

AMOEBIC LIVER ABSCESS: SONOGRAPHIC PATTERNS AND
COMPLICATIONS IN ENUGU, NIGERIA.

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ABSTRACT

This study evaluated the sonographic patterns and complications of amoebic liver abscess (ALA) in Enugu, Nigeria.

Request forms, case notes, sonographic reports and images of all patients who had amoebic liver abscess diagnosed at Hansa Clinics Enugu and at the UNTH Enugu within a period of 8 months of 2001 were reviewed. Sonograms obtained were analyzed for size, shape, location, echocharacteristics and complications.

Of 3700 abdominal ultrasound examinations done, 62 (1.7%) cases of ALA were identified during the review period. Of these, 5(8%) were females and 57(92%) males.

Their ages ranged between 19 and 78 years. The echopatterns encountered in 86 abscess cavities, were echorich in 48 abscesses (58%); echopoor and anechoic in 13 (17.4%) and mixed or inhomogenously hypoechoic in 25 (29.6%) of the abscesses. 18 patients had 21 ALA complications sonographically. These were 3 jaundice, 3 Ascitis, 2 subhepatic effusion, 1 heterotopic splenic abscess, 1 extraperitoneal rupture, 1 intraperitoneal rupture, 3 subphrenic abscess and 7 pleuropulmonary complications.

Untreated complicated hepatic amoebic

abscesses are associated with high morbidity and mortality and should receive urgent medical intervention. Sonography remains a veritable tool in the timely investigation of right upper quadrant abdominal pain especially in areas of endemic amoebiasis. Its application would reduce morbidity and mortality of ALA.

ABSTRAIT

Cette étude a évalué les modèles et les complications sonographic de l'abcès amibien de foie (ALA) dans Enugu, Le Nigéria.

Formes de demande, notes de cas, des rapports et les images sonographic de tous les patients qui ont fait diagnostiquer l'abcès amibien de foie aux cliniques Enugu Hansa et à l'UNTH Enugu au cours d'une période de 8 mois de 2001 ont été passés en revue. Sonograms obtenu ont été analysés la taille, forme, endroit, echocharacteristics et complications.

De 3700 examens abdominaux d'ultrasons faits, 62 (1.7%) caisses l'ALA ont été identifiées pendant la période de revue. De ces derniers, 5(8%) étaient des femelles et 57(92%) des mâles.

Leurs âges se sont étendus entre 19 et 78 ans. Les echopatterns produits en 86 cavités d'abcès, étaient l'echorich dans 48 abcès (58%) ; echopoor et sourd dans

13 (17.4%) et mélangé ou inhomogenously hypoechoic dans 25 (29.6%) des abcès. 18 patients ont eu 21 complications l'ALA sonographically. C'étaient l'ictère 3, 3 Ascitis, effusion 2 subhepatic, 1 abcès splénique heterotopic, 1 rupture extraperitoneal, 1 rupture intraperitoneal, 3 7 pleuropulmonary complications d'abcès subphrenic et.

Des abcès amibiens hépatiques compliqués non traités sont associés à la morbidité et à la mortalité élevées et devraient recevoir l'intervention médicale pressante. Sonography reste un véritable outil dans la recherche opportune sur la douleur abdominale de bon quart de cercle supérieur particulièrement dans les secteurs de l'amibiase endémique. Son application réduirait la morbidité et la mortalité de ALA.

INTRODUCTION

As recent as 1978, up to 20% of the world's population was known to harbour *Entamoeba histolytica* although only 5-6% of these hosts might develop clinical amoebiasis. Currently amoebiasis is said to have a prevalence of 1 to 2% in tropical Africa^(1,2). Unhygienic living conditions as well as any breakdown of social infrastructure especially water supply expectedly tend to cause rising incidence of water borne diseases like amoebiasis etc.

Amoebic liver abscess is one of the most common non-enteric manifestations of this disease occurring in 1 to 25% (average 8.5%) of patients who have clinical infestation. Left untreated, amoebic liver abscess gives rise to increased morbidity and mortality. In such circumstances, it could present with protean manifestations especially when the index of suspicion is low. Such uncommon manifestations are due to complications which result from the rupture of the

abscess into the neighbouring cavities of the pleura, pericardium, peritoneum, retroperitoneum etc or compression of the tubular structures in the hepatic hilum or fistulization of the colon and bronchi or distant embolic dissemination to the brain, spleen etc.^(3,4,5)

Detection of the root causes of these complications can remain elusive for weeks or months with obvious attendant worsening prognosis. Within the last decade, the newer modalities of cross-sectional 3D imaging eg. Computer Tomography (CT); Magnetic Resonance Imaging (MRI) and Ultrasound (US) have sprung to the rescue of the physician in ensuring early diagnosis. Recent literature is inundated with numerous reports on the role of these newer modalities in effecting not only a quick and efficient detection of amoebic liver abscesses but also in monitoring the size of lesion and in interventional percutaneous decompression by aspiration of the contents of these abscesses.

