

—Report on Experiments and Clinical Cases—

Inflammatory Pseudotumor in the Spiegel Lobe of the Liver
of an Elderly Woman

Nobuhisa Teranishi¹, Hiroshi Yoshida¹, Yasuhiro Mamada¹, Nobuhiko Tanai¹,
Yoshiaki Mizuguchi¹, Tetsuya Shimizu¹, Tsubasa Takahashi¹, Koho Akimaru¹,
Zenya Naito² and Takashi Tajiri¹

¹Surgery for Organ Function and Biological Regulation, Nippon Medical School, Graduate School of Medicine

²Integrative Pathology, Nippon Medical School, Graduate School of Medicine

Abstract

We describe an inflammatory tumor in the Spiegel lobe of the liver of an 81-year-old woman. The patient was referred to our hospital for evaluation of a fever of over 39°C and upper abdominal pain. Both conditions had persisted for five days in spite of antibiotic treatment. Initial laboratory tests revealed a serum C-reactive protein concentration of 20.9 mg/dL and white blood cell count of 15,500/ μ L. Abdominal ultrasound showed a hypoechoic lesion measuring 4 cm in diameter in the Spiegel lobe of the liver. A follow-up abdominal ultrasound revealed that the hypoechoic lesion was not decreased in size. Computed tomography showed a moderate-to-high-density area in the arterial phase and a low-density area in the Spiegel lobe on delayed phase. Magnetic resonance imaging showed a faint low-intensity lesion on T1-weighted imaging and moderate-to-high-intensity lesion on T2-weighted imaging in the Spiegel lobe. Angiography showed a slight hypervascularity in the area of the Spiegel lobe. Antibiotics and γ -globulin were commenced soon after admission and the fever gradually improved. Ultrasound-guided liver biopsy revealed that the hepatic parenchyma was almost completely replaced by dense hyalinized fibrous tissue and inflammatory cells. These findings were construed to indicate a benign lesion, but the tumor remained unchanged. Malignant disease could not be completely ruled out. Segment 1 of the liver was resected. Macroscopic examination of the resected specimen revealed a gray, fibrotic, solid tumor. The border of the tumor was well-circumscribed but not encapsulated. Microscopically, the tumor showed a marked fibrotic background with infiltration by a mixed population of lymphocytes, plasma cells, histiocytes, and reactive, plump spindle cells. The postoperative course was uneventful. The patient has remained well in the 10 months since the resection without recurrence.

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Key words: inflammatory pseudotumor, liver

Introduction

Inflammatory pseudotumor (IPT) is a rare benign lesion histologically characterized by the presence of 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 data suggestive of inflammation, but a definitive diagnosis can be difficult unless clinical abnormalities are present¹.

We report the case of an elderly woman with IPT in the Spiegel lobe of the liver.

Case Report

An 81-year-old woman was referred to the First Department of Surgery at Nippon Medical School for evaluation of a fever and upper abdominal pain that had persisted for 5 days at another hospital. Her fever had remained above 39°C for the entire 5-day duration in spite of antibiotic treatment. Initial laboratory tests revealed the following: serum glutamic oxaloacetic transaminase concentration, 45 IU/L (normal, <28 IU/L); serum glutamic pyruvic transaminase concentration, 46 IU/L (normal, <33

IU/L); serum alkaline phosphatase concentration, 208 IU/L (normal 66 to 220 IU/L); serum lactic dehydrogenase concentration, 272 IU/L (normal, 180 to 460 IU/L); serum gamma glutamic transpeptidase concentration, 32 IU/L (normal, 8 to 39 IU/L); serum C-reactive protein concentration, 20.9 mg/dL (normal, <0.3 mg/dL); white blood cell count, 15,500/ μ L (normal, 4,000 to 8,000/ μ L). The serum concentration of carcinoembryonic antigen was 1.3 ng/mL (normal <2.5 ng/mL).

Abdominal ultrasound showed a hypoechoic lesion measuring 4 cm in diameter in the Spiegel lobe of the liver. A follow-up abdominal ultrasound revealed that the hypoechoic lesion was not decreased in size (**Fig. 1**). Computed tomography (CT) showed moderately dense area in the arterial phase and a low-density area in the Spiegel lobe on delayed phase (**Fig. 2**). Magnetic resonance imaging showed a slight low-intensity lesion on T1-weighted imaging and moderate-to-high-intensity lesion on T2-weighted imaging in the Spiegel lobe (**Fig. 3**). Angiography showed slight hypervascularity in the area of the Spiegel lobe (**Fig. 4**).

