Atypical sonographic appearance of a hepatic haemangioma in the presence of fatty infiltration

K. Gopal*, R. Kasturi, S. Sukumar

South Manchester University hospitals, Wythenshawe, Manchester, UK

Introduction

Haemangioma of the liver is a common benign tumour with a reported incidence of up to 20% in the general population. They are more common in women with a female to male ratio of 5:1. These are usually asymptomatic with few associated complications and are managed conservatively. It is therefore important to make an accurate diagnosis. The typical hepatic cavernous haemangioma presents no diagnostic difficulty, but atypical appearances can lead to diagnostic errors.

Case report

A 45-year-old woman presented with weight gain and abdominal distension. Her past medical history included hysterectomy for carcinoma of the cervix (20 years before this presentation). Clinical examination and laboratory blood tests were normal.

On ultrasonography, well-defined circular lesions measuring approximately 3 cm, with decreased echo reflectivity surrounded by a focal area of echogenicity were seen in both lobes of the liver (Figs. 1 and 2). Given the background of previous malignancy, a metastasis was suggested. Subsequent contrast-enhanced computed tomography (CT) showed these well-defined lesions with strong vascular enhancement, raising the possibility of haemangiomata. These lesions were noted to be surrounded by a focal area of decrease attenuation (Fig. 3). Magnetic resonance imaging (MRI) of the liver was then performed because of the discrepancy between the two techniques. On heavily T2-weighted MRI these lesions showed high signal intensity similar to that of cerebrospinal fluid (CSF; Fig. 4). On in-phase T1-weighted imaging, the focal area of hyperechogenicity on ultrasound, exhibited a high signal intensity, which on out-of-phase T1-weighted imaging lost its signal, thereby confirming the signal characteristics of fat (Figs. 5 and 6). The diagnosis of multiple haemangiomas on the background of focal fatty infiltration was confirmed using MRI.

Discussion

Hepatic haemangioma is the most common benign liver tumour and the second most common tumour after hepatic metastases. It is usually asymptomatic, but may also present with pain due to partial infarction or pressure on the surrounding tissues. They may also rupture but this occurs infrequently. The management is usually conservative and very rarely involves surgical excision.

The typical hepatic cavernous haemangioma presents no significant diagnostic problems on imaging. These lesions appear hyperechoic and homogeneous with well-defined margins and posterior acoustic enhancement. There is usually no detectable signal within the lesion on Doppler examination due to slow flow in the vascular channels. On CT, haemangioma appears as a hypoattenuating lesion on non-contrast images,

E-mail address: karthikgopal73@yahoo.co.uk

Figure 1 Ultrasound shows a well-defined hypoechoic lesion surrounded by a focal area of hyperechogenicity in the right lobe of liver.
which shows peripheral globular enhancement on arterial phase CT. Delayed imaging shows centripetal enhancement that progresses to uniform filling. On using MRI, haemangiomas appear as well-defined high signal intensity lesions on T2-weighted images, which are identical to CSF. The gadolinium enhancement is similar to that of iodinated contrast enhancement on CT. The above characteristic findings do depend on the size of the lesion and most lesions between 2-4 cm are easily diagnosed using imaging. However, small haemangiomas (<1.5 cm) are difficult to characterize as they do not possess the classic globular enhancement. These lesions present as tiny enhancing dots in the haemangioma with a propensity to slow fill in, producing an appearance of a “bright dot”. Whereas larger lesions (>4 cm) often have atypical internal features such as an area of central fibrosis, which can prevent complete contrast medium uptake on both CT and MRI, and in some cases the larger lesions take in excess of 10 min to opacify. On ultrasound atypical lesions may appear heterogeneous.

Fatty infiltration of the liver is a common finding and may be focal or diffuse. It may change the typical appearance of the haemangioma making it difficult to characterize on imaging and often other imaging techniques are required to diagnose these lesions. When fatty infiltration occurs, haemangioma appear hypoechoic, isoechoic or hyperechoic relative to the fatty liver on ultrasound examination, which is due to the increased echo texture of the surrounding liver. Similarly on non-enhanced
CT, haemangioma may appear hyperattenuating relative to the fatty liver. Contrast enhancement is similar to its typical appearance.\(^1\,^5\) On MRI, haemangioma is typically high signal on T2 (Fig. 4) with characteristic gadolinium enhancement similar to that seen on CT. On T1-weighted gradient-echo (GRE) in-phase imaging, high signal is seen surrounding the haemangioma, which on out-of-phase imaging is low signal, confirming fat (Figs. 5 and 6). MRI thus allows a confident diagnosis of haemangioma in the presence of fatty liver.\(^11\)

Other atypical appearances of haemangioma include an echoic border on ultrasonography, rapidly filling heterogeneous haemangioma, calcified, hyalinized, cystic or multilocular haemangiomas.\(^12\,^13\)

Haemangiomas on a background of fatty liver produce an atypical appearance on ultrasound. A specific diagnosis can be established with other imaging techniques, especially MRI. Although haemangioma in the presence of fatty liver is uncommon, knowledge of this helps to avoid diagnostic errors.

### References