Sonography is highly recommended for these purposes because it is the cheapest of these modalities and it is very reliable, simple and radiation-free. On ultrasound, amoebic liver abscess has been described as rounded, subcapsular cavitory lesions with well defined margins and variable sizes and internal echopattern^(6,10).

The abscess cavities occur more commonly in adults than children, more in the right lobe than left, and more in males than females. The aim of this work is to determine the sonographic pattern of complications in our environment so as to facilitate quick and timely diagnosis as well as effective management.

MATERIALS AND METHODS

The request forms, case notes, sonographic reports and images of all amoebic liver abscesses diagnosed at Hansa Clinics, Enugu and UNTH Enugu in the first 8 months of the year 2001

were retrospectively reviewed. All examinations were carried out by either of 2 consultant Radiologists using one of the following 3 commercially available ultrasound machines namely: Phillip Sterling equipped with Convex Probe 3.5mHz and a linear probe 7.5mHz; Siemens SL-1 and Combison 311 equipped with 3.5mHz and 5mHz sector probes.

Sagittal and transverse images were obtained throughout the liver and the neighbouring organs of the chest and abdomen. The sonograms were analyzed for size, shape, location and echocharacteristics. The diagnosis of amoebic liver abscess was confirmed by the recovery of typical "anchovy" sauce on needle aspiration or surgical decompression in 45 patients by excellent response to specific amoebicidal drugs chloroquine or metronidazole (38 patients), by autopsy (in 2 patients) or by positive indirect hemagglutinin titres in the range of 1:512 or greater (in 6 patients). The inclusion criteria for complications were as follows:

- a. Evidence of the effects of compression by the abscess on the hilar tubular structures eg Jaundice and ascites, dilated biliary ducts seen on ultrasound.
- b. Evidence of extension of abscess by rupture or otherwise into the pleural pericardial, peritoneal, intraperitoneal or extraperitoneal space eg. Effusions, ascites.
- c. Evidence of embolic systemic or portal dissemination to other organs, resulting in heterotopic abscess formation in the lung or spleen, adrenal, brain etc.

RESULTS

A total of 62 (1.7%) cases of ALA were identified out of 3700 (1.7%) abdominal ultrasound examinations done in the 2 institutions in the period

under review. Of this number, 5(8%) patients were female and 57(92%) were male. Table 1 shows the frequency distribution of abscesses according to the age of patients.

The 31-40 age groups showed the highest incidence constituting 29% of cases seen. Table 2 shows the frequency distribution of abscess number relative to the number of patients. In 50 cases (80%) only one abscess cavity is visualized while in 12 (20%) multiple abscesses were identified. The multiple abscesses ranged between 2 and 6 in number. The right lobe constituted the seat of the largest number of abscesses. This lobe alone accounted for 80.6% cases while the left accounted for 8.1% cases of all abscesses. In 11.3% of cases, both lobes were equally involved. Fig 2 shows the distribution of abscesses according to size.

The most common echopattern encountered in 86 abscess cavities was the echorich pattern 48 abscesses (58%); 13(17.4%) were recorded as having the echopoor or anechoic pattern while 25(29.6%) of the abscesses were noted to have the mixed or in homogeneously hypoechoic echopattern.

Regarding complications, 21 of these were identified in 18 patients who had clinically and sonographically confirmed amoebic liver abscess. Of this number pleuropulmonary complication fig. 1(n=7), Ascites(n=3) and Jaundice (n=3) accounted for the highest number. These were followed by subhepatic effusion (n=2), extraperitoneal rupture (n=1) and heterotopic splenic abscess(n=1). (see Fig 1).

Table 3 shows the frequency of complications relative to site and no. of abscesses.

DISCUSSION

Amoebic liver abscess (ALA) is the most common extracolonic manifestation of amoebiasis. It is said to

occur in up to 1/3 of the patients with amoebiasis^(1,2,3). It complicates the asymptomatic colonic infection more often than its symptomatic counterpart and this is the main reason why the disease may be overlooked or misdiagnosed.⁽¹⁾

Ultrasonography is widely accepted as a first time technique for imaging focal hepatic lesions including liver abscesses^(1,3,10). This is attributable to its low cost, great availability and high accuracy. It has also been shown to facilitate early diagnosis and intervention when necessary⁽¹³⁾. It is useful not only in the diagnosis but also in the follow up of the condition to assess resolution. Resolution of these lesions could take months and may be delayed even when marked clinical improvement has occurred. The patterns of abscess resolution in the absence of surgical interference of any form have been observed namely:

- Type 1:- Complete disappearance of abscess cavity within 3 months
- Type 2:- Gradual reduction and disappearance of the cavity
- Type 3:- Rapid reduction until 25% of the cavity remains and then delayed resolution⁽¹¹⁾

Our series have shown that the patterns of amoebic liver abscess in this environment largely parallel what has been established elsewhere in terms of age, sex, number, size, location and echopattern with few modifications. Regarding age and sex, for example, the peak age incidence occurred in 30-40 year age group while the sex of predilection was essentially male. These findings were similar to those of previous authors and could in our circumstance be due to the fact that the majority of the affected patients were itinerant male traders in their most active years who often travelled long distances which exposed them to eating in unhygienic

environments outside their regular homes. Again in this series, the right lobe was the more frequently involved lobe in comparison to the left lobe both as a solitary and as multifocal lesions. This distribution pattern whereby the right lobe alone accounted for over 80% of lesions is consistent with the observation of others and may not be unrelated to the fact that the right lobe receives most of the blood draining the most frequently involved primary site of intestinal amoebiasis, the right colon, through the "streaming" effect in the portal venous flow^(4,5,9).

