Ultrasonography of amoebic liver abscess

Kaesorn Vajarapongse*
Darunee Wetchsetnont* Laddawan Vajaragupta*
Vacharee Buachum* Sukalaya Lerdum*

* Department of Radiology, Faculty of Medicine, Chulalongkorn University.
Gray scale ultrasonogram is now used to evaluate the focal lesion in the liver. The ultrasonographic features of the typical abscess had been described.\(^{(1-6)}\) We have analysed the ultrasonographic features of the amoebic abscesses in attempt to clarify some specific ultrasonographic appearances.

**Material and methods**

The ultrasonography of 52 patients (60 abscesses) with proved amoebic liver abscesses at Chulalongkorn Hospital during 1980–1983 were retrospectively analysed. The abscesses were proved either by aspiration, serologic test, clinical response to metronidazole or surgery. Some abscesses were needle aspirated under ultrasound guidance. The ultrasonography was performed with PHO-SONIC 8 m. ACPHL using 2.25 or 3.5 MHz transducer. The age incidence was between 20–50 years, with 43 males and 9 females. Abdominal pain, fever with chill were the commonest presenting symptoms. The ultrasonographic appearances of the abscesses were analysed with regard to size, shape, location, echogenic patterns, and through transmission. The ultrasonic appearance of the liver is an homogeneous internal architecture with fine uniform distribution of echoes without focal disruption. The degree of echogenicity of the lesion in the liver was compared to the echogenicity of the normal liver parenchyma. The high level echoic or hyperechoic lesion had higher amplitude and numbers of echoes than normal liver. The isoechoic lesion showed equal number and intensity of echoes to the normal liver parenchyma. The low level echoic or hypoechoic lesion had less number and intensity of echoes than normal liver. The anechoic lesion was an area of absence echoes. However the anechoic lesion may contain variable amounts and intensity of the internal echoes. When the sound beam passes through the fluid-filled structures, there will be an increase in the intensity of the echoes behind the posterior wall of the structure which is called through transmission or sound enhancement. The margin of the abscesses had different echogenicity and was referred to the thickness of the wall of abscess in this presentation.

**Results**

Forty six patients had one abscess, 4 had 2 abscesses, and 2 had 3 abscesses. The size varied from 3 to 12 cm. in diameter. Fifty five abscesses were located in the right lobe, 5 in the left lobe. Forty two abscesses in the right lobe were contiguous to the liver capsule. Most of the abscesses were round or ovoid shape. The echogenic patterns were shown in table I.
Table 1

Ultrasonographic feature

I. Echogenic character in the abscess.
   1. Well defined poor echoic area. (Fig. 1) 16 (26.7%)
   2. Anechoic area contained
      A. Fine. homogeneous low level echoes (Fig. 2) 14 (23.3%)
      B. Mixed irregular different level echoes (Fig. 3) 6 (10%)
      C. Homogeneous low level echoes with anechoic center (Fig. 4) 1 (1.7%)
      D. Some low level echoes at the lower portion (Fig. 5) 10 (16.7%)
      E. Fluid—debris level (Fig. 6) 3 (5%)
   3. Low or isoechoic area with peripheral echo free halo (Fig. 7) 10 (16.7%)

II. Distal sonic enhancement.
   presence 42 (70%)
   absence 18 (30%)

III. Echogenic wall
   No 44 (73.3%)
   Thin (Fig. 8) 10 (16.7%)
   Thick (Fig. 9) 6 (10%)

Ten patients with amoebic abscesses had follow up scans from 3 to 90 days. The sonographic changes were studied. The early abscess showed iso—echogenic area distinguished from the normal liver by peripheral echo free halo. All the abscesses in the follow up scans were decrease in size and internal echoes. Fig. 10, 11

