

# LIVER RESECTION

## Patient Information

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### Outline:

- What is a liver resection?
- What is the liver?
- Why might one undergo liver resection?
- What does this operation involve?
- What are the risks of liver resection?
- What to expect pre- and postoperatively?

### What is a liver resection?

Liver resection is also called hepatectomy. It is the surgical removal of part of or all of the liver.

### What is the liver?

In health, the liver is a large organ which is found in the right upper part of the abdomen ("belly"). It has many functions. This includes—breakdown of substances including many medications; produces various proteins including clotting factors; produces bile; as well as helps the body manage sugars and fats.

It is situated below the diaphragm and behind the right lower rib cage. It is unique in the body in that it has 2 blood supplies—the hepatic artery which carries blood from the heart and the portal vein which carries blood from the intestines to the liver. This direct route from the intestines to the liver also explains why the liver is a common site for spread from cancers of the intestine (such as colon cancer). It also has ducts which drain bile from the liver into the intestines. These ducts join together to form the common bile duct.

### Why might one undergo liver resection?

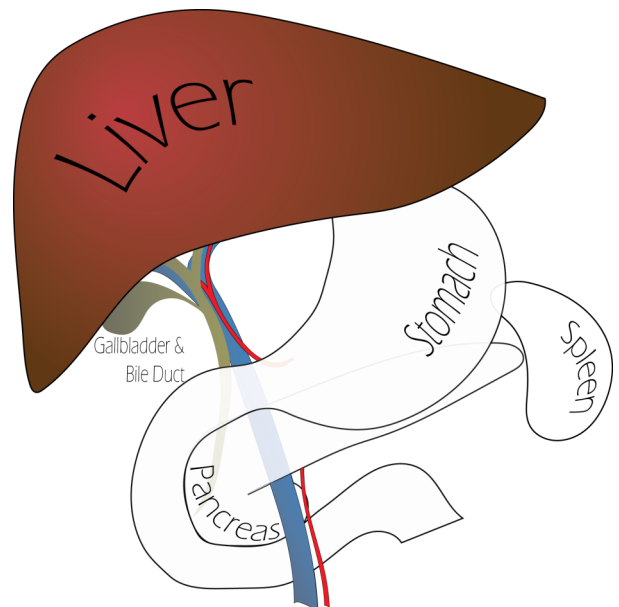
The most common reason for this operation is for a tumour or cancer of the liver. Sometimes, the tumour is removed because cancer cannot be ruled out. Common cancers include cancer of the liver (hepatocellular carcinoma), cancer spread from colon cancer (colorectal liver metastases) or cancer of the bile ducts (cholangiocarcinoma).

Usually, the tumour is diagnosed on scans, either CT or MRI. Importantly, a biopsy is often not required prior to performing surgery if the tumour/lump is suspicious enough. This is because of the fear of spread of cancer by the biopsy needle coupled with the fact that no needle biopsy can completely exclude the presence of cancer.

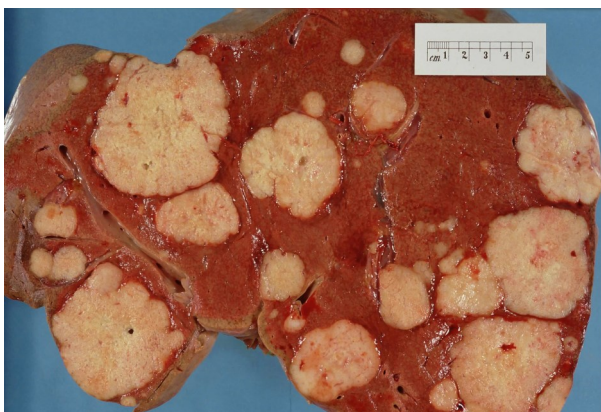
Not all cancers or tumours can be removed surgically. The liver plays an important role in maintaining life and therefore an adequate amount of liver needs to remain after surgery. Therefore, factors to consider include: the number of tumours, their size, their location and the patient's liver function and whether there is spread elsewhere.

### Can we "grow" the liver before surgery?

Sometimes, the amount of liver which will remain after surgery is expected to be too small for survival. In these cases, your surgeon may send you for a Portal Vein Embolisation. This procedure involves blocking off some of the blood vessels to the part of the liver planned for removal. This leads to shrinkage in this part of the liver and growth of the part which is to remain. You will have a scan a few weeks after the procedure to assess for growth. If successful, surgery will be carried out.



**The liver and surrounding structures. The green, blue and red structures represent the bile duct with the gallbladder; the portal vein (main vein supplying blood to the liver); and the hepatic artery (the artery to the liver).**



**Cross section of a liver with multiple metastatic deposits (cancer spread from elsewhere) in it.**

Source: Public domain image from Wikipedia uploaded by Haymanj

Version 1.0R

### What does this operation involve?

Depending on the amount of liver to be removed, the complexity of the procedure can vary greatly. Resection can vary from a small section of liver ("wedge resection") to half the liver ("hemihepatectomy") or more than half ("extended hepatectomy").

Depending on the complexity, the operation may be performed with open surgery or sometimes, keyhole (laparoscopic) surgery. After making an incision, the surgeon will often first perform an ultrasound to reconfirm that the tumours can indeed be removed. If surgery is found to be not possible at that stage, the procedure will be stopped. This is important as blindly going ahead with surgery may lead to harm without seeing any of the potential benefits of such major surgery.

S/he will then proceed to free up that part of the liver from surrounding structures, then isolate and control the blood supply into that part of the liver. Finally, the surgeon will cut through the liver with special instruments. Meticulous technique is required as many minute blood vessels and bile ducts pass through the substance of the liver.

