J. Tokyo Wom. Med. Univ.
75 (5) 133～137 (2005)

Inflammatory Pseudotumor of the Liver Detected Nine Years after Pancreaticoduodenectomy: A Case Report

Koichi KUBOTA[1,3], Toshihiko HOSOKAWA[3], Noriyuki ISOHATA[3], Kazuya SHIMAO[1,3], Keiji SUZUKI[2] and Kenji OGAWA[3]

Departments of Surgery[1] and Pathology[2], Nishiarai Hospital
Department of Surgery, Tokyo Women's Medical University Daini Hospital[3]

(Accepted March 31, 2005)

The patient was a 67 year-old man who had undergone pancreaticoduodenectomy for duodenal papillary cancer. He was admitted to the Department of Medicine for the treatment of diabetes mellitus and a liver tumor was found by abdominal ultrasonography. Although the patient did not have fever, elevated inflammatory markers and biliary enzymes were observed, while tumor markers were normal. Various imaging studies suggested a metastatic liver tumor, but a definitive diagnosis was not possible. Therefore, percutaneous needle liver biopsy was performed and a diagnosis of inflammatory pseudotumor of the liver was made. Inflammatory pseudotumor of the liver is a hepatic mass formed by the infiltration of inflammatory cells and the proliferation of fibrous tissue. From the histological findings, this patient was concluded to have a resolving liver abscess that had formed due to cholangitis as a late complication of pancreaticoduodenectomy.

Key words: inflammatory pseudotumor of the liver, percutaneous needle liver biopsy

Introduction

Inflammatory pseudotumor is a rare benign disease in which a mass is formed by infiltration of inflammatory cells and proliferation of fibrous tissue[1]. When this condition occurs in the liver, differentiation from a malignant tumor is difficult and unnecessary hepatectomy is often performed.

We encountered a patient in whom inflammatory pseudotumor of the liver was discovered incidentally after pancreaticoduodenectomy for duodenal papillary cancer. Differentiation from a metastatic liver tumor was difficult, but the correct diagnosis was obtained by percutaneous needle liver biopsy and appropriate treatment was provided.

Case Report

The patient was a 67-year-old man. In October 1993, he underwent pancreaticoduodenectomy for duodenal papillary cancer at our hospital and the histological diagnosis was moderately differentiated adenocarcinoma. His postoperative course was satisfactory.

In April 2003, he visited the Ophthalmology Department of our hospital due to impaired visual acuity, and diabetic retinopathy was diagnosed. He was admitted to the Department of Medicine for the treatment of diabetes, and a liver tumor was detected by abdominal ultrasonography. Then he was transferred to our department for further investigation and treatment.

Examination on admission revealed conjunctival pallor, but there were no other abnormal findings. His laboratory data are as follows. The hemoglobin was 9.4 g/dl and anemia was confirmed. The white blood cell count was high ($1.03 \times 10^4/\mu l$) and the serum C-reactive protein level was elevated to 8.8 mg/dl. The erythrocyte sedimentation rate was also elevated to 132 mm/h, so an inflammatory process was indicated. The serum albumin level was 2.6 g/dl and the aspartate aminotransferase (AST) level was 60 IU/*l*, suggesting malnutrition

Table Laboratory data on admission

RBC	282 × 10^4 /μl	TP	7.5 g/dl
Hb	9.4 g/dl	Alb	2.6 g/dl
Ht	27.7 %	T.Bil	0.9 mg/dl
WBC	1.03 × 10^4 /μl	AST	60 IU/*l*
Plt	40.4 × 10^4 /μl	ALT	37 IU/*l*
ESR	132 mm/h	Alp	812 IU/*l*
CPR	8.8 mg/dl	γ-GTP	240 IU/*l*
CEA	1.78 ng/ml	Amy	43 IU/*l*
AFP	2.08 ng/ml	BUN	26.4 mg/dl
CA19-9	20.2 U/ml	Crea	1.4 mg/dl
HBs-Ag	(−)	Na	130 mEq/*l*
HCV-Ab	(−)	Cl	99 mEq/*l*
		K	4.9 mEq/*l*

