

## *Original Communications*

### THORACIC AMŒBIASIS

BY

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WARTIME experience led one to respect amœbic liver infection as a potentially insidious condition especially when masquerading as acute thoracic disease.

Evidence of disease in the right chest was found in 10 out of 26 patients, suffering from hepatic amœbiasis in Middle-East hospitals, but realization of its significance was often delayed.

In spite of the many original papers on this subject, textbooks still emphasize the relatively common lung abscess and barely mention these atypical syndromes, which are consequently too often regarded as side-effects or late complications rather than predominating features.

For these reasons a detailed account of some of our patients should be profitable.

*Case 1.*—A private soldier, aged 20. Mauritian.

28.4.45: Admitted to hospital with fever, cough and pain in right thorax.

O.E.—Distressed. T. 102.4. P. 130. R. 42. Right lower lobe.—Diminished resonance. Tubular breath sounds. Increased vocal resonance. Some adjacent crepitant râles. Leucocyte count 15,600 per c.mm. Neutrophils 90 per cent. Three blood films—no malarial parasites.

*Treatment.*—Sulphapyridine. First dose of 2 grammes, thereafter 1 gramme four-hourly.

*Progress.*—No improvement apart from a slight fall in pulse-rate. Remittent fever rising to 103.6 on the fourth evening.

2.5.45: Leucocytes 7,800. Polymorphs 78 per cent.

3.5.45: T. 103.2. P. 110. The right base was dull and breath sounds absent—above it there were signs of lobar consolidation.

*Portable X-ray Report.*—(a) Considerable elevation of right diaphragmatic cupola. (b) Slight displacement of heart; bifurcation of trachea to the right. (c) Dense opacity roughly triangular in shape in right mid-zone. Upper border ill-defined but horizontal, suggesting consolidation of right middle lobe with some degree of atelectasis.

An injection of emetine hydrochloride 1 grain was given at once and repeated on the succeeding nine days. Improvement was dramatic. Temperature fell throughout the next day and was normal the day after; there was a parallel decline in pulse and respiration rates. Dullness at right base diminished, and consolidation resolved.

7.5.45: Second X-ray. Consolidation of right lung field has almost completely resolved. Right cupola is less elevated and moves feebly on respiration.

11.5.45: Sigmoidoscopy up to 10 inches. Normal mucous membrane. A little viscid mucopus in lumen. Microscopic examination of it revealed only pus cells.

14.5.45: Discharged. After two weeks he returned for a further course of emetine injections, followed by oral emetine bismuth iodide and Yatren retention enemata.

*Investigations.*—Stools. No vegetative entamoebæ or cysts. Sigmoidoscopy. Normal mucous membrane: only macrophages were detected in the scrapings. Final X-ray and screen examination of thorax showed clear lungs, and the diaphragm normal in height and shape with equal and full movement.

*Case 2.*—A private soldier, aged 33. Mauritian.

This man was admitted to hospital four times within two months. The main symptoms were fever, productive cough and pain in right shoulder.

*Examination Revealed.*—(a) Subacute spasmodic bronchitis which was most marked at the right base. (b) Early clubbing of fingers. (c) A moderately enlarged but insensitive spleen. No liver enlargement was detected. Leucocyte count during first admission was W.B.C. 12,400 per c.mm. (polymorphs 60 per cent, lymphocytes 38 per cent, eosinophiles 2 per cent). No abnormality was noted in two anteroposterior films of chest. Some mucus and degenerate leucocytes were noted in the stools, but no cysts or vegetative forms of *Entamoeba histolytica*. The patient recovered quickly from these four attacks but in view of recurrent fever and enlarged spleen he received a massive course of atebriane before his fourth discharge. Eleven weeks later symptoms returned but on readmission to another hospital he was found to be more acutely ill. Signs of lobar pneumonia were detected at the right base.

The first anteroposterior film, showed elevation of medial part of right cupola, and above it an opaque area of lung extending up to the hilum. Restricted movement was found on radioscopy.

W.B.C. 18,800 per c.mm. Polymorphs 80 per cent.

Courses of sulphapyridine, sulphathiazole, and penicillin caused no improvement. A second X-ray taken six days later showed further elevation of medial part of right cupola, obliterating the cardiophrenic angle. The lung opacity just above it had increased in size and density. Signs and symptoms quickly resolved after starting his course of injections of emetine hydrochloride. Shortly afterwards he reached hospital for the sixth time with a mild recurrence of bronchitis, but recovered in a few days. Further stool examinations were negative.

