

Delayed hemorrhage from hepatic artery after ultrasound-guided percutaneous liver biopsy: A case report

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Abstract

Percutaneous liver biopsy is considered one of the most important diagnostic tools to evaluate diffuse liver diseases. Pseudoaneurysm of hepatic artery is an unusual complication after ultrasound-guided percutaneous liver biopsy. Delayed hemorrhage occurs much less frequently. We report a case of pseudoaneurysm of the hepatic artery of a 46-year-old man who was admitted for abdominal pain after 4 d of liver biopsy. The bleeding was controlled initially by angiographic embolization. However, recurrent bleeding could not be controlled by repeat angiography, and the patient died 4 d after admission from multiorgan failure. The admittedly rare possibility of delayed hemorrhage should be considered whenever a liver biopsy is performed.

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Key words: Hemorrhage; Hepatic artery; Percutaneous liver biopsy

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INTRODUCTION

Percutaneous liver biopsy is considered one of the most important diagnostic tools to evaluate diffuse liver diseases. The most common complication of percutaneous liver biopsy is bleeding. The major complication and mortality rates are about 2%-4% and 0.01%-0.33% respectively^[1]. Ultrasonography-guided percutaneous liver biopsy has been shown to increase the diagnostic yield and significantly decrease complications even on outpatients^[2-4].

The less common complication of delayed bleeding after percutaneous liver biopsy, has a higher mortality associated with late recognition^[5]. Pseudoaneurysms of the hepatic artery initially should be managed with angiographic embolization, reserving surgical intervention for failure of embolization^[6]. Here we report a case of fatal delayed hemorrhage from pseudoaneurysm of the hepatic artery after percutaneous liver biopsy. The diagnosis was confirmed by ultrasound and angiography.

CASE REPORT

A 46-year-old man with genotype 1b chronic hepatitis C virus (HCV) infection was evaluated for progressive fatigue and elevated aminotransferases. The hemoglobin, prothrombin time, bleeding time, and platelet count were normal. Abdominal ultrasound was normal and ultrasonography showed no focal hepatic lesion or evidence of cirrhosis. He received a liver biopsy to evaluate the pathologic change before interferon therapy. A percutaneous liver biopsy was conducted under ultrasonographic guidance with a 2.8-mm Menghini-type aspiration needle with one pass. Chronic hepatitis was diagnosed based on histopathological assessment according to a scoring system that includes semi-quantitative assessment of liver disease grading and staging^[7]. Laboratory data and liver biopsy revealed moderate activity (grade 2/4, stage 2/4). After liver biopsy, transient hypotension was noted during the first two hours of in-hospital observation and the patient was discharged 6 h later.

Four days later, the patient complained of right upper quadrant pain radiating to the right shoulder. The abdomen was soft with normal bowel sounds and mild right upper quadrant tenderness without rebound tenderness. The patient denied abdominal trauma. Laboratory results including white blood cell count (WBC): $5.5 \times 10^9/L$; platelet count (PCT): $204 \times 10^9/L$; hematocrit (HCT): 47%; prothrombin time international normalized ratio (INR): 1.0; aspartate aminotransferase (AST): 107 IU/L; alanine aminotransferase (ALT): 145 IU/L; total bilirubin (TBIL): 16 $\mu\text{mol/L}$; alkaline phosphatase (ALP): 128 IU/L; BUN and serum creatinine (CRE): were normal. His blood pressure (BP) was 19.3/11.3 kPa, and heart rate (HR) 69 beats/min. The diagnosis of pseudoaneurysm was established 4 d after the percutaneous liver biopsy by abdominal ultrasonography. The patient suddenly became hemodynamically unstable



Figure 1 Angiography of the right hepatic artery. Pseudoaneurysm (arrows) in the right hepatic artery branch.

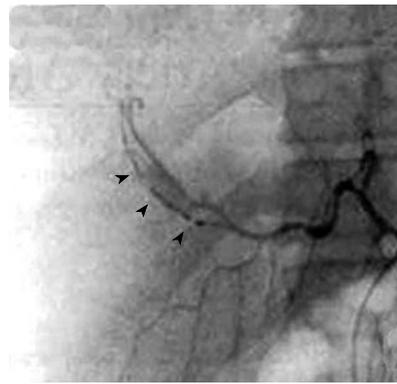


Figure 2 Platinum coils (arrows) are seen filling the feeding branch. Angiography obtained after embolization of the branch leading to and from the pseudoaneurysm.

