X-ray Films in the Diagnosis of Chronic Amoebic Hepatitis*

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Chronic amoebic hepatitis has been a subject of much controversy. Only recently, after many years of experimental study, has it been possible to establish its existence as a distinct clinicopathological entity (Doxiades and Candreviotis, 1961; Doxiades *et al.*, 1961, 1963; Doxiades, 1962).

One of the major difficulties in its diagnosis is that a negative result of stool examination does not exclude amoebiasis any more than a negative result of a sputum examination for the Koch bacillus excludes tuberculosis of the lungs. These practical difficulties and limitations of stool examination as a sole means of detecting amoebae create the need for some other reasonably reliable diagnostic method by which the existence of the disease can be at least suspected before confirmation by stool examination.

For many years we have personally examined all our patients by thorax fluoroscopy and have often observed changes in the right diaphragm. Further investigation of the cases with the changes showed that most of them belonged to the group suffering from amoebiasis. Changes in the right diaphragm in cases of liver abscess have already been described (Galloway, 1946; Shanks and Kerley, 1950; De Bakey and Ochsner, 1951; Ochsner, 1962).

A bulging may be noted in the medial and anterior portions of the right diaphragm on the radiograph. If the abscess ruptures into the subphrenic space there is a characteristic elevation of the anterior half of the diaphragm in the lateral radiograph, and of the medial half with obliteration of the

we were able to demonstrate liver enlargement in most of the patients presenting abnormal elevation of the diaphragm on the right. In order to have a double check we examine the patient first in the erect and then in the supine position. Inspiration exposures are made on 36 by 43-cm. films, and include the diaphragm contour and the brim of the true pelvis. In this way the entire frontal-plane contour of the liver can be recorded. A constant 150-cm. target-to-film distance is maintained. In measuring the liver size we draw two parallel lines, one through the highest point of the organ, under the diaphragmatic dome, and another through its right lower edge. The vertical distance between these two lines gives its size. By this method we are able to observe the upper and lower margins of the liver simultaneously, and to make direct measurements from the film as an index of its size. Sometimes when the lower margin of the liver is difficult to identify, opaque filling of the colon is helpful in locating it. This simple method is very satisfactory. We find no reason to use pneumoperitoneum.

In Fig. 1a the patient had been suffering for a long time from a low-grade febrile weakness and malaise. The x-ray examination showed an enlargement of the liver, especially of the upper border, with a small amount of pleural effusion. This finding prompted us to consider the possibility of amoebic hepatitis (Doxiades *et al.*, 1961), which was confirmed by a positive stool examination. Fig. 1b, which was taken after antiamoebic treatment, shows that both the pleural effusion and the shadow of the right diaphragm have diminished.

FIG. 1.—Elevation of right dome with pleural effusion due to amoebiasis; (a) before, (b) after treatment.

cardiophrenic angle in the posterior-anterior radiograph. This is in contradistinction to a pyogenic subphrenic space associated with acute appendicitis, in which there is elevation of the posterior half in the lateral radiograph and of the lateral half in the posterior-anterior radiograph.

Furthermore, we observed similar abnormalities of the right diaphragm in cases of amoebiasis without suppuration. Examining these abnormalities of the right diaphragm, we also observed an increase in the size of the underlying liver. In order to make a systematic study of the above observations we took x-ray films of the liver, always under the same conditions. Using a standardized radiographic examination of the abdomen,

Fig. 2a shows that the patient's condition resembled the previous case, but it was much milder and could therefore easily escape notice. The decrease in the size of the liver after treatment is more easily seen if one compares the two triangles of both pictures (Fig. 2a and b), which are made up of the heart shadow, the right diaphragm, and the lower margin of the rib.

Because of cases like the above we decided to examine radiologically the livers of all our patients.

The Present Series

From the 2,641 admissions during the year 1962 we selected by routine fluoroscopy 485 patients who were suspected of an enlargement of the liver. Of these 485 cases, 200 have been

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excluded either because the hepatomegaly was negligible or because it was due to various other causes—for example, carcinoma, infectious hepatitis, cirrhosis, echinococcus cyst, leukaemia, etc. The remaining 285 cases (10.8% of the 2,641 total admissions) showed hepatomegaly on x-ray examination.

All these cases were repeatedly examined for parasites, and in 60 of them *Entamoeba histolytica* was found in the stools. In

The patients were given only anti-amoebic treatment, to which they responded by an improvement of their clinical symptoms, on average 77.4%, as well as by a decrease of the hepatomegaly, on average 68%.