Regarding complications, extrahepatic rupture was the most frequent complication encountered in this study. A rupture or leak could occur into the thoracic cavity, the peritoneal or pericardial cavity or retroperitoneum. In this study, pleuropulmonary complications consisting of right pleural effusion and atelectasis accounted for the highest incidence of complications. This finding is also in agreement with those of other workers.⁽⁹⁾ Peritoneal and pericardial effusions were relatively uncommon in our series probably because our patients reported early for treatment. We also encountered two complications not previously reported in recent imaging literature. These comprised of one case of extraperitoneal rupture into the anterior abdominal wall and another of a coexistent ectopic abscess in the spleen.

In respect of the first case, the abscess was diagnosed at the clinical stage when it was "pointing" in the right paraumbilical region. It would have probably drained via external skin sinuses in the presonography era if surgery had not fortuitously intervened. This variety of complication could be explained on the basis of the sonographically proven knowledge that many an amoebic liver abscess tends to localize superficially under the liver capsule thereby putting the latter under

undue pressure that could lead to rupture.

In respect of the second case, splenic abscess is a recognized but most unusual complication of amoebiasis. Its concurrent or heterotopic existence with a hepatic abscess has not however been described in current imaging literature. We believe that this complication arose from the process of embolization known to seldom occur in amoebiasis. This phenomenon has been reported to give rise to abscesses in the brain, lung, spleen etc^(4,5).

Untreated complicated hepatic amoebic abscesses are associated with high morbidity and mortality and therefore require urgent attention for effective medical and sometimes surgical intervention. Although sonography has been found helpful in the detection of simple amoebic liver abscesses, its usefulness in the recognition and management of complicated cases has not been sufficiently stressed⁽⁹⁾. The utility of sonography should be extended to include scanning of the entire chest and abdomen so as to detect abscesses or

effusions in the neighbouring lung, spleen, heart etc. These measures would definitely help reveal complications which if left untreated would worsen prognosis.

The other complications encountered in this series and also reported by earlier authors are Jaundice, ascites and subhepatic effusion. Our experience as well as those of others suggests that both Jaundice and ascites tend to occur most commonly in the presence of multifocal abscesses especially when these are associated with impingement of hepatic hilar tubular structures.^(9,14,15,16)

In conclusion, sonography remains a veritable tool in the investigation of right upper quadrant abdominal pain especially in areas endemic for amoebiasis. Its application enables the physician to quickly diagnose not only the primary liver abscesses but also its various complications which otherwise could cause high morbidity or mortality once they escape early recognition.

TABLE 1
 Frequency distribution of abscesses according to Age of Patients

| Age | 20-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | Total |
|-----------------|-------|-------|-------|-------|-------|-------|-------|
| No. of Patients | 10 | 18 | 10 | 10 | 12 | 2 | 62 |
| Percentage | 16.1% | 29.1% | 16.1% | 16.1% | 19.4% | 3.2% | 100% |

TABLE 2
 Frequency of number of abscess cavities according to number of patients

| No. of abscess cavities | 1 | 2 | 3 | 4 | 5 | 6 | |
|-------------------------|-------|------|------|------|------|------|------|
| No. of patients | 50 | 6 | 3 | 1 | 1 | 1 | 62 |
| Frequency | 80.6% | 9.7% | 4.8% | 1.6% | 1.6% | 1.6% | 100% |

TABLE 3
 Frequency of complications in terms of abscess number and abscess sites

| Type of Complications | Frequency | Site of abscess | No. of abscess cavities | % |
|-------------------------------|-----------|-----------------|-------------------------|------|
| Jaundice | 3 | Both lobes | Multifocal | 14.3 |
| Ascites | 3 | Both lobes | Multifocal | 14.3 |
| Subhepatic Effusion | 2 | Right lobe | Multifocal | 9.4 |
| Heterotopic abscess (Splenic) | 1 | Left lobe | Solitary | 4.7 |
| Extraperitoneal Rupture | 1 | Both lobes | Multifocal | 4.7 |
| Intraperitoneal Rupture | 1 | Right lobe | Solitary | 4.7 |
| Subphrenic Abscess | 3 | Right lobe | Solitary | 14.3 |
| Pleuro Pulmonary Complication | 7 | Right lobe | Solitary | 33.3 |
| Total | 21 | | | 100 |



Fig. 1: Transverse Ultrasound Scan
 Left upper abdomen showing Liver
 and Splenic abscesses

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