Discussion

The specific ultrasonic features of the amoebic abscess can not be definitely established. There are wide variation of the echogenicity of the abscess from totally anechoic to echoic lesion. Nevertheless most of the amoebic abscesses showed well defined low level echoes, round or ovoid shape, peripheral location, distal sonic enhancement without echogenic wall. The ultrasonographic appearances are related to the phases of development, organization and repair of abscess.\(^{(12-15)}\) In our cases, the early abscesses tended to be iso—echogenic and turned to be hypo or anechoic in the follow up sonograms. Corresponding to the pathology and pathogenesis of the amoebic abscess, the early phase is characterized by granuloma or micro abscesses, the cavity is formed later by coalescence of a number of smaller abscesses.\(^{(12-15)}\). The contents of the abscess give different echogenicity. In the experimental studies showed that the sonographic appearance of the fluid
collection containing cholesterol, protein, lipid, fat, and suspension of protein macroaggregates were echogenic.\(^{(7-11)}\) Some early abscesses showed isoechoic lesion with peripheral echo free halo. The peripheral echo free halo may represent the inflammatory reaction and the increased blood flow in the adjacent parenchyma.\(^{(2,8)}\) Few abscesses had echogenic wall. The well formed fibrous wall is indicating chronicity as well as secondary infection.\(^{(12)}\) The echogenic wall is not the common ultrasonic finding of amoebic abscess.

**Conclusion**

This presentation showed the common ultrasonographic features of the amoebic abscess that may help to establish the diagnosis. The ultrasonography guided needle aspiration is a useful method to quickly and definitely diagnose the abscess. If diagnosed early, amoebic abscess can be treated effectively at low cost. If undiagnosed, significant morbidity and mortality may occur.

The ultrasonographic appearance of amoebic liver abscess was studied in 52 patients (60 abscesses). The size, shape, location, echogenic patterns, and through transmission were analysed. The frequent ultrasonographic features of amoebic abscess were single, round or ovoid shape, peripheral location, poor echoic or homogenous low echoic lesion (50%), no echogenic wall (73.3%) with distal sonic enhancement (70%).

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**Fig. 1** Transverse scan shows a well defined poor echoic area in the right lobe with distal sonic enhancement. There is no echogenic wall.
Fig. 2  Transverse scan shows a well defined anechoic area containing homogeneous low level echoes with distal sonic enhancement.

Fig. 3  Sagittal scan through the right lobe shows a round anechoic area containing mixed irregular different level echoes. There is no definite distal sonic enhancement.
Fig. 4 Sagittal scan shows an abscess in the right lobe. The echogenic pattern is homogeneous low level echo with central echo-free area. Slight distal sonic enhancement is shown.

Fig. 5 Sagittal scan through the right lobe shows a well defined anechoic area with low level echoes at the inferior portion.
Fig. 6 Sagittal scan shows two abscesses in the right lobe. Fluid-debris levels and distal sonic enhancement are seen.

Fig. 7 Sagittal scan shows a well defined isoechoic area in the right lobe distinguished from normal liver by the peripheral echo-free halo. There is distal sonic enhancement.
Fig. 8 Sagittal scan through the right lobe shows an abscess with thin echogenic wall.

Fig. 9 Transverse scan of the liver shows a thick wall abscess in the right lobe.
Fig. 10 A. Transverse scan shows an isoechoic lesion with marginal echo free halo.

Fig. 10 B. Follow up scan 7 days later shows decrease in the internal echoes and size.
Fig. 11 Sagittal scan shows two abscesses in the right lobe. The small one is a well defined homogeneous isoechoic area with peripheral echo free halo. Slight distal sonic enhancement is seen. The large one is anechoic lesion containing some internal echoes at the inferior portion. Mark distal sonic enhancement is seen.
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ขอเก็บ! รูปในงานสังเคราะห์วัชสาร
วันที่ 28 ธันวาคม 9 กันยายน 2527 หน้า 981

เรื่อง Ultrasonography of amoebic liver abscess ของ พ.ธ. เกษร วิชยิทธิ์
รูปที่ถูกต้องคือ รูปแนบในรูป 10B รูปล่างเบนรูป 10A
References