*Case 3.*—An officer, aged 31. Union Defence Force.

This officer previously had two short attacks of diarrhoea. (a) In 1941; (b) in January 1945. He had never suffered from dysentery.

20.5.45: Admitted to hospital complaining of (a) fever; (b) pain—right thorax; (c) pain—right shoulder aggravated by deep inspiration, he was found to have right basal bronchopneumonia. Fever declined by lysis and condition steadily improved following a course of sulphathiazole 20 grammes in all. The persistent right shoulder pain was attributed to fibrositis and was treated with physiotherapy.

3.7.45: Readmitted with recurrence of fever and of right basal bronchopneumonia, but this time the lower margin of the liver was tender and palpable.

*X-ray chest:* "Both lower zones show increased striation. On the right side there are some unresolved areas."

*Blood.*—Hb. 84 per cent; W.B.C. 9,200 per c.mm. (neutrophiles 67 per cent), lymphocytes 18 per cent, monocytes 14 per cent, eosinophiles 1 per cent).

12.7.45: A second anteroposterior film of thorax showed a crescent-shaped cap over the right diaphragmatic cupola. The lateral film of this cap showed it to be the top of a second and posterior bulge.

19.7.45: Low remittent fever persisted. Second leucocyte count: W.B.C. 10,000 per c.mm. (neutrophiles 67 per cent, lymphocytes 31 per cent, monocytes 9 per cent, eosinophiles 4 per cent). No vegetable amœbæ or cysts were found in three samples of fæces.

19-20.7.45: In the night acute pain in the right thorax and abdomen suddenly developed. After a bout of coughing, the patient expectorated about 7 ounces of blood

with pink pus, followed by plugs of blood-stained mucopus. This material contained no amœbæ. It was not offensive. The abdomen was now tender and rigid. Signs of fluid extending up to a level of 1 inch below the right clavicle were confirmed by a third film which also showed displacement of mediastinum to the left.

Daily injections of 1 grain of emetine hydrochloride were commenced at once.

20.7.45: W.B.C. 14,000 per c.mm. (polymorphs 89 per cent, lymphocytes 6 per cent, monocytes 5 per cent). The patient's distress was relieved by aspiration of 3 pints of brown turbid fluid from the right thorax. The deposit consisted of red cells and degenerate leucocytes. Fever subsided four days after the first dose of emetine, and condition rapidly improved thereafter.

26.7.45: More fluid was aspirated from the right thorax and the remainder slowly absorbed during the next five weeks.

TABLE I.—(1) FREQUENCY OF THORACIC AMŒBIASIS; (2) TYPE OF UNDERLYING HEPATIC LESION

	A	B	C
<i>Number of patients suffering from</i>	<i>Diffuse hepatitis</i>	<i>Liver abscess</i>	<i>Total</i>
I Simple hepatic amœbiasis	13	3	16
II Additional thoracic lesions	7	3	10
III Total	20	6	26

The group of patients shown in the second line of Table I includes the 3 patients described above, but excludes all those who only suffered from the minor effects of diaphragmatic irritation and pressure at the right base.

The incidence of thoracic conditions is therefore 10 out of 26 or 38 per cent, which is a relatively high proportion [1, 5, 11, 12]. The records of 3 of these 10 patients are not complete.

TABLE II.—CLINICAL FEATURES

<i>Previous History</i>						
Amœbic hepatitis	...	...	...	...	...	1
Clinical dysentery	...	...	...	...	...	1
Recurrent enteritis	...	...	...	...	...	3
Recurrent fever	...	...	...	...	...	2
Chronic bronchitis	...	...	...	...	...	2
Recurrent acute bronchitis	...	...	...	...	...	1
<i>Main Symptoms (Excluding Fever)</i>						
Cough	...	...	...	...	...	5
Hæmoptysis	...	...	...	...	...	3
Pain around right base	...	...	...	...	...	5
Pain. Costal margin and hypochondrium	...	...	...	...	...	3
Right shoulder pain	...	...	...	...	...	4
<i>Signs (Sometimes Absent at the Start)</i>						
Right subcostal margin tender	...	...	...	...	...	7
Liver edge felt	...	...	...	...	...	5
<i>Thoracic—Lobar consolidation</i>						
Bronchopneumonia	...	...	...	...	...	4
Bronchitis	...	...	...	...	...	3
Dry pleurisy	...	...	...	...	...	2
Pleural effusion	...	...	...	...	...	2

*Previous History.* (Details in Table II).—Secondary amœbiasis should be included in the differential diagnosis of recurrent fever, without localizing signs.

