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# Focal fatty change in the liver: Report of two cases which were difficult to distinguish from a neoplastic tumor in the liver

Eiji Nozato, Masayuki Shiraishi, Takao Miyaguni, Takashi Oushiro, Hideaki Shimoji and Yoshihiro Muto

*First Department of Surgery, Faculty of Medicine, University of the Ryukyus*

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## ABSTRACT

The presence of fatty change in the liver can be diagnosed by routine screening examinations, such as ultrasonography or computed tomography. However, when it takes a focal shape (focal fatty liver), an accurate diagnosis is not as easy as for diffuse fatty changes in the liver. In this report, we present two cases of focal fatty change of the liver which were finally diagnosed by biopsies. Ultrasonography showed an irregular hyperechoic area (2.5×2.2cm) located in the left median lobe (segment 4) of the liver in the first case, and an irregular hypoechoic area (2.3cm in diameter) located in segment 7 in the second case. Computed tomography (CT) and hepatic arterialangiography in case 1, CT and magnetic resonance imaging (MRI) in case 2 could not establish a final diagnosis. A final diagnosis of focal fatty change was only possible by means of a percutaneous fine needle biopsy in the first case and an open needle biopsy in the second. Regarding pathology, both regions contained various sized lipid droplets in the cytoplasm of the hepatocytes. In conclusion, these cases indicated that focal fatty change may not demonstrate any particular appearance using conventional diagnostic modalities, and therefore a needle biopsy is thought to be mandatory for making a differential diagnosis. *Ryukyu Med. J., 17(4)223~227, 1997*

Key words: focal fatty change, liver tumor, hepatocellular carcinoma, cholangiocellular carcinoma

## INTRODUCTION

Diffuse fatty change of the liver is a well recognized entity and is usually detected by either ultrasonography (US) or computed tomography (CT). On the other hand, focal fatty change of the liver tends to be a poorly recognized entity[1-3]. Focal fatty change has been diagnosed in patients ranging in age from 20 to 80 years-old with no difference in gender[3,4]. The imaging patterns of this entity in CT or US vary among the cases, depending on the amount of fat deposits and its distribution in the liver. When focal fatty change is irregularly distributed, it demonstrates a segmental geographic pattern or occasionally appears as a space occupying region[4,5]. These regions are often difficult to differentiate from neoplastic tumors using conventional diagnostic procedures. We herein report two cases of focal fatty change of the liver which could not be diagnosed with conventional diagnostic procedures.

## CASE REPORTS

Case 1

A 37-year-old-Caucasian male was referred to our department, on September 19, 1996 for evaluation of a hyperchoic area of the liver which had been incidentally pointed out at a US screening. He had no history of liver disease, alcohol or drug abuse. On admission, he did not show any abnormal physical signs or abdominal symptoms. He was 168cm tall and weighed 71kg with a BMI (body mass index) of 25.1. The laboratory data were all normal, and HBs-antigen, HCV-antibody, tumor-markers (AFP, CEA and CA19-9) were also within the normal range.

Abdominal US showed an irregular hyperechoic area (2.5×2.2cm) in the left medial segment (segment 4) (Fig. 1). Dynamic CT and CT angiography also showed an irregular low density area (2×2.5cm) with an enhanced rim at its margin (Fig. 2, 3). Hepatic angiography showed neither tumor staining nor any vascular abnormality. Since a definite diagnosis could not be made

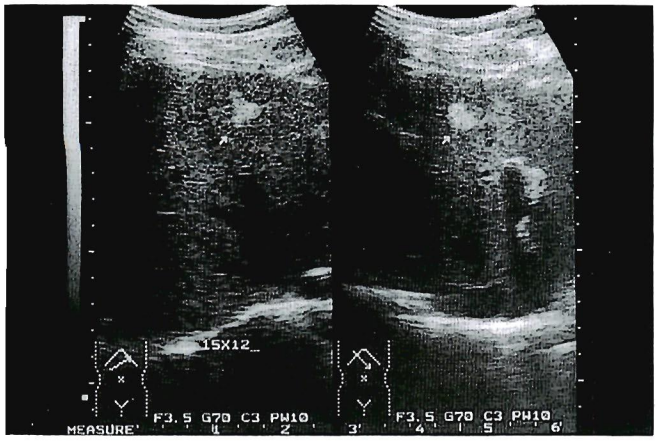


Fig. 1 Ultrasonography showing an irregular hyperechoic area lying below the left medial segment (Case 1).

