—Case Reports—

Inflammatory Pseudotumor in the Liver Associated with Intrahepatic Bile Duct Stones Mimicking Malignancy

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Abstract

We describe a 71-year-old man with an inflammatory tumor arising in segment 5 of the liver. The patient was admitted because of acute pain in the right upper quadrant of the abdomen and fever. Initial laboratory tests revealed the following: serum alkaline phosphatase concentration, 634 IU/L; serum gamma glutamic transpeptidase concentration, 1,378 IU/L; serum C-reactive protein concentration, 0.89 mg/dL; and total bilirubin concentration, 8.9 mg/dL. Abdominal ultrasonography, computed tomography (CT), and magnetic resonance imaging showed a mass, 3 cm in diameter, in segment 5 of the liver. Magnetic resonance cholangiopancreatography showed a lesion of moderate-to-high signal intensity on T2-weighted images of segment 5. Endoscopic retrograde cholangiopancreatography revealed a common bile duct stone. The intrahepatic bile ducts of segment 5 could not be visualized after the use of contrast material. Endoscopic sphincterotomy was performed to remove the common bile duct stone. Antibiotics were administered soon after stone removal, and fever gradually resolved. Positron emission tomography revealed hot spots in segment 5 of the liver. Three weeks after discharge, the patient was readmitted with an acute pain in the right upper quadrant of the abdomen. Abdominal ultrasonography, CT, and magnetic resonance imaging showed enlargement of this area. Inflammatory changes of segment 5 due to cholangitis with intrahepatic bile duct stones was diagnosed. Because malignant disease could not be completely ruled out, segment 5 of the liver was resected. Macroscopic examination of the resected specimen revealed a gray, fibrotic, solid tumor associated with intrahepatic bile duct stones. Microscopic examination of the tumor showed proliferation of spindle-shaped myofibroblastic cells in a mixed myxoedematous, dense fibrotic stroma, associated with infiltration by various acute and chronic inflammatory cells. The postoperative course was uneventful, and the patient was discharged on postoperative day 16.
(J Nippon Med Sch 2009; 76: 154–159)

Key words: inflammatory pseudotumor, liver, intrahepatic bile duct stone

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Introduction

Inflammatory pseudotumor (IPT) is a rare benign lesion histologically characterized by a heterogeneous population of acute and chronic inflammatory cells, particularly plasma cells, macrophages, and fibroblasts, accompanied by areas of fibrosis and necrosis. Patients with IPT commonly have symptoms and laboratory findings suggestive of inflammation, but a definitive diagnosis is often difficult to establish in the absence of clinical abnormalities[1]. IPTs most frequently occur in the lung, but have also been reported in the stomach, retroperitoneum, orbit, central nervous system, and liver[2]. We report a case of IPT associated with intrahepatic bile duct stones mimicking malignancy.

Case Report

A 71-year-old man was admitted to Nippon Medical School Hospital with acute pain in the right upper quadrant of the abdomen and fever. The patient had a history of hypertension managed with medication. Initial laboratory tests revealed the following: serum aspartate aminotransferase concentration, 233 IU/L (normal, <28 IU/L); serum alanine aminotransferase concentration, 354 IU/L (normal, <33 IU/L); serum alkaline phosphatase concentration, 634 IU/L (normal, 66 to 220 IU/L); serum lactic dehydrogenase concentration, 232 IU/L (normal, 180 to 460 IU/L); serum gamma glutamic transpeptidase concentration, 1,378 IU/L (normal, 8 to 39 IU/L); serum C-reactive protein concentration, 0.89 mg/dL (normal, <0.3 mg/dL); total bilirubin concentration, 8.9 mg/dL (normal, 0.2–1.2 mg/dL); albumin concentration 4.1 g/dL (normal, 3.8–5.5 g/dL); and white blood cell count, 3,300/μL (normal, 4,000 to 8,000/μL). The serum concentration of carcinoembryonic antigen was 0.6 ng/mL (normal < 2.5 ng/mL), and that of CA19-9 was 41.2 U/mL (normal, <37 U/mL).

