

LWER BIOPSY

Pages with reference to book, From 167 To 169

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DEFINITION

Liver biopsy is an important diagnostic procedure that permits morphological and histochemical examination of liver.

INDICATIONS

1. Diagnosis of primary liver disease.
2. Hepatomegaly of uncertain origin.
3. Assessment of progression of disease and response to therapy.
4. Differential diagnosis of jaundice.
5. Confirmation of malignant disease.
6. Staging and diagnosis of lymphoproliferative disorders (e.g., lymphoma, Hodgkins disease).
7. Evaluation of splenomegaly of uncertain origin.
8. Diagnosis of granulomatous and uncommon infections (fevers of unknown origin, like tuberculosis).
9. Diagnosis of metabolic diseases like glycogen storage disease. Diagnosis of Midtystem disease like sarcoidosis, haemachromatosis, amyloidosis.

PREPARATION

1. Regardless of technique being used, it is best to admit the patient for a few hours into hospital for observation, though liver biopsy is now being performed with increasing frequency on out-patient basis^{1,2}.
2. The patient is reassured and the procedure explained in simple words.
3. Percutaneous liver biopsy is usually performed at the bedside of the patient, usually in the morning with patient fasting, since fasting liver is less congested.
4. Sedation is unnecessary in most of the cases except in a few neurotic or psychotic patients and in children (injection valium I/V). Even if it is used, it should not be so deep that the patient's cooperation is lost.
5. a) Evaluation of respiratory status.
b) Ability of the patient to assume position for liver biopsy.
c) Coagulation profile, i.e. prothrombin time, bleeding time, platelet, activated partial thromboplastin time.

POSITION OF PATIENT

For intercostal access the patient should be supine near the edge of the bed with one pillow, with his right arm raised and placed under his head to widen the intercostal space. The left arm remains beside the trunk. Some operators like to rotate the trunk towards the left to varying degrees³.

SITE

Biopsy can be performed intercostally or subcostally. Subcostal approach is used in cases where a biopsy of a specific area is necessary and when the liver constantly extends below the costal margin for at least two inches. In the subcostal approach in order to avoid the gallbladder, one must keep at least two inches away from the midclavicular line in expiration. For intercostal approach the site is selected by percussing out the area of maximum dullness in midaxillary line. We usually biopsy between 8th and 10th intercostal space. If hepatic dullness is absent on percussion, biopsy should not be done unless guided by ultrasound or CT scan.

INSTRUMENTS/MATERIAL

Vim Silvermann needle/Aspiration needle/Trucut needle.

Syringes 10cc and 50cc.

Needle 21 G and 25 U.

Xylocaine 2%.

Sterile packs containing towels, gauze, gloves, forceps, bowels, knife blade or skin piercer.

Two specimen bottles with formaline.

Adhesive tape.

Spirit, betadine.

TECHNIQUE

Aspiration (Menghini's) Method³

It consists of a thin walled steel shaft and a short bevelled tip sharpened all the way around (1.4mm wide and 70mm long). After taking all aseptic measures, local anaesthetic is infiltrated at the biopsy site and down to include the liver capsule. A small hole is made in the skin and subcutaneous fascia with a piercer to facilitate entry of the biopsy needle and to avoid damage to the sharp end of the needle. The biopsy needle is then attached to a 50cc syringe containing 10-20ml of xylocaine (or normal saline). The needle is then advanced, while the patient is breathing quietly, until it is felt to go into the space overlying the liver. 3-5ml of xylocaine is injected to clear any debris from the needle. The patient is then asked to breathe out and then stop breathing, suction is applied to the syringe and the needle is rapidly advanced in and out of the liver in one swift movement, pointing towards xiphisternum while maintaining suction through out the movement. Depth of penetration should be prejudged according to thickness of chest wall and the site of the lesion to be biopsied. Jamshidi's disposable needle, a modification of Menghini's needle, can also be used.

VIM SILVERMANN

Needle consists of an outer 16G sheath about 8cm long and a longer, longitudinal split inner cutting blade. First the inner cutting blade is inserted into the outer pointed sheath and whole assembly advanced through a small incision made intercostally into the liver. The cutting blade is quickly pushed forward as far as it could go (about 13cm), while the outer sheath is held firmly in its place. At this point the cutting blade is held steady while the outer sheath is advanced over it with the rotating motion bringing the assembly back to its original relation but advanced 1.5cm further into the liver. The entire assembly is rotated approx. 90° breaking the terminal attachment of the liver fragment and then the entire assembly is withdrawn, the specimen being held in place in the distal portion of the split blade.

TRUCUT⁴

The needle (or cannula) is approx. 9" long with an outer diameter of 1.8mm. It has an inner obturator with a sharpened point and a 2cm slot just behind the pointed tip. The whole instrument with the cannula/or needle advanced over the obturator is inserted into the substance of the liver, while holding the plastic hub attached to the needle in one hand and that attached to the obturator in the other. The cannula is then retracted and advanced rapidly without advancing the obturator. Liver tissue fills the specimen notch in the obturator and the cannula cuts it off neatly from the rest of the organ. The entire assembly is then withdrawn. It has the advantage of procuring a non-fragmented specimen in a fibrotic liver permitting preservation of biopsy architecture.

POST-OPERATIVE CARE

1. Patient should lie on his right side for two hours.
2. Patient should remain in bed for 24 hours.
3. Vital signs should be checked for first few hours.

CONTRAINDICATIONS

Absolute

1. Bleeding tendencies.

2. Sepsis (Chest wall infection).
3. Biliary obstruction (Increased risk of biliary peritonitis) ^{5,6}.
4. Suspicion of hydatid cyst or hemangioma.
5. Severe debility.

Relative

1. Congested liver (Increase risk of hemorrhage) ⁷.
2. Uncooperative patient.
3. Massive ascites.
4. Inability to detect liver dullness on percussion unless directed by Ultrasound or CT Scan.
5. Amyloidosis.

Complication

1. Damage to neighbouring organs (kidney, colon, lung, distended gall bladder).
2. Bile peritonitis^{6,7}.
3. Hemorrhage^{8,9,10}.
4. Intrahepatic haematoma¹¹.
5. Accidental puncture of abscess or hydatid cyst.
6. Infection at needle site.
7. Pain.
8. Bile pleuritis¹².
9. Shock¹³.
10. Fever.
11. Needle fracture (Rare).

COMMENTS

1. Percutaneous Liver Biopsy is a safe procedure (serious complications in 1 in 1000) with very little pain involved in experienced hands. It can be performed by any physician who understands indications, contraindications its limitations and complications and who is well familiar with anatomy of chest and abdomen.
2. The intercostal vessels and nerves travel along the inferior border of the rib, one should insert needle for biopsy along the superior border of the rib.
3. One second aspiration technique has revolutionised liver biopsy by greatly reducing the chances of complications and is now the most commonly performed method of liver biopsy.
4. Trucut method is best indicated in hard cirrhotic liver, to avoid fragmentation by aspiration method.
5. In infiltrative liver diseases, two passes of the aspiration needle in different directions can increase the chances of diagnosis by 10 — 20%. Examination of fluid in biopsy syringe for cytology can further increase chances of diagnosis by another 10%.

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