Of interest are the different variations of the enlarged liver of amoebic origin, the description of which appears in another paper.

FIG. 2.—Elevation of right dome; (a) before, (b) after treatment.

most of the patients the liver was not palpable because of its soft consistency and thus could easily escape clinical detection. On the basis of the past history, the clinical picture, the eventual positive stool examination for *E. histolytica*, and the enlargement of the liver shown by x-ray examination, all these 285 patients were suspected of suffering from chronic amoebic hepatitis.

The great majority of these patients complained of diffuse abdominal pain, constipation alternating with diarrhoea, mucus in the stools, abdominal tenderness, headaches, dizziness, weakness and malaise, psychoneurotic manifestations, etc. The Table shows the frequency of these symptoms in the 285 patients.

Finally, the reported cases are all from Greece, and we would be interested to know whether or not similar cases can be found in other countries.

In the following cases chronic amoebic hepatitis was diagnosed by x-ray examination and the liver responded to anti-amoebic therapy.

Case Reports

Case 1.—A 48-year-old man was admitted to hospital, having suffered for the past year from loss of appetite, nausea, headaches, fatigue, and weakness, accompanied by tenderness and a feeling of

FIG. 3.—Case 1. Hepatomegaly of amoebic origin before and after treatment.

Frequency of Symptoms in 285 Cases of Chronic Amoebic Hepatitis

Clinical Manifestations	No. of Cases	%
Diffuse pain of abdomen	261	91.6
Constipation alternating with diarrhoea	199	69.8
Fullness of abdomen	185	64.9
Mucus in stools	131	46.0
Psychoneurotic symptoms	93	32.6
Tenderness in right hypochondrium	89	31.2
Dizziness	87	30.5
Headache	63	22.1
Weakness	45	15.8
Pellagra	35	12.3
Abdominal colic	23	8.1
Vasomotion	15	5.3
Dysentery	5	1.7

fullness in the region of the right hypochondrium. He had previously been admitted to another hospital with a diagnosis of carcinoma of the liver. On clinical examination the liver was enlarged to 6 cm. below the right costal margin and firm. Laboratory data were within normal limits, except cephalin flocculation ++, bromsulphalein 8%, and serum glutamic pyruvic transaminase 60 units. On stool examination *E. histolytica* was found on two occasions. Proctoscopy did not reveal any pathological lesion. Needle liver biopsy was performed; histologically, the specimen presented a picture of chronic hepatitis of moderate intensity, characterized by slight enlargement of the portal triads, with inflammatory cellular infiltration, mainly by lymphocytes. In some

sections small spheroid formation with the morphological features of *E. histolytica* were found, either at the portal triads or in the portal capillaries, among the liver cells. No tumour cells were found. By inoculation of the patient's liver specimen to experimental animal liver we succeeded in reproducing a picture of chronic hepatitis similar to that seen in the patient, as well as transmitting the *E. histolytica* (Doxiades and Candreviotis, 1961; Doxiades *et al.*, 1961, 1963; Doxiades, 1962). X-ray examination showed enlargement of the liver which diminished about 4 cm. after anti-amoebic therapy, as proved by x-ray re-examination (Fig. 3). The last two stool examinations for parasites were also negative. The patient left hospital in good health and was advised to continue anti-amoebic therapy.

Case 2.—A woman aged 54 was admitted to the Evangelismos Hospital complaining of tenderness in the right hypochondrium, nausea, headaches, dizziness, and a pain in the precordial area. These symptoms had first appeared a year before admission. A cardiologist had been consulted and had found nothing pathological concerning her heart. Her past history mentioned gastro-intestinal disturbances since childhood and amoebic colitis at the age of 37. On physical examination the liver was found to be enlarged 5 cm. below the costal margin, of soft consistency, and slightly painful on palpation. The stool examination revealed *E. histolytica*. X-ray examination of the liver showed a considerable enlargement of the right lobe extending below the iliac crest. The patient's response to emetine treatment was satisfactory. The clinical symptoms disappeared and the liver was smaller in size (Fig. 4).

FIG. 4.—Case 2. Hepatomegaly due to amoebiasis before and after treatment.

FIG. 5.—Case 3. A bulging of the upper border of the liver near the cardiophrenic angle, which diminished after anti-amoebic treatment.