Abdominal ultrasonography showed a hypoechoic lesion, 3 cm in diameter, with several stones in segment 5 of the liver **(Fig. 1)**. Computed tomography (CT) disclosed a low-density area and,

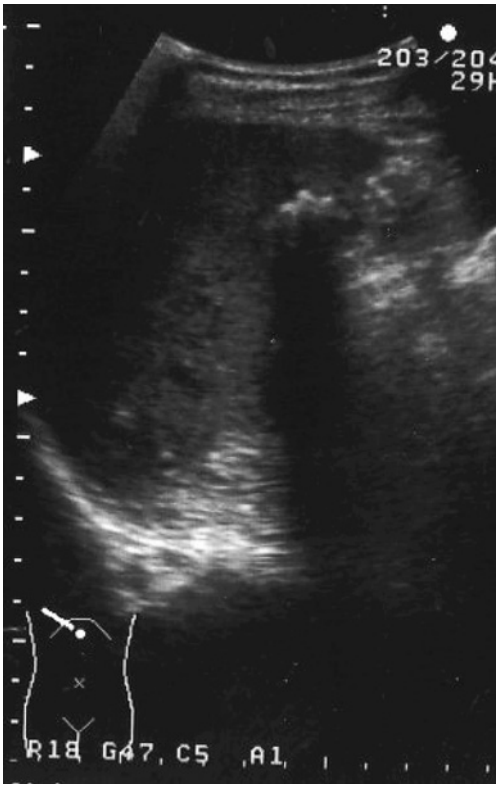

Fig. 1 Abdominal ultrasonography showed a hypoechoic lesion measuring 3 cm in diameter with several stones in segment 5 of the liver.

after injection of contrast medium, moderately dense area in the arterial phase in segment 5 **(Fig. 2a, b)**. Magnetic resonance imaging showed a lesion of slightly low signal intensity on T1-weighted images and of moderate-to-high signal intensity on T2-weighted images in segment 5 **(Fig. 3a, b)**. Magnetic resonance cholangiopancreatography showed a lesion of moderate-to-high signal intensity on T2-weighted images in segment 5 **(Fig. 4a)**. Inflammatory changes of segment 5 due to cholangitis with intrahepatic bile duct stones was diagnosed. Endoscopic retrograde cholangiopancreatography revealed a common bile duct stone. The intrahepatic bile ducts of segment 5 were not evident after injection of contrast material **(Fig. 4b)**. Endoscopic sphincterotomy was performed to remove the common bile duct stones. Antibiotics were administered soon after stone removal, and the fever gradually resolved.

After discharge, positron emission tomography (PET) revealed hot spots in segment 5 of the liver