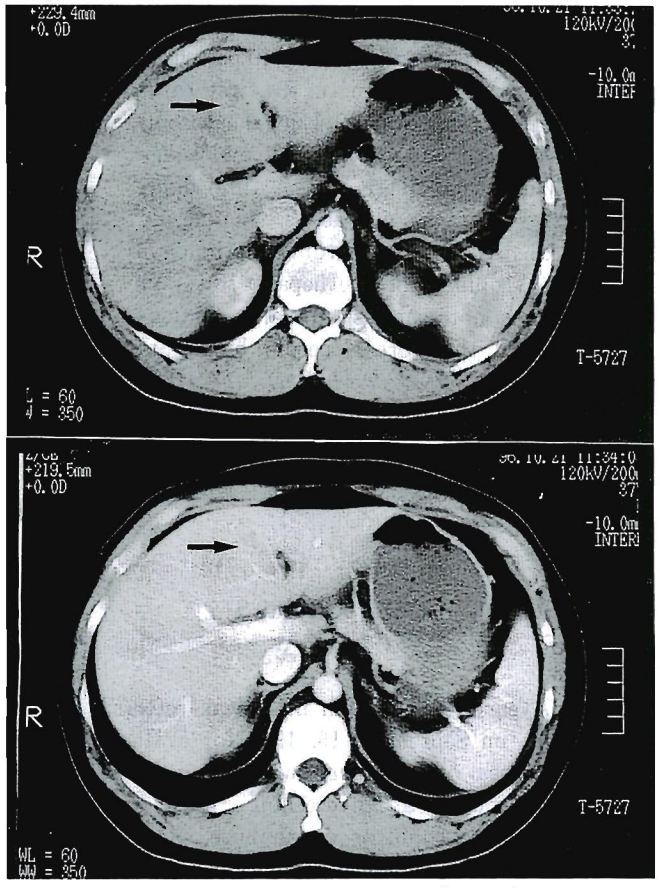


Fig. 2 Dynamic CT in early phase (above) showing a slightly marginal enhancement effect of the low density region, while in the delayed phase (below), enhancement effect was unclear (Case 1).

based on these diagnostic measures, an echo-guided percutaneous fine needle biopsy was thus performed. The histologic examination showed the hepatocytes to contain various sized lipid droplets (Fig. 4).

Case 2

A hypoechoic region of the liver was pointed out in

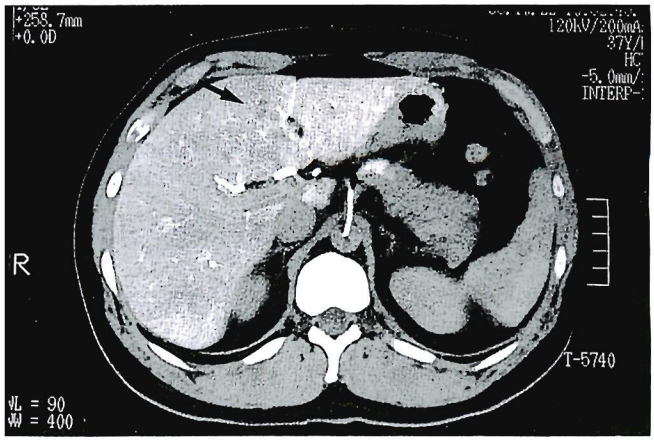


Fig. 3 CT angiography findings were identical to the dynamic CT findings (Case 1).