Case 3.—A woman aged 56 was admitted to the Evangelismos Hospital complaining of dizziness, headaches, and fatigue for a long time prior to admission. On physical examination only a slight enlargement of the liver was noticed. The laboratory examinations revealed nothing abnormal. X-ray examination showed the liver to be enlarged both at the lower and at the upper border. The upper border especially showed a bulging near the cardiophrenic angle. Proctosigmoidoscopy disclosed hyperaemia and a fine granulomatous appearance up to 23 cm. On rectal biopsy cellular formations with the morphological features of *E. histolytica* were found. The patient underwent anti-amoebic therapy, as a result of which the symptoms disappeared. On x-ray re-examination the liver was

found to be smaller in size and the bulging had diminished (Fig. 5).

Case 4.—A 27-year-old electrician was admitted to the Evangelismos Hospital, having suffered for the past year from tenderness and pain in the right hypochondrium, borborigmus, diffuse abdominal pain, anorexia, and low-grade pyrexia. On physical examination a dullness and fine moist rales were found at the right base of the lung. On palpation the colon was tender and the liver enlarged four fingerbreadths below the right costal margin, soft in consistency, and tender on deep palpation. X-ray examination of the chest showed a picture of pneumonitis in the right base and an elevation of the right diaphragm. The laboratory data were within normal limits and *E. histolytica* was found on stool examination. X-ray examination of the liver showed enlargement of both the lower and the upper border. The patient underwent treatment with emetine, which resulted in an improvement of the clinical manifestations as well as a decrease in the size of the liver (Fig. 6).

Discussion

The above cases are presented as evidence of our observations on hepatomegaly of amoebic origin.

It is worth noting that to date very little has been known or written about the radiological detection of hepatomegaly.

It was generally thought to be difficult to ascertain the norms of the liver. However, having for many years personally examined all our patients by fluoroscopy, we have found that in many cases there is an elevation of the right dome of the liver, with or without bulging, and beneath this hepatomegaly. Because a large percentage of the radiologically detected hepatomegalies were of unknown origin, whereas this phenomenon was seen in the majority of our cases of chronic amoebiasis, we decided to investigate both the different causes of the hepatomegalies and their relation to chronic amoebiasis. In our study we have included only the cases of obvious

hepatomegaly, and not those in which the enlargement of the liver was negligible.

We have mentioned above that it has been difficult to ascertain the norm of the liver. Perhaps the fact that these 285 cases have until now been considered either radiologically normal or due to other pathological causes has contributed to this belief.

FIG. 6.—Case 4. Enlarged liver before and after treatment.

It is of interest to note the morphological changes of the liver which we observed radiologically. There are changes of the upper border of the liver only, changes like the described bulging, which is not due to suppuration. This fact has been proved by scanning of the liver. There are the changes of the lower border of the liver, especially of the right lobe, which sometimes reaches lower than the crista iliaca. All these changes will be described in detail in a further article.

Radiological amelioration occurred in 68% of our cases. There are, however, also cases in which definite clinical amelioration was seen without this being evident radiologically.

We speak of "chronic amoebiasis" because it was especially interesting to note that of our 285 cases only 5 (1.7%) were cases of amoebic dysentery. This proportion applied to all our patients does not exceed 2.5%, and clearly indicates that, in Greece at least, amoebic hepatitis occurs more often than amoebic dysentery. This fact fully corroborates our personal opinion that the prevalent clinical picture is that of chronic amoebiasis and amoebic hepatitis, while the dysentery syndrome is simply an episode of the disease.

There is confusion of the terms "amoebic dysentery" and "chronic amoebiasis"; consequently amoebiasis is thought to be a tropical disease. For this reason most doctors do not even consider the possibility of this infection. As we have had many cases of chronic amoebiasis in patients from Central Europe

and England who have never left the European continent, we would say that amoebic dysentery and liver abscess are usually tropical syndromes, whereas chronic amoebiasis is universally indigent.

Naturally, we cannot claim that this method of diagnosis is infallible, but it is surely most useful, and it helps the physician when considering the possibility of amoebic infection.

Summary

A new method of diagnosing chronic amoebic hepatitis has been described. Among 2,641 total admissions to our medical department during a 12-months period, hepatomegaly was detected radiologically in 285 cases (10.8%).

Out of the 285 cases, 77.4% clinically and 68% radiologically have favourably responded to anti-amoebic treatment, although in only 60 of them were amoebae found on stool examination.

The method we have described facilitates consideration of the presence of amoebic infection even when stool examination is negative.

It also induces physicians to include amoebic infection in their differential diagnosis in cases of hepatomegaly.

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