

Blind Percutaneous Needle Liver Biopsy: Still the Gold Standard Method in Diagnosing Chronic Liver Diseases

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Abstract

Percutaneous liver biopsies were done for 55 patients in 2 central hospitals in Kirkuk & Sulaimaneyah in Iraq. The patients were 40 males & 15 females. The clinical conditions for which liver biopsies were indicated included liver cirrhosis, chronic hepatitis, liver tumors, undiagnosed hepatomegaly, fatty liver & pyrexia of unknown origin (PUO). The diagnostic accuracy in reaching the final diagnosis of chronic liver disease was more than 50% in cases of cirrhosis & 100% in the other causes, although the number of those cases were small to draw accurate conclusions. The complications included only a minor complication in only one case, without major complications or deaths.

Key words: Liver cirrhosis, percutaneous needle liver biopsy, laproscopic liver biopsy.

Introduction

Liver biopsy is usually the most specific test to assess the nature and severity of liver diseases. In addition, it can be useful in monitoring the efficacy of various treatments. There are currently several methods available for obtaining liver tissue: percutaneous biopsy, trans-jugular biopsy, laparoscopic biopsy, or fine needle aspiration guided by ultrasonography or computed tomography (CT). Each of these methods has advantages and disadvantages⁽¹⁾.

The size of the biopsy specimen, which varies between 1 and 3 cm in length and between 1.2 and 2 mm in diameter, represents 1/50,000 of the total mass of the liver.⁽¹⁾ Usually, for evaluation of diffuse liver disease, a specimen of 1.5 cm in length is adequate for a diagnosis to be made. The number of portal triads present in the specimen is important; most hepatopathologists are satisfied with a biopsy specimen containing at least six to eight portal triads, especially in cases of

chronic liver disease in which the extent of injury may vary among portal triads. An adequate specimen is usually provided by all the needles currently used for liver biopsy. Specimens obtained with standard thin-bore or spring-loaded needles measure between 1.4 and 1.8 mm in diameter, and those obtained with Menghini or Tru-cut needles measure up to 2 mm in diameter⁽¹⁾.

Liver biopsy is of proven value in the following situations: 2

- (1) hepatocellular disease of uncertain cause.
- (2) prolonged hepatitis with the possibility of chronic active hepatitis.
- (3) unexplained hepatomegaly.
- (4) unexplained splenomegaly.
- (5) hepatic filling defects by radiologic imaging.
- (6) fever of unknown origin.
- (7) staging of malignant lymphoma.

Liver biopsy is most accurate in disorders causing diffuse changes throughout the liver and is subject to sampling error in focal infiltrative disorders such as hepatic

metastases. Liver biopsy should not be the initial procedure in the diagnosis of cholestasis. The biliary tree should first be assessed for signs of obstruction. Contraindications to performing a percutaneous liver biopsy include significant ascites and prolonged INR. Under these circumstances the biopsy can be performed via the transjugular approach.

According to a recent reviews,^(3,4) the most common indications for liver biopsy were; to stage chronic liver disease, mostly chronic hepatitis C, to aid in the diagnosis of elevated liver tests, usually ruling out nonalcoholic fatty liver disease & NASH& to evaluate elevated liver tests in a liver transplant recipient. Even for patients in whom serologic tests point to a specific liver, a liver biopsy can give valuable information regarding staging, prognosis, and management.

Liver biopsy although traditionally is the 'gold standard' for the evaluation of liver diseases, there are several situations in which its role is being challenged. In hepatitis C, liver biopsy helps assess prognosis and treatment candidacy. An important exception is genotype 2 or 3 because treatment is more likely to succeed and therapy is relatively short in duration. For hepatitis B, liver biopsy gives some prognostic information, but serologic tests and hepatic biochemical tests are the primary determinants of treatment candidacy. Non-alcoholic fatty liver disease can sometimes be accurately diagnosed without a liver biopsy and, furthermore, there are no specific therapies available. The role of liver biopsy to assess methotrexate-associated hepatotoxicity remains controversial. Finally, patients with focal liver lesions usually do not require biopsy and, in the case of hepatocellular carcinoma, biopsy carries a risk of needle-track seeding. In short, the need for liver biopsy depends on the specific situation and should be performed when there is

sufficient uncertainty about diagnosis, severity of disease, prognosis, and treatment decisions.⁽⁵⁾

A trans-jugular approach to liver biopsy is often used in patients with a contraindication to percutaneous biopsy, when concomitant Trans-jugular Intrahepatic Portosystemic Shunt (TIPS) is planned, or according to provider preference. Although the biopsy specimen is often smaller and more fragmented than that acquired from a percutaneous approach, it is usually diagnostic^(5,6,7).