*Onset of disease* was acute in 5 and subacute in 3 patients. The initial diseases of the other 2 subsided after courses of sulphathiazole but major relapses occurred soon afterwards.

*Presenting Features.*—3 patients who suffered from fever and pain at the right base, and over the liver, appeared at first to have simple hepatitis. Evidence of additional chest disease was found later.

The hepatic focus was masked at first in 5 patients, whose original signs and symptoms were those of thoracic disease.

Two patients were febrile and toxæmic for some days before local signs developed in the right lung.

Earlier appreciation of the significance of shoulder pain would have hastened the diagnosis on three occasions [1, 8, 11, 13].

#### DEVELOPMENT OF HEPATO-PULMONARY AMŒBIASIS

The occurrence and character of these pulmonary conditions depends on the site, extent and acuity of the underlying liver infection. The usual stages of development are as follows [4]:

(1) *Restricted or Abnormal Movement of the Right Dome.*—These were the only radiological defects to be observed in 2 patients. In one of them reverse movements of the cupola on sniffing and on forced inspiration were



FIG. 1 (Case 1).—3.5.45: Specific treatment commenced on the same day.

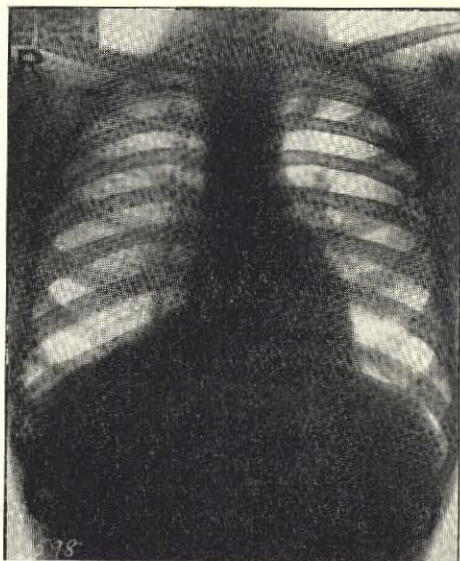


FIG. 2 (Case 2).—17.11.44.

seen in addition to the limited respiratory movement. These latter tests, described by Munk [9], were found useful but not specific.

(2) *A raised right dome* either generalized, or a local hump or a combination of both as in Case 3. Obliteration of right cardiophrenic angle, a feature emphasized by Oschner and DeBailey [10, 11], can be seen in figs. 1 and 3.

(3) *Basal fibrinous pleurisy* causing thickened pleura, adhesions and obliteration of the costophrenic angle. Pleural pain and friction commonly occur in simple amœbic hepatitis and patients exhibiting these signs alone do not concern us. Right shoulder pain is caused by dry pleurisy over the central two-thirds of the right domes [11, 13]. Thickening of the septum between middle and lower lobes may appear later [3].

(4) *Bronchopneumonia at the Right Base*.—Air entry is diminished and breath sounds are harsh with added crackling râles on inspiration.

Opacities are based on the right dome and may obscure its outline. Their shape may be triangular with apex towards the hilum [10] or else amorphous and of unequal density. There may also be transverse or oblique linear shadows which are probably caused by atelectatic patches [9].

(5) *Amœbic Lung Abscess*.—Not one example occurred. The abscess of Patient 3 must have been subdiaphragmatic before rupturing. It is probable, therefore, that even without specific treatment the progress of hepatopulmonary amœbiasis may be arrested before an abscess forms.

#### OTHER THORACIC CONDITIONS DUE TO HEPATIC AMŒBIASES

(a) *Lobar pneumonia* in these patients, e.g. 1 and 2, the onset was acute although local manifestations were sometimes delayed. In the films of 2 patients the opaque areas were seen in the right mid-zone and were separated from the right cupola by an area of clear lung. Traction of mediastinum to the right, observed in fig. 1 showed that the condition was partly atelectatic.

(b) *Bronchitis*.—Both of these patients had previously suffered from bronchitis. Onset of illness was subacute. Râles although present at both bases were more marked on the right. Anteroposterior chest films were normal. Stools which were examined because of associated liver tenderness in one patient, and paradoxical diaphragmatic movements in the other, were positive on each occasion. Both patients responded quickly to treatment.