with an HR 135 beats/min and BP 10.7/5.3 kPa 13 h after admission, which was over 5 d after the percutaneous liver biopsy. The repeat HCT was 39%. The patient was resuscitated and underwent immediate angiography, which showed a pseudoaneurysm in the right hepatic artery branch (Figure 1). The pseudoaneurysm measured approximately 1.8 cm × 2.1 cm. The patient was treated with embolization performed by multiple straight of the right hepatic artery branch (Figure 2). The angiography was repeated 28 h after admission and revealed continued extravasation of blood from the right lateral subcapsular location. These demonstrated new areas of active arterial extravasation with possible complex laceration of the right hepatic lobe. The laboratory tests obtained 33 h after admission showed INR 2.1; ALT: 3970 IU/L; AST: 4910 IU/L; ALP: 290 IU/L; TBIL: 32 μmol/L; albumin (ALB): 17 g/L, CRE: 230 μmol/L; and BUN: 19 mol/L. Soon afterward, the patient received surgery, which revealed right hepatic lobe laceration with hemorrhage. After surgery, the patient's condition continued to deteriorate with a decreasing HCT. Repeated ultrasound of the liver revealed the interval development of multiple cystic lesions in the right hepatic lobe compatible with intrahepatic hematomas. No further surgical intervention was performed because of the diffuse nature of the bleeding. The patient died 4 d after admission from multiorgan failure.

DISCUSSION

Outpatient percutaneous liver biopsy is a common practice in the differential diagnosis and treatment of chronic liver disease. The major complication and mortality rates were about 2%-4% and 0.01%-0.33% respectively^[1]. According to the recent National Institutes of Health (NIH) Consensus Conference on the management of chronic hepatitis C, liver biopsy is recommended before therapy to assess the severity and activity of the liver disease^[18]. Treatment with interferon is recommended if the liver biopsy shows evidence of septal fibrosis and/or moderate-to-severe necroinflammatory changes. More recent view on the issue of performing a liver biopsy in hepatitis C patients advises to perform a liver biopsy in genotype 1 patients, but usefulness of histologic assessment in genotypes 2 or 3 is debated, since these patients have a very good virological response^[9]. At the best, liver biopsy is supported by a grade III recommendation^[9]. Early bleeding

within hours can result from intrahepatic hematoma or laceration of the liver capsule^[1]. Previous studies showed an overall complication rate of 0.28% and fatality rate of 0.03% among 189 085 liver biopsies^[10]. Other reports showed, there were 3 deaths (0.004%) in 68 276 and 19 deaths (0.052%) in 36 786 liver biopsies^[11]. Factors associated with an increased risk of hemorrhage included increasing age, number of biopsy passes and presence of malignancy in the liver^[1,12]. The risk of hemorrhage or complication^[13] was not related to the biopsy needle type or diameter of the needle^[14].

Pseudoaneurysms more commonly occur in patients who are post liver transplant or post cholecystectomy^[15,16]; only 11 pseudoaneurysms occur among 1211 patients undergoing multiple liver biopsies after liver transplantation, whereas only 2 (0.17%) cases were attributed to percutaneous liver biopsy^[17]. This case report demonstrated an unusual complication of hepatic artery pseudoaneurysm from percutaneous liver biopsy. The use of teep mattress sutures for initial control of bleeding is preferred^[18]. After percutaneous liver biopsy with liver diseases, most patients experiencing these events were asymptomatic, and angiographic defects were found in 61% of angiography performed within 1 wk but in 11% of angiography done after more than 1 wk^[16]. The present case showed that clinical features of pseudoaneurysms may range from asymptomatic to hemobilia to massive delayed fatal hemorrhage. Ultrasound with Doppler can be used to diagnose pseudoaneurysm and to evaluate portal blood flow. A celiac or selective hepatic angiography will demonstrate the actual location and size of the pseudoaneurysm^[16,19]. A few previous studies showed that embolization of a hepatic artery pseudoaneurysm had a success rate of 97%, and the occlusion of the more proximal hepatic artery caused by dissection or thrombosis may necessitate a direct percutaneous approach^[15]. Both transarterial and direct percutaneous accesses to pseudoaneurysms have also been successfully employed^[15]. However, direct embolization of the pseudoaneurysm, allowing patency of the hepatic artery, has also been reported^[15]. In this case, bleeding from pseudoaneurysm of the hepatic artery was controlled initially with embolization, but laboratory tests performed after embolization suggest that the patient apparently had ischemic hepatitis and continued to deteriorate from rebleeding. The patient died 4 d after admission from

multiorgan failure. Ischemic hepatitis or shock liver is defined as an extensive hepatocellular necrosis associated with a decrease in hepatic perfusion due to systemic hypotension. Serum aminotransferase levels (ALT and AST) increased rapidly after the ischemic episode and peaked within 1 to 3 d to at least 20 times the upper normal limit. After recovery, aminotransferases returned to near normal levels in 7-10 d of the initial insult^[20].

In conclusion, delayed fatal hemorrhage from pseudoaneurysm of hepatic artery is an unusual complication after percutaneous liver biopsy. Pseudoaneurysms should initially be managed with angiographic embolization^[6], and surgical intervention may be needed if embolization fails.

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