

Gallstones and Laparoscopic Cholecystectomy

Information sheet

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1) Introduction

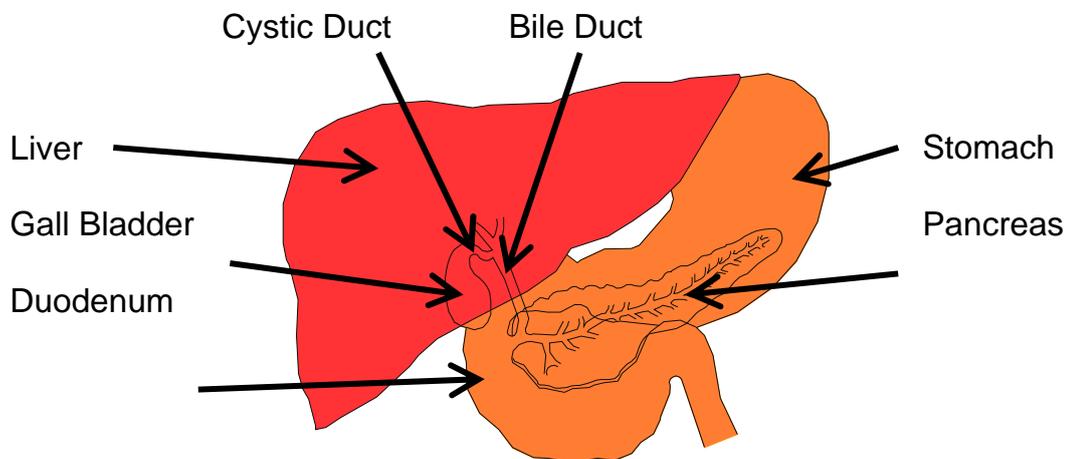
Gallstones may form in the gall bladder or less commonly the main bile duct. Laparoscopic cholecystectomy is removal of the gall bladder using minimally invasive (keyhole) techniques. This operation has now become the gold standard for all gall bladder operations and procedures and has distinct advantages over the older open operation. However it should not be seen as minor or without possible complications.



Different types of gallstones

2) Anatomy and Physiology

The gall bladder is a self-contained sac connected by a small duct (cystic duct) to the main bile duct (common bile duct). It is situated under and is adherent to the liver. It has a blood supply from one or two small arteries that run alongside the cystic duct into the gall bladder. The gall bladder varies in size from person to person but will also change with chronic irritation from gallstones within it. It is usually the size and shape of a small pear. The gall bladder acts as a reservoir for bile. Bile is produced by the liver and this trickles down the bile duct into the gut (duodenum) where it helps to absorb fat from the diet we eat. Some bile passes from the bile duct into the gall bladder where it is concentrated and stored. When we eat a rich meal the fat in the food triggers the release of a hormone from the wall of the duodenum (cholecystokinin) which causes the gall bladder to contract and release a little extra bile to help absorb the extra fat. This is why eating fatty food often triggers pain from the gallbladder. Gallstones are crystals of cholesterol and bile pigment which precipitate out in the concentrated bile in the gallbladder. Gallstones are commoner in western peoples, women, people between 25 and 50, the overweight and those with a family history of gallstones.



3) Symptoms from gallstones

Gallstones cause different symptoms depending on their size and location. However many patients have gallstones without knowing it and will never get symptoms. Simply having gallstones does not mean they should be treated.

a) Stones in the Gall Bladder

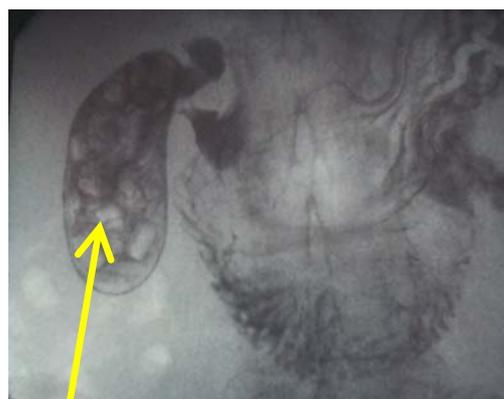
Stones that form in the gall bladder and cannot escape down the cystic duct because they are too large may cause pain and infection. The pain is often under the ribs on the right side or in the centre of the upper abdomen (tummy) and may also be felt in the back. It is usually a dull rising pain that may take many hours to fade. It is often brought on by food, particularly fatty foods. The pain is due to chronic irritation of the gall bladder by the stones.

