Eur Radiol (2003) 13:2233–2235
DOI 10.1007/s00330-002-1731-5

LETTER TO THE EDITOR

Masamitsu Hatakenaka
Toshisada Adachi
Ayumi Matsuyama
Masaki Mori
Yasuji Yoshikawa

Xanthogranulomatous cholecystitis: importance of chemical-shift gradient-echo MR imaging

Received: 6 September 2002
Accepted: 27 September 2002
Published online: 13 February 2003

M. Hatakenaka (✉) · T. Adachi
Department of Radiology,
Medical Institute of Bioregulation,
Kyushu University, 874–0838 Beppu, Japan
e-mail: hatake@beppu.kyushu-u.ac.jp
Tel.: +81-97-7271720
Fax: +81-97-7271607

A. Matsuyama · M. Mori
Department of Surgery,
Medical Institute of Bioregulation,
Kyushu University, 874–0838 Beppu, Japan

Y. Yoshikawa
Department of Pathology
and Laboratory Medicine,
Medical Institute of Bioregulation,
Kyushu University, 874–0838 Beppu, Japan

Sir,
We report a case of xanthogranulomatous cholecystitis (XGC) resembling gallbladder carcinoma in which the correct diagnosis was suggested by using chemical-shift gradient-echo MR imaging (CSI).

An 80-year-old man presented with nausea and loss of appetite. Physical examination revealed jaundice. Abdominal ultrasound revealed a diffusely thickened gallbladder wall and cholelithiasis. Contrast-enhanced CT of the abdomen revealed a mildly enhanced thickened gallbladder wall with cholelithiasis and choledocholithiasis. Hypoattenuated nodules in the gallbladder wall were hardly detected.

Magnetic resonance imaging was performed with a superconducting magnet operating at 1.5 T (Signa, General Electric Medical Systems, Milwaukee, Wis.). Conventional MR images also demonstrated the findings described above. Breath-hold CSI was performed using a fast multiplanar gradient-echo pulse sequence with transverse magnetization spoiling (Fig. 1). Echo times of 2.7 ms and 4.2 ms were employed for out-of-phase and in-phase images, respectively. The TE for CSI was automatically selected by the machine. In-phase and out-of-phase MR images were obtained using the same scanning condition, resonance frequency, receiving attenuation parameters, and transmit attenuation parameters except TE. A slightly high intensity area in the thickened gallbladder wall was shown in the in-phase image (Fig. 1b, region 2). The signal intensity of this region was slightly higher in the in-phase image than in the out-of-phase image. We considered that this result suggested the presence of a small amount of fat in the thickened gallbladder wall. Gadolinium-enhanced MR images revealed a mildly enhanced thickened gallbladder wall, although hypointense nodules were hardly detected. Our suggested radiological diagnosis was XGC with cholelithiasis and choledocholithiasis because fat was suggested in the thickened gallbladder wall.

At operation, the gallbladder wall was thickened diffusely and several gallstones were present. After cholecystectomy, choledocholithotomy was performed to remove the common bile duct stones. A CSI of the surgical specimen revealed almost the same findings as those of in vivo CSI (Fig. 2). A region (Fig. 2, region 1) in the gallbladder wall showed higher signal intensity in the in-phase image than in the out-of-phase image, suggesting the presence of fat.

The histological findings revealed markedly thickened adventitia of the gallbladder due to accumulation of foamy histiocytes and lymphocytes with focal replacement by fibrosis. The histological diagnosis was XGC

