Spontaneous regression of a solitary necrotic nodule of the liver

Chang Soo Choi · Eun Young Cho ·
Jin Soo Jeong · Chong Ju Im · Bong Joon Yang ·
Haak Cheoul Kim

Received: 16 October 2009 / Accepted: 10 July 2010 / Published online: 29 July 2010
© Asian Pacific Association for the Study of the Liver 2010

Abstract Solitary necrotic nodules of the liver occur rarely. Although these nodules are usually benign, they are surgically removed in most cases because they cannot be differentiated from malignant lesions. To date, the natural history of solitary fibrous nodules remains unclear. We present the case of an incidentally detected hepatic mass (diameter 2 cm) in a 35-year-old man. The hepatic mass was diagnosed as a solitary necrotic nodule by liver biopsy. Follow-up radiologic examination revealed that the solitary necrotic nodule had spontaneously regressed. This is the first report on the natural course history of a solitary necrotic nodule.

Keywords Liver · Solitary necrotic nodule · Natural course

Introduction

Solitary necrotic nodules are rare lesions, first reported by Shepherd and Lee [1]. Solitary necrotic nodules are usually benign lesions, but some nodules may show the presence of cancer foci, while some may be associated with gastrointestinal (GI) malignancy [2]. These nodules are characterized by specific histological features such as a central necrotic core enclosed by a hyalinized fibrotic capsule containing elastic fibers. The radiological findings of solitary necrotic nodules are similar to those of hepatic malignancies, and most patients have to undergo surgery to

establish a definitive diagnosis [3]. Therefore, the complete natural history of solitary necrotic lesions remains unknown

In this study, we have reported the first case of a solitary necrotic nodule diagnosed by liver biopsy and have shown the natural course of the solitary necrotic nodule.

Case report

A 35-year-old man was referred to our hospital for the evaluation of a 2-cm hepatic mass. This lesion was incidentally found during a routine health check-up performed 2 weeks earlier. The patient was diagnosed with fatty liver disease 4 years ago. No signs of malignancy or infection were observed, and the patient had no symptoms. On admission, his physical examination was unremarkable. The routine laboratory tests were normal, except that the serum level of alanine aminotransferase (ALT) was 68 IU/L. The serum levels of carcinoembryonic antigen (CEA), carbohydrate antigen 19-9 (CA 19-9), and alpha-fetoprotein were normal. The patient's serological profile was negative for hepatitis B or C antigens. No history of alcohol abuse was documented.

An abdominal ultrasonograph (US) showed a low-intensity mass, with ill-defined margins and a diameter of 2 cm, located in segment 6 of the liver (Fig. 1). Abdominal contrast-enhanced computed tomography (CT) showed the presence of an enhanced rim around the 2-cm mass during the arterial phase and an irregular hypodense area, in segment 6, during the portal phase (Fig. 2). Magnetic resonance imaging (MRI) was performed after 1 week, and the irregular mass showed low T1-weighted signal intensity, and high T2-weighted signal intensity (Fig. 3). A comparison between the images obtained at this time point

C. S. Choi · E. Y. Cho (✉) · J. S. Jeong ·
C. J. Im · B. J. Yang · H. C. Kim
Department of Internal Medicine, College of Medicine,
Wonkwang University Hospital, Iksan, Korea
e-mail: love6970@wonkwang.ac.kr

Fig. 1 An abdominal ultrasonograph revealed a 2-cm hypoechoic mass with ill-defined margins in segment 6 of the liver (*arrow*)

and those obtained 1 week earlier showed that the hepatic mass had spread to the subcapsular area of the liver. Because the mass seemed to have increased in size, a feature of malignant masses, we performed ultrasound-guided liver biopsy. The histological examinations showed a central core necrotic tissue encapsulated by fibrotic components and inflammatory cells; these findings were suggestive of a solitary necrotic nodule (Fig. 4). In order to determine whether the lesion is related to infection with fungi and mycobacteria, we performed Gomori methenamine silver (GMS) stain, immunohistological stain of

mycobacteria using anti-mycobacterium bovis antibody, and Fite's stain (for acid fast bacilli), but all of their findings were negative. Further, to exclude the possibility of association of this mass with GI malignancy, we performed upper GI endoscopy and colonoscopy and confirmed that the GI tract was normal.

The patient was treated conservatively and follow-up examinations were performed because the mass was not malignant. However, MRI revealed that the mass had expanding features, and we performed a follow-up abdominal CT 1 month after the diagnosis. The abdominal CT showed that the size of the mass had decreased to 1 cm. Another follow-up CT performed after 7 months showed complete resolution of the mass (Fig. 5).