When there is also infection the pain becomes more intense and prolonged, lasting days rather than hours. It is associated with tenderness at the point of pain and signs suggesting infection such as a fever, a raised pulse, flushing and generally feeling unwell. This condition is known as acute cholecystitis and needs treatment with antibiotics.

With time both conditions can result in scarring of the gall bladder.



Stones in the gall bladder on ultrasound



Stones in the gall bladder on X-ray

b) Stones in the Common Bile Duct

If gallstones are small enough they may pass out of the gall bladder into the main bile duct where they are held up temporarily at the bottom end by a narrowing a natural narrowing in the duct. This causes pain known as biliary colic. The pain is again felt under the ribs on the right side or in the centre of the upper abdomen (tummy) and may also be felt in the back. The pain is usually much more intense but shorter in duration lasting minutes or a few hours. The pain may make patients feel restless, nauseous or even induce vomiting. It is often brought on by food, particularly fatty foods. Patients may also notice mild, short-lived, signs of jaundice; slight yellowing of the skin or white of the eye and a more orange discolouration of the urine. This type of pain is best treated at home by rest and pain killers until it subsides.

Usually such gallstones pass through the sphincter into the gut and are passed unnoticed with the stool. When they do not pass and block the bile duct full jaundice

develops with obvious yellowing of the skin and darkening of the urine. This condition requires medical treatment and patients should consult their GP or local hospital accident and emergency as a matter of urgency.

4) Treatment of gallstones in the Gallbladder

Some patients may discover they have gallstones incidentally when a scan is done for some other reason. Patients who have no symptoms from their gallstones do not require treatment.

Patients who have mild symptoms from their gallstones that do not inconvenience them or interfere with their lives also do not require treatment particularly if they suffer from some other medical condition which may increase the risk from an anaesthetic.

The majority of patients with troublesome symptoms from their gallstones are best treated by removal of the gallbladder. For those who are not able to undergo surgery other techniques are available and listed below.

a) Removal of the Gall Bladder (cholecystectomy)

Patients who have had symptoms from their gallstones usually require removal of the gallbladder. Removing the stones alone is not sufficient as the gallbladder produces the stones. Simply removing the stones will result in more stones being produced by the gallbladder if this is left.

The laparoscopic operation is usually performed as a day-case or with 24 hours in hospital. A general anaesthetic is required and the operation takes 45 minutes on average. Four small incisions are made in the abdominal wall. One at (or in larger patients just above) the belly button and three under the ribs on the right side (very occasionally a 5th incision is needed on the left side). A camera and long instruments are inserted into the abdomen. A membrane covers the gall bladder and holds it in place under the liver. This is divided. The duct to the gall bladder (cystic duct) and the artery to the gall bladder (cystic artery) are found, clipped and then divided. The gall bladder containing its stones is then removed from under the liver and extracted through one of the incisions (usually the belly button incision).

Occasionally an X-ray of the main duct is required during the operation (cholangiogram). This is usually because there is some doubt before the operation that there may be stones in the main bile duct. For this a small tube is placed into the cystic duct and 'dye' injected to outline the duct for the X-ray. The tube is then removed and the cystic duct is clipped and divided. If stones are found in the bile duct at the time of surgery your surgeon will have discussed whether these are to be removed as well as the gall bladder during surgery or by a second procedure using a flexible telescope placed through the mouth and stomach (an ERCP) following the surgery.

