Ultrasound in the Diagnosis of Granulomatous Liver Disease

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Ultrasound is a widely used method of assessing the liver for space occupying lesions and, more recently, parenchymal liver disease. We have reviewed the ultrasound scans and reports of 11 patients with biopsy proven granulomatous liver disease. Multiple echogenic lesions 3-5 mm in diameter, each surrounded by an hypoechoic halo, were seen in the liver of all the patients and in the spleens of three patients. A specific diagnosis of granulomatous hepatitis was suggested at the time of scanning in seven patients. An abnormal liver was noted in the other four patients but no specific diagnosis was suggested.

We believe that granulomata in the liver can be detected using ultrasound and, if the above appearances are seen during an ultrasound scan, a diagnosis of granulomatous hepatitis should be considered.

Ultrasound of the liver is an established examination, particularly for the detection of space occupying lesions such as metastases. Recently there has been increasing evidence that ultrasound may also be used to both diagnose and monitor parenchymal liver disease (Saverymuttu et al., 1986; Taylor et al., 1986).

We describe the ultrasound features in 11 cases of granulomatous disease of the liver.

METHODS

All patients examined in the past five years who had both ultrasound examination of the liver and a liver biopsy showing granulomata were included. All biopsies were performed within one week of the ultrasound examination except one which was performed within one month. Scans were performed with a Technicare Autosector (real time) using a 5 MHz transducer. The ultrasound images, report and the patient's case notes were then reviewed.

RESULTS

Eleven patients were entered into the series with an age range of 29-70 years (mean 47). There were eight males and three females. All patients showed an abnormal liver texture on ultrasound. They were divided into two groups: group A, consisting of seven patients, represented those patients in whom a diagnosis of granulomatous liver disease was suggested at the time of the ultrasound examination, and group B, consisting of four patients, represented those in whom an abnormality of the liver was noted during the ultrasound examination but no specific diagnosis was suggested. The final diagnosis was unknown in 10 patients at the time of scanning. Clinical details of both groups are given in Table 1.

All 11 liver ultrasound scans showed small, moderately echogenic lesions 3-5 mm in diameter in the liver. They were each surrounded by an hypoechoic halo (Fig. 1). Three patients had similar lesions in the spleen (Fig. 2).

Review of the ultrasound reports showed that of the four patients in group B, three were described as having increased attenuation in the liver consistent with fatty change and diffusely increased echoes throughout the liver of uncertain significance. The fourth patient was described as having fatty change alone. Biopsy in all four patients showed fatty change in addition to granulomata.

Histology

The epithelioid granuloma is the histological hallmark of granulomatous hepatitis and is formed by the aggregation of epithelioid macrophages and tissue histiocytes which become surrounded by variable numbers of small lymphocytes. Multinucleated giant cells formed by the coalescence of epithelioid cells, and known as Langhan's giant cells, may be seen. In tuberculosis, the granulomas may undergo central necrosis and reticulin forms around the granuloma which eventually undergoes fibrosis. Sarcoïd granulomata do not undergo necrosis (Fig. 3).

DISCUSSION

Parenchymal liver disease is increasingly recognised using ultrasound. A description of the parenchymal patterns and the presence or absence of attenuation of ultrasound that is observed in patients with fatty liver, fibrosis and a combination of both has been provided by Saverymuttu et al. (1986). Subsequent studies in which attenuation was measured have confirmed the impression that the increased attenuation is due to steatosis (Taylor et al., 1986; Garra et al. 1987).

Hepatic involvement in tuberculous infection is not uncommon. The commonest form is miliary infection in which nodules of 0.5-2 mm in diameter are found in the liver in 80% of patients at post-mortem (Korn et al., 1959). Much less common is macronodular involvement. These nodules are 2-3 cm in diameter and represent intrahepatic tuberculosis. There is little published information on the ultrasound features of tuberculous hepatitis but there are several case reports of tuberculous hepatitis being confused with metastatic disease (Zipser et al., 1976; Fernandes et al., 1984; Forward et al., 1985). These authors describe single or multiple nodules appearing as defects on an isotope liver scan and as hypo-echoic lesions on ultrasound scan. Two patients with miliary tubercul-
Table 1 - Clinical details of the patients

<table>
<thead>
<tr>
<th>No.</th>
<th>Age</th>
<th>Sex</th>
<th>Clinical features</th>
<th>Biopsy Site of ultrasound abnormality</th>
<th>Diagnosis</th>
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<tr>
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<tr>
<td><strong>Group A</strong></td>
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</tr>
<tr>
<td>1</td>
<td>34</td>
<td>M</td>
<td>Elevated LFTs</td>
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<td>2</td>
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<td>F</td>
<td>Malaise</td>
<td>+ Liver</td>
<td>Sarcoidosis</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
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<td>Dyspnoea Cough Fever</td>
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<td>4</td>
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<td>5</td>
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<td>Jaundice Diarrhoea Weight loss</td>
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<td>7</td>
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<td><strong>Group B</strong></td>
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<td>23</td>
<td>M</td>
<td>Malaise Fever</td>
<td>+ Liver</td>
<td>Brucellosis</td>
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LN—lymph nodes
LFTs—liver function tests

Fig. 1 - An ultrasound scan through the liver showing multiple, small, echogenic lesions each with an hypoechoic halo (arrows).

sarcoidosis in whom liver ultrasound showed hypoechoic lesions of 0.5–2 cm in diameter have been described (Blangy et al., 1988). In addition, Abiri et al. (1985) have reported three patients with miliary tuberculosis in whom ultrasound showed enlargement of the liver and abdominal lymphadenopathy, but no comment was made on the appearance of the liver parenchyma.

We can trace no reports on the ultrasound appearances of sarcoidosis or brucellosis in the liver.

Care should be exercised when examining the liver for granulomata as they can be overlooked if there is coincident fatty change. The appearance of multiple, small, echogenic lesions in the liver or spleen surrounded by a hypoechoic halo should be interpreted with caution as both mycotic abscesses and multiple metastases may also have this appearance (Fig. 4) although other features may be present; for example evidence of the primary lesion. Furthermore, patients with multiple abscesses and lymphoma may be found to have multiple small hypoechoic lesions on liver ultrasound (Fig. 5).

In summary, we believe that granulomata can be demonstrated in the liver using ultrasound. If the described appearances are seen on a liver ultrasound examination, a diagnosis of granulomatous liver disease should be considered.

REFERENCES


Fig. 3 - Haematoxylin and Eosin stained section (magnification × 66) of the liver showing two non-caseating granulomata of sarcoidosis.

Fig. 4 - An ultrasound scan through the liver of a patient with biopsy proven metastatic adenocarcinoma. Lesions similar to those in Figs 1 and 2 are seen (arrows).

Fig. 5 - An ultrasound scan through the liver of a patient with biopsy and culture proven *Strep. millei* microabscesses. Multiple hypoechoic lesions are seen, some of which resemble those in Figs 1 and 2.


