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Ethanol ablation in postbiopsy liver hemorrhage following two failed embolizations☆,☆☆

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ABSTRACT

A 42-year-old male presented with intraperitoneal hemorrhage 5 days following percutaneous liver biopsy for suspected hepatocellular carcinoma. Diagnostic angiogram localized the bleeding to segment VI hepatic artery branches. Two consecutive arterial embolizations with microspheres and platinum coils failed to control the bleeding. The patient was a poor surgical candidate, so ultrasound-guided ethanol ablation of the bleeding source and surrounding liver segment was employed as salvage therapy. The patient stabilized clinically and was discharged home to begin palliative therapy.

1. Introduction

Percutaneous liver biopsy is a well-established interventional procedure for the diagnosis of diffuse and focal liver disease. The most important complication of percutaneous liver biopsy is bleeding. The incidence of severe hemorrhage requiring hospitalization and further surgical or radiological intervention has been reported between 1 in 2500 to 1 in 10,000 biopsies [1,2]. Severe hemorrhage usually is clinically detectable within a matter of hours, but rare occurrences of late bleeding have been reported from days to a few weeks postbiopsy [1,3,4]. Increased risk of severe postbiopsy hemorrhage and mortality in patients with underlying liver malignancies has been reported [5,6]. Management of bleeding complications ranges from supportive care and blood transfusion to angiographic embolization and surgery [1,7,8]. Alternative therapies following failure of embolization and surgery are not well described in the literature, but percutaneous ethanol injection represents a potential ablative strategy that is effective and widely available.

2. Case presentation

A 42-year-old male with suspected hepatocellular carcinoma underwent an uncomplicated ultrasound-guided percutaneous liver biopsy confirming the diagnosis. He was discharged home on enoxaparin for portal vein thrombosis associated with the lesion with instructions to delay therapy for 48 h postprocedure. Five days later, the patient returned to the hospital with abdominal pain. On questioning, the patient admitted to beginning enoxaparin the day of discharge. On physical exam, the abdomen was distended, diffusely tender to palpation with rebound tenderness. His temperature was 94.6 °F (34.8 °C), blood pressure 99/73 mmHg, respiratory rate 34 breaths/min, and heart rate 122 beats/min. Laboratory data were remarkable for red blood cell count of 2.83 M/ul, hemoglobin of 8.0 G/dl, and hematocrit of 23.5%, lower than his postbiopsy hematocrit of 39.1%. International normalized ratio was 1.24 on admission, platelet count was 219,000/ul, and there were no signs of disseminated intravascular coagulation. Computed tomography (CT) of the abdomen and pelvis showed hemoperitoneum with active arterial extravasation in segment VI at the biopsy site (Fig. 1-A). He was given two units of packed red blood cells, four units of fresh frozen plasma, and one unit of isotonic fluids in the emergency department.

The patient was taken emergently to the interventional suite where a diagnostic angiogram localized an apparent site of hemorrhage (Fig. 1-B). Technically successful embolization of a segment VI hepatic artery branch with an interlock coil (VortX Interlock Coils, 2 mm×4 mm Boston Scientific, Marlborough, MA, USA) was performed (Fig. 1-C). Further subselective catheterization and angiography revealed a second site of hemorrhage in segment VI (Fig. 1-D). Embolization of the feeding artery was achieved with two additional interlock coils (VortX Interlock Coils 3 mm×6 mm

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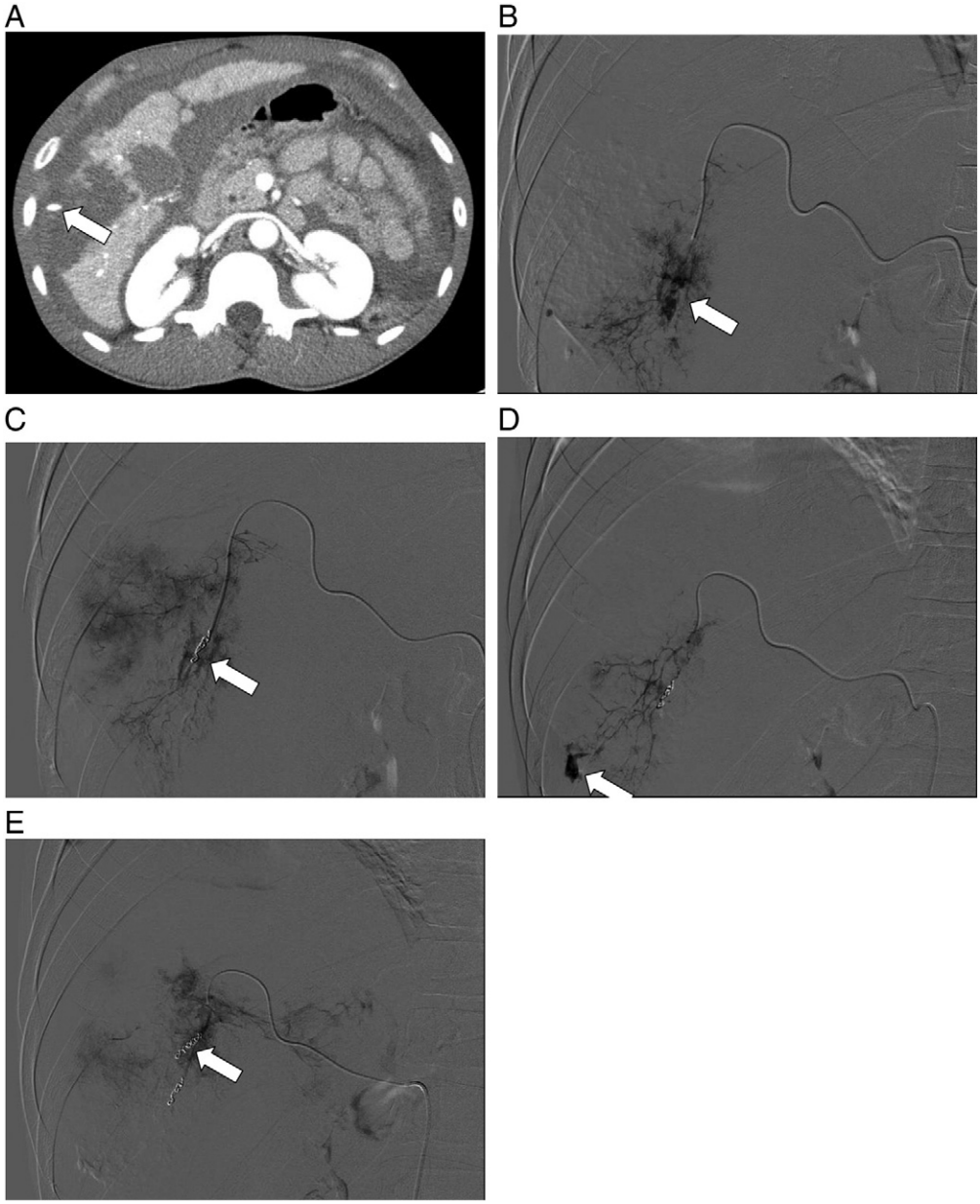

Fig. 1. (A) Post liver biopsy CT showing hemoperitoneum with active arterial extravasation near the biopsy site (arrow); (**B**) Diagnostic angiogram shows one site of hemorrhage (arrow); (**C**) Angiogram following highly selective embolization with the deployment of platinum coil (arrow) shows no sign of hemorrhage; (**D**) Diagnostic angiogram shows additional site of hemorrhage (arrow); (**E**) Angiogram following highly selective embolization with the deployment of additional platinum coils (arrow) shows no sign of hemorrhage.

and 2 mm×5 mm, Boston Scientific, Marlborough, MA, USA). The postprocedural arteriogram showed no hemorrhage (Fig. 1-E), and the patient's hemoglobin trended up to 9.6 G/dl. The patient returned to the medical intensive care unit in stable condition for further monitoring.

Over the next 24 h, the patient's hemoglobin trended down to 7.8 G/dl despite administration of an additional unit of packed red blood cells. A follow-up CT-angiogram showed persistent active hemorrhage at the biopsy site (Fig. 2-A), and the decision was made to undergo a second embolization. Distal branches of the right hepatic artery supplying segment VI were embolized using microspheres (Contour SE microspheres, 300–500 and 500–700 microns Boston Scientific, Marlborough, MA, USA). The proximal branch of the right hepatic artery supplying segment VI was then embolized with the deployment of two 0.018" fibered platinum coils (Fig. 2-B) (VortX-18 Fibered Platinum Coils, 3 mm×3.3 mm and 2 mm×5 mm, Boston Scientific, Marlborough, MA, USA) and one interlock coil (VortX Interlock Coil, 4 mm×4.1 mm, Boston Scientific, Marlborough, MA, USA). The patient received four units of packed red blood cells and two units of fresh frozen plasma during the procedure, and postprocedural arteriogram showed no hemorrhage (Fig. 2-C).

The patient returned to the intensive care unit where his hemoglobin and hematocrit continued to fall on serial measurements. General surgery evaluated the patient and advised against surgical attempts to control the bleeding. Since two embolizations failed to control the bleeding, the decision was made to attempt ultrasound-guided ethanol ablation of the bleeding vessel and segment VI vessels of the liver. The biopsy tract and area of the bleeding segment VI vessels were identified under ultrasound with Doppler (Fig. 3-A). The tract and feeding vessels were ablated with a slow percutaneous injection of absolute ethanol into the interstitium about the original biopsy tract. A total of 7 ml were infused to embolize the tract (Fig. 3-B) and 10 ml to the interstitium in the area of the bleeding vessels, obtaining hemostasis (Fig. 3-C & D). The patient stabilized and improved postablation and was discharged home.

At 2-week follow-up, the patient was clinically stable, his hemoglobin and hematocrit were 10.8 G/dl and 33.7%, respectively, and he began