Antibiotics and γ -globulin were commenced soon after admission and the fever was gradually improved.

An ultrasound-guided liver biopsy was performed

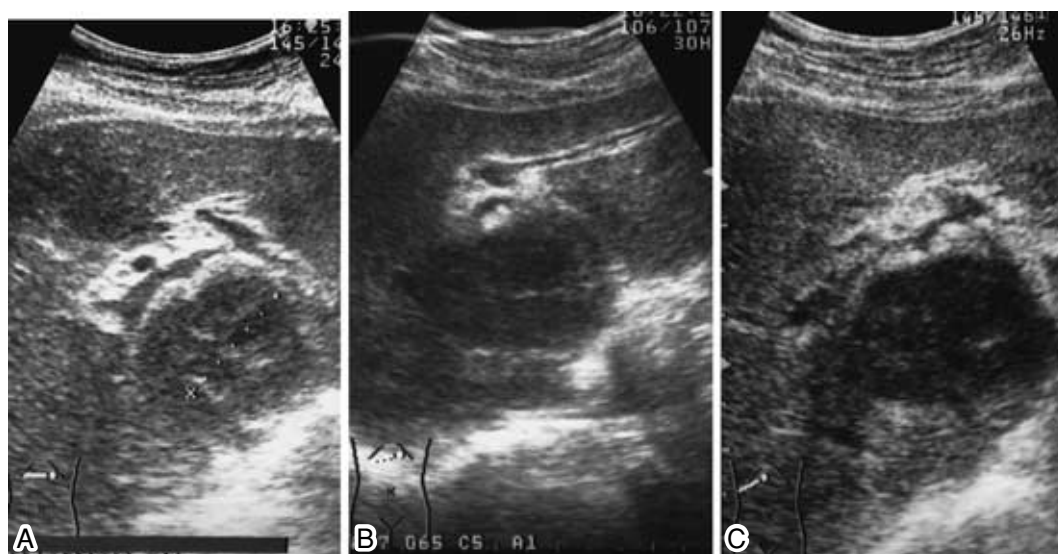


Fig. 1 Abdominal ultrasound showed a hypoechoic lesion measuring 4 cm in diameter in the Spiegel lobe of the liver. Follow-up abdominal ultrasound revealed that the hypoechoic lesion was not decreased in size. (A) on admission, (B) 5 days after admission, (C) 12 days after admission.

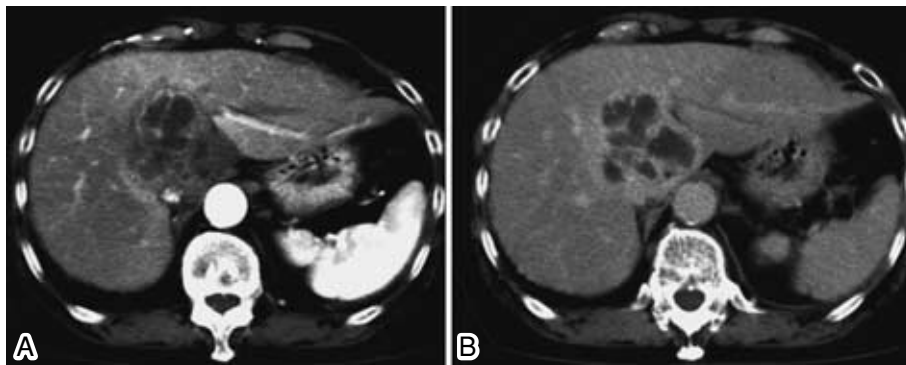


Fig. 2 Abdominal computed tomography revealed low density in the area of the Spiegel lobe (A, early phase; B, delay phase).

