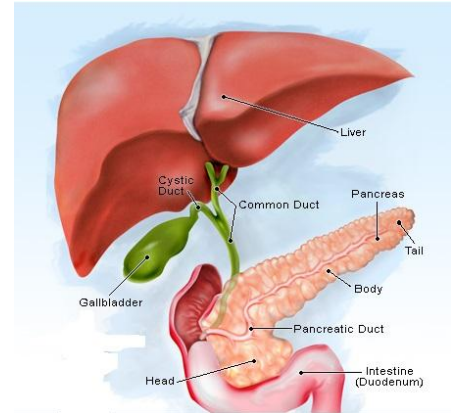


INFORMATION ON PANCREATIC HEAD AND PERIAMPULLARY CANCER

What is Pancreas?

The pancreas is a gland located in the back of your abdomen behind the stomach. pancreas is divided into four parts: the head, neck, body and tail. The head lies surrounded the first part of the small intestine called the duodenum and the distal end the main bile duct runs through it before joining the duodenum. The neck and body lie behind the stomach. Important blood vessels run behind the neck and in contact with the head. These are the portal and superior mesenteric veins and the superior mesenteric artery. They carry blood from the bowel to the liver and supply blood to the bowel. The tail extends across to the left side.

The pancreas produces digestive juices to aid absorption of nutrients, which travels down a fine tube within the pancreas called the pancreatic duct to empty into the duodenum via a nipple-like structure called the ampulla where it joins the bile duct. The pancreas also produces a hormone called insulin, which is released directly into the circulation to control the level of sugar in the blood. Lack of insulin causes diabetes. Most of the insulin producing tissue is located in the tail of the pancreas.



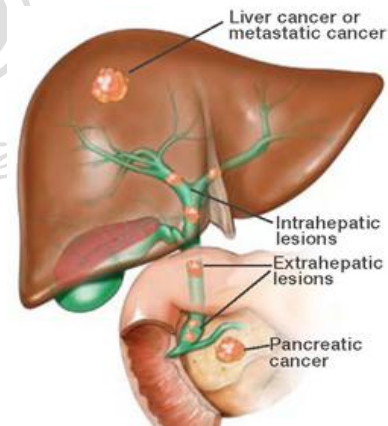
What is Obstructive Jaundice?

Jaundice is the yellow discolouration caused by accumulation of bilirubin in tissue. The detection of the cause of jaundice is important in the management. Jaundice results from interference in the normal flow of bilirubin. Jaundice may result from:

- Conditions affecting the red blood cells.
- Conditions affecting the liver cells.
- Conditions affecting the tiny bile ducts within the liver.
- Conditions affecting the common bile duct outside the liver.

The first three do not require surgical intervention. However, conditions affecting the common bile duct needs to be corrected using some form of procedure. The bile from all the tiny bile ducts in the liver drains into the common bile duct. If the common bile duct becomes narrowed or blocked (obstructed) then bile which contains bilirubin can seep out into the bloodstream and cause jaundice. This is sometimes called obstructive jaundice or post-hepatic jaundice (hepatic is another word for liver). Conditions that can cause this include:

- **Gallstones.** Gallstones occur when bile, which is normally fluid, forms stones. Most gallstones form in the gallbladder and do not cause any problem. Jaundice is an uncommon complication of gallstones. It occurs if a gallstone comes out of the gallbladder, but gets stuck in the common bile duct. Bile then cannot pass into the gut, and so seeps into the bloodstream.
- **Pancreatic cancer** in the head of the pancreas can block the flow of bile.
- **Inflammation of the pancreas** (pancreatitis) can cause swelling of the pancreas which may block the flow of bile.
- **Biliary atresia.** In this condition part, or all, of the bile ducts become inflamed. This then leads to scarring (fibrosis) and narrowing and blockage of the bile ducts. The cause is not clear.
- **Cancer of the gallbladder** may grow to block the common bile duct.