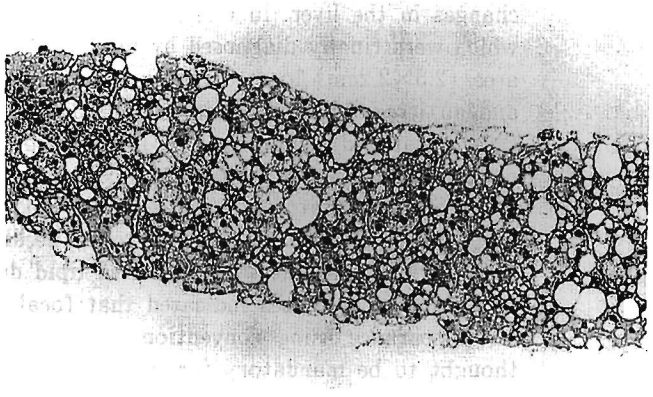

Fig. 4 A microphotograph of the biopsied specimen showing various sized lipid droplets (Case 1). (HE, ×25)

a 69-year-old female by US screening. She was diagnosed as having hepatic malignancy and was thus referred to our department on October 25, 1996. She had no history of liver disease, alcohol or drug abuse. Regarding family history, her elder brother had died of liver cirrhosis accompanied with hepatoma at 70 years of age.

On admission, she did not demonstrate any particular clinical symptoms or abnormal physical signs. She was 147cm tall and weighed 48kg with a BMI of 22.2. Regarding the laboratory data, she had hyperlipidemia (total cholesterol 258mg/dl, triglyceride 369mg/dl) and normal tumor marker levels (AFP, CEA and CA19-9). HBs-antigen and HCV-antibody were negative.

US showed an irregular hypoechoic region (2.3 cm in diameter) in the posterosuperior segment of the liver without any apparent finding of fatty change around the hypoechoic area (Fig. 5). Since she was hypersensitive to iodine, enhanced CT could not be performed. Plain CT showed an irregular low density area in segment 7 of the liver (Fig. 6). This region appeared as a low-intensity area on the T1 weighted MR images, and as a high-intensity area on T2 (Fig. 7). Since we could not rule out either cholangiocellular carcinoma

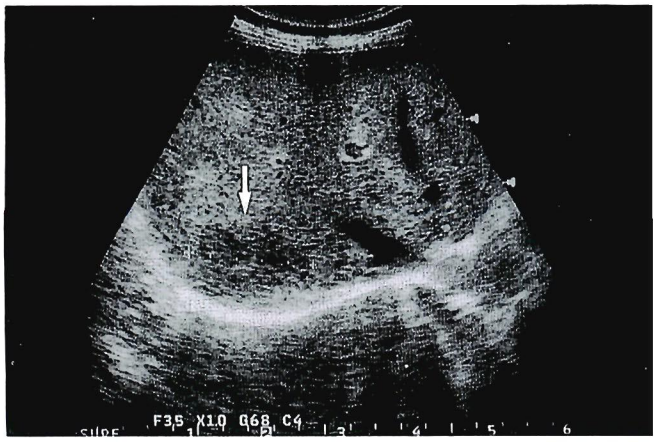

Fig. 5 Ultrasonography showing an irregular hypoechoic area in the posterosuperior segment (Case 2).