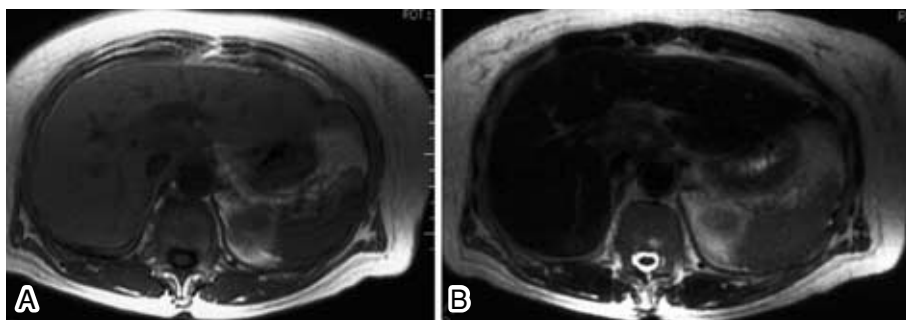


Fig. 3 Magnetic resonance imaging showed a moderate-to-low-intensity lesion on T1-weighted imaging (A) and a moderate-to-high-intensity lesion on T2-weighted imaging (B) in the Spiegel lobe of the liver.



Fig. 4 Angiography revealed slight hypervascularity in the area of the Spiegel lobe.

for the histological diagnosis of the mass. Microscopic examination of the biopsy specimen

revealed that the hepatic parenchyma was almost completely replaced by dense hyalinized fibrous tissue and inflammatory cells (**Fig. 5A**). Based on these findings, we concluded that the lesion was benign. On the other hand, the tumor remained unchanged in spite of the abatement of the patient's fever. Referring back to earlier reports of malignant neoplasms hidden inside IPT-like lesions, we decided that malignant disease could not be completely ruled out. We resected segment 1 of the liver and discovered an indurated mass with surrounding infiltration and adhesion.

Macroscopic examination of the resected specimen revealed a gray, fibrotic, solid tumor. The tumor border was well-circumscribed but not encapsulated (**Fig. 6**). Microscopically, the tumor showed a marked fibrotic background with infiltration by a mixed population of lymphocytes, plasma cells, histiocytes, and reactive, plump spindle cells (**Fig. 5B**).

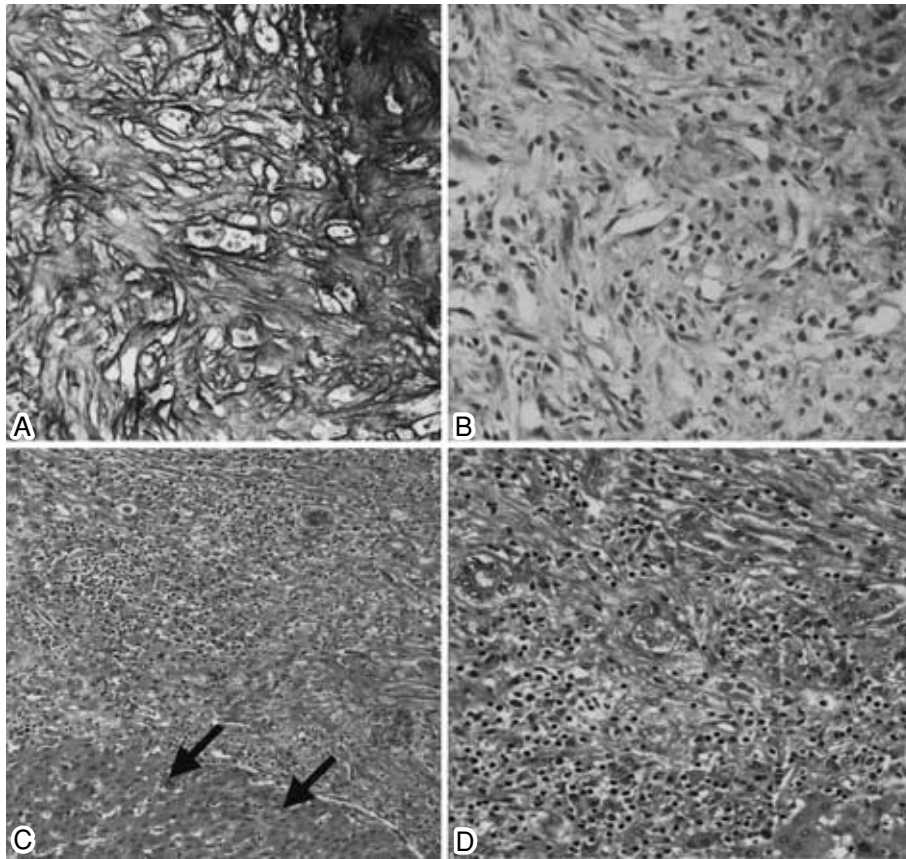


Fig. 5 Microscopic examination of the liver biopsy revealed that the hepatic parenchyma was almost completely replaced by dense hyalinized fibrous tissue and various inflammatory cells (A: Pap stain $\times 100$) (B: Masson stain $\times 100$). Microscopically, the tumor showed a marked fibrotic background with infiltration by a mixed population of lymphocytes, plasma cells, histiocytes, and reactive, plump spindle cells. Nontumor hepatocytic region was observed, too (**arrows**). (C: H.E. stain $\times 40$, D: H.E. stain $\times 100$).

