PANCREATIC RESECTION

Patient Information

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Outline:

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

What is a pancreatic resection?

Pancreatic resection is also called pancreatectomy. It is the surgical removal of part or all of the pancreas.

What is the pancreas?

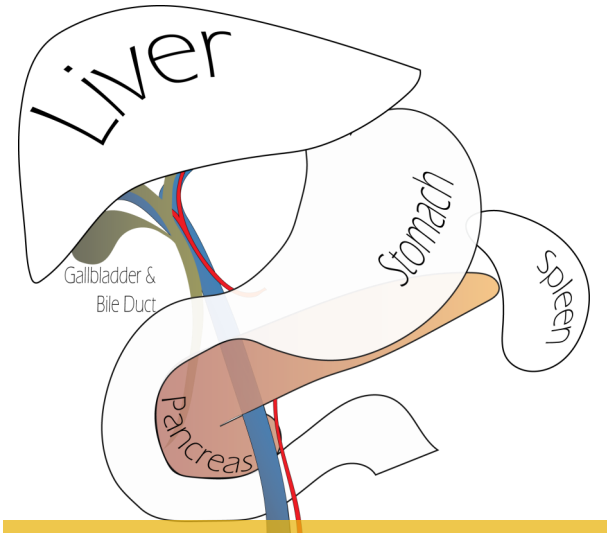
In health, the pancreas is an organ which is found in the abdomen ("belly"). Its function includes the production of enzymes to digest fats as well as hormones involved in regulating blood sugars.

It is an elongated organ which runs from just below the liver on the right towards the left upper part of the belly. It is hidden far back behind all the stomach and bowels. It is shaped like a candy cane—it is shaped like a hook on the right, wrapping around the major blood vessels supplying the intestines. On the left, it is straight with the end in contact with the spleen.

Why might one undergo pancreatic resection?

The most common reason for this operation is for a tumour of the pancreas. This tumour may be malignant (cancerous), pre-malignant (can lead to cancer) or sometimes the tumour is removed because cancer cannot be ruled out.

Usually, the tumour is diagnosed on scans, either CT or MRI. With the same scan or an additional scan, the spread of the tumour is ruled out. Blood tests called tumour markers may also be performed to help with the diagnosis. Importantly, a biopsy is often not required prior to performing surgery if the tumour/lump is suspicious enough. This is because no needle biopsy is able to rule out cancer with 100% certainty. And since the consequences of missing a cancer is so severe, surgery is usually the best option.

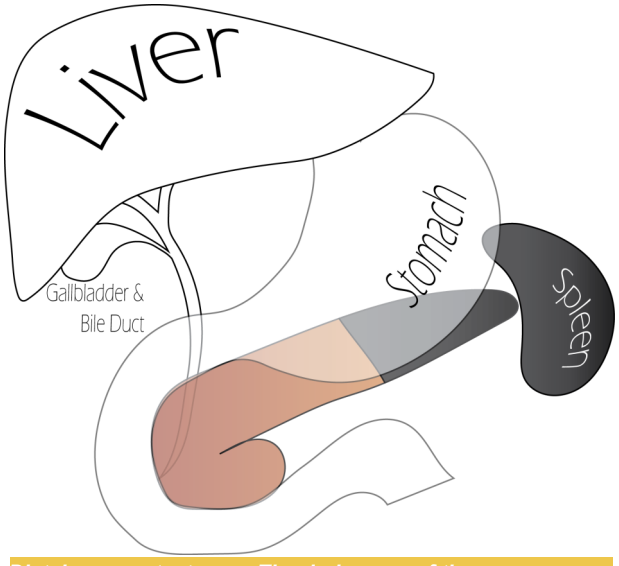


The Pancreas can be found behind and close to many major organs. The tail (left side) is found next to the spleen, whereas the head is close to the duodenum, stomach, bile duct and major blood vessels (blue and red tubes)

What does this operation involve?

Any pancreatic resection is a major operation. Due to the anatomy, the complexity of the operation varies depending on the part of the pancreas to be removed. Essentially, the right side of the pancreas is surrounded by blood vessels, the stomach, duodenum and the bile duct whereas the left side is situated close to the spleen.

Whipple operation (pancreaticoduodenectomy) - This is an operation to remove the right side of the pancreas. Because of the structures surrounding it, this operation involves the removal of part of the stomach, duodenum, part of the bile duct and the gallbladder as well. If the tumour invades into the major blood vessels, part of this may be removed also. Clearly, after removing so many organs, the various parts need to be "re-plumbed". This forms the second part of the operation and leakage from these joins is a cause of complications.



