Hemorrhage after Transjugular Liver Biopsy Requiring Embolization

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Transjugular liver biopsy was first described by Dotter in 1964¹ and usually performed when direct percutaneous biopsy is contraindicated due to coagulopathy or perihepatic ascites. Arterial bleeding after biopsy requiring embolization is rare.

CASE REPORT

A 22-year-old man with an anaplastic oligodendroglioma was referred to the vascular and interventional radiology section by the hepatology service in our hospital for transjugular liver biopsy for acute liver failure. The patient was coagulopathic: after transfusion of fresh frozen plasma, the international normalized ratio 1.7 and the platelet count was 67,000. After informed consent, conscious sedation was achieved with midazolam and fentanyl. The right neck was prepped and draped in usual fashion. The right internal jugular vein was accessed using ultrasound guidance, and an 8-French short vascular sheath was introduced over a 0.035-inch J guide wire. The right hepatic vein was cannulated with a 5-French multipurpose catheter (Cook, Bloomington, IN) and a 0.035-inch guide wire. A hepatic venogram was performed (Fig. 1), and the cannula of the transjugular biopsy kit (Laboratories-200, Cook) was introduced into the right hepatic vein over a 0.035-inch super stiff Amplatz wire (Boston Scientific, Natick, MA). Three 19-gauge core biopsies were obtained from the right lobe of the liver. Pathological analysis revealed cholestasis with severe steatosis.

The patient was noted to have a slowly falling hematocrit on postoperative days 1 and 2, which prompted further evaluation with a computed tomographic scan (Fig. 2). This revealed intrahepatic hemorrhage. Because of a continuing slow drop in hematocrit despite transfusion with blood products and fresh frozen

plasma, the patient was brought back to the interventional radiology section for further evaluation.

The right common femoral artery was catheterized and a 5-French sheath was inserted. An abdominal aortogram (not shown) was performed, revealing conventional visceral arterial anatomy. Selective catheterization was then performed using a RC-1 catheter (Boston Scientific). Selective hepatic angiography confirmed ongoing bleeding at the site of biopsy (Fig. 3). Superselective catheterization was performed with a 3-French microcatheter (Progreat, Terumo, Sommerset, NJ), and two subsegmental branches were embolized with 4-mm platinum microcoils (Boston Scientific). Postembolization hepatic arteriography demonstrated satisfactory occlusion, and no further bleeding occurred.

DISCUSSION

Protracted bleeding after transjugular liver biopsy is unusual and typically indicates inadvertent traversal of liver capsule or arterial injury, either laceration, pseudoaneurysm, or arteriovenous fistula. The overall complication rate for transjugular liver biopsy is reported to be ~7%.² Notably, complications in the pediatric population are much more common (~17% incidence of total complications) compared with the adult population. Minor complications are most common in both adults and children and include access site complications such as carotid puncture and neck pain as well as minor liver puncture-related complications such as abdominal pain. Major reported complications occur in 0.5% of cases and include hepatic hematoma, intraperitoneal hemorrhage, inferior vena cava perforation, renal vein perforation, and ventricular arrhythmia. Reported mortality is 0.09% in adults, and reported deaths include intraperitoneal hemorrhage (five reports), presumably

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Figure 1 Transjugular liver biopsy. Digital subtraction hepatic venogram shows normal confluence of hepatic veins.

due to capsular puncture, and ventricular arrhythmias (three reports), presumably due to sheath folding into the right atrium.

There are very few reported cases of intrahepatic hematoma (0.05% incidence) like the one in this report. Symptomatic hemorrhage is more commonly encountered with capsular puncture and subsequent intraperitoneal bleeding. Given the rare incidence, delayed recognition has been reported.³ Bleeding may occur secondary to pseudoaneurysm, arterial laceration, or

arterial portal fistula. Embolization is the treatment of choice for hepatic arterial hemorrhage irrespective of etiology. Hepatic arteries are end arteries with minimal collateralization in most people. Therefore, embolization proximal to the site of bleeding typically arrests hemorrhage, although common hepatic angiography should be performed to exclude collateral supply to an area of hemorrhage or a second site of bleeding. A variety of embolic agents may be successfully employed for hemostasis. I prefer coils for nearly all types of hepatic embolization due to ease of deployment and fluoroscopic visualization. Occasionally, it is helpful to combine coils with Gelfoam pledgets or a Gelfoam slurry to achieve optimal hemostasis. Because the liver has a dual blood supply, ischemic complications are rare after arterial embolization except in liver transplant recipients who depend on the hepatic arteries to perfuse bile ducts. Despite this fact, I tend to embolize as selectively as possible and typically use microcatheters to achieve subselective catheterization. As in any type of embolization for hemorrhage, it may be necessary to sacrifice elegance for speed depending on the clinical status of the patient.

Venous embolization has been reported for refractory hemorrhage, although I have not needed to pursue this option in my own experience. One other complication sometimes requiring embolization merits discussion: hepatobiliary fistula presenting with hemobilia. Usually this can be managed conservatively, but embolization is occasionally required. In these patients, bleeding is commonly seen emerging from the papilla of Vater on upper endoscopic exam, and these patients are ideal candidates for arterial embolization.

Figure 2 Computed tomographic (CT) scan after biopsy. (A) Unenhanced axial CT image shows complex right hepatic hematoma with blood dissecting into the subcapsular space. (B) Coronal reformatted enhanced CT image shows hematoma confined to the liver without evidence of intraperitoneal hemorrhage.

Figure 3 Embolization of bleeding hepatic arteries. (A) Arterial phase of common hepatic angiogram shows conventional anatomy. (B) Venous phase of common hepatic angiogram shows extravasation of contrast material, indicating active hemorrhage (arrow). (C) Digital subtraction (venous phase) common hepatic angiogram shows active extravasation (arrow). (D) Fluoroscopic image shows superselective microcoil embolization. (E) Fluoroscopic image shows microcoil embolization of two hepatic arteries. (F) Final postembolization digital subtraction proper hepatic arteriogram shows arrest of hemorrhage.

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SUGGESTED READING

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