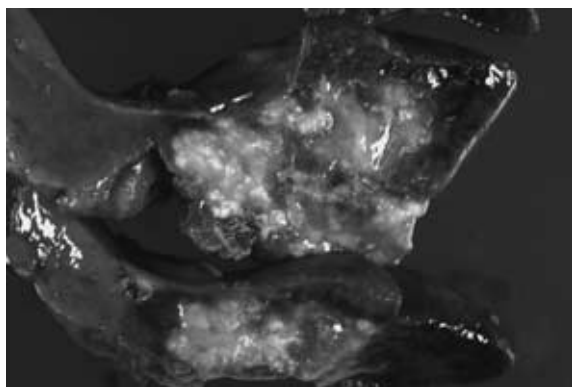


Fig. 6 Macroscopic examination of the resected specimen revealed a gray, fibrotic, solid tumor. The tumor border was well-circumscribed but not encapsulated.

The postoperative course was uneventful and the patient was discharged on postoperative day 10. Follow-up CT showed no residual or recurrent tumor. The patient has remained well in the 10 months since the resection without additional treatment.

Discussion

IPTs are most frequently found in the lung, but they have also been reported in the stomach, retroperitoneum, orbit, central nervous system, and liver². The first patient with IPT of the liver was reported in 1953 by Pack and Baker³. Most of the hepatic IPTs reported since have occurred in childhood and early adulthood^{4,5}. Among the adult

cases, the male : female ratio has ranged from 1 : 1 to 3.5 : 1^{2,5-7}. Most reported IPTs of the liver have been solitary solid tumors arising in the right hepatic lobe^{4,5}. IPT of the liver appears to be more common in non-European populations. The lesion in the present report was discovered in the Spiegel lobe of an 81-year-old Japanese woman. This is a rare case of IPT.

Clinically, the overwhelming majority of patients present with intermittent fever, abdominal pain, and laboratory data suggestive of an active inflammatory process⁵.

CT remains the mainstay of diagnosis. Yoon and coworkers⁸ have summarized the CT findings suggestive of IPT. The most important trend to note is a difference in the enhancement patterns of IPT and hepatocellular carcinoma: unlike the former, the latter exhibits hyperdensity in the arterial phase followed by hypodensity with enhancement of only the capsule on delayed-phase CT scans. In addition, the portal vein occlusion often seen with hepatocellular carcinoma is the result of venous invasion, intraluminal tumor growth, and vessel expansion. In contrast, the venous occlusion seen in association 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 a fading of the radiological findings over time. Alternative diagnoses can be considered if the patient can be observed for 2 or 3 months before the appropriate course of treatment must be decided. Tumors often regress spontaneously with conservative treatment^{2,7,9-12}.

When it is difficult to distinguish IPT from a malignant liver tumor based solely on imaging modalities, the diagnosis should be made with a needle biopsy. Note, however, that fibrous lesions are difficult to diagnose using fine-needle aspiration. According to the reports, IPTs have been misdiagnosed as malignant with this technique on at least two occasions^{13,14}.

Histologically, IPTs are characterized by diffuse, dense, hyalinizing collagen in bundles or whorl-like patterns infiltrated with plasma cells and other inflammatory cells. There are no cellular anaplasias or abnormal mitoses to suggest malignancy. Due to

their densely hyalinized structure, IPTs are characteristically very hard. Someren categorized IPTs into three histologic types: hyalinized sclerosing, xanthogranuloma, and plasma-cell granuloma¹⁵. However, the considerable variation of the histologic features identified within single lesions makes it difficult to apply histologic criteria usefully in the clinical management of these unusual lesions, other than to exclude malignancy. IPT of the liver can be defined as a localized mass consisting of a fibrous stroma, chronic inflammatory infiltrate with plasma cells, and the absence of anaplasia. This may mimic malignant disease by its gross appearance and its manifestations in imaging.