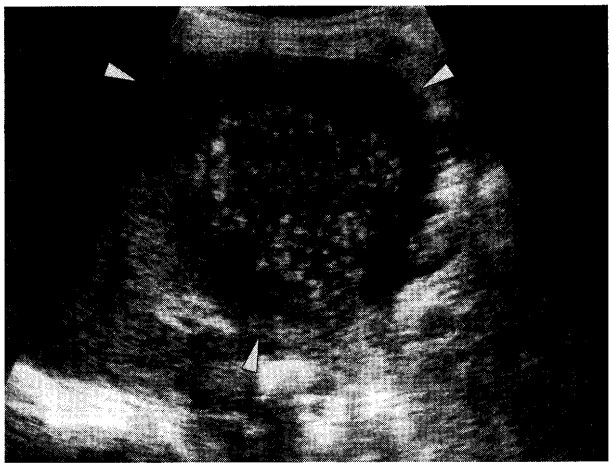

Fig. 1 Ultrasonography performed on 1 day after admission revealed well distinct low echoic mass with numerous strong echoes in the anterior segment of the liver.

and mild liver dysfunction, respectively. Alkaline phosphatase, a biliary enzyme, was elevated to 812 IU/*l* and γ-glutamyl transferase was increased to 240 IU/*l*. However, tumor markers (CEA, CA19-9, and AFP) were normal, and HBs-Ag and HCV-Ab were negative (Table).

Abdominal ultrasonography revealed intrahepatic pneumobilia and a low echoic mass (6 cm in diameter) with distinct margins in the anterior segment of the liver. Numerous strong echoes were also observed in the mass (Fig. 1).

Plain abdominal CT scans revealed intrahepatic pneumobilia, while the anterior segment of the liver contained a 7.5 × 8.5 cm irregular and heterogeneous low-density area, which was weakly enhanced by the contrast medium (Fig. 2).

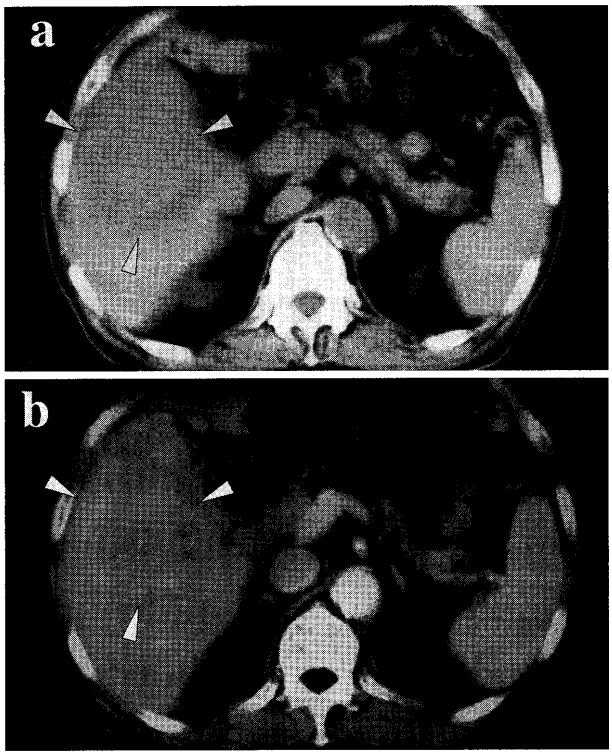

Fig. 2 Plain CT scans performed on 4 days after admission revealed irregular and heterogeneous low-density area in the anterior segment of the liver (a), and which was weakly enhanced by the contrast CT (b).

On dynamic abdominal CT, the lesion showed central enhancement in the early phase, but only the margin was enhanced in the late phase (Fig. 3).