### Are there alternatives?

In general, tumour resection would lead to the best outcomes. However, alternatives include: burning of the tumour if it is small (ablation),

blocking off the blood supply to the tumour with chemotherapy (TACE) or radiotherapy (TARE), or chemotherapy. Your surgeon would discuss the alternatives with you. The decision regarding the best treatment may be made at a multidisciplinary team (MDT) meeting.

## What are the risks of a liver resection?

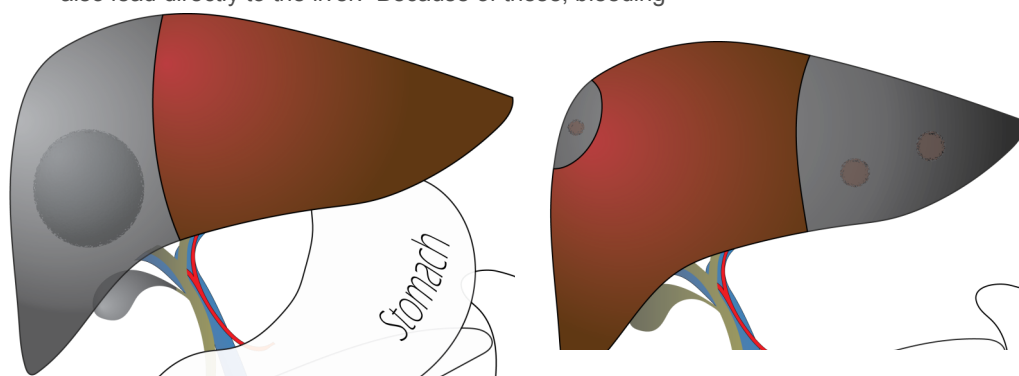
Like all procedures, liver resection has risks associated with it. However, as these are major operations, the risks are very significant. Firstly, there are risks associated with the anaesthetic. These will vary depending on your age and other medical issues. The anaesthetist will assess you in the pre-admissions clinic and will explain more about this to you.

Second, there are the surgical risks. These vary depending on the type of liver resection and whether any other structures are removed at the same time. They include:

- **Bile leak** – The liver has many small bile ducts coursing throughout its substance. Any of these can leak bile. Sometimes this leak is minor and will resolve by itself, at other times, it requires decompression of the bile duct by using by endoscopy (ERCP).
- **Bleeding**—The liver also has a lot of minute blood vessels. The main blood vessels draining the intestines also lead directly to the liver. Because of these, bleeding

within the abdomen may occur. Sometimes this is severe and may require blockage of the artery by an injection (“interventional radiology”) or by reoperation.

- **Damage to surrounding structures**—The bile ducts, blood vessels and bowel are found around the liver and may be damaged during the procedure.
- **Liver failure** —The risk of this depends on the amount of liver which is removed. The less liver which remains, the more likely this will be a problem. This is managed by preventing and treating other complications and supporting the patient’s condition until the liver recovers its function. Tests for liver function, careful planning and portal vein embolisation (see page 1) all help to prevent this complication.
- **Death**—Like any major operation, there is a risk of death during or after the operation. The risks are greater for more complex operations, especially when large portions of the liver is removed or when there is removal of parts of blood vessels or bile ducts. The risk is in general less than 1 in 20.
- **Other complications**—such as clots in the legs or lungs, urinary, chest infections, adhesions and hernias may also occur.



**Left**—The tumour is in the right side of the liver. A “right hepatectomy” (removal of the right half of the liver, including removal of the gallbladder) can be performed (greyed areas).

**Right**—Multiple tumours, but in areas where we can remove. Part of the left liver is removed (“left lateral sectorectomy”) and a small area on the left is also removed (“wedge resection”).

## How do I prepare myself for surgery?

You will be asked to fast for a period of time before surgery. Depending on when your operation is scheduled, it is generally either midnight the night before or after an early morning breakfast the day of surgery. On the morning of surgery, you should take all your medications except for your diabetic medications and blood-thinning medications. Your surgeon or anaesthetist will give you specific advice regarding this. If you are taking blood thinners such as aspirin, warfarin, clopidogrel (“Iscover”) / “Plavix”) etc, you should inform your doctor so that appropriate instructions are given to you as you may need to stop these for a few days prior to surgery.

## What would I expect after the surgery?

When you wake up from surgery, you will be a bit drowsy. You may have a few things connected to you of coming out of your body: a line going to your neck for administration of drugs (“central line”), a urine tube to collect urine (“catheter”), one or two plastic tubes coming out of your belly to drain the site of the operation (“drains”), a line going to your back to help you control pain (“epidural”) and a tube coming from the nose which drains the stomach (“NG tube”). You may also be connected to a machine which will give you pain medications which is controlled by a button (“PCA”). If you have a PCA, you should use it whenever you need pain killers—generally when your pain is such that you are unable to take a deep breath.

The first day, you may be expected to sit out of bed and maybe go for a little walk the next day. *Early walking and deep breathing exercises are some of the most important things you can do to help yourself recover.* It helps both your lungs to breath and prevents clots in the legs. Over the course of a few days, you will gradually feel stronger and the variety of tubes connected to you will gradually be removed. Food will also be gradually introduced. You will spend at least a day or two in the High Dependency Unit.

Whilst it may take only a week or two of hospital stay, the total recovery is much longer. You may feel weak, lethargic and have a poor appetite for a few months, but this should improve over time. When you get home, please do not lift anything heavy (>10kg) or do anything strenuous for six weeks. We will usually see you for a check up at around the 6 week mark.

### Any further questions?

#### Feel free to ask us!

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### Your Surgeon:



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