



Review Article on Prevention and Treatment of Gallstones

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Abstract

Cholecystitis (inflammation of the gallbladder) is mainly caused by gallbladder stones which are common with prevalence as high as 60 % to 70% in American Indians and 10% to 15% in white adults of developed countries and more prevalent in females. It is caused by high content of cholesterol or bilirubin in bile and gallbladder being unable to empty well. It causes no symptoms sometimes, but severe pain and if left untreated gallbladder perforation occurs leading to peritonitis/sepsis and even death in 5 – 50 % of cases. It can be mainly prevented by maintaining normal bodyweight, eating healthy foods mostly fruits and vegetables and doing regular exercises. Its common treatment for symptomatic cases is by three methods of cholecystectomy (surgical removal of gallbladder) out of which laparoscopic cholecