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TIPS AND TRICKS

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Bleeding hepatic pseudoaneurysm complicating percutaneous liver biopsy with interventional treatment options

Abbreviation *CT* computed tomography

Hepatic percutaneous biopsy is considered to be a safe technique with reported average mortality and morbidity rates of about 0.01–0.1% and 0.1%, respectively. The reported rate of major complications, including hemorrhage, bile leak, hemothorax and perforation of the abdominal viscera, is around 3.2%. Pseudoaneurysms of the hepatic arteries are uncommon complication of percutaneous liver biopsy. However, when they occur they have a high risk of bleeding. Therefore, early management is required.

A 50-year-old female was referred to our hospital with a history of ultrasound-guided percutaneous liver biopsy for the investigation of hepatosplenomegaly with liver cirrhosis diagnosed by ultrasound. The biopsy was performed with a 0.9-mm needle biopsy with a single pass. The immediate post-biopsy course was uneventful, and the patient was discharged from the hospital the same day. Three days later, the patient was admitted via the emergency unit with a history of acute abdominal pain and vomiting. There was no history of hematemesis or melena. On examination, the patient presented with jaundice and abdominal tenderness, which was more pronounced in the epigastric region. The vital signs were stable.

Ultrasound examination of the abdomen was performed on admission and showed a large 10×9-cm hematoma in the right hepatic lobe. Conservative management of the hematoma with observation was employed, and she was followed up by daily ultrasound, which did not show any progression of the hematoma. Ten days later, the patient presented with persistant abdominal pain. CT scan of the abdomen showed an increase in the size of the previously diagnosed hematoma with a high suspicion of pseudoaneurysm. The patient was referred to our hospital for further assessment and management. The patient had a tri-phasic CT scan of the abdomen, which showed hepatosplenomegaly with a large heterogeneous mass lesion of low attenuation measuring about 15×16 cm in its longest axial access involving the right hepatic lobe in keeping with the previously diagnosed hepatic hematoma (Fig. 1). The late venous phase image showed a persistant enhancing area measuring around 2.5×1.5 cm within the above-described hematoma in keeping with the diagnosis of pseudoaneurysm (Figs. 2, 3).

The patient underwent transarterial angiography with selective and super-selective catheter placement in the celiac artery and the left and right hepatic arteries employing a 4F catheter. The early arterial phase showed a pseudoaneurysm in a segmental branch of the right hepatic artery. Two coils of 4 mm in length and 3 mm in width were placed proximal to the aneurysm in the feeding artery. The post-embolization angiogram showed minimal blood flow within the pseudoaneurysm (Figs. 4, 5). The post-embolization course was uneventful, the bleeding was controlled, the patient was followed up by ultrasound and she was discharged home.

Acute hemorrhage is the most common complication of liver biopsy, the majority of which are recognized before the patient is discharged from the hospital. There is an association of increased risk of hemorrhage and increased patient's age undergoing liver biopsy, the number of passes and the use of atropine. It was found that there is an increased risk of nonfatal and fatal hemorrhage among patients biopsied for the investigation of malignancies when compared to patients biopsied for the investigations of diffuse liver disease. Pseudoaneurysms of the hepatic artery have been reported after percutane-

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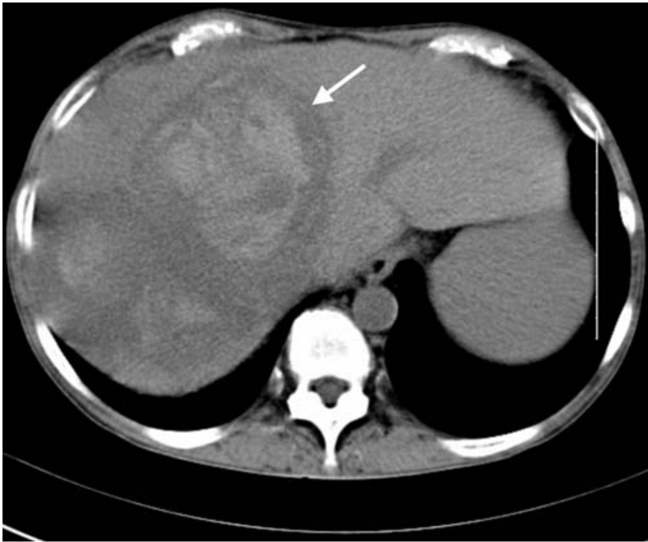