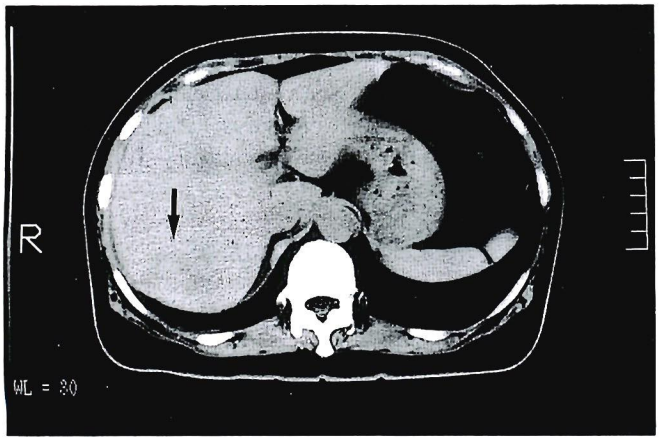

Fig. 6 A plain CT showing an irregular low density area (Case 2).

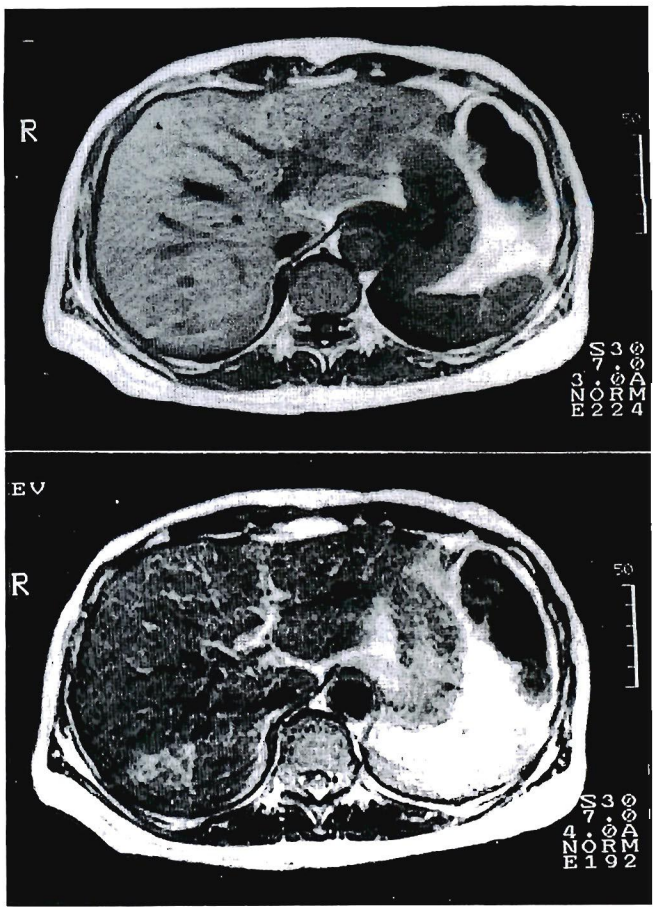

Fig. 7 In MRI, the region shows low-intensity on the T1 weighted image (above) and iso-intensity on the T2 weighted image (below) (Case 2).

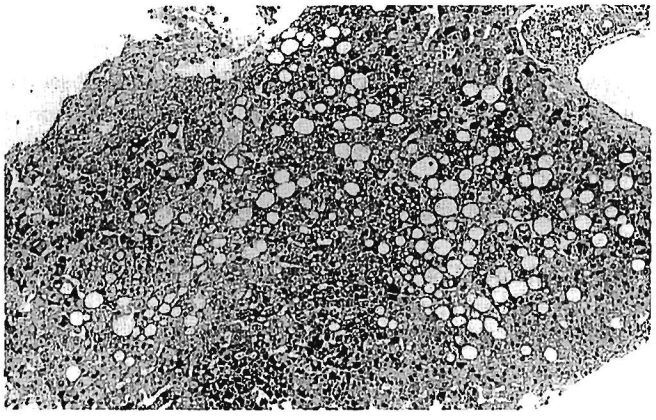

Fig. 8 A microphotograph of the biopsied specimen showing various sized lipid droplets (Case 2). (HE, ×50)

or some other hepatic malignancy in the differential diagnosis, a laparotomy was performed on November 12, 1996. At laparotomy, the liver demonstrated a dark red color, and no tumor mass was palpable. There was a fibrotic scar tissue on the surface of the posterior superior segment. By an intra-operative US, the hypoechoic region was detected just beneath the scar tissue which was the same finding as that observed in the preoperative US. An echo-guided needle biopsy was thus performed in this region, and the histology of the frozen section revealed fatty change in the liver. In a pathologic study of the biopsied specimen, the hepatocytes contained various sized lipid droplets and hepatocellular ne crosis was also observed around the areas of fatty change (Fig. 8).

