

## LIVER BIOPSY GUIDELINES: PATIENT/LAY SUMMARY

### 1. Introduction

A liver biopsy is a diagnostic test which involves the removal of small quantities of tissue from the liver and is usually done under local anaesthetic. This procedure allows microscopic examination tends to be an accurate method of diagnosing and determining the severity of various liver related (hepatic) diseases and conditions such as cancer, hepatitis and scarring.

### 2. Purpose of guidelines

These new liver biopsy guidelines are designed to provide health care professionals and their patients with clear recommendations about the role and use of liver biopsy in practice.

Despite the growth of non-invasive imaging techniques in recent years and a better understanding of how blood clotting works, the study of tissues (histology) by obtaining a sample (biopsy) and examining it under a microscope to detect any abnormalities or disease remains invaluable in many cases.

Liver biopsies are usually carried out by a radiologist, a medical doctor who specialises in diagnosing and treating disease and injury through the use of medical imaging techniques including x-rays, computed tomography (CT scans), magnetic resonance imaging (MRI), nuclear medicine, positron emission tomography (PET scans), fusion imaging, and ultrasound.

### 3. Purpose of a liver biopsy

There are many causes of liver disease and it is sometimes difficult to diagnose and work out the best treatment using other tests such as non-invasive imaging techniques or blood tests.

Liver biopsies offer the opportunity to obtain a sample of tissue and examine it under a microscope to detect any abnormalities or disease. This remains invaluable in some patient cases as histology (the study of human tissue) can be the only way to diagnose some types of liver disease and identify how advanced it has become.

The main reasons for a liver biopsy are to

- help clarify diagnosis,
- determine severity of liver damage or grade of tumour,
- help predict prognosis in a person with a known diagnosis,
- inform treatment decisions,
- monitor disease progression or response to treatment,
- obtain liver tissue for non-histological assessment (microbiology, biochemical, other),
- support research.

It is important that patients are fully informed about the risks, benefits and alternatives to a biopsy and have given full informed consent. The procedure must be carried by a competent, qualified healthcare professional and the samples taken must be of an adequate quality and size. All healthcare professionals who are involved in requesting, obtaining and interpreting the liver biopsy need to know the reasons for the biopsy including the underlying liver condition.

The biopsy sample must be examined by a specialist doctor who is able to interpret the findings. If for any reason, a biopsy is done outside these guidelines or the written hospital protocol, there should be discussions by all of the members of the multi-disciplinary team (including histopathologists - doctors who are experts in the interpretation of cells and tissue samples) prior to the biopsy and the decision and reasons recorded in the medical notes. This should also be discussed with the patient.

Liver biopsies should only be undertaken if the information cannot be obtained by other less invasive means.

Table A (Appendix) provides a list of all of the different types of liver conditions and explains when a liver biopsy may be deemed appropriate for each condition and also explains other less-invasive means that should be considered.

#### 4. Meeting patient concerns

Some patients express a degree of anxiety about having a biopsy, are unsure what it involves or why they have to have it, how long it takes or how much it is likely to hurt.

The British Liver Trust Helpline has identified three key areas for improvement that need to be addressed by clinicians and these are highlighted within the guidelines.

**Communication:** Clinicians should explain clearly to patients, why they need a biopsy and advise them if there are any alternatives to a biopsy and what the advantages and disadvantages of these alternatives would be. The risks associated with the biopsy procedure should be clearly explained.

**Consent:** Patients should have enough time to fully discuss the indications, alternatives, risks and benefits of having a liver biopsy before they consent to the procedure. This conversation should take place in a quiet area with a health professional with a specialist knowledge of biopsy who is equipped to answer any concerns. Ideally, clinicians should not seek to gain consent for the procedure on the day it is being given. Patients should have time to reflect and speak to their loved ones if they wish.