Abdominal angiography showed no hypervascularity, while slight stretching and compression of vessels around the mass in the arterial phase. In the venous phase, the mass was seen as a hypovascular lesion (Fig. 4). No abnormal findings were obtained by upper gastrointestinal endoscopy or colonoscopy.

Based on these findings, a metastatic liver tumor was suspected, but a definite diagnosis could not be made. Therefore, percutaneous needle liver biopsy (Bard Biopty™ 23 mm, Bard® Biopty-Cut®: 20G 200 mm) was performed on day 20 after admission under ultrasonographic guidance.

Histological examination of the liver biopsy specimen revealed the granulation tissue with infiltration of plasma cells and lymphocytes, and a part of this, Glisson's sheath was formed by the infiltrations of neutrophils and fibrous expansion. The presence

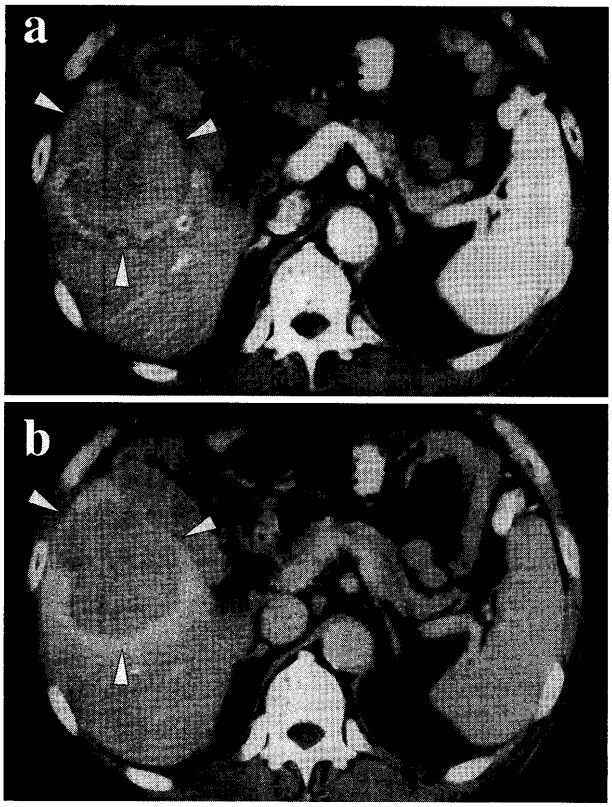

Fig. 3 Dynamic CT performed on 7 days after admission showed the enhancement of central part of the lesion in the early phase (a), but only the margin was enhanced in the late phase (b).

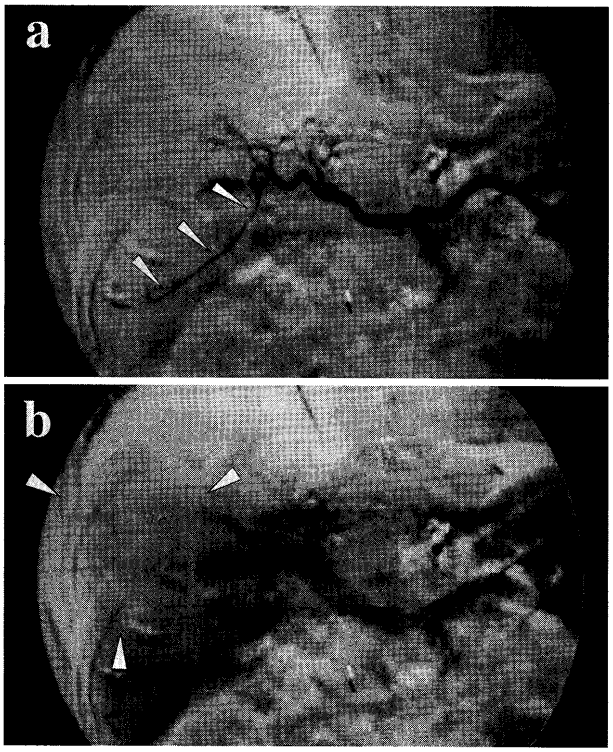

Fig. 4 Abdominal angiography performed on 10 days after admission showed no hypervascularity, while slight stretching and compression of vessels around the mass in the arterial phase (a), and the mass was seen as hypovascular lesion in the venous phase (b).

of inflammatory cell infiltration and fibrous tissue proliferation with no evidence of cancer indicated that the mass was composed of inflammatory granulation tissue (Fig. 5).