## DISCUSSION

Two cases of focal fatty change of the liver, which could not be differentiated from the neoplastic region, have been presented in this report. In both of these cases, irregular shaped hepatic regions were incidentally found by routine abdominal US screening. However, the US images of these two cases were not similar, namely, the regions were hyperechoic in case 1 and hypoechoic in case 2. On abdominal CT, the regions were recognized as low density areas.

Kiran *et al.* classified the US appearances of fatty infiltration of the liver into a geographic pattern, focal involvement by fatty infiltration and focal sparing by

fatty infiltration[6]. According to this classification, our cases might thus be classified into the focal involvement category since no surrounding fatty change was observed. The regional shapes, segmental or lobar wedge distribution without any mass effects, were also characteristic in these regions[6]. In our cases, these regions were also located peripherally close to the liver capsule, and thus we could not evaluate the mass effects correctly based on the observed dislocation of the hepatic vascular structures.

On CT imaging, focal fatty change is known to be visualized as an irregular low density area without being enhanced by contrast medium[3,6]. In case 1, however, there was an atypical enhanced rim around the region which suggested some hypervascular change to have occurred around the region. Previous reports have described an MR image of focal fatty change to be recognized as a high-intensity area on the T1 weighted image, and as an iso-intensity area on T2[7]. However, in case 2, the region was detected as a low-intensity area on the T1 weighted image, and as a high-intensity area on T2. These findings of MR thus indicate that the region might contain more vascular components than usual. These series of imaging features in our cases showed a tumor-like region in the liver, but a differential diagnosis with a true tumor such as hepatocellular carcinoma (HCC), cholangiocellular carcinoma or some benign tumor was difficult. HCC is the most frequent malignancy in the liver, and sometimes HCC demonstrates fatty metamorphosis in cancer cells. From previous reports, HCC with fatty metamorphosis has been characterized by a mosaic pattern in US, CT and MRI, the existence of capsular formation in the US, angiogram, CT and dynamic MRI findings[8-10]. In our cases, an atypical enhanced rim around the region was observed on CT in case 1, but neither a mosaic pattern nor a septum in the tumor could be observed in either case.

Fatty change in the liver usually occurs in a diffuse form throughout the liver[3,11,12]. This homogenous fatty change of the liver, commonly called "fatty liver", can often be detected in daily practice and is associated with many pathogenetic factors such as alcohol, obesity, drugs (e.g. steroids, tetracycline, anticancer agents), malnutrition (e.g. kwashiorkor, short bowel syndrome), congestive heart failure, diabetes, hyperlipidemia, pregnancy and so on[2,4,11-14]. However, our cases did not demonstrate any of these pathogenetic factors except for hyperlipidemia in case 2. As a result, no pathogenetic factors could be specified as a causative factor of the atypical pattern of the focal fatty change in our cases.

Brawer *et al.* considered the focal tissue hypoxia to be the cause of focal fatty change, because the focal fatty change mainly occurs at the site of the subcapsular region or median segment of the liver which is the site periphery to the portal venous and hepatic arterial circulation[4]. In case 1, the region was located in the median segment of the liver that is watershed of the right and left hepatic artery[4]. These anatomic features might be the reason why the regional tissue hypoxia leads to focal fatty change. As a result, the hypervascularity around the focal fatty change in the CT image might thus be thought to occurr secondary to tissue hypoxia. On the other hand, in case 2, hepatocellular necrosis was recognized in a pathologic study and scar tissue formation was observed macroscopically. We thus hypothesized that these inflammatory processes might have induced hypervascularity, which resulted in the imbalance of local blood perfusion, and finally contributed to the appearance of focal fatty change in specific areas of the liver.