Fig. 1 A 50-year-old female with bleeding pseudoaneurysm of the right hepatic artery segmental branch secondary to percutaneous ultrasound-guided biopsy. Selected image of a noncontrast CT scan of the liver showing hepatosplenomegaly with a large heterogeneous mass lesion of low attenuation measuring about 15×16 cm in its longest axial access involving the right hepatic lobe in keeping with hepatic hematoma (*arrow*)

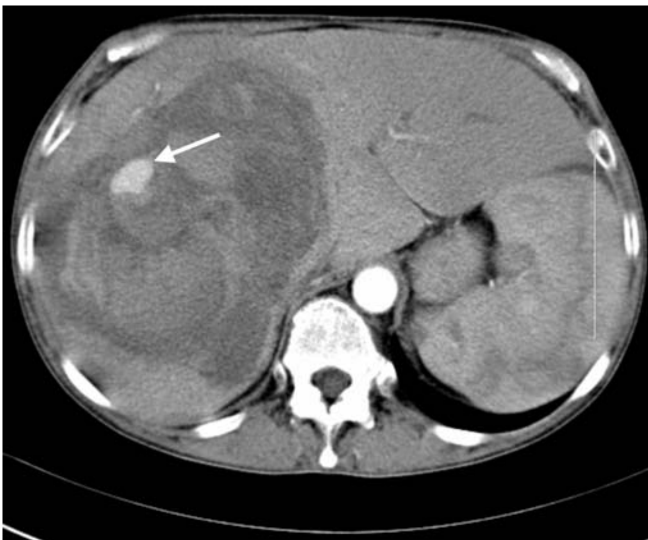

Fig. 2 A 50-year-old female with bleeding pseudoaneurysm of the right hepatic artery segmental branch secondary to percutaneous ultrasound-guided biopsy. Selected image of abdominal post-contrast arterial phase CT scan of the liver showing a densely enhanced area measuring around 2.5×1.5 cm within the hematoma in keeping with pseudoaneurysm (*arrow*)

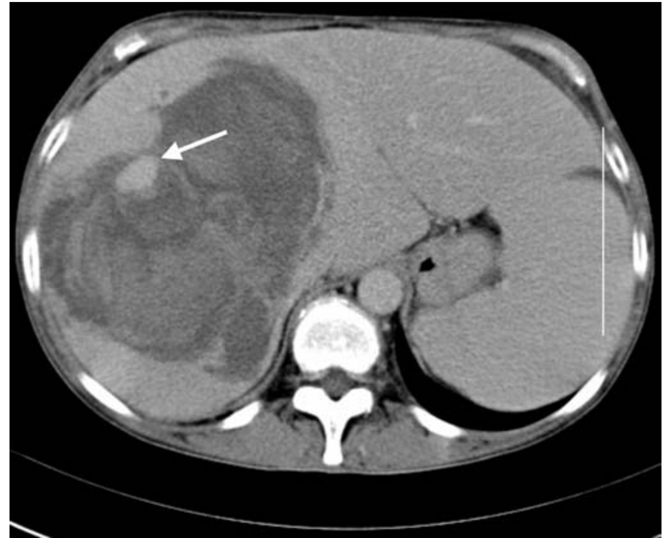

Fig. 3 A 50-year-old female with bleeding pseudoaneurysm of the right hepatic artery segmental branch secondary to percutaneous ultrasound-guided biopsy. Selected image of abdominal post-contrast venous phase CT scan of the liver showing a densely enhanced area measuring around 2.5×1.5 cm within the hematoma in keeping with pseudoaneurysm (*arrow*)

