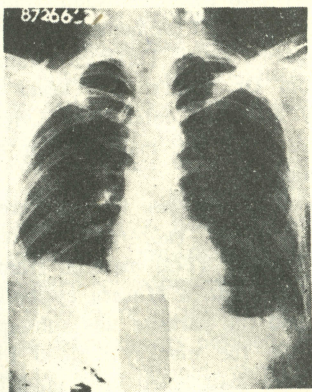


Fig. 6-b. Six days later, development of right pleural effusion was seen. (Jan. 14, 1970).

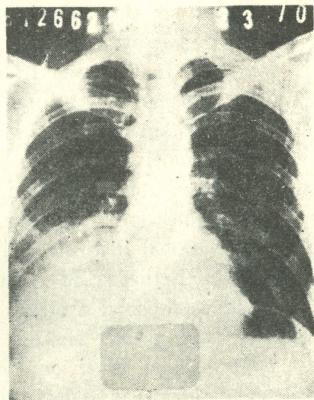


Fig. 6-c. Two months after chest pain, beginning of pneumonic consolidation in the right lower lobe was noted (Feb. 3, 1970).

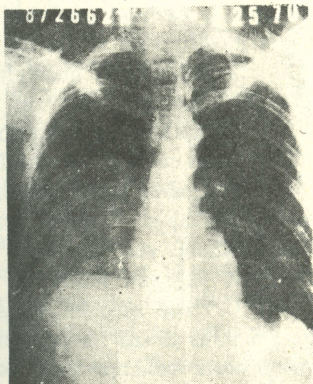


Fig. 6-d. Two and half months after development of symptoms, well developed pulmonary consolidation in the right lower lobe and bronchohepatic fistula were noted. (Feb. 25, 1970).



Fig. 6-e. The lateral view of Fig. 6-d, Pulmonary consolidation was well demonstrated. (Feb. 25, 1970).