Discussion

Solitary necrotic nodules are rare lesions, and they are usually assumed to be benign. Recently, however, the occurrence of solitary necrotic nodules has been reported to be related with carcinoma [2]. The pathogenesis and natural history of these lesions is poorly understood. Two major theories have been reported on the pathogenesis of these lesions. One theory states that this lesion occurs as a result of trauma or a previous parasitic infection. A solitary necrotic nodule has been reported to occur in patients with

Fig. 2 Abdominal contrast-enhanced computed tomography (CT) showed an irregular hypoattenuated mass of about 2 cm. This mass was enhanced at the peripheral rim during the arterial phase (*arrow*)

Fig. 3 Abdominal liver magnetic resonance imaging (MRI) showed that the nodule was hypointense (*arrow*) on T1-weighted imaging (WI) and hyperintense (*arrowhead*) on T2WI. This lesion expanded to the subcapsular area as compared with the computed tomography findings obtained 7 days earlier

Fig. 4 The histological examination of the liver biopsy sample showed central necrotic tissue surrounded by a borderline zone containing infiltrative inflammatory cells and fibrotic changes. The outer layer shows normal hepatocytes (hematoxylin and eosin stained section, magnification $\times 200$)

a history of a parasitic infection [4, 5]; the occurrence of a necrotic nodule with dystrophic calcification and a central coiled nematode has also been reported [6]. The other theory pertains to the sclerotic evolution of a hemangioma. Solitary necrotic nodules have been reported to be supplied by a “feeding vessel” [7]. However, the origin of solitary hepatic nodules remains controversial.

Solitary necrotic nodules of the liver are frequently found incidentally, and the identification of these nodules has increased with the evolution of imaging technology. Because of the concern about a possible malignancy, surgery was performed in all the cases reported in the literature; in other cases, the lesion was detected at autopsy [3, 8, 9]. Therefore, the natural course and prognosis of these lesions remains unknown. However, in this case, we diagnosed the solitary necrotic nodule by liver biopsy and

subsequently planned appropriate treatment, thereby avoiding unnecessary surgery and facilitating the monitoring of the clinical course.

Recently, Deniz and Coban [2] reported that the solitary necrotic nodule associated with malignancy mainly involves the GI system. Therefore, we examined the GI system during diagnosis of this lesion. However, our patient did not show any evidence of GI malignancy. Solitary necrotic nodules related to carcinoma have been reported in patients aged 45 years or more [2]; therefore, since our patient was 35 years old, malignancy was eliminated from the differential diagnosis.

A case where the lesion quickly expanded within a short period of time has been reported [10]. Although in our patient the lesion rapidly expanded within 1 week, it showed complete regression over time. Generally, most patients have no abdominal symptoms. However, intermittent abdominal pain or discomfort has been reported in some patients [3, 9].

Abdominal US of a solitary necrotic nodule generally shows heterogeneous echoes and most nodules are hypoechoic with unclear margins. The CT findings show that the nodules have unclear margins and appear as hypodense lesions with variable differences in the peripheral enhancement during each phase of the imaging; but, the enhancement was not significant during any phase [3, 11]. MRI findings showed low signal intensity on T1-weighted images (WI), and slightly high intensity on T2WI. All the radiological findings in our case were consistent with those observed in a solitary necrotic nodule. However, these findings are not sufficient to provide a definitive diagnosis. On the basis of the clinical manifestations, history, and laboratory and imaging findings, a solitary necrotic nodule of the liver was suspected before surgery in only 7.8% of patients [3, 11]. The findings of a liver biopsy are often equivocal [9]; however, liver biopsy is important for definitive diagnosis and for planning the appropriate

Fig. 5 Follow-up abdominal computed tomography shows complete regression of the mass 7 months later (arrow)

treatment. The treatment options for a solitary necrotic nodule are based on the severity of the case [9]. Although all patients with solitary necrotic nodule undergo surgical treatment, our case illustrates that some patients may not require surgery.

In conclusion, we described for the first time the natural course of a solitary necrotic nodule of the liver with complete spontaneous regression. Therefore, conservative treatment and follow-up observation may be considered as a treatment option in patients with a solitary necrotic nodule of liver. Further studies are required to evaluate the clinical course and prognosis of a solitary necrotic nodule.

References

1. Shepherd NA, Lee G. Solitary necrotic nodules of the liver simulating hepatic metastases. *J Clin Pathol* 1983;36:1181–1183
2. Deniz K, Coban G. Solitary necrotic nodule of the liver: always benign? *J Gastrointest Surg* 2010;14:536–540
3. Zhou YM, Li B, Xu F, Wang B, Li DQ, Liu P, Yang JM. Clinical features of solitary necrotic nodule of liver. *Hepatobiliary Pancreat Dis Int* 2008;7:485–489
4. Tsui WMS, Yuen RWS, Chow LTC. Solitary necrotic nodules of the liver: parasitic origin? *J Clin Pathol* 1992;45:975–978
5. Shephred NA. Solitary necrotic nodule. *J Clin Pathol* 1990;43:348–349
6. Clouston AD, Walker NI, Prociv P. Parasitic origin of a solitary necrotic nodule of the liver. *J Clin Pathol* 1993;46:578
7. Berry CL. Solitary “necrotic nodule” of the liver: a probable pathogenesis. *J Clin Pathol* 1985;38:1278–1280
8. Bery CL. Liver lesion in an autopsy population. *Hum Toxicol* 1987;6:209–214
9. Delis SG, Kelgiorgi DA, Sofianidis AA, Triantopoulou CC, Pappaliou IA, Dervenis CG. Solitary necrotic nodule of the liver mimicking hepatocellular carcinoma: a case report. *Cases J* 2009;2:85
10. Imura S, Miyake K, Ikemoto T, Morine Y, Fujii M, Sano N, et al. Rapid-growing solitary necrotic nodule of the liver. *J Med Invest* 2006;53:325–329
11. Yoon KH, Yun KJ, Lee JM, Kim CG. Solitary necrotic nodules of the liver mimicking hepatic metastasis: report of two cases. *Korean J Radiol* 2000;1:165–168