Once the gall bladder is extracted, a drain (plastic tube) may be left draining fluid from the operation site through one of the wounds on the right side and all the remaining wounds are closed. The drain is usually removed the next day or, if a day case, just prior to discharge.



A removed gallbladder

i) After the operation

Most patients are well enough to drink and eat within a few hours of the operation. Patients can start to get out of bed into a chair and then walk around when all the effects of the anaesthetic have worn off, usually after 4 to 6 hours.

Most patients are fit enough for discharge from hospital within 24 hours and require simple oral painkillers for the first 3 to 5 days. Patients will find that their exercise tolerance will gradually increase over the ten days following surgery and get back to normal physical activity at 10 to 14 days from the surgery. Strenuous activity may need to wait another week. In general if it doesn't hurt it's OK; if it does, don't do it, stop and try again in another day or two.

When you return to work will depend on how strenuous your job is and you are the best judge of whether you can perform your normal work. Most people will return to work at 10 to 14 days from the surgery.

Slight bruising around the wounds is normal in the first two weeks following surgery and will settle over a few weeks. If a wound starts to weep or discharge you should consult your GP or bring forward your follow up out-patient appointment.

Driving: You should resume driving only when you are confident about performing an emergency stop. To test this, sit in your car with the engine off and place your foot hard on the break. If it is uncomfortable to do this you should not resume driving but wait and try the manoeuvre again the next day.

It is not uncommon to experience mild bruising around the wounds. This will settle over 2 to 3 weeks. Some patients also experience mild heartburn or a slight change in consistency of the stool for a few months after the operation. If it does not settle or is severe you should consult your GP or surgeon.

ii) Problems with the Operation

Conversion to an open operation: On average 95 out of 100 patients will have a successful keyhole operation. In a small number of patients the operation cannot be completed using the keyhole method. The commonest cause for this is scarring around the gall bladder. If the gallstones have been present for a long time or there have been many attacks of acute cholecystitis this may induce a large amount of scarring around the gall bladder. Often this will not cause a problem. However if it is not possible to distinguish between the cystic duct and the main bile duct because of this scarring it is better to perform an open operation than risk damaging the main bile duct. This will require a formal long incision in the tummy wall either under the right ribs or up-and-down in the middle of the tummy wall. Obviously, recovery is prolonged if this happens and patients will usually stay in hospital for 5 to 7 days and take about 4 to 6 weeks to recover.

Although the scan done to diagnose the gallstones can sometime predict how likely it is that the keyhole operation will need to be abandoned, this is not usually the case. In view of this your surgeon will ask you to consent to the possibility of an open operation at the time of signing for the keyhole operation.

Bile Leakage: Approximately 1 patient in 100 will experience a leak of bile from the raw surface of the liver where the gall bladder has been removed or from the end of the cystic duct because the clips used to close this have come off. This can sometimes be associated with an unsuspected stone in the main bile duct. This bile causes intense irritation of the tummy cavity and results in pain and feeling generally unwell. The pain is greater than would be expected with just the wounds and gets worse rather than better. This usually occurs within a few days of the surgery but can be seen up to two weeks later. These symptoms require urgent medical attention; usually a repeat scan, an operation to place a drain and an ERCP procedure using a flexible telescope placed down the mouth and through the stomach to divert the leaking bile into the gut.

Bile Duct Injury: Injury to the main bile duct has always been a rare complication of gall bladder surgery. For example, it is well documented that this happened to British Prime Minister, Anthony Eden in the 1950's during an open cholecystectomy. The incidence of this injury is approximately 2 patients in 1000 undergoing the operation and usually results in conversion to an open operation. If it is minor, the injury is dealt with by closing the bile duct with sutures and then leaving a drain to take fluid away from the operation site or by inserting a tube into the bile duct and also leaving a drain. Provided there is no leakage of bile the tubes are removed after 10 to 14 days and after an X-ray if there is a tube in the bile duct. Occasionally an ERCP and stent is also needed. If the main bile duct is completely divided this is usually treated by stitching it to a segment of bowel. This is a bigger and longer operation. This too requires tubes and drains to be left around the operation site. Occasionally this operation might need to be done at another hospital. In which case a tube is left draining bile and the wound is closed before waking the patient up prior to transfer, usually the next day.