The final diagnosis was inflammatory pseudotumor of the liver based on three points: ① clinical evidence of an inflammatory process, ② normal tumor markers, and ③ detection of inflammatory granulation tissue on histological examination.

The clinical course was uneventful after liver biopsy and the patient was discharged on day 35 after biopsy for follow up as an outpatient. At his request, no antibiotics or nonsteroidal anti-inflammatory agents were administered. Follow-up abdominal CT showed that the mass, which was initially 7.5 × 8.5 cm in size, decreased to 7 × 6 cm in August and to 5.5 × 6 cm in October (Fig. 6).

Discussion

Inflammatory pseudotumor resembles a tumor clinically, but it has no malignant features histologically and is a benign condition that is part of the healing process of nonspecific inflammation in mesenchymal tissue. This condition has been reported in various organs, including the lungs, the orbits, salivary glands, pleura, ovaries, spleen, digestive tract and lymph nodes, but it is rarely found in the liver[1].

Inflammatory pseudotumor of the liver was first reported by Pack et al[2] in 1953, and the first report of its association with malignant disease was made by Newbould et al[3] in 1992. In 1993, Shek et al[4] reviewed the reported cases. With advances in imaging modalities, the number of reported cases has tended to increase.

Pathologically, this disease is characterized by formation of a mass in the hepatic parenchyma due to inflammatory cell infiltration (mainly plasma cells) and the proliferation of fibrous tissue. The etiology and pathogenesis remain unclear. Bacterial or viral infection, an immune reaction, and localized bleeding have all been suggested, but no conclu-

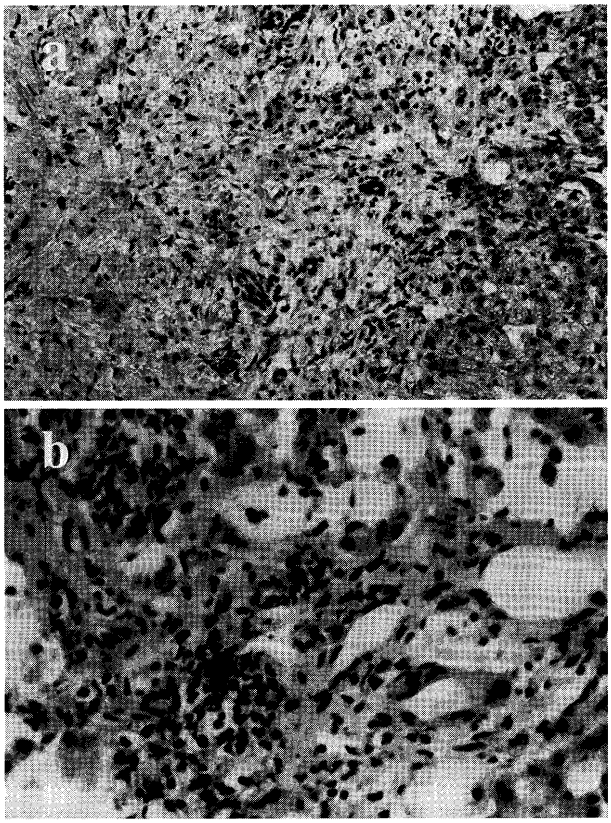

Fig. 5 Percutaneous needle liver biopsy was performed on 20 days after admission.
a: Histological examination of the liver biopsy specimen revealed the granulation tissue formed by the infiltration of neutrophils, and liver cell cord were damaged (HE stain, ×33).
b: Interlobular bile ducts were also infiltrated by neutrophils, the bile duct walls were damaged, and parenchymal tissue surrounding Glisson's sheath were replaced by the granulation tissue (HE stain, ×50).