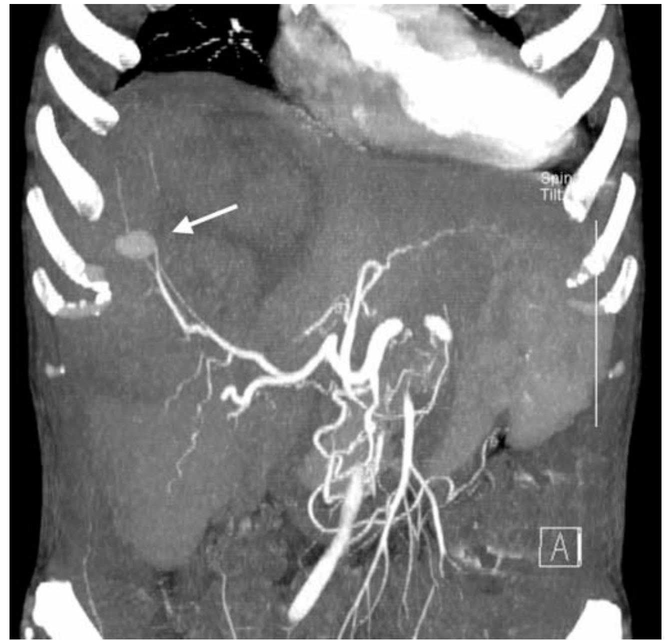

Fig. 4 A 50-year-old female with bleeding pseudoaneurysm of the right hepatic artery segmental branch secondary to percutaneous ultrasound-guided biopsy. CT maximum projection image demonstrates the pseudoaneurysm (*arrow*)

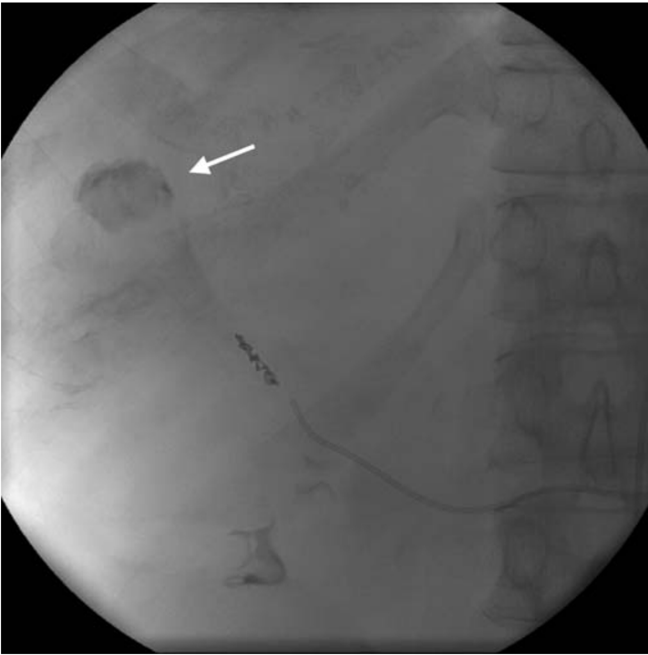

Fig. 5 A 50-year-old female with bleeding pseudoaneurysm of the right hepatic artery segmental branch secondary to percutaneous ultrasound-guided biopsy. Selected image from the transcatheter hepatic angiogram examination, immediate post-coil embolization of the pseudoaneurysm feeding artery showing minimal blood flow through the aneurysm (*arrow*)

ous liver biopsy, and they are an uncommon cause of delayed hemorrhage. However, when they occur they carry a high risk of hemorrhage. Pseudoaneurysms are often clinically silent and discovered upon evaluation for various clinical reasons, including abdominal pain, jaundice and anemia. Angiography is the most sensitive technique for the diagnosis of pseudoaneurysms.

Transcatheter embolization of hepatic pseudoaneurysms is an effective method of treatment and a variety of embolic agents including coils, gel foam particles, polyvinyl alcohol and glue have been employed.

Percutaneous injection of thrombin into the pseudoaneurysm with ultrasound or CT scan guidance can be used as an alternative approach when transcatheter embolization is not feasible because of adverse vascular anatomy or contraindication to intravenous contrast material. Surgical intervention should be preserved for patients in whom embolization fails to control the bleeding.

Potential complication of therapeutic embolization includes infection, retrograde propagation of a thrombus, accidental embolization of other arteries, accidental tissue necrosis of adjacent organs and worsening of liver function.

Late complications of percutaneous hepatic biopsy are not common. However, when they occur they carry a considerable mortality. Pseudoaneurysms have a high potential for rupture and bleeding. Therefore, aggressive treatment with embolization should be considered as the treatment of choice.