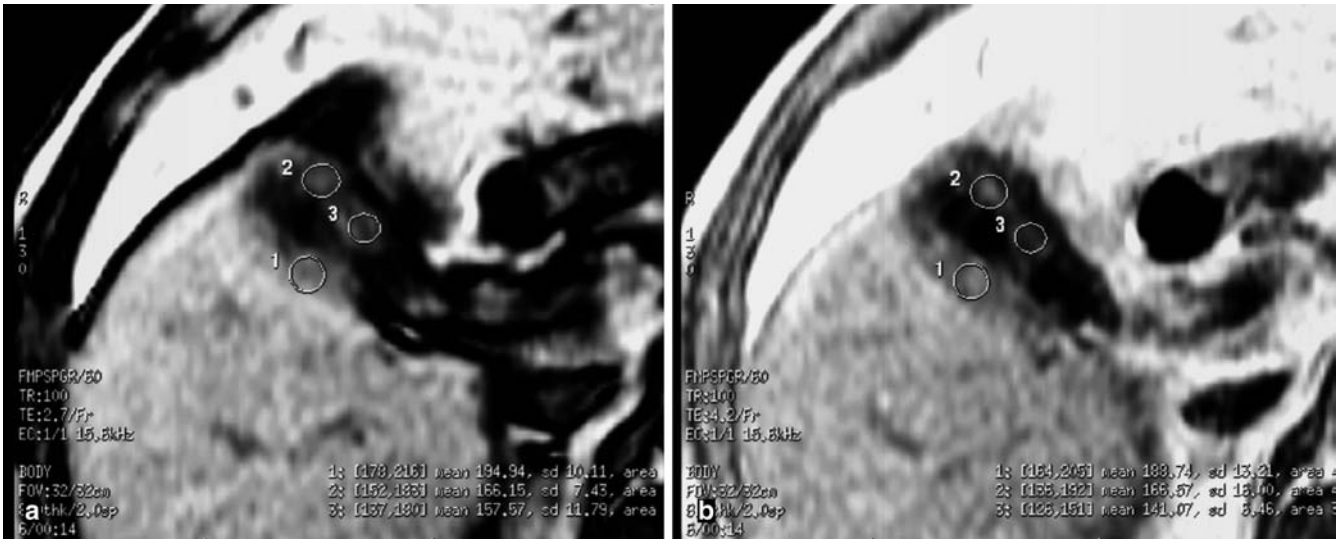

Fig. 1 **a** Chemical-shift gradient-echo MR imaging (CSI; out of phase) of the abdomen (fast multiplanar gradient-echo pulse sequence with transverse magnetization spoiling; TR 100 ms, TE 2.7 ms, flip angle 60°, 8-mm slice thickness, 2-mm slice gap, 256×128 matrix, one excitation). Signal intensity of regions *1–3* is 194.94, 166.15, and 157.57, respectively. **b** A CSI (in phase) of the abdomen (TE 4.2 ms). Signal intensity of regions *1–3* is 188.74, 166.57, and 141.07, respectively. Region *2* shows that the signal intensity is slightly higher in the in-phase image than in the out-of-phase image, suggesting the presence of fat. In-phase and out-of-phase images were obtained sequentially because simultaneous imaging was not possible with this MR system

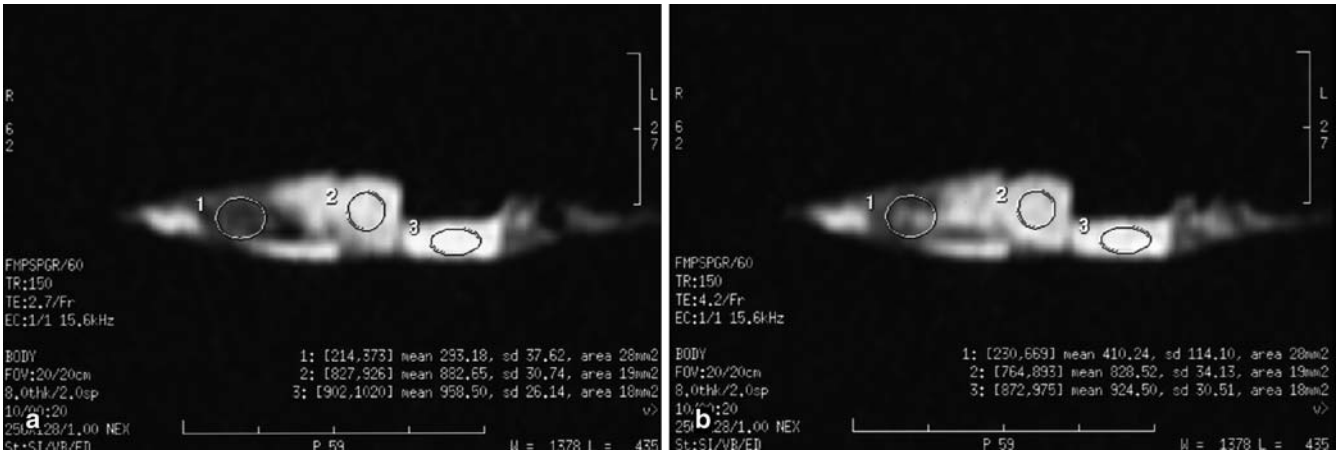

Fig. 2 **a** A CSI (out of phase) of the surgical specimen (fast multiplanar gradient-echo pulse sequence with transverse magnetization spoiling; TR 150 ms, TE 2.7 ms, flip angle 60°, 8-mm slice thickness, 2-mm slice gap, 256×128 matrix, one excitation). Signal intensity of regions *1–3* is 293.18, 882.65, and 958.50, respectively. **b** A CSI (in phase) of the surgical specimen (TE 4.2 ms). Signal intensity of regions *1–3* is 410.24, 828.52, and 924.50, respectively. Region 1 shows that the signal intensity is higher in the in-phase image than in the out-of-phase image, suggesting the presence of fat

with cholelithiasis and choledocholithiasis.

Differentiating XGC from gall bladder carcinoma is important for proper surgical management; however, overlaps of CT and sonographic features make it difficult. Several reports on XGC have concluded that hypoattenuated or hypoechoic area occupying a large area of thickened gall bladder wall can be suggestive of XGC [1, 2, 3]; however, correct diagnosis is difficult in cases like ours, which do not, probably due to a small extent or a small amount of fat content in xanthogranuloma, demonstrate a hypoattenuated or hypoechoic area in a thickened gallbladder wall.

The CSI in a 1.5-T unit has been reported to be sensitive for detection of cytoplasmic fat and useful in diagnosing hepatocellular carcinoma, adrenal neoplasm, and renal cell

carcinoma. In this case, we used this technique to detect a small amount of fat in the thickened gallbladder wall. Region 2 in Fig. 1 demonstrated slightly higher signal intensity in the in-phase image than in the out-of-phase image. According to the result, we suspected the presence of a small amount of fat and could make a correct diagnosis. Ex vivo MR images demonstrated the presence of fat in the thickened gallbladder wall more clearly compared with in vivo MR images. Slight location difference between in-phase and out-of-phase images due to sequential breath-hold imaging may account for this because simultaneous imaging was not possible with this MR system. We conclude that CSI may play an important role in differentiating XGC from gallbladder carcinoma especially in cases in which a hypoattenuated or hypoechoic area in a thickened gall bladder wall is obscure.

References

1. Chun KA, Ha HK, Yu ES et al. (1997) Xanthogranulomatous cholecystitis: CT features with emphasis on differentiation from gallbladder carcinoma. Radiology 203:93–97
2. Kim PN, Lee SH, Gong GY et al. (1999) Xanthogranulomatous cholecystitis: radiologic findings with histologic correlation that focuses on intramural nodules. Am J Roentgenol 172:949–953
3. Parra JA, Acinas O, Bueno J et al. (2000) Xanthogranulomatous cholecystitis: clinical, sonographic, and CT findings in 26 patients. Am J Roentgenol 174:979–983