Laparoscopic liver biopsy allows visualization of the peritoneal cavity and liver surface. It is a safe procedure that can be done under conscious sedation, although it requires expertise that is not readily available{and necessitates general anesthesia}. In one large study of 1794 patients, laparoscopic liver biopsies performed in a hepatology training programme provided definitive diagnoses of chronic liver disease in 98% of patients with a rate of only 0.45% major complications.^(5,8) Confirming using bedside ultrasound(U/S), not absolutely necessary, but on a rare occasion, helps:^(3,4)

1. To avoid gallbladder or a hepatic hemangioma or a cyst.
2. In advanced liver disease, avoid right hepatic lobe hypoplasia, or colonic interposition
3. To find the best timing for the biopsy(not the traditional end of expiration, but rather at some point of the inspiratory effort)
4. Makes the left lobe accessible through the anterior abdominal wall.

Objective

In the era of laparoscopy, we tried to evaluate the diagnostic role of closed percutaneous needle liver biopsy, especially for those patients who tolerate general anesthesia poorly.

Setting

- 1- Azadi general hospital/Kirkuk/Iraq.
- 2- Sulaimany teaching hospital / Sulaimany / Iraq.

Patients and Methods

During the period from Jan. 2005-Jan. 2008, a total of 55 patients underwent closed percutaneous needle liver biopsy, by adult Menghini needle. The procedures were carried out by the authors personally. The indications were undiagnosed hepatomegaly, cirrhosis, hepatic tumours, and PUO.

Preparations

Daily injection of vitamin K for three days. Hospital admission. Preprocedural investigations performed & included: Bleeding time, PT, CBP, blood group. And repeat ultrasound examination. Fresh frozen plasma being ready.

Technique

No premedication with diazepam. Strict asepsis (mask, gloves & sterile draps). Patient positioned supine on the edge of the bed with the head resting on one pillow and the abducted right arm at the end of expiration for several seconds. Procedure explained in detail to the patient, stressing the need to hold breath. This was practiced with the patient (breath in, breath out, hold it). By percussion, the upper border of the liver was localized at the end of expiration, the biopsy site was marked on the chest wall, two intercostal spaces below the localized upper liver border, between the anterior & mid-axillary lines. The right lower chest was cleansed thoroughly with antiseptic solution. The skin over that site, at the upper border of the rib, was infiltrated with 10 ml 1% plain lignocaine &

then the breath was held in expiration, the parietal pleura, diaphragm and liver capsule was anaesthetized. A small skin incision was made with scalpel. Adult Menghini needle of 10 cm long and 1.6 diameter was used. The needle was attached to a 20 ml syringe containing normal saline, all expressed except for 2 ml of saline. The assembly was advanced through the skin incision down the intercostal ligament. Any debris within the needle tip was cleared by expressing the remaining saline. With the patient holding the breath in full expiration, the needle was rapidly advanced to the depth of 8 cm from the skin surface (almost the needle's length) while simultaneously applying suction to the syringe. The assembly was immediately withdrawn. The entire procedure took one or two seconds. The sliver of the tissue was gently expressed onto filter paper and placed in buffered formalin. Sterile dressing was applied to the puncture site.

Patient was informed about possible pleuritic pain or shoulder pain. The patient was kept supine till next day.

Record of pulse, blood pressure and respiratory rate was done quarter-hourly for 2 hours, half hourly for 2 hours, hourly for 4 hours and then two-hourly for 16 hours. Full blood count was checked on the next day.

