Case report

Med Ultrason 2014; 16(1): 70-74
DOI: 10.11152/mu.2014.2066.161.lc1rb2


Liliana Chiorean1, Radu Badea1, Sorin Dudea1, Olimpia Chira1, Simona Manole1, Cosmin Caraiani1, Cosmin Puia1, Toader Zaharie1

1Department of Radiology and Computed Tomography, “Octavian Fodor” Institute of Gastroenterology and Hepatology, 2Department of Ultrasonography, “Octavian Fodor” Institute of Gastroenterology and Hepatology, “Iuliu Hatieganu” University of Medicine and Pharmacy, 3Radiology Department, Emergency County Hospital, “Iuliu Hatieganu” University of Medicine and Pharmacy, 4Department of Gastroenterology, “Octavian Fodor” Institute of Gastroenterology and Hepatology, 5Department of Surgery, “Octavian Fodor” Institute of Gastroenterology and Hepatology, “Iuliu Hatieganu” University of Medicine and Pharmacy, 6Department of Pathology, “Octavian Fodor” Institute of Gastroenterology and Hepatology, Cluj-Napoca, Romania

Abstract

Focal nodular hyperplasia (FNH) is a hepatic disease first described in 1958. The existence of an accessible and minimally invasive imagistic investigation to establish the diagnosis in a large number of cases would be desirable, especially because once diagnosed, the disease needs no treatment. We present the case of a young woman with long term use of oral contraceptives in which the diagnosis of FNH was established at a routine ultrasound. Evolution of disease during the pregnancy and the atypical imagistic aspect of liver lesions raised many problems of differential diagnosis.

Keywords: focal nodular hyperplasia, liver, contrast-enhanced ultrasound, pregnancy, oral contraceptives.

Introduction

Focal nodular hyperplasia (FNH) is a benign liver disease with pathogenesis and evolution frequently associated with high estrogenic levels, situation sustained by the disease’s prevalence in women between 20 and 50 years of age [1]. The exact pathogenesis of FNH remains uncertain, the possible cause being a hyperplastic response to a regenerative non-neoplastic nodule caused by a congenital vascular malformation [2,3]. The association between multiple FNH and hemangiomas is known as the syndrome of multipless FNH [4]. The differential diagnosis includes other hypervascular liver lesions (adenomas, hepatocellularomas, hypervascular metastasis) [5]. Although the condition usually has no clinical significance, the recognition of its imagistic issues is important to avoid inutile diagnostic procedures (biopsy, surgery). In cases in which the imagistic diagnosis cannot be done certainly, biopsy (percutaneous or laparoscopic) or surgery are necessary [6].

We present the case of a young woman with FNH in which the evolution of liver lesions during pregnancy, along with the imagistic appearance has raised problems of differential diagnosis, requiring histopathological examination.

Case report

A 34 years old woman, pregnant in the first trimester (first pregnancy), was evaluated by abdominal ultrasound (US) during a routine visit. A hypoechoic, well defined 6/4.5 cm focal liver lesion (FLL) in the fourth hepatic segment was described (fig 1a). Doppler examination identified two arterial axes crossing the lesion and giving radial spoke-wheel-like branches. The suggestive echographic appearance, the absence of clinical symptoms and the use of oral contraceptives for a long time (about 11 years), have focused the diagnostic towards FNH. For a more accurate diagnosis, a contrast-enhanced ultrasound (CEUS) was recommended, but the examination was postponed (the procedure is contraindicated in pregnancy).

Pregnancy and birth have been normal and at four months postpartum, the patient was reevaluated. This time many FLLs were detected (at least eight). In the fourth hepatic segment there were three adjacent lesions stretching over an area of 10/5 cm (fig 1b). The other lesions, having dimensions between 1 and 3 cm, were localized at the level of both hepatic lobes. It was considered that the condition has a progressive feature, raising questions about the diagnosis of FNH and further investigation was decided.

A computed-tomography (CT) has been performed. The lesions were hypodense on the native examination, with intense, homogenous enhancement in early arterial phase (fig 2a), becoming isoenhanced with the surrounding liver parenchyma during the portal venous phase (fig 2b) and slightly hypoechoenanced during the late phase, at 3 minutes after contrast agent injection. The central scar was sketched at the level of the biggest lesions during the late phase, at 45 minutes after contrast-agent injection. The imagistic aspect further supported the initial diagnosis of FNH but, given their large number and the rapid evolution in time, the patients was referred to our department.