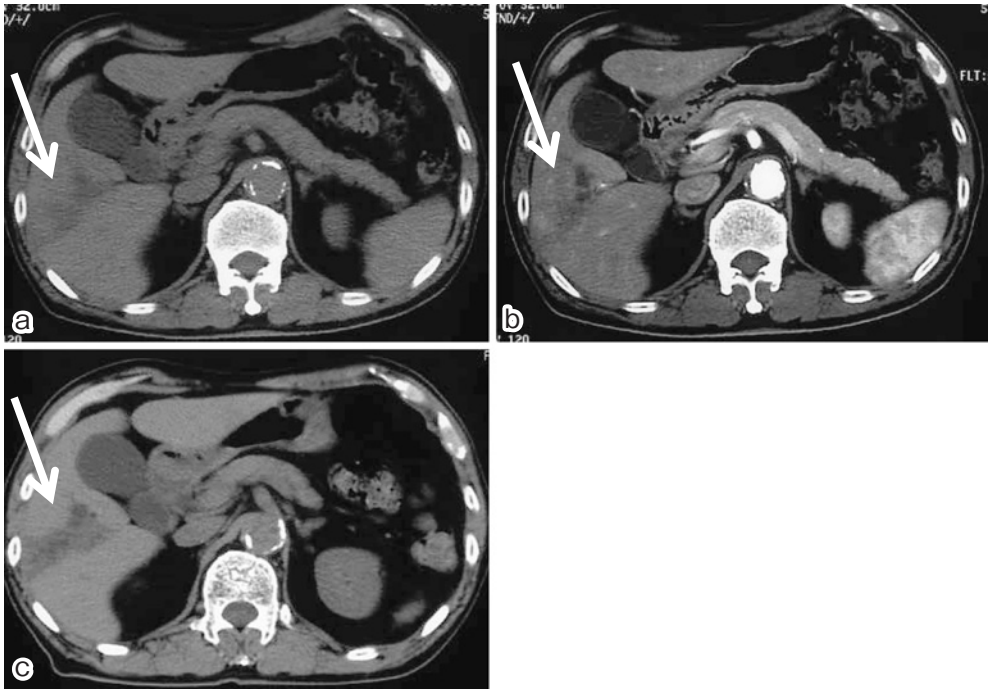

Fig. 2 Computed tomography (CT) showed a low-density area **(arrow)** (a) and, after injection of contrast medium, moderately dense area in the arterial phase in segment 5 **(arrow)** (b). Three weeks after discharge, the patient was readmitted, and CT showed an enlarged low-density area in segment 5 **(arrow)** (c).

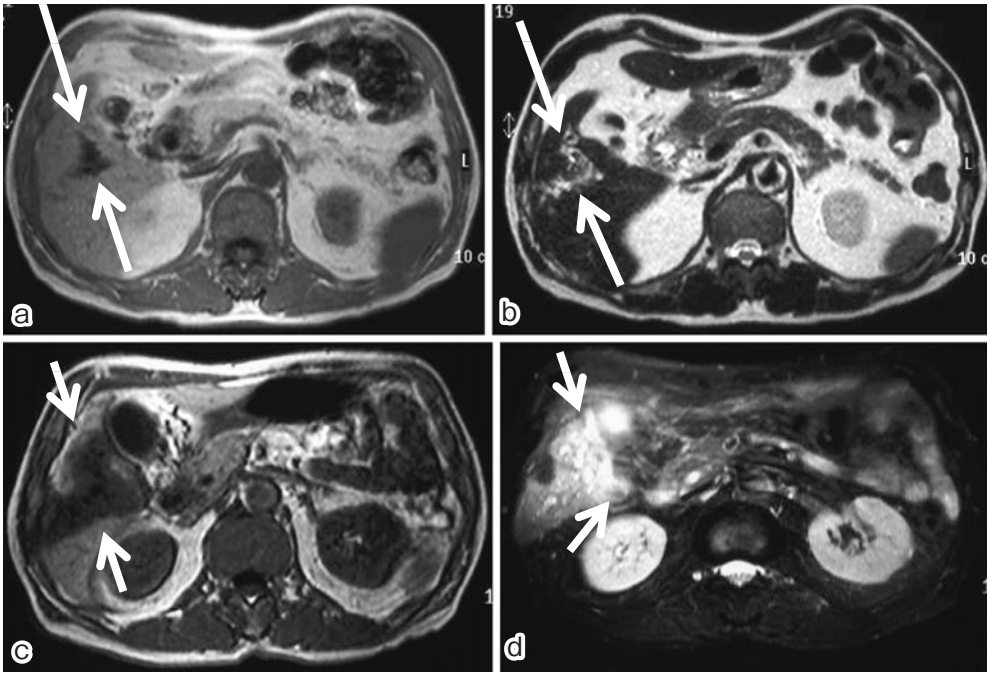

Fig. 3 Magnetic resonance imaging showed a lesion of slightly low signal intensity on T1-weighted images **(arrows)** (a) and a lesion of moderate-to-high signal intensity on T2-weighted images in segment 5 **(arrows)** (b). Magnetic resonance imaging showed enlargement of this area on T1-weighted images **(arrows)** (c) and T2-weighted images **(arrows)** (d).