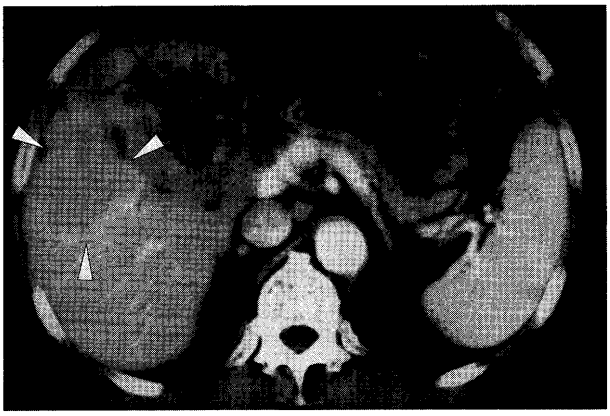

Fig. 6 Follow-up CT performed on 6 months after liver biopsy showed the mass initially 7.5 × 8.5 cm in size, was decreased to 5.5 × 6 cm.

sions have been reached. The infectious theory is supported by the association with systemic symptoms such as fever and fatigue, as well as by the clinical course, laboratory data, and histological findings[5]. Therefore, this disease is usually considered to be a stage in the healing process of chronic liver abscesses.

Based on the histological features, Someren[5] classified inflammatory pseudotumors into three types: ① the xanthogranuloma type, ② the plasma cell granuloma type, and ③ the sclerosing pseudomotor type. However, the mass in our patient fit the plasma cell granulation type, Glisson's sheath was consisted of immature granulation tissue with infiltration of many neutrophils. In Glisson's sheath, interlobular bile ducts were also infiltrated by neutrophils, the bile duct walls were damaged, and parenchymal tissue surrounding Glisson's sheath were replaced by the granulation tissue. These findings were indicative of cholangitis.

Therefore, our patient's mass was assumed to be a healing liver abscess that had developed due to recurrent cholangitis, since the mass appeared after pancreaticoduodenectomy and pneumobilia was observed. Ammori et al[6] stated that cholangitis as a late complication of pancreaticoduodenectomy was caused by reflux of bowel contents into the biliary tree due to loss of the mechanism preventing bile juice reflux, and by stasis of bile juice due to stenosis at the anastomotic site caused by ischemia.

This is a benign disease and spontaneous resolution occurs in almost all patients[7], so there are not many indications for surgery and conservative therapy is performed as a rule[8]. However, hepatectomy is occasionally performed because the imaging findings resemble those of cholangiocarcinoma or metastatic liver tumor and making a differential diagnosis is difficult.

Many patients show a heterogeneous low echoic mass on abdominal ultrasonography, low-density areas associated with enhancement on abdominal CT, and hypovascularity with tumor staining in the parenchymal phase on abdominal angiography. However, there are no imaging findings characteristic of this disease, differentiation from malignant liver tumors is difficult, and a definitive diagnosis is often

first made by histological examination. Recently, some cases where a definitive diagnosis was obtained by percutaneous needle liver biopsy have been reported[9], as in the present patient.

The characteristic symptoms of this disease are fever, upper abdominal pain, and jaundice. Other features include elevated biliary enzymes, normal tumor markers, and negativity for HBs-Ag and HCV-Ab. Therefore, this disease requires differential diagnosis and percutaneous needle liver biopsy should be performed in patients with a suspected malignant liver tumor on imaging, normal tumor markers, and inflammatory findings during the clinical course.