The associated prognosis has been fair regardless of whether the patients are treated conservatively or undergo surgery. It thus 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 again, malignant disease could not be completely ruled out. Some IPTs have been known to recur or metastasize, and some patients die of the disease^{6,16-18}. Conservative therapy for IPT needs to be continued over a long term. 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 in the 10 months since her discharge without additional treatment. Surgical procedures might be necessary to confirm the histologic diagnosis and control the disease.

References

1. Fukuya T, Honda H, Matsumata T, Kawanami T, Shimada Y, Muranaka Y, Hayashi T, Maeda T, Sakai H, Masuda K: Diagnosis of inflammatory pseudotumor of the liver: value of CT. *AJR* 1994; 163: 1087-1091.
2. Jais P, Berger JF, Vissuzaine C, Paramelle O, Clays-Schouman E, Potet F, Mignon M: Regression of inflammatory pseudotumor of the liver under conservative therapy. *Dig Dis Sci* 1995; 40: 752-756.
3. Pack GT, Baker HW: Total right hepatic lobectomy: report of a case. *Ann Surg* 1953; 138: 253-258.
4. Uetsuji S, Nakagawa A, Kwon AH, Komada H, Imamura A, Kamiyama Y: Inflammatory pseudotumor of the liver: report of a case and review of the literature. *Surg Today* 1996; 26: 517-521.

5. Shek TW, Ng IO, Chan KW: Inflammatory pseudotumor of the liver. Report of four cases and review of the literature. *Am J Surg Pathol* 1993; 17: 231–238.
6. Horiuchi R, Uchida T, Kojima T, Shikata T: Inflammatory pseudotumor of the liver. Clinicopathologic study and review of the literature. *Cancer* 1990; 65: 1583–1590.
7. Gollapudi P, Chejfec G, Zarling EJ: Spontaneous regression of hepatic pseudotumor. *Am J Gastroenterol* 1992; 87: 214–217.
8. Yoon KH, Ha HK, Lee JS, Suh JH, Kim MH, Kim PN, Lee MG, Yun KJ, Choi SC, Nah YH, Kim CG, Won JJ, Auh YH: Inflammatory pseudotumor of the liver in patients with recurrent pyogenic cholangitis: CT-histopathologic correlation. *Radiology* 1999; 211: 373–379.
9. Chen KT: Inflammatory pseudotumor of the liver. *Hum Pathol* 1984; 15: 694–696.
10. Kessler E, Turani H, Kayser S, Bar-Ziv J, Chaimoff C: Inflammatory pseudotumor of the liver. *Liver* 1988; 8: 17–23.
11. Zamir D, Jarchowsky J, Singer C, Abumoch S, Groisman G, Ammar M, Weiner P: Inflammatory pseudotumor of the liver: a rare entity and a diagnostic challenge. *Am J Gastroenterol* 1998; 93: 1538–1540.
12. Hakozaiki Y, Katou M, Nakagawa K, Shirahama T, Matsumoto T: Improvement of inflammatory pseudotumor of the liver after nonsteroidal anti-inflammatory agent therapy. *Am J Gastroenterol* 1993; 88: 1121–1122.
13. Lupovitch A, Chen R, Mishra S: Inflammatory pseudotumor of the liver. Report of the fine needle aspiration cytologic findings in a case initially misdiagnosed as malignant. *Acta Cytol* 1989; 33: 259–262.
14. Broughan TA, Fischer WL, Tuthill RJ: Vascular invasion by hepatic inflammatory pseudotumor. A clinicopathologic study. *Cancer* 1993; 71: 2934–2940.
15. Someren A: "Inflammatory pseudotumor" of liver with occlusive phlebitis: report of a case in a child and review of the literature. *Am J Clin Pathol* 1978; 69: 176–181.
16. Tanino M, Ohta G: An autopsy case of xanthogranuloma in the liver. *Jpn J Gastroenterol* 1981; 78: 1803–1806.
17. Andreola S, Cattoretti G, Lombardi L, Audisio RA, Regalia E, Bosch JP, Mazzaferro V, Doci R: Inflammatory pseudotumor of the liver: report of two cases. *Tumori* 1990; 76: 517–523.
18. Biselli R, Ferlini C, Fattorossi A, Boldrini R, Bosman C: Inflammatory myofibroblastic tumor (inflammatory pseudotumor): DNA flow cytometric analysis of nine pediatric cases. *Cancer* 1996; 77: 778–784.

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