Distal pancreatectomy—The dark areas of the pancreas and spleen are removed during the operation

Distal pancreatectomy—This is an operation to remove the left side of the pancreas. Because the spleen lies right next to the tail of the pancreas, it is often removed during this surgery. Occasionally, depending on the suspected diagnosis of the tumour and its location, the spleen may be left intact ("spleen sparing")

Total Pancreatectomy— This is less commonly performed. It is an operation to remove the entire pancreas. Because there will be no pancreas left, one will need to use medications to replace the function of the pancreas. In particular, insulin to control blood sugars and pancreatic enzymes for food digestion.

Note that at the beginning of the operation, your surgeon will inspect the abdomen for spread of cancer and also assess the tumour for "resectability" (ie, whether it is possible to safely remove the tumour). If it has spread or it is not "resectable", the operation may 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.

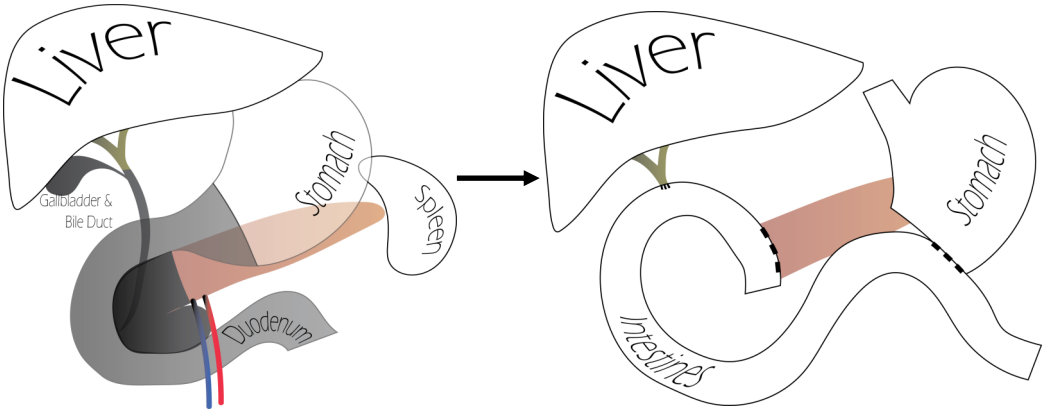
Some of the above surgery can be performed with keyhole surgery (laparoscopic) especially distal pancreatectomy. In general, any type of pancreatic surgery will take many hours to complete.

What are the risks of a pancreatic resection?

Like all procedures, pancreatic 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 pancreatic resection and whether any other structures are removed at the same time. They include:

- *Pancreatic leak* – This is a feared complication in pancreatic surgery. In distal pancreatectomy (tail surgery), the leak arises from the cut end of the pancreas. In a Whipple procedure, the leak arises at the join between the pancreas and the bowel. Leakage is much more serious in a Whipple procedure because contact of the pancreatic juice with intestinal contents (at the join) causes activation of the enzymes which can damage surrounding structures by "digestion". The risk varies, but is greater than 1 in 10. The treatment may require medications, drainage, endoscopy or reoperation.
- *Leakage at other joins including bile leak*—This may occur after a Whipple procedure. This is less common than a pancreatic leak. Sometimes such a leak will require reoperation to fix.
- *Bleeding*—Due to the closeness of the pancreas to the major blood vessels, 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.
- *Ileus or delayed gastric emptying* – The handling of the bowel and the stomach join may cause the bowel to stop functioning for a while after the operation.
- *Damage to surrounding structures*—There are major blood vessels and bowel around the area. Rarely, these structures may be damaged during the procedure.
- *Diabetes*—The risk of this depends on the amount of pancreas which is removed. When a total pancreatectomy is performed, diabetes (often difficult to control) will occur.
- *Nutritional problems* – The lack of pancreatic enzymes and the "re-plumbing" that occurs may impair the absorption of nutrients. One may therefore require nutritional and enzyme supplementation.
- *Death*—Like any major operation, there is a risk of death during or after the operation. The risks are greater for an operation involving the head of the pancreas due to its greater complexity. The risk is less than 1 in 20.



Whipple Procedure: The dark areas of the pancreas, the duodenum (the first part of the intestine), the bile duct and gallbladder are removed.

The image on the left shows the anatomy after "re-plumbing". There are three joins: at the stomach, the bile duct and the pancreas. These may be sources of leaks.

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 anesthetist 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 or coming out of your body: a line going to you 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 feel you need pain killers—generally when your pain is such that you are unable to take a deep breath.

On the first day following surgery, you are expected to sit out of bed and may even go for a little walk. *Early walking and deep breathing are some of the most important things you can do to help yourself recover.* They help both your lungs to breath and prevents clots in the legs. Over the next 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 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: