ADVANCED LAPAROSCOPIC LIVER AND PANCREATIC SURGERY (ALLPS)

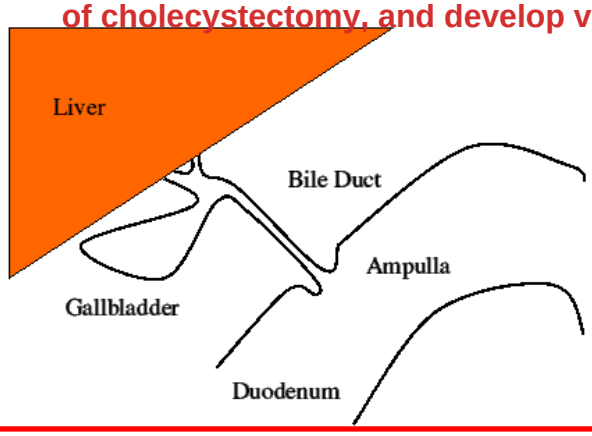
GALLBLADDER AND BILE DUCT SURGERY

1) Background

The gallbladder is a small pear shaped organ that lies in the upper right part of the abdomen just underneath the liver and close to the diaphragm and rib cage. It acts as a reservoir for bile which is a digestive juice made by the liver and excreted down the bile duct which is a narrow tube coming out of the liver. The gallbladder is connected to the bile duct by a tube called the cystic duct. Bile enters and leaves the gallbladder via this connecting tube. The bile duct runs down to the bowel where it enters the duodenum. The valve where the bile duct meets the duodenum is called the ampulla (ampulla of Vater) it is also known as the sphincter of Oddi.

When you have a meal the sight and smell of food causes a complex chain of events to start which control release of bile into the duodenum from the gallbladder and bile duct via the ampulla. Food, particularly fatty food, entering the gut is a further strong stimulus for release of bile, which continues to be released until food and digestive juices reach the next part of the bowel.

Most patients suffer permanent impairments of the digestive system as a consequence of cholecystectomy, and develop various disorders as a result of poor digestion.



If you do not have a gallbladder (e.g. following surgery) it makes very little difference to this process since bile is stored in the bile duct instead of the gallbladder. A normal gallbladder holds only around 25-40ml of bile. An average person makes 500-800ml of bile per day.

2) Gallstones

No mention - Gallbladder concentrates bile by removing up to 90% water volume Delivered to neutralize stomach acid to provide the alkaline conditions needed in the small intestine

Gallstones are extremely common, as many as twenty per cent of the UK population may get them during their life time. Most people with gallstones get no symptoms and need no treatment.

Gallstones are usually made from cholesterol or bile pigments, both of which are normal constituents of bile. They may develop for several reasons, either because of an excess of one or other constituent in the bile or because the gallbladder is not emptying properly thus allowing sediment to form or because there are abnormal proteins in the bile triggering precipitation of cholesterol or pigment stones.

Most stones are just a few millimetres across although occasionally they may reach 4-5cm

3) Common symptoms

When gallstones start to cause problems they usually give some of the following symptoms.

Pain, this is usually felt under the ribs on the right hand side of the abdomen (tummy), it may be felt across the whole of the upper abdomen in some patients. It may last minutes or hours. It can be very severe, it is usually a sharp, cramping or aching pain that cannot easily be relieved except by strong medication. Women often compare it to labour pains. It is often called *biliary colic* by doctors. The pain may travel into the back or shoulder. It is usually worse after eating fatty foods.

Bloating / indigestion, uncomfortable distension of the abdomen after fatty meals

Jaundice, yellow pigmentation of the skin and eyes, often accompanied by very *dark urine and pale bowel motions*. This is usually caused by passing a stone.

Itching / fever / rigors. Patients with stones in the bile duct often get itchy skin, a high temperature and episodes of shaking / tremor (rigors). Anyone with these symptoms should seek urgent medical advice.

4) Laparoscopic (keyhole) surgery

Most patients with symptomatic gallstones are advised to have the gallbladder removed. This can usually be done as a keyhole operation involving four small holes in the wall of the abdomen (tummy), through which a camera and various operating instruments are introduced. In general this is a relatively safe operation that takes between twenty and ninety minutes depending on the complexity of the case and the degree of inflammation around the gallbladder. In patients in whom we suspect there may be stones in the bile duct we take pictures of the duct either with a *laparoscopic ultrasound* probe placed directly on the bile duct, or by injecting dye into the bile duct and taking X-rays *(operative cholangiogram)*.

Most patients go home on either the same day as the operation or the next day.

5) Bile duct stones

Bile duct stones can cause severe symptoms and trigger some quite dangerous illnesses such as pancreatitis (inflammation of the pancreas) and cholangitis (bile duct infection / inflammation). We always remove bile duct stones (unless they are very tiny), there are several ways of dealing with them.

a) Laparoscopic bile duct exploration this is a keyhole technique used to remove stones from inside the bile duct by passing baskets and other instruments into the bile duct and fishing the stones out under X-ray guidance. It is mainly suitable for cases where the bile duct is dilated and there are only a few small or medium sized stones lying in it. It can be a technically very difficult procedure and it is only successful in around 60% of cases. However in experienced hands it is a low risk procedure about as safe as ordinary keyhole gallbladder surgery.

b) Open bile duct exploration this is used for cases where the stones in the duct are large, impacted or cannot be removed by other methods. It is an open operation involving a 15-25cm incision in the top right hand side of the abdomen beneath the rib cage to allow access to the bile duct. Most patients stay in hospital for around a week after the surgery and take 8-12 weeks to return to full normal activities. In complicated or recurrent bile duct stones the operation may include a drainage procedure replumbing the bile duct to improve the ow of bile into the bowel and prevent stones reforming. This is major surgery and carries an increased risk of postoperative complications when compared with keyhole surgery, however it is extremely effective.

c) ERCP and sphincterotomy this is an endoscopic technique where a flexible telescope is passed via the mouth into the duodenum and used to extract stones from the lower end of the bile duct by cutting open the muscular valve (sphincterotomy) at the ampulla (see diagram of anatomy above) and passing baskets and balloons up the duct from below. It is a relatively safe procedure but it still has risks including pancreatitis, haemorrhage, duodenal perforation and cholangitis. The mortality for this procedure is generally quoted as being between 1:250 and 1:500 across the UK..

d) PTC this involves passing needles and tubes through the wall of the abdomen to gain access to the bile ducts in the liver. It is rarely used for retrieving gallstones, usually in patients not fit for surgery in whom ERCP has failed.

No mention of Postcholecystectomy Syndrome risk developed by upto 40%

6) Common questions before gallbladder surgery

Life long and chronic for some

My symptoms have eased off , do I still need the operation? Once gallstones have started to cause symptoms the problems tend to keep coming back time after time, usually getting more and more frequent. Thus in general we recommend operating on patients who have had any typical biliary symptoms and have stones on ultrasound.

Should I be on a low fat diet? This usually improves symptoms in the short term but it will not make stones resolve.

Is it safer to have open surgery? In general the overall risks of laparoscopic and open surgery are both low. Laparoscopic (keyhole) surgery allows a much faster return home and return to full physical activity / work. The disadvantage of keyhole surgery is that it is associated with higher levels of injury to the common bile duct (see anatomy diagram), which is a very serious complication, the nationally accepted figure for bile duct injury is approximately 1:150 cases. All of the surgeons on this website are specified biliary experts each removing between fifty and one hundred and twenty gallbladders per year. As a group our incidence of minor bile duct injury is 1:400 and major bile duct injury 1:800 over the last two years, the mortality from the surgery is approximately 1:1000 cases. The disadvantages of open surgery are higher levels of post operative pain, longer hospital stay and increased risk of serious cardiac and respiratory complications such as heart attacks / chest infections / pneumonia / deep vein thrombosis and pulmonary embolus (blood clots on the lung), the mortality from open surgery is around 1:200.

What is a cholangiogram? This is an X-ray of the bile ducts done during the operation to exclude stones in the bile duct. We usually do one if you have been jaundiced, had pancreatitis or your scans or blood tests suggest there may be a stone stuck in the main bile duct.

How long will I stay in hospital? If you are reasonably fit and not overweight then we should be able to do this as a day case where you spend only 6-8 hours or so in hospital. If you are less fit then you will need to stay at least one night in hospital. For open surgery the standard length of stay is 5-10 days depending on your fitness and the magnitude of the operation.