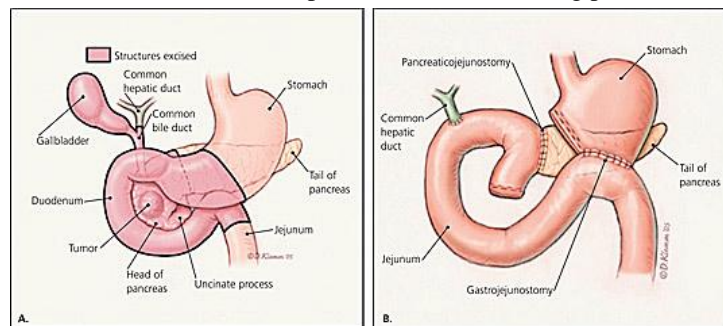
The diagnosis is reached based on investigations which include various blood tests including liver functions tests and imaging tests like CT scan and MRI scan. Rarely a biopsy is needed. If the investigations shows a cancer far too progressed for a curative procedure, then only a needle biopsy is planned.

The Procedure:

Pancreatoduodenectomy involves the removal of the head of the pancreas, the duodenum, the gallbladder and part bile duct. There is a strong possibility that the lump in the head of the pancreas will be a cancer. Usually, a small part of the stomach and a short length of small intestine beyond the duodenum are also removed. The end of the remaining bile duct (called the common hepatic duct); the remaining pancreas and the stomach are then connected to the small bowel to ensure flow of bile, digestive juices and food into your intestines. The procedure generally takes between **6-8 hours**.

This operation is performed for likely cancer of the head of pancreas or to treat cancer in the lower part of the common bile duct, duodenum or ampulla. It may also be performed

for benign (non cancerous) disorders, such as a particular forms of pancreatitis.

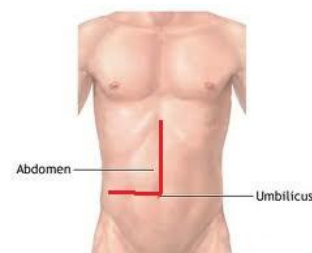


Occasionally during the pancreatoduodenectomy operation, your surgeon may find that the disease is not suitable for surgery, perhaps because many lymph nodes (draining glands) are affected, or perhaps because the cancer has spread further than the pancreas involving major blood vessels that cannot be removed. We may choose to perform a **bypass operation**, so that further blockage of the bile duct or stomach is prevented. We will discuss the result with you and your family, and will discuss other types of treatment. A drainage tubes will be placed at the end of the surgery. These would be removed after a few days.

Approaches to Surgery:

Minimal Access Surgery (MACS): One or more tubes are placed into the abdomen and instruments passed down the tube to examine the inside of the abdomen and pelvis using a camera and video monitor. Sometimes, bands of fibrous tissue grow around the bowel or other organs. If so, the doctor may need to cut these. The surgeon looks for any signs that make the **procedure not viable (inoperability)** like spread of disease to liver or other sites. This is called **staging laparoscopy**. If operable, the surgeon proceeds with the mobilization of affected part systematically looking for involvement of major vessels and other organs (**mobilization**). The surgeon may **convert to open procedure** if the surgeon perceives that proceeding with laparoscopy may not be feasible or dangerous for the patient. Once fully mobilized and transected, the reconnection of remaining pancreas and the stomach to the small bowel is performed through a small incision (7-8cm). MACS reduces the size of the wound resulting less pain, less blood loss, quicker recovery and shorter hospital stay.

Open: The surgeon opens the abdomen and examines the extent of the disease. The surgeon looks for any signs that make the **procedure not viable (inoperability)** like spread of disease to liver or other sites. If operable, the surgeon proceeds with the mobilization of affected part systematically looking for involvement of major vessels and other organs (**mobilization**) and completes the procedure as mentioned above.



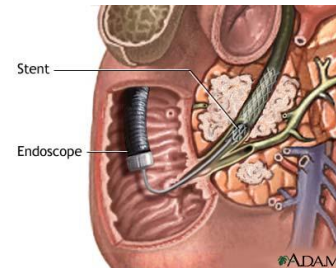
What are the benefits of the operation?

Without surgery, the average survival of patients with pancreas and periampoullary cancer is less than one year, and very few survive more than two years. A successful operation may improve your chance of cure to between 10-40%. The aim of the operation is to completely remove the cancerous growth, and give you the best chance of cure. This is why a wide area of tissue around the affected area is removed. The chance of the cancer coming back depends on the type of cancer you have, how far the cancer extends and how many lymph nodes are involved. This will only be accurately known after the operation when the pathologist examines the removed pancreas.

Are there any alternative treatments?

In the case of pancreas cancer and periampoullary cancer, there are no alternative treatments with a hope of cure. Chemotherapy may be discussed if surgery is not possible.

Bile duct stenting may be performed in order to relieve your jaundice. However, this does not cure the disease. The stent may perform for 3-6 months. This is used mainly in cases where surgery is not feasible. Some times stenting is used in order to relieve very high jaundice (>20gm%) before surgery in order to improve general condition of the patient (preoperative stenting).



General Preparations:

Before surgery, the bowel must be prepared. You will be on a clear fluid diet and given a medicated drink to help clean the large bowel. This can cause diarrhoea and cramps, and may be tiring. The medicated drink will completely empty your bowel. You will then fast for at least 6-8 hours before your surgery.

Once inside operating room, a thin tube (epidural) will be placed in your back. This would be used for painkillers after your surgery. Once **under general anesthesia** a urinary catheter is placed in the bladder and you would be positioned for access to the chest, abdomen and pelvis. A thin flexible tube would be passed through your nose into stomach (nasogastric tube) to clear the contents in the stomach. This tube will be maintained for few days after surgery. To prevent complications such as infection, you will be given antibiotics at the time of your operation. To stop a blood clotting in your legs from happening a small injection of a drug known as anticoagulant will be given daily after the operation.

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What will happen after my operation?

You will be nursed in the ICU for at least the first few days after your operation depending on your progress. The reason for staying could be something as relatively minor as needing to counteract the epidural's affect on your blood pressure with a medication that requires heart monitoring. You will have a tube that passes down your nose and though to the stomach. This allows any fluid to be removed so that you don't feel sick. You may also have a small feeding tube (jejunostomy) to the left side of your abdomen. This allows you to be given liquid nourishment in the short term. It is usually removed before you go home, but can be left in for 2-3 weeks if necessary.

Wound: Your wound may be stitched (using staples) together. The body can absorb some types of stitches, while clips and other types of stitches need to be removed several days after your operation. Your wound dressing will be checked regularly and once clean will be removed completely.

Pain: You will be given analgesics (pain killers) for as long as you need them. The type of drug will depend on the extent of your surgery and the amount of discomfort you experience. Pain should be treated early rather than allowing it to become worse, so if at any time you find it difficult to move or breathe deeply because of pain, you must tell the nurse or doctor. In the first few days after your surgery you will require stronger painkillers; these may be given through the epidural infusion. Later you will move onto more moderate painkillers as the discomfort begins to settle.

Abdominal wound drains: You may also have one or two tubes near your abdominal operation site(s). These plastic tubes allow fluid drainage and help to recognize complications, such as an anastomotic leak. Your drains will be in for several days and will be removed by nursing staff, when the fluid loss reduces, or when the nature of the fluid not to represent any type of leak. Once removed a dry dressing is applied, but occasionally a bag is needed over the site if there is enough fluid lost from the site of the drain.

Moving Around: The physiotherapist will encourage you to breathe deeply, cough, move around and exercise your arms and legs. Although your mobility will be restricted at first because of the various tubes in place, it is important that you follow the instructions from the nurses and physiotherapists. In the days following surgery the physiotherapist will encourage you to sit in a chair by the bed and later walk around the ward. This can help prevent a chest infection and blood clots in the legs, and is a very important part of recovery.

Eating and Drinking: Part of your operation has involved joining the stomach and small intestine together. Your oral intake will be limited until we are confident that bowel joints are intact and the stomach is able to empty. When you are allowed to eat, you will start on fluids and slowly build up to normal foods. This may start from the very next day of surgery. Occasionally, despite apparent readiness to drink and eat, you might experience vomiting if the stomach is not ready to empty, and excessive fluid is building up in it. This usually settles over a few days and some different types of medications can help with this. The Dietitian will discuss the types of food that you can expect to eat in hospital and when you go home. In the early phase, particularly after going home, it is important to get used to eating smaller meals more frequently, as your body is getting used to the change in anatomy and food capacity as a result of the surgery.

What can I expect when I go Home?

Following discharge, it is important that you have someone with you to help with cooking and shopping. If you live alone we suggest that you arrange for a friend or relative to stay with you or help on a regular basis for 7 to 10 days after leaving hospital.