**Post-procedure:** Patients should be given clear information at the point of discharge following the procedure. This should include advice about the pain they are likely to experience, the duration of any discomfort and any medication they should take. They should also have clear advice about the circumstances in which they should seek further medical assistance and how they should do this.

#### 5. The risks of having a biopsy

Generally, liver biopsy is a very safe procedure, but it is not free of risk. All invasive procedures have an associated risk of illness or disease (morbidity) or death (mortality). The reported risk of complications varies depending on the type of biopsy.

The risk of a biopsy needs to be balanced against the benefits that the findings of a biopsy will provide. The development of complications is not necessarily the fault or error of the healthcare professional.

Complications are uncommon but there may be some mild pain or discomfort in the area of the biopsy. In a small number of cases there is some minor bleeding that soon stops.

After a biopsy, patients should seek medical advice when:

- Bleeding occurs from the site of the biopsy
- The biopsy site becomes red, angry looking or swollen
- A high temperature (fever) develops
- The biopsy site is still painful after a few days and painkillers do not help

In more severe and rarer cases, a blood transfusion and/or an operation is required to deal with it. On occasion it is possible for bile to leak from the liver internally. There is a small risk that the small wound will become infected after the biopsy.

#### 6. When might there be an increased risk?

There are certain circumstances where there is an increased risk, and these are listed below. Where possible the risk should be minimised, but biopsy is justified when the risks outweigh the benefits.

A biopsy should only be done where there are questions around diagnosis and the possible benefits to patient are outweighed by the risks.

**Uncooperative or anxious patients:** A patient may not cooperate due to genuine fear and anxiety about the procedure. It is important that patients are able to cooperate with all instructions including lying very still as any sudden movement while the needle is penetrating can lead to significant injury and bleeding. Sedation and even general anaesthetic/anaesthesia may be used in certain cases.

**Extra hepatic biliary obstruction:** Sometimes there is a blockage of the normal flow of bile from the liver to the intestinal tract. This is called extra hepatic biliary obstruction, and, in these cases, there is an additional risk as the procedure may result in a bile leak and may cause peritonitis (inflammation of the abdominal wall), septicaemia (from sepsis), shock and very occasionally death.

**Bacterial Cholangitis:** This is when infected bile enters into the circulation system. If a patient has Bacterial Cholangitis, there is a risk of peritonitis and septic-shock after a liver biopsy. However, a liver biopsy can be useful as it can offer useful bacteriological information especially in the context of investigation of tuberculosis or when people have a very high temperature and the reasons are unclear (pyrexia of unknown origin).

**Ascites:** A liver biopsy in a patient carrying a large volume of ascites has associated risks. This is due to the difficulty in obtaining a biopsy specimen because of the distance between the abdominal wall and the liver and the risk of uncontrollable bleeding. However, research trials do not substantiate these risks and it is therefore considered relatively safe. Image guidance following a paracentesis (an ascites drain) should be considered to reduce the risk.

**Obesity:** The biopsy should be obtained using ultrasound guidance as the liver may be more difficult to localise or through the transjugular route.

**Pregnancy:** Liver biopsies are rarely needed in pregnant patients. One small study showed that the procedure was linked with a small increased risk of premature birth. Where there is no threat to life it is reasonable to do a biopsy after the delivery of the baby.

Focal lesions with cystic element: Modern imaging techniques can often identify benign cystic lesions in the liver thereby eliminating the need for biopsy in many cases.

Where possible, risks should be minimised by using methods such as sedation, ascites drainage and biliary decompression. Biopsy is justified when the benefits outweigh the risks.

#### 7. Different techniques for undertaking a liver biopsy

All hospitals must have a formal process for assessing the suitability and competence of those who perform biopsies and for ensuring that they have enough training and experience to undertake the procedure safely.

**Percutaneous liver biopsy:** This is the most common type of biopsy. It involves inserting a thin needle through the skin into the liver and removing a small piece of tissue. Before the procedure, you will be asked to lie on their back or on their left side. The skin over the liver region is then cleaned and prepared by applying antiseptic. Some local anaesthetic is then injected into a small area of skin and tissues just over a part of the liver (usually between two lower ribs on the right-hand side) to make the skin in this area numb. A special hollow needle is inserted through your skin into the liver. The clinician will ask you to breathe in and then out and then hold your breath while the needle is inserted into the liver. The needle will remove a small sample of liver tissue for further examination. The doctor or clinician obtaining the biopsy may be guided by an ultrasound scanner or computerised tomography scan for greater accuracy. Such scans are painless. Imaging can potentially reduce the risk of complications. Contrast-enhanced ultrasound may be of use in those with advanced chronic liver disease.[1]

**Blind liver biopsy** is where experienced clinicians perform the biopsy without imaging guidance. The guidelines state that a blind liver biopsy should not be performed without recent liver imaging (within the preceding 3 months) and this imaging should be reviewed before undertaking a non-guided biopsy.

**Plugged Liver biopsy:** A plugged liver biopsy is a modification of the above (percutaneous) approach. It is used in cases where patients have impaired coagulation (their blood is not clotting optimally) or ascites and where transjugular liver biopsy is not feasible. There is no definitive evidence on routine use of tract plugging biopsies, nor is there definite evidence to recommend its use in patients at increased risk of bleeding, although its use in this latter setting is prevalent among trained operators. Although available evidence is weak, a plugged liver biopsy may be considered over a transjugular approach in the biopsy of a focal liver lesion or where a larger tissue specimen is required, when there is impaired coagulation.

**Transvenous/transjugular biopsy:** This is used in patients who have difficulty with blood clotting where there is a risk of bleeding. It is a relatively safe technique which reduces the risk of bleeding.

You will be asked to lie on your back and the radiologist applies a numbing medication on one side of the neck and makes a small incision. They then insert a flexible hollow tube (catheter) into the jugular vein. A contrast dye is then injected into the tube and a series of images taken. The dye allows the specialist to see the hepatic vein. A biopsy needle is then threaded through the tube and one or more liver samples are taken. The catheter is carefully removed, and the incision covered with a bandage.

**Transfemoral liver biopsy:** This uses the femoral vein as an access point and may be adopted if a transjugular biopsy fails or is not technically feasible for example where patients have internal jugular vein thrombosis.

Endoscopic ultrasound-guided liver biopsy: This method provides a high-resolution, detailed image of the liver so that a biopsy needle can be safely directed to the organ

Laparoscopic liver biopsy: This technique tends to be used in hospitals where access to transjugular liver biopsy is not possible, where patients have issues with their blood clotting and in those who have a combination of a focal liver lesion or tumour and a bleeding disorder (coagulopathy) where a tissue sample is essential for diagnosis. This procedure is usually done under general anaesthetic. Small tools are then inserted including a tiny video camera and guided to the liver to take tissue samples. The tools are finally removed, and the incisions are closed with stitches.

Variable facilities are available in different hospitals and will dictate the type of biopsy that can be offered. If necessary, patients should be referred in a timely fashion to a regional centre that can offer alternative facilities if it is deemed clinically necessary.

#### 8. What care should you receive after your liver biopsy?

Biopsies are usually done on the day and do not necessitate an overnight stay. You are expected to lie on your side and are observed for at least 3 hours to check there is no further bleeding. Any pain or discomfort experienced can usually be treated with painkillers.

The liver tissue samples are sent to a laboratory to be examined by a doctor who specializes in diagnosing disease (pathologist) who will search for signs of liver disease and damage. The advice is to rest to ensure the liver has a chance to heal properly.

The report may take two weeks or so to come back but if special tests are required, may be longer

#### 9. Informed consent

Consent should be obtained from all patients prior to a liver biopsy in accordance with national guidelines. Consent must be voluntary, informed and the patient must have the mental capacity to decide. Information should be given orally and supplemented in written form using language that is comprehensible. The patient should be aware of the benefits and risks in advance of the procedure. The information on risks should be given in easy to understand language. For example: 'Out of a 1000 people like you having a liver biopsy, 2 will develop bleeding requiring a transfusion....'

Where a biopsy is undertaken solely or partly for research purposes, patients must be fully informed and the procedure approved by the appropriate ethics committee/body in alignment with hospital regulations.

#### 10. Clinical considerations

To ensure that the biopsy is done as safely and effectively as possible, the responsible healthcare professional will consider the indication (reason) for the biopsy; any current medication and allergies; medical history; aftercare; recent blood tests and platelet count; blood clotting and liver function. They will review any previous imaging and consider the size and shape of the liver and whether there are any other complications such as ascites.

When requesting a liver biopsy, the clinician will also consider whether the patient has antimicrobial prophylaxis and what is the best approach.

Immediately prior to the biopsy, they will check to make sure they are dealing with the right patient (for example checking date of birth, post code etc), the informed consent and that any medication has been modified as necessary. There is no definitive practice to suggest whether patients should 'be nil by mouth' before undergoing a biopsy. Some centres advise fasting for a minimum of 2 hours.

### 11. Monitoring after the liver biopsy

Patients are monitored so pain can be treated appropriately, and any complications detected and attended to early. Factors associated with complications include the type of biopsy, the width and type of needle, clotting characteristics, the size and shape of the liver, ascites and so on.

Most complications become evident/apparent within 3 hours of the procedure. All patients should be monitored with regular clinical observations for at least 3 hours after a procedure.

Discharge should only happen if your condition is stable: that is when your circulation is acceptable/stable, there is no evidence of bleeding, blood pressure is normal, and you do not have complaints of pain or shortness of breath.

Prior to discharge, patients should be given oral and written instructions regarding further monitoring and day to day activities. This should include advice to rest and not drive motor vehicles, to operate heavy machinery, undertake strenuous activity or lift heavy objects for 48 hours.

If they experience any symptoms that would suggest discomfort, infection or injury, patients should be instructed to contact the hospital and be provided with contact details to do this.

### 12. What happens to the sample after the liver biopsy?

The sample is sent to a laboratory where it is assessed by a pathologist. They then send a report back to the clinician. The reason for the liver biopsy should be clearly communicated to the pathologist by the clinician who undertook the biopsy. Results of recent clinical investigations and a note of the reports of any previous liver biopsies should also be included.

The biopsy report should include the size of the biopsy specimen and confirm that the sample is in their assessment sufficient to assess the liver disease. The report should conclude with a concise diagnostic summary. For routine non-urgent biopsies, the report should be provided in most cases within 10 days. When the report is required more urgently, (e.g. acute liver failure, transplant) a preliminary report should be provided by telephone or email.

For biopsies obtained outside a specialist centre, the reporting pathologist should have access to a second opinion from a liver centre.

Samples from liver biopsies should be stored for 30 years. Reviewing biopsies over time can inform how the liver disease is progressing.

### 13. Professional responsibility

The decision to undertake a biopsy involves a number of clinicians with different specialist skills. Patients should have confidence that the decision to undertake a biopsy is correct and that the risks are carefully assessed. The decision should be supported by a multi-disciplinary team. The person who is obtaining the biopsy must be informed when new information becomes available.

All members of the team involved in the clinical decision making should be aware of the risks and benefits in each individual case. Serious complications (bile leakage, severe pain requiring additional hospitalisation, any bleed requiring a blood transfusion and (in very occasional cases) deaths must be recorded and monitored.

Much clearer guidance on the competencies required and the training needed to undertake a liver biopsy should be developed.

#### 14. Quality standards

For non-urgent biopsies, the interval between request and biopsy should be less than four weeks, regardless of which type of procedure is adopted.

All patients should be given oral and written information about the indications, benefits and risks to biopsy alongside details of post discharge support.