Exclusion criteria

1. Uncooperative patient.
2. Bleeding diathesis, prothrombin time >17 sec, platelet <100
3. Suspicion of hydatid disease or liver abscess, biliary sepsis, angiomatous tumour
4. Bile duct obstruction, advanced chronic airway disease, localized skin infection
5. Focal left lobe lesions (for laparoscopic control)
6. Potentially respectable malignancy

Results

Total number of patients for whom percutaneous needle liver biopsies were

done, was 55 patients. Age range of the patients was; 50-75, male 40& female 15.

Table 1. CLINICALLY DIAGNOSED GROUPS (Diagnosed BY CLINICAL FEATURES supported by laboratory tests, U/S +/- CT)

CLINICAL PROBLEM	NO.OF CASES
LIVER CIRRHOSIS	21
HEPATIC TUMOURS	16
CHRONIC HEPATITIS	10
FATTY LIVER	1
PUO	1
UNDIAGNOSED HEPATOMEGALY	6

Table 2. HISOLOGIC DIAGNOSTIC YEILD

Clinical diagnosis	Total	Cases where liver biopsy established diagnosis
Liver Cirrhosis	21: (11)diagnosed (10) cryptic→	*Alcoholic:5 * Viral B =4, *Viral C=non *Primary biliary cirrhosis=1 * Hemochromatosis=1 Cryptic
Hepatic tumors	16	*15 metastatic *1 primary.
Chronic hepatitis	10	*Alcoholic=3 *Viral B =2 * Viral C=non *Autoimmune=5
Fatty liver	1	Alcoholic fatty liver.
Fever of unknown origin	1	Tuberculosis.
Undiagnosed hepatomegaly.	6	6 Non-alcoholic steatoheaptitis(NASH)

Table 3. complications

Type of complications.	Number
Minor (shoulder/or abdominal pain).	All
Major (bleeding requiring blood transfusion).	Non
Deaths.	Non

Complications

Other than shoulder and/or abdominal pain, which (which occurred in all the patients who underwent percutaneous needle liver biopsy), and was tolerable in all except one who necessities frequent

analgesia, no serious complications were recorded.

Discussion

Total number of patients for whom percutaneous needle liver biopsies were done, was 53 patients with age range

between 50-75 years, with male 40& female 15.

In a Canadian study of liver biopsies done for diffuse liver disease for 67 patients, with age range, between 20-70 years (younger than our patients); sex, 43 male and 27 female; nearly similar to this study⁽⁹⁾. In this study clinically diagnosed cases for whom percutaneous needle liver biopsy was planned, included 20 patients with liver cirrhosis, 16 patients with hepatic tumors, 10 patients with chronic hepatitis, 5 patients with undiagnosed hepatomegaly, one patient with fatty liver & one patient with pyrexia of unknown origin (PUO).

In a recent Italian study, indications for the procedure were; chronic hepatitis C, nonspecific elevated liver biochemical, followed by chronic hepatitis B and suspected nonalcoholic steatohepatitis.⁽¹⁰⁾ Of the 55 patients in this study, the diagnostic accuracy in diagnosing the cause of diffuse chronic liver disease was 45 out of 55 (around 89%), being more than 50% accurate in diagnosing the cause of clinically diagnosed liver cirrhosis & 100% accurate in diagnosing other categories namely, hepatic tumors, chronic hepatitis, undiagnosed hepatomegaly, fatty liver& pyrexia of unknown origin, but the number of cases specially the last categories were small to draw a final conclusion on the diagnostic accuracy of liver biopsy in these conditions. Studies had proved that in properly selected patients, liver biopsy has a high benefit/risk ratio and is often considered the final and definitive diagnostic test⁽¹¹⁾.

The complications that occurred during or after the procedure in this study comprised only minor complications in the form of abdominal and/or shoulder pain except for one of them was so severe that necessitate frequent analgesia, while no major complication or deaths occurred in this study. Studying complications of more than 4000 percutaneous liver biopsies done in Canada, pain requiring admission

occurred in 0.51% & bleeding 0.35% & were most common, while only six patients (0.14%) died; all had malignancies⁽¹²⁾.

Conclusions

1. Needle liver biopsy remains the gold stander for diagnosis of chronic or infil trative hepatic disease.
2. in patients planned to have laparoscopic liver biopsy, needle biopsy obviates the need of general anesthesia and its attendant risks.
3. though an invasive procedure,percutaneous needle liver biopsy is safe .

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