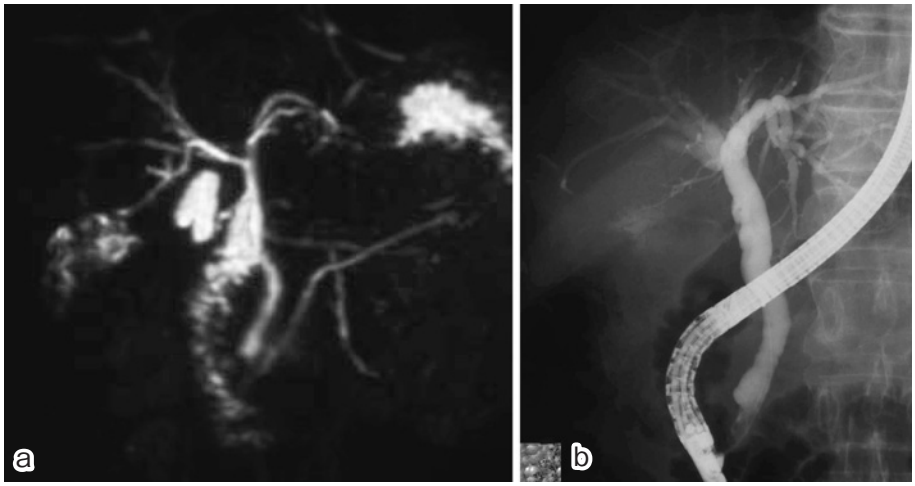

Fig. 4 Magnetic resonance cholangiopancreatography showed a lesion of moderate-to-high signal intensity on T2-weighted images in segment 5 (a). Endoscopic retrograde cholangiopancreatography demonstrated a common bile duct stone. The intrahepatic bile ducts of segment 5 were not evident after injection of contrast material (b).

(Fig. 5). Three weeks after discharge, the patient was readmitted to Nippon Medical School Hospital because of an acute episode of right upper quadrant abdominal pain. Abdominal ultrasonography showed an enlarged hypoechoic lesion, 5 cm in diameter, with several stones in segment 5 of the liver. CT showed an enlarged low-density area in segment 5 **(Fig. 2c)**. Magnetic resonance imaging showed enlargement of this area on T1- and T2-weighted imaging **(Fig. 3c, d)**. Inflammatory changes of segment 5 due to cholangitis with intrahepatic bile duct stones was diagnosed. Because malignant disease could not be ruled out, segment 5 of the liver was resected and was found to contain an indurated mass with surrounding infiltration and adhesion.

Macroscopic examination of the resected specimen revealed a gray, fibrotic, solid tumor associated with intrahepatic bile duct stones **(Fig. 6)**. Pus was discharged from the intrahepatic bile ducts after stone removal. Microscopic examination of the tumor showed proliferation of diffuse myofibroblastic and mesenchymal cells in a mixed myxoedematous, dense fibrotic stroma, with many small vessels and marked infiltration by various acute and chronic inflammatory cells. The myofibroblastic cells had spindle-shaped or polygonal eosinophilic cytoplasm with small vesicular nucleoli. However, there was no cytologic atypia or nuclear hyperchromasia. A few normal mitotic figures were present in the tumor cells **(Fig. 7)**.

The postoperative course was uneventful, and the patient was discharged on postoperative day 16. Follow-up CT showed no residual or recurrent tumor. The patient has remained well during the 18 months since the resection, without additional treatment.

Discussion

Most previously reported hepatic IPTs have occurred in childhood and early adulthood[3,4]. Among cases in adults, the male: female ratio has ranged from 1 : 1 to 3.5 : 1[2,4–6]. Most IPTs of the liver have been solitary solid tumors arising in the right hepatic lobe, similar to the present case[3,4]. IPT of the liver appears to be more common in non-European populations. Nearly all patients present with intermittent fever, abdominal pain, and laboratory data suggestive of an active inflammatory process[4].

On CT scans, enhancement patterns differ between IPT and hepatocellular carcinoma: unlike IPT, hepatocellular carcinoma exhibits hyperdensity in the arterial phase, followed by hypodensity with enhancement of only the capsule on delayed-phase CT scans[7]. The portal vein occlusion often associated with hepatocellular carcinoma results from venous

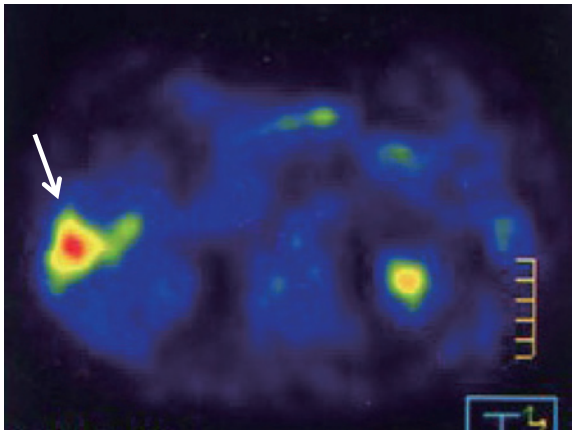

Fig. 5 After discharge, positron emission tomography (PET) revealed hot spots in segment 5 of the liver **(arrow)**.