The liver US was repeated and completed with CEUS, located in segment IV, occupying an area of ~ 10/5 cm.

Fig 1. Grey scale ultrasonography, transversal section: a) hypoechoic focal liver lesion, at the level of segment IV, well defined, having dimensions of ~6/4.5 cm; b) in evolution, three adjacent focal liver lesions, located in segment IV, occupying an area of ~10/5 cm.

Fig 2. Abdominal CT, axial sections: a) the lesions show intense, homogenous contrast agent enhancement, with central scar unenhanced during early arterial phase; b) the lesions became isoenhanced compared to the surrounding liver parenchyma during portal venous phase.

Fig 3. CEUS examination, centered on the lesions from the segment IV: a) the lesions are hyperenhanced during arterial phase, showing early and homogenous enhancement; b) early “wash-out” in portal phase; c) the lesions being completely washed in late

tense intake of the contrast agent, with filling from center to periphery, with complete enhancement at 20 seconds after injection and with intense “wash-out” from the portal phase, the lesions being completely washed in late

Fig 4. Abdominal MRI: a) T2-weighted MRI showed slightly hypointense lesions with a more hypointense central scar; b) in the arterial phase, enhanced dynamic T1-weighted MRI, the lesions were hypointense but the central scar remained hypointense; c) in the late venous phase, the lesion remained hypointense compared to the surrounding liver parenchyma, with hypointense signal at the level of central scar.

Fig 5. The macroscopic intraoperative aspect

Hyperintense lesion at the level of central scars. Complete blood tests have been done, all the results were normal.

Discussion

FNH is the second most common benign hepatic tumor after hemangioma, with an incidence of approximately 3-5% in general population and higher prevalence in women (12:1) [3,8]. Usually it is asymptomatic, rarely grows or bleeds, and has no malignant potential [9]. Most of the time it is incidentally discovered [10]. Reported incidence of the symptomatic cases is largely variable (from 10% to 59%), the most frequent symptom being the right upper quadrant pain [9]. The disease is divided from a morphopathological point of view in two groups: typical and atypical [5]. The typical cases (80%) of FNH are characterized by the presence of three coexisting histological changes: abnormal nodular architecture, malformed vessels and proliferation of bile ducts. In atypical cases, the abnormal architecture or the malformed vessels are missing, the proliferation of biliary ducts being always present [4].

US is the first method used for detection of this lesion. In gray scale, FNH has a variable aspect: hypo-, iso-, or slightly hyperchoic. Sometimes a peripheral hypchoic halo can be seen, due to the compression of the surrounding liver parenchyma or the presence of some blood vessels [5].

CT examination brings additional information about vascularization [11]. At CEUS, particularly pattern of enhancement of FNH during the arterial time is a centrifugal, “spoke-wheels”-like fill-in that starts less than 30 seconds after contrast-agent injection [aspect present in > 90% of lesions larger than 3 cm] [12]. Usually, the enhancement is maintained in the portal and late venous phases [13].

Several studies have been published reporting the imaging characteristics of FNH, using the portal phase imaging. The portal venous phase at the onset of pregnancy can be assumed. However, the presence of pathologic phenomena in arterial phase does not exclude the diagnosis of FNH [13].

The presence of three coexisting histological changes: abnormal nodular architecture, malformed vessels and proliferation of bile ducts, allows the diagnosis of FNH [5,15]. MRI has sensibility of 70% and specificity of 98% for FNH diagnosis [16]. The lesions typically appears iso- or hypointense on T1 sequences (94-100%), homogenous (96%), with a hyperintense central scar on T2 sequences, aspect which appears in 84% of cases of FNH (16,17). The lesions typically appears homogenous during the arterial phase, becoming hyperdense, except for the central scar which remains unenhanced. The lesion is isodense during the portal phase and in the late phase the enhanced, hyperdense central scar can be seen [5,15].

Final diagnosis of FNH can be made when two imagistic examinations formulates the same result, in clinical and imagistic examinations formulates the same result, in clinical FNH is the second most common benign hepatic tumor after hemangioma. Possible conditions.

References