Wound infection: Infection of a keyhole wound is uncommon and usually occurs at the belly button wound. If the wound becomes red and starts to discharge fluid or pus you should see your GP or bring forward your out-patient follow-up appointment. This may require antibiotics or the scar to be opened slightly so a dressing can be placed into it. Occasionally a wound infection is due to a small gallstone or stone fragment that has fallen into the wound on removal of the gallbladder. If this is the case the stone will usually come out with the discharge.

Bleeding: Serious bleeding is very uncommon. All patients develop a small collection of blood below the liver where the gall bladder has been removed. This is usually a few millilitres and the body absorbs it without the patient being aware of it. Occasionally bleeding may occur from a branch of the cystic artery where the gall bladder has been removed or a blood vessel that may run close to the wound just below the breast bone.

Bleeding from the cystic artery that can not be stopped with clips on the artery is usually noted at surgery and may require an open operation. As a bleeding artery of this small size is sometimes not apparent at the time of surgery because it goes into spasm it may become apparent immediately after surgery on the observations taken by the nurses and again requires further surgery possibly an open operation.

Bleeding from the port wound is usually self-contained and stops by itself although this can form a bruise or collection of blood that is tender and takes a few weeks to disperse. If it is not self contained the wound may need to be explored at a further small operation to tie of the vessel.

Hernias at the wounds: The wounds at the belly button and just below the breastbone are usually slightly bigger than the other two and require internal stitches to close them. Occasionally these stitches can give way and a transient bulge may form gradually under the

wound. This usually takes a few years. If this occurs you should go back to your surgeon as it may require further surgery to deal with this.

Indigestion and Bowel Symptoms: It is common for patients to get indigestion and heartburn for a few months following the operation. If troublesome this can be treated by your GP. Irritable bowel like symptoms can become worse and the stool may become soft and more frequent. This is usually transient. Rarely soft stools can be permanent because the colon is irritated by bile salts. This can be treated with medicines that bind bile salts.

b) Shattering Gallstones

If a patient is not fit for surgery and getting a lot of symptoms stone shattering is a possible option. For this technique a patient lies on a machine that focuses high frequency sound waves at the stones. This then shatters them into small fragments that may pass or be dissolved. Unfortunately there are some major drawbacks to the technique

- Patients need to have no more than three stones that are all greater than 1 cm in diameter.
- The stones should not contain calcium. An additional X-ray scan is required to determine this.
- The gallbladder should be working properly. A dynamic scan is needed to determine whether the gallbladder contracts after a meal containing fats.

If any of these criteria apply, stone shattering is not possible.

In addition

- The small fragments of stone will often cause pain as they pass
- Stone fragments that remain in the gallbladder need dissolving by taking daily additional tablets containing bile salt. The total process to get rid of all stone fragments may take up to 18 months.
- As the gallbladder is still intact and it is this organ that produces gallstones, recurrence of the stones is very high and 60-80% will return within 2 years.

c) Removing Stones by Creating a Track to the Skin

If patients are getting a lot of troublesome symptoms and are not fit for surgery or stone shattering a track can be created between the gall bladder and the skin over a tube placed in the gallbladder. Using a mild sedative the track is gradually stretched up to allow a telescope to be passed into the gall bladder to remove the stones. This procedure is usually reserved for very frail patients with symptomatic gallstones.

5) Treatment of Stones in the Bile Duct

Most stones that pass from the gallbladder to the bile duct then pass harmlessly into the gut. The process may cause pain (biliary colic) but no more than this. If a stone does not pass it may block the duct and cause jaundice or rarely, cause infection in the bile duct.

Your surgeon may know you have stones in the bile duct because they are seen on the ultrasound scan or bile duct X-ray during a gall bladder operation. Alternatively your surgeon may suspect you have gallstones in the bile duct from your symptoms, blood tests or features on the scan but without seeing the stone directly.