The pain and amount of discomfort experienced following surgery varies between individuals, but you can expect to feel some discomfort for up to three months after your operation. You continue with painkiller tablets if needed.

You may go home with the jejunostomy feeding tube and ward nurses will show you how to care for it. There should be no need to have nourishment via this tube at home and the tube will be removed after a couple of weeks in the outpatient department.

You may take a bath or shower as normal. A first do not bathe if you are alone in the house. Climbing the stairs may be a struggle at first. You will need to avoid lifting, pushing and carrying for 6 weeks after your operation.

Will I require any further treatment for my cancer?

For pancreas cancer chemotherapy is now recommended routinely after surgery to improve the chances of cure. We are also increasingly recommending this for ampullary cancer.

Will I become diabetic after a Whipple operation?

The pancreas produces insulin that is required for control of blood sugar. There is some risk of developing diabetes after this operation, but it doesn't occur for most patients. In our experience, patients who are not diabetic before surgery are unlikely to develop diabetes afterwards. Patients who are diabetic before surgery may need additional diabetic medication or insulin after surgery.

What may be the long term consequences of the operation?

Malabsorption: This may be a problem for some patients. This is the poor digestion and absorption of food, resulting in loose stools that are greasy, pale and tend to float. The production pancreatic enzymes needed for digestion of food will be reduced after surgery. They will need to be replaced with long term treatment using pancreatic enzyme capsules (called Creon) with food.

Alteration of diet: There is no restriction to your diet following this operation, although you may need to eat smaller meals more regularly. You may need to Snack between meals to minimise the symptoms of bloating or discomfort. The Dietitian will give you advice about your diet and supplements that you can have between meals to improve your nutrition. It will take several months for your digestion to settle down and your ability to eat return to normal.

Loss of weight: It is common for patients to lose weight compared to their weight before their illness. We would expect you to start regaining some of the lost weight by three months after surgery.

Increased risk of Ulcers: This results from the loss of signals from the duodenum that would normally shut off stomach acid production, and a reduced bicarbonate production from the pancreas to neutralise acid. We want you to stay on an acid reducing medication lifelong to control this risk (usually omeprazole or pantoprazole).

Risks of the Procedure

The following are the commoner risks. There may be other unusual risks that have not been listed here. Please ask your doctor if you have any general or specific concerns.

general risks and limitations:

- Bleeding could occur and may require a return to the operating room. Bleeding is more common if you have been taking blood thinning drugs.
- May develop a clot in a leg vein (deep vein thrombosis), causing pain and swelling. Part of this may break free and move to my lungs (pulmonary embolus), making me breathless.
- The wound may be abnormal and the wound can be thickened, red and painful.
- My wounds may become infected and this may delay healing and may require antibiotics or surgery.
- May develop areas of minor collapse in the lungs, increasing my risk of getting a chest infection. I may require treatment with physiotherapy.
- Urinary tract infection. Antibiotics may be used to control the infection.
- Heart attack or stroke could occur from strain of surgery.
- The risk of death due to this procedure is about 6%.

Specific risks and limitations:

- The most serious problem is leakage of pancreatic, bile or gastric juices into the abdominal cavity, due to breakdown of the anastomosis. Leakage where the bowel was stitched together. This may require further surgery or prolonged period of IV feeding (total perenteral nutrition).
- If there is pancreatic leak, there is a small risk of developing aneurism of blood vessels that may require procedures to prevent massive bleeding (angiography and coil blocking of the vessel)
- Bowel may not function temporarily after the operation and I will not be able to eat or drink normally until its activity returns in a few days
- Deep bleeding in the abdomen. This may need fluid replacement or blood transfusion or further surgery.
- There is a risk of recurrence of the disease even when the disease is completely removed surgically.
- Infection in the abdominal cavity. This may form an abscess may need drainage and antibiotics.
- Fistula (abnormal communication) may form between loops of bowel or skin due to problems related to abnormal healing. These fistulas may heal spontaneously over months or may need a surgery to close.

- There may be a delay to pass urine spontaneously for some days and in some cases may need a urinary catheter for several weeks.
- Loops of bowel may become stuck to the operation site (adhesions), causing blockages that may require further surgery. This can occur even years later.
- Weakness in the wounds (incisional hernia) that may require later treatment.

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