(c) *Serous Pleural Effusion*.—One hæmorrhagic effusion was encountered, but there was not one serous effusion that could reasonably be attributed to hepatic amœbiasis although such cases are frequently described [1, 2, 9, 12].

#### PATHOLOGY

Vegetative *Entamœbæ histolyticæ* were only found in the stools of 2 patients. Routine sigmoidoscopic examinations during convalescence revealed no ulcers or gross inflammation. Scrapings were only positive on one occasion.

Total leucocyte counts ranged from 23,000 to 5,000 per c.mm. The average was 14,700 per c.mm. The percentage of polymorphs varied from 90 per

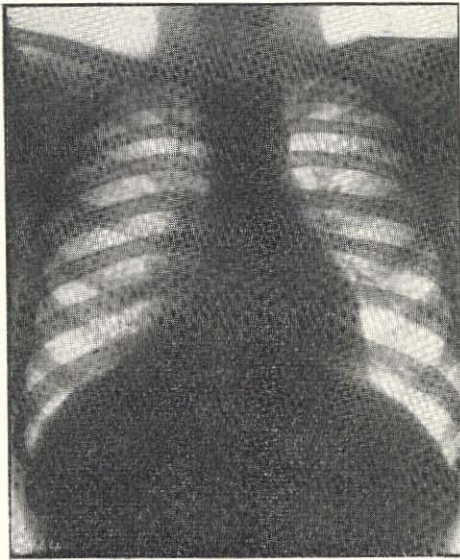


FIG. 3 (Case 2).—23.11.44 (approx.).

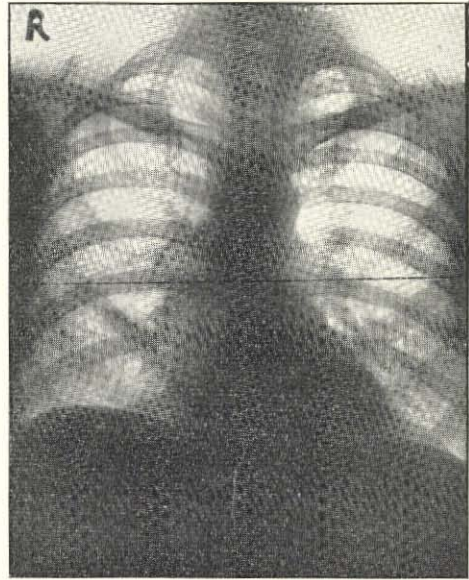


FIG. 4 (Case 3).—4.7.45.

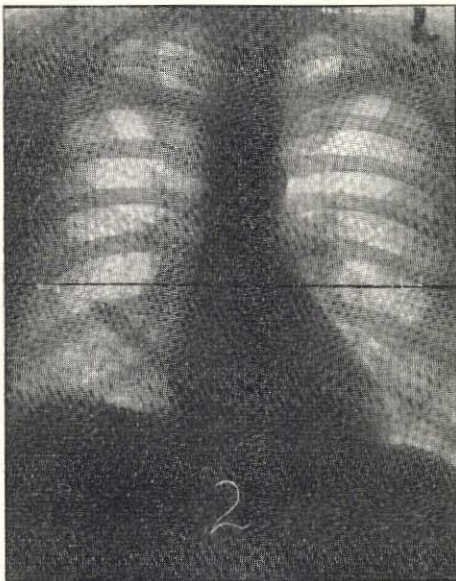


FIG. 5 (Case 3) —14.7.45.

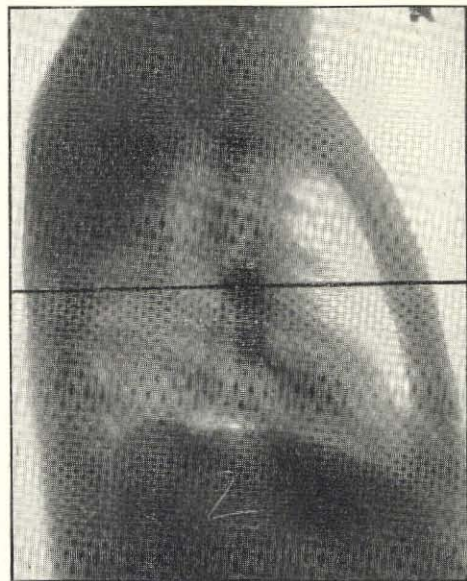


FIG. 6 (Case 3).—(Lateral) 14.7.45: The abscess ruptured six days afterwards.

cent to 50 per cent with an average of 71 per cent. These white cell counts hardly differed from those of patients who had simple amœbic hepatitis. Our record, therefore, of a slight total leucocytosis without a corresponding increase in the percentage of polymorphs is similar to the findings of others [10, 11].

As no amœbic lung abscess was encountered the nearest approximation to anchovy sauce sputum was the pink pus coughed up by Patient 3. Two others had small hæmoptyses. Sputum of the remainder was scanty, mucopurulent and not distinctive. On no occasion were any amœbæ detected.

#### TREATMENT

Only on four occasions was emetine the first and original treatment. Owing to mistaken diagnoses 5 patients received courses of sulphonamides at first. One of them had penicillin as well.

Most patients quickly recovered and became afebrile from two to four days after starting a course of daily 1 grain injections of emetine hydrochloride lasting ten or twelve days. Blood pressures were maintained and toxic signs were absent. Standard courses of stovarsol, emetine bismuth iodide, and Yatren enemata were given later.

The hæmorrhagic effusion of Patient 3 was tapped several times. Exploration of the liver or surgical drainage was never considered.

#### DIAGNOSIS

In our experience the vague group of basal pneumonias, including virus pneumonia, was the main source of confusion. Unlike others [3, 10, 11] we seldom had to consider tuberculosis as an alternative.

Admittedly the diagnosis of thoracic amœbiasis in our patients were not only unconfirmed, but sometimes rested on slender evidence.

Amœbæ were only found twice in the stools. They were never discovered in sputum, pleural fluid or expectorated abscess contents.

Conclusions therefore largely depended on the effect of emetine, which was usually rapid but not always so. The final opinions were not those of a single observer but rested on the available facts as assessed by all who attended the patient.

The correct use of emetine as a therapeutic test requires judgment and experience. The treatment of acutely ill patients cannot always depend on laboratory confirmation. Its premature use, on the other hand, led sometimes to delay in reaching a correct diagnosis.

#### PATHOGENESIS

There are three significant points in our experience of hepato-pulmonary amœbiasis.

(1) Diffuse hepatitis was the commoner underlying liver condition, compared with liver abscess.

(2) In spite of the high incidence of thoracic conditions, no amœbic lung abscess was found.

(3) Signs and symptoms of chest disease were often acute and preceded those of the underlying liver condition rather than following them.

Of course amœbæ must sometimes pass up the transdiaphragmatic lymphatics [4, 5, 11, 13] and penetrate pleura and lungs to set up a right basal pneumonia, followed perhaps by a lung abscess.

Consideration, however, of these three points leads me to believe that although signs of pneumonic, pleural, bronchitic or atelectatic lesions may appear first, these processes are often, nevertheless, just indirect results of subdiaphragmatic inflammation. The actual entry of amœbæ into the thorax may be delayed until a lung abscess begins to form or until a liver abscess ruptures upwards.

It is still more difficult to ascribe lesions separated from the diaphragm by a zone of clear lung, to the direct action of amœbæ.

(1) *Double Pathology*.—Some of these patches of consolidation are attributed to independent bacterial inflammation of areas of lung rendered vulnerable by pressure or other factors. This theory can hardly be reconciled with the curative effect of emetine.

(2) *Atelectasis*.—The right mid-zone opacity of Case 1 was partly atelectatic. Munk has described several cases in which "atelectatic plates" occur above the raised right dome. These he attributes to pressure.

(3) *Linear opacities*, such as that observed in figs. 4 and 5, may be either small interlobar effusions or thickened interlobar septa.

(4) *Blood-borne Emboli from Colon to Lung*.—We encountered no examples of this rare condition described by Dormer [3], Manson-Bahr [8], Oschner [10, 11], and Zaky [13].

None of these theories is comprehensive and further speculation based on limited material is unprofitable since these conditions, however produced, are cured by emetine.

A study of our patients emphasizes the old precept: that underlying amœbic infection should always be considered when a right-sided chest disease occurs in a patient who has lived in an endemic area.

#### SUMMARY

(a) 10 out of 26 patients with hepatic amœbiasis had lesions in the right chest. Yet not a single lung abscess was found.

(b) Amœbic hepatitis was the commoner underlying condition, compared with liver abscess.

(c) Signs and symptoms of chest disease were often acute, and preceded those of the associated liver condition.

(d) Right shoulder pain received insufficient attention.

(e) These chest lesions may not always be due to the actual entry of amœbæ into the thorax.

(f) The consideration of pulmonary amœbiasis in the differential diagnosis of right-sided chest disease is advocated.



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