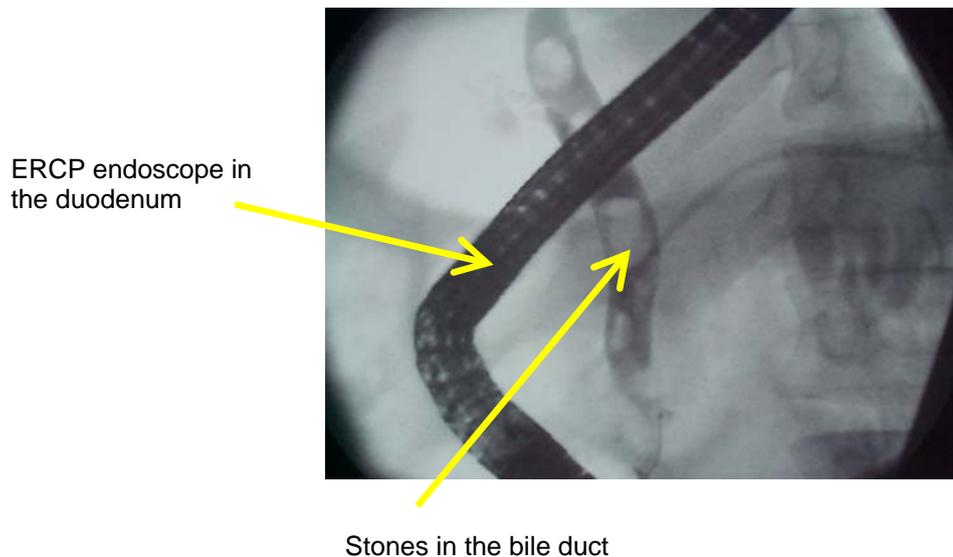
If a stone has definitely been seen or you have jaundice the next stage in treatment is an ERCP (Endoscopic Retrograde Cholangio-pancreatography). If you are not jaundiced but a stone is suspected your surgeon may request a magnetic resonance scan of the bile duct to make a definite diagnosis. If a stone is confirmed then an ERCP is required.

a) ERCP

This procedure is not currently performed at Kingston Hospital or any of the local private hospitals in the area around Kingston Hospital. Patients are therefore usually transferred to St George's Hospital to have it done.

Whilst under sedation a flexible telescope is placed through the mouth and advanced down the gut to a point just beyond the stomach where the bile duct joins the gut. A fine catheter is then passed down the telescope and into the bile duct to inject 'dye', and an X-ray is taken. If stones are seen these can then usually be removed at the same time.

To remove the stones the small sphincter muscle at the bottom of the duct is divided using a special knife placed down the telescope. If the stones do not fall out they can be removed using a further instrument with either a wire basket or small balloon that is passed down the telescope into the bile duct, and used to sweep the stones out.



i) Complications of ERCP

Bleeding: This occurs in less than 1 in 100 patients who need an ERCP and can be treated with a heated probe placed down the telescope. If it is prolonged or profuse surgery may be needed.

Pancreatitis: The procedure can cause inflammation of the pancreas gland in up to 5 in 100 patients particularly if the sphincter has been cut. It usually causes increasing tummy pain, is diagnosed with a blood test and requires admission to hospital. It usually settles in 5 to 7 days.

b) Surgery for Bile Duct Stones

If it is not possible to reach or remove the bile duct stones at ERCP surgery may be needed. This can be performed using keyhole methods (often at the same time as removing the gallbladder) or an open operation. During this operation the bile duct is

opened and the stones removed. Post operative treatment is the same as for minor injury to the bile duct.

6) Further Information

If you have any queries concerning your surgery

- Raise these with Mr Willson at your out-patient appointment
- Talk to your GP
- If you have had your surgery use the contact numbers given to you from the day surgery unit at Kingston Hospital or any of the Private Hospitals

Peter Willson
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