

GALLSTONES

Gallstones (biliary calculi) are small stones made from cholesterol, bile pigment and calcium salts, usually as a mixture that forms in the gall bladder. The gall bladder is a small sac that holds bile, a digestive juice produced by the liver that is used in the breakdown of dietary fats. The gall bladder extracts water from its store of bile until the liquid becomes highly concentrated. The presence of fatty foods triggers the gall bladder to squeeze its bile concentrate into the small intestine. Gallstones are a common disorder of the digestive system, and affect around 15 per cent of people aged 50 years and over. Some things which may lead to the formation of gallstones include the crystallisation of excess cholesterol in bile and the failure of the gall bladder to fully empty. In most cases, gallstones don't cause any problems. However, prompt treatment may be necessary if stones block ducts and cause complications, such as infections or inflammation of the pancreas (pancreatitis).

Symptoms

In approximately 70 per cent of cases, gallstones cause no symptoms (asymptomatic).

The symptoms of gallstones may include:

- Pain in the abdomen and back. Pain is generally infrequent but severe.
- Increase in abdominal pain after eating a fatty meal.
- Jaundice.
- Fever and pain, if the gall bladder or bile duct becomes infected.

Different types

There are three main types of gallstones, including:

- Mixed stones - the most common type. They are comprised of cholesterol and salts. Mixed stones tend to develop in batches.
- Cholesterol stones - comprised mainly of cholesterol, a fat-like substance that is crucial to many metabolic processes. Cholesterol stones can grow to significant sizes, large enough to block bile ducts.
- Pigment stones - bile is greenish-brown in colour, due to particular pigments. Gallstones made from bile pigment are typically small but numerous.

Complications of gallstones

If gallstones present no symptoms, there is rarely any need for treatment. Complications that may require prompt medical treatment include:

- Biliary colic - a gallstone can migrate from the body of the gall bladder into its neck (cystic duct), leading to obstruction. This causes severe pain, this pain is usually felt high in the centre of the abdomen or lower chest. It can also radiate to the back in the region of the right shoulder blade.
- Inflammation of the gall bladder (cholecystitis) - the gall bladder duct becomes blocked by a gallstone, leading to infection and inflammation of the gall bladder. Symptoms include fever, severe abdominal pain, nausea and vomiting.
- Jaundice - if the bile duct leading to the bowel is blocked by a stone, trapped bile enters the bloodstream instead of the digestive system. The bile pigments cause a yellowing of the skin and eyes. The urine may also turn orange or brown.
- Pancreatitis - inflammation of the pancreas, caused by a blocked bile duct low down near the pancreas. Pancreatic enzymes irritate and burn the pancreas and leech out into the

abdominal cavity. Gallstone induced pancreatitis can be extremely severe and can be fatal.

- Cholangitis - inflammation of the bile ducts, which occurs when a bile duct becomes blocked by a stone, and the bile gets secondarily infected. This causes pain, fever, jaundice and rigors (shaking).

Diagnosis methods

Gallstones are diagnosed using a number of tests, including:

- General tests - such as physical examination and x-rays.
- Ultrasound - sound waves form a picture that detects the presence of gall stones.
- Endoscope test - called endoscopic retrograde cholangiopancreatography (ERCP). A thin tube is passed through the oesophagus and stomach to the duodenal, dye is injected through the opening of the bile duct into the duodenum to allow x-ray imaging of the bile ducts and gall bladder.
- HIDA scan - a special type of nuclear scan that assesses how well the gall bladder functions.

Treatment options

Gallstones that present no symptoms generally don't require any medical intervention. Treatment depends on the size and location of the gallstones, but may include:

- Dietary modifications - such as limiting or eliminating fatty foods and dairy products.
- Surgery - to remove the entire gall bladder, or stones from bile ducts. Most people with symptomatic gallstones will require surgery. The primary procedure these days is 'keyhole' (laparoscopic) surgery. Abdominal surgery (laparotomy), where

the gall bladder is removed through an incision in the abdomen is now reserved for those in whom laparoscopic surgery fails.

- Lithotripsy - a special machine generates sound waves to shatter stones. This treatment is rarely used.
- Medications - there are drugs available that can dissolve gallstones, but this treatment is only rarely given, due to side effects and a variable success rate.

Cholecystectomy

Most gallstones do not cause any symptoms, and generally do not require any treatment. However, if the stones are in the gallbladder, and are causing recurrent abdominal pain, known as biliary colic, it may be necessary to surgically remove the gallbladder using a procedure called cholecystectomy. There are 2 different ways this operation can be done-through open surgery, or through 'keyhole' surgery (laparoscopy). Gallstones that are in the bile duct are usually removed by endoscopy (see ERCP) or by surgery.