American College of Gastroenterology recommend - success 40 to 80%

Can you dissolve the stones? There are treatments that can dissolve stones to some extent, however you require lifelong drug treatment and the medications are not effective for the majority of stones. These treatments are only used as a last resort for patients not fit for surgery in the UK.

Can you break the stones with lasers / ultrasound etc? Extra corporeal shock wave lithotripsy (ESWL) is a well recognised technique for breaking up kidney stones which are usually hard and chalky and shatter well. Unfortunately gallstones are soft and often fatty so they do not shatter well, plus if they do break up rather than passing or

No disclosure of root causes for Gallstones include, pregnancy, rapid wight loss, parasites, celiac, contraception and pain medications

 Function is to concentrate and release bile when food leaves the stomach, neutralize acid

dissolving you are usually left with lots of small stones rather than a few big ones. This may cause more rather than fewer symptoms. This is another last resort treatment that is almost never used in the UK. Statement cannot be backed by any evidence based medical study - Needed

Do I need my gallbladder? No, its only function is to store bile. If you develop gallstones it is probably not emptying properly already and is therefore largely redundant. There are other mechanisms which control the production, release and storage of bile and these fully compensate for the loss of the gallbladder.

Can you just take the stones out? Yes we could but this would be a pointless exercise as you would just make new stones in the gallbladder and need more treatment.

No attempt to diagnose root cause of gallstones - Only forced option - Surgery

7) Common questions after surgery

How long do I need off work? For keyhole surgery you will need a couple of weeks o unless your job is a very heavy manual job (e.g. labourer / hod carrier / nurse / farmer) when you are better advised to take 3-4 weeks o in total. If you have open surgery then for an oce job you will need around four to six weeks o work and for a heavy manual job 2-3 months.

When can I drive? For any operation the key question is can you safely control the car and do an emergency stop? For keyhole surgery most people are comfortable enough to achieve this 7-10 days after surgery. For open surgery it is more like 4-6 weeks.

When can I play sport again? The same answer applies as for return to work, relatively gentle sports (swimming / jogging) can be resumed a fortnight after keyhole surgery if you feel comfortable, but very physical or contact sports (e.g. circuit training / weight training / rugby / martial arts) should be left for a month or so. After open surgery gentle sporting activity can be resumed after 4-6 weeks and more strenuous physical exertion after 8-12 weeks.

I have a red patch around one of the wounds, is this ok? It is common to get a little bruising and redness around the port sites (laparoscopic wounds) on your tummy, most often the port closest to your navel is affected. If this extends for more than an inch (2.5cm) on either side of the wound, or if it discharges pus or is very hot and swollen it should be reviewed either by your practice nurse, GP, or a member of the surgical team as you may be developing a wound infection.

I have had more pain and my urine has gone dark, is this right? About one person in five gets a similar pain to their gallstone pain within the first few weeks of surgery, this usually passes quickly and does not require further investigation or action. It probably represents passing a few tiny pieces of stone debris that have been dislodged during surgery. However very occasionally (1 or 2 cases per 100) a larger fragment of stone has been dislodged and this may get stuck in the lower bile duct and cause severe symptoms and dark urine and even jaundice. *If you become jaundiced after gallbladder surgery you must see your doctor at once and be referred back to your surgeon or another surgeon familiar with your case the same day.*

I have been sent home with a T-Tube coming out of my tummy what is this? If we surgically explore the bile duct to remove stones from it we usually leave a T shaped rubber drainage tube in the bile duct as a temporary safety valve whilst it is healing up again. One end of this comes out of the wall of the abdomen and drains some of your bile into a bag. The tube is usually left in for 2-6 weeks depending on the nature of the surgery. It can easily be removed in clinic when everything has safely healed inside.

8) Bile duct Reconstruction.

This major surgery is usually performed to correct injuries to the bile duct which are most commonly caused during surgery for gallstones. If you have a bile duct injury it is best to have it dealt with by a specialist hepatobiliary surgeon with a specific interest in this work. In Southampton two surgeons deal with the majority of these problems from the surrounding region **.**

9) Malignant diseases of the gallbladder and bile ducts.

Gallbladder cancers and bile duct cancers are rare in the UK. They are *cholangiocarcinomas* and are best considered either with primary liver cancers (see Liver surgery page) if they arise in the gallbladder or upper bile ducts close to the liver. Tumours in the lower bile duct behave like pancreatic cancers and should be considered with them (see Pancreatic surgery page).

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