

BASIC PATIENT SAFETY

Reviewing Best-Practice Procedures to Minimize Patient Risk

Percutaneous Liver Biopsy

Maya Gambarin-Gelwan, MD
Assistant Professor of Medicine
Weill Medical College
Cornell University

G&H What are the complications and adverse events that can occur in association with percutaneous liver biopsy and what is the prevalence of each in clinical practice?

MG Minor complications include transient abdominal or right shoulder discomfort and transient drop in blood pressure. Approximately 25% of patients experience pain in the right upper quadrant or right shoulder after liver biopsy. The pain is usually dull, worse with inspiration, mild in nature, and of short duration.

The major complications associated with liver biopsy include bleeding (intraperitoneal hemorrhage or intrahepatic and subcapsular hematomas), infection, perforation of intra-abdominal organs, or puncture of the lung.

Serious intraperitoneal hemorrhage occurs in 0.16–0.32% of liver biopsy procedures. Intrahepatic and subcapsular hematomas can be found in approximately 0.059%, although one study found subcapsular hematomas in 7% of asymptomatic patients on routine postprocedural imaging. Free intraperitoneal hemorrhage may result from laceration caused by deep inspiration during the biopsy, or may be related to penetrating injury of a branch of the hepatic artery or portal vein. Incidental kidney biopsy can also result in bleeding. Bleeding usually becomes apparent 3–4 hours after the procedure. Severe unremitting abdominal pain despite analgesia should prompt further evaluation for internal bleeding.

Bile peritonitis has been reported in 0.06–0.09% of patients. Transient bacteremia has been observed in 6–14% of patients and is usually inconsequential; however, bacterial sepsis has been reported in 0.088% of patients, mostly in those with biliary obstruction and cholangitis. Prophylactic antibiotics should be considered in patients with primary sclerosing cholangitis.

Gallbladder perforation has been reported in 0.117% of procedures. Some centers recommend a light breakfast containing a small amount of fat (such as butter or whole milk) for patients with an intact gallbladder; this will empty the gallbladder and may reduce the likelihood of injury during biopsy. Puncture of the lung, leading to hemothorax or subcutaneous emphysema, has been reported in 0.014–0.35% of procedures.

It is very important to discuss potential complications with patients prior to a liver biopsy.

G&H What are the basic steps in preparing biopsy patients to ensure a safe procedure?

MG Patients need laboratory tests administered to check coagulation status prior to the procedure. Each patient should be screened for platelet count and prothrombin time. Some centers also recommend measuring bleeding time. Patients on hemodialysis should have a liver biopsy on the day after dialysis; some centers give DDAVP (desmopressin) prior to the procedure. Patients should also be questioned about personal and family history of excessive bleeding.

The next step is to examine the patient's medications. If a patient is taking aspirin or nonsteroidal anti-inflammatory drugs, we advise them to stop 7–10 days before the procedure. If a patient is on warfarin or other blood thinners, their treating physician should be consulted to determine how long they can be off the medication. In addition, some herbal therapies, such as ginkgo biloba, can increase bleeding time or interfere with platelet aggregation and should be held.

Patients should be reminded of these restrictions on the day of the procedure to be sure that they have followed instructions. It is not uncommon for patients to forget and to take an aspirin or other pain reliever the night before a scheduled biopsy. In these cases, the physician needs to decide whether to proceed. In an elective procedure, I would generally reschedule.

G&H Could you describe the optimal setting and procedure for taking a liver biopsy?

MG Biopsy should only be performed in a setting that can provide adequate monitoring, generally a hospital or ambulatory surgical center. Post-procedure, a nurse should

be available at all times and the patient's vital signs (blood pressure and heart rate) should be checked every fifteen minutes for the first hour, then every 30 minutes for the following two hours, and then hourly until the patient is discharged home (4–6 hours following the procedure). Approximately 60% of all complications from the biopsy manifest within the first two hours following the procedure. Immediately following the procedure, we keep our patients in the right decubitus position for 1 hour, followed by a supine position for an additional 3 hours.

G&H What are your recommendations regarding sterilization and reuse of biopsy needles/kits?

MG I generally use one-time-use, disposable biopsy kits, although some practices still sterilize and reuse needles.

G&H Are there any novel procedures or technologies being utilized to further increase patient safety in liver biopsy?

MG We routinely use on-site ultrasound marking for biopsy. Several studies have demonstrated a lower complication rate and a higher diagnostic yield using

ultrasonographic guidance. We also perform ultrasound immediately following the procedure to look at postprocedure bleeding.

G&H Are there alternatives to percutaneous biopsy for patients at risk for complications?

MG In patients who are coagulopathic, have large ascites, or have a hematologic malignancy, the risk of bleeding is greater. In these cases, transjugular biopsy technique may provide a better alternative.

Suggested Reading

Sheela H, Seela S, Caldwell C, et al. Liver biopsy: evolving role in the new millennium. *J Clin Gastroenterol.* 2005;39:603-610.

Thanos L, Zormpala A, Papaioannou G, et al. Safety and efficacy of percutaneous CT-guided liver biopsy using an 18-gauge automated needle. *Eur J Intern Med.* 2005;16:571-574.

Farrell RJ, Smiddy PF, Pilkington RM, et al. Guided versus blind liver biopsy for chronic hepatitis C: clinical benefits and costs. *J Hepatol.* 1999;30:580-587.

Younossi ZM, Teran JC, Ganiats TG, Carey WD. Ultrasound-guided liver biopsy for parenchymal liver disease: an economic analysis. *Dig Dis Sci.* 1998;43:46-50.

Muir AJ, Trotter JF. A survey of current liver biopsy practice patterns. *J Clin Gastroenterol.* 2002;35:86-88.