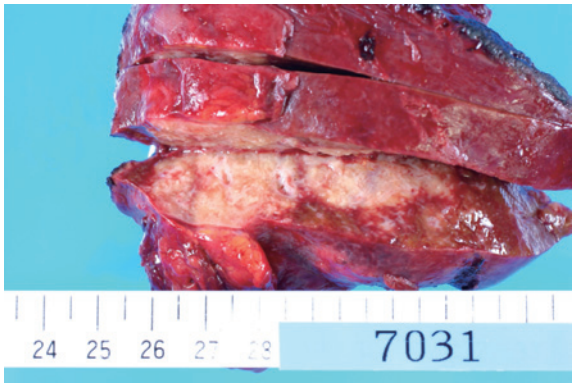

Fig. 6 Macroscopic examination of the resected specimen revealed a gray, fibrotic, solid tumor. The tumor border was well-circumscribed but not encapsulated.

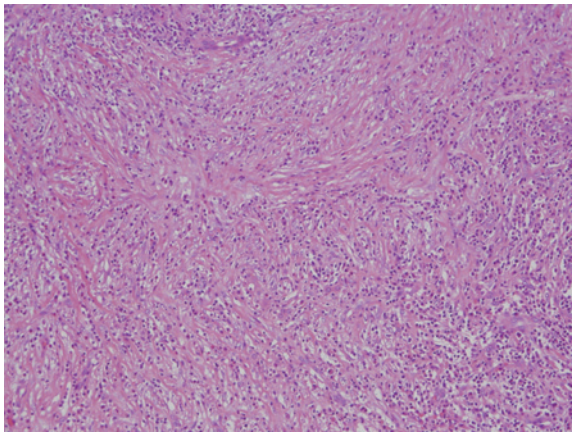

Fig. 7 Microscopic examination of the tumor showed proliferation of spindle-like myofibroblastic cells in a mixed myxoedematous and dense fibrotic stroma with infiltration of various acute and chronic inflammatory cells (hematoxylin and eosin, ×70).

invasion, intraluminal tumor growth, and vessel expansion. In contrast, the venous occlusion associated with IPT results from gross thickening of the venous wall and obliteration of the lumen. The most important diagnostic feature of IPT of the liver is the disappearance of radiological findings over time. Alternative diagnoses can be considered if the patient can be observed for 2 or 3 months before treatment. Tumors often regress spontaneously with conservative treatment[2,6,8–11].

If it is difficult to distinguish IPT from a malignant liver tumor solely on the basis of imaging findings, a needle biopsy should be performed to confirm the diagnosis. However, fibrous lesions are difficult to diagnose with fine-needle aspiration. With this technique IPTs have been misdiagnosed as malignant on at least 2 occasions[12,13]. Histological features of IPTs include diffuse, dense, hyalinizing collagen in bundles or whorl-like patterns infiltrated by plasma cells and other types of inflammatory cells. There are no cellular anaplasias or abnormal mitoses to suggest malignancy. Owing to their densely hyalinized structure, most IPTs are extremely firm. Considerable variation in histologic features within the same lesion has precluded the development of histologic criteria for the clinical management of these unusual lesions, apart from the exclusion of malignancy. IPT of the liver can be defined as a localized mass consisting of a fibrous stroma and a chronic inflammatory infiltrate with plasma cells in the absence of anaplasia. The gross appearance and imaging findings may resemble those of malignant disease.

ITP carries a fair prognosis, regardless of whether patients receive conservative therapy or surgery. It remains unclear whether liver resection or antibiotics have any effect on IPT of the liver. Antibiotic therapy seemed preferable to surgery in our case, but malignant disease could not be ruled out. Some IPTs recur or metastasize, and some patients die of their disease[5,14,15]. Conservative therapy for IPT must be continued for a long time. The postoperative course was uneventful in our case, and the patient was discharged on

postoperative day 10. Follow-up CT showed no residual or recurrent tumor. The patient has remained well during the 10 months since discharge, without additional treatment. Some patients might require surgical procedures to confirm the histologic diagnosis and control disease.

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(Received, January 27, 2009)
(Accepted, February 12, 2009)