Open cholecystectomy

Open cholecystectomy is a relatively safe procedure where the gallbladder is removed through an incision in the abdomen below the ribs on the right-hand side of the body.

The gallbladder is not an essential organ, and can be removed with few adverse effects. Some people (less than 5 per cent) might find that they have an increase in stool frequency after the operation. This can usually be easily corrected using anti-diarrhoeal medications. There is a small risk of other surgical complications which include damage to the bile duct or bleeding of the bile duct. Only one in 20 people having their gallbladder removed requires open surgery. The rest undergo laparoscopic cholecystectomy.

Laparoscopic cholecystectomy

These days most gallbladders are removed using a procedure known as laparoscopic cholecystectomy or 'keyhole' surgery. This technique involves inflating the abdominal cavity with carbon dioxide, then inserting very fine instruments and a specialised tiny video camera through a few small cuts in the abdomen wall. The gallbladder is then cut free under video surveillance and taken out of the body through one of the incisions.

Laparoscopic cholecystectomy is safer, and has fewer complications, than open surgery. It also involves less post-operative pain, less scarring and allows a speedier recovery time. In open cholecystectomy the abdominal muscles are cut, but with laparoscopic cholecystectomy this is not necessary, so recovery is simpler. Hospitalisation is generally 1-2 days, rather than the 5-8 days associated with open cholecystectomy. On occasion, surgeons may have to abandon the laparoscopic method and switch to open surgery if they have difficulties during the procedure.

GALLSTONES IN PREGNANCY

Gallstones may affect as many as 6% of pregnant women. Pregnancy alters bile composition and gall bladder emptying slows in the second trimester increasing the risk of gall stones.

Risk factors are multiple pregnancies and previous gallbladder disease.

Symptoms are similar in pregnancy to non-pregnant. The usual presentation is with pain in the right-upper-quadrant or epigastrium peaking at 12-24 hours. This may radiate towards the back and there may be epigastric or right-upper-quadrant tenderness.

Jaundice occurs only in 5% of occasions. Gallstones account for approximately 7% of patients with jaundice in pregnancy.

Jaundice often requires surgical intervention usually via laparoscopic cholecystectomy. Uncomplicated cholecystectomy is safer in first and second trimesters with fetal loss approx. 5% but with common bile duct exploration, especially if complicated by pancreatitis, one can find a high maternal (15%) and fetal mortality (60%).

INTRAHEPATIC CHOLESTASIS OF PREGNANCY (ICP)

This is a reversible form of cholestasis (blockage to the flow of bile) developing in the third trimester of pregnancy and usually resolving rapidly after delivery. Intrahepatic cholestasis of pregnancy occurs in less than 1 : 1000 pregnancies. It typically arises in the third trimester of pregnancy

Family clusters of the problem occur and there is increased prevalence in certain populations (eg Chile).

A dominant inheritance is possible.

The problem is likely to represent a pre-existing subclinical defect in a bile transport system which is unmasked in pregnancy by the effect of high levels of circulating hormones during the last trimester. This is supported by the fact that women with a history of ICP are prone to cholestasis induced by oral contraceptives and vice versa.

Symptoms are itch (prurities) alone (80%), or with jaundice(20%).

Liver function tests show minimal or no transaminase elevation

Serum bile salts are increased, and there is mild to moderate steatorrhoea (fatty stools).

Medical treatment of ICP is controversial. Ursodeoxycholic acid is used where pruritis can be very severe and provides safe and effective relief.

Close fetal surveillance prior to and during delivery is needed.

There is no increased risk to mother but an increased risk of preterm delivery, fetal distress and increased perinatal mortality rate (1-3.5%). ICP recurs in 60-70% of subsequent pregnancies.

PRE-ECLAMPSIA AND HELLP

Hepatic dysfunction with preeclampsia has long been recognised but more recently it has been strongly associated with HELLP syndrome (Haemolysis, elevated liver enzymes and low platelets) which complicates 3-10% pre-eclamptic pregnancies. The initial clinical presentation is with epigastric pain, nausea and vomiting.

In HELLP, haemolysis (rapid destruction of red blood cells) occurs (with elevated bilirubin and lactic dehydrogenase), moderately

elevated transaminases and a drop in the platelet count. Jaundice may occur due to DIC and haemolysis. Lab abnormalities peak 1-2 days postpartum and then return to normal within 3-11 days.

The most effective treatment for HELLP is prompt delivery. There is insufficient evidence to support the use of steroids.

Maternal mortality associated with HELLP is 2% - with bleeding disorders, placental abruption, pulmonary oedema (heart failure) and liver haematoma/rupture the most serious complications. Perinatal mortality rate is 33%. The risk of recurrence in future pregnancies is 3-4%.