In conclusion, we have presented two cases of focal fatty change in the liver which demonstrated unusual features on various imaging studies. One case revealed inflammatory changes in macroscopic and pathological studies. Our cases indicated that focal fatty change may sometimes not demonstrate any particular appearance in conventional diagnostic measures, and therefore a needle biopsy is thought to be mandatory for the differential diagnosis.

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## REFERENCES

1) Mulhern C.B. Jr., Arger P.H. and Coleman B.G.: Nonuniform attenuation in computed tomography study of the cirrhotic liver. Radiology 132: 399-402, 1979.
2) Scott W.W. Jr., Sanders R.C. and Siegelman S.S.: Irregular fatty infiltration of the liver: diagnostic dilemmas. AJR 135: 67-71, 1980.
3) Robert A.H., Melvyn K., Panol C.R. and William M.T.: CT Appearance of Focal Fatty Infiltration of the Liver. AJR 139: 277-281, 1982.
4) Michael K.B., Garth E.A. and Klaus J.L.: Focal Fatty Change of the Liver, a Hitherto Poorly Recognized Entity. Gastroenterology 78: 247-252, 1980.
5) Kimura K.: irregular fatty change: Fukubu-echo no ABC Takehara Y., Akimoto S. and Kimura K., 204-205, Nihon Ishikai, Tokyo, 1992 (in Japanese).
6) Kiran A.J. and John P.M.: Spectrum of CT and Sonographic Appearance of Fatty Infiltration of the Liver. Clinical Imaging 17: 162-168, 1993.
7) Banba T. and Fukano M.: Focal fatty change of the liver. Ryoikibetsu-Shokogun-Shirizu 8: 14-17, 1995 (in Japanese).
8) Tanaka S., Kitamura T., Sasaki Y., Taniguchi H. and Ishiguro S.: Hepatocellular Carcinoma: Sonographic and Histologic Correlation. AJR 140: 701-707, 1983.

9) Yoshikawa J., Matsui O., Takashima T., Ida M., Takanaka T., Kawamura I., Kakuda K. and Miyata S.: Fatty Metamorphosis in Hepatocellular Carcinoma: Radiologic Features in 10 Cases. AJR 151: 717-720, 1988.
10) Ohashi I., Sasaki Y., Imaoka S., Masutani S., Iwamoto S., Furukawa H., Ishikawa O., Kabuto T., Kameyama M., Koyama H., Iwanaga T., Inoue E., Fujita M. and Ishiguro S.: Three cases of primary hepatic lipomatous tumors. Acta Hepatologica Japonica 33: 636-642, 1992 (in Japanese).
11) Tanaka N.: Fatty Liver. Ryoikibetsu-Shokogun-Shirizu 8: 18-20, 1995 (in Japanese).
12) Clain J.E., Stephens D.H. and Charboneau J.W.: Ultrasonography and Computed Tomography in Focal Fatty Liver Report of Two Cases With Special Emphasis on Changing Appearances Over Time. Gastroenterology 87: 948-952, 1984.
13) Matsui O., Takahashi S., Kadoya M., Yoshikawa J., Gabata T., Takashima T. and Kitagawa K.: Pseudolesion in Segment of the Liver at CT during Arterial Portography: Correlation with Aberrant Gastric Venous Drainage. Radiology 193: 31-35, 1994.
14) Nishimoto H., Obara S., Morita K., Uechi O., Nishioka M., Yoshida J. and Maeda C.: A Case of Focal Fatty Liver Difficult to Distinguish from the Liver Metastasis of Rectal Cancer on CT. Rinsho-Hoshasen 34: 367-70,1989 (in Japanese).