Surgical treatment such as hepatectomy should be performed in some patients with symptoms like abdominal pain and jaundice and in cases where making a definitive diagnosis by percutaneous needle liver biopsy proves difficult. The diagnosis and treatment of this disease need to be improved since spontaneous resolution occurs in many patients and conservative therapy is preferable[10].

References

1) **Torzilli G, Inoue K, Midorikawa Y et al**: Inflammatory pseudotumors of the liver: prevalence and clinical impact in surgical patients. Hepatogastroenterology **48**: 1118–1123, 2001
2) **Pack GT, Baker HW**: Total right hepatic lobectomy, report of a case. Ann Surg **138**: 253–258, 1953
3) **Newbould MJ, Kelsey A, Lendon M et al**: Inflammatory pseudotumor of the liver masquerading as a metastasis in a child treated for nephroblastoma. Med Pediatr Oncol **20**: 172–175, 1992
4) **Shek TWH, Ng IOL, Chan KW**: Inflammatory pseudotumor of the liver. Am J Surg Pathol **17**: 231–238, 1993
5) **Someren A**: Inflammatory pseudotumor of the liver with occlusive phlebitis. Am J Clin Pathol **69**: 176–181, 1978
6) **Ammori BJ, Leseph S, Attia M et al**: Biliary strictures complicating pancreaticoduodenectomy. Int J Pancreatol **28**: 15–24, 2000
7) **Isobe H, Nishi Y, Fukutomi T et al**: Inflammatory pseudotumor of the liver associated with acute myelomonocytic leukemia. Am J Gastroenterol **86**: 238–240, 1991
8) **Hakozaki Y, Kato M, Nakagawa K et al**: Improvement of inflammatory pseudotumor of the liver after nonsteroidal anti-inflammatory agent therapy. Am J Gastroenterol **88**: 1121–1122, 1993
9) **Nakama T, Hayashi K, Komada N et al**: Inflammatory pseudotumor of the liver diagnosed by needle liver biopsy under ultrasonographic tomography guidance. J Gastroenterol **35**: 641–654, 2000
10) **Koea JB, Broadhurst GW, Rodgers MS et al**: Inflammatory pseudotumor of the liver: demographics, diagnosis, and the case for nonoperative management. J Am Coll Surg **196**: 226–235, 2003

膵頭十二指腸切除術９年後に生じた肝炎症性偽腫瘍の１例

西新井病院 [1]外科, [2]病理科
[3]東京女子医科大学 附属第二病院 外科

窪田（クボタ） 公一（コウイチ）[1,3]・細川（ホソカワ） 俊彦（トシヒコ）[3]・五十畑則之（イソハタノリユキ）[3]
島尾（シマオ） 一也（カズヤ）[1,3]・鈴木（スズキ） 慶二（ケイジ）[2]・小川（オガワ） 健治（ケンジ）[3]

今回われわれは，悪性腫瘍術後で転移性肝腫瘍が疑われたが，経皮的針肝生検により肝炎症性偽腫瘍と診断し得た症例を経験した．症例は67歳の男性．十二指腸乳頭部癌に対する膵頭十二指腸切除術の既往がある．糖尿病のために当院の内科に入院し，腹部超音波検査で肝腫瘍が指摘された．発熱はないが，炎症所見と胆道系酵素の上昇を認めた．腫瘍マーカーは正常値であった．種々の画像検査で転移性肝腫瘍が疑われたが確定診断は得られなかった．そこで経皮的針肝生検を行い，組織学的に炎症性肉芽組織と判断され，肝炎症性偽腫瘍と診断した．肝炎症性偽腫瘍は炎症性細胞の浸潤と線維性組織の増生による腫瘤が肝に形成される疾患である．その発生要因は不明であるが感染が有力視され，慢性肝膿瘍と同一疾患と考えられている．自験例は，組織学的所見より膵頭十二指腸切除術後の晩期合併症としての胆管炎から肝膿瘍が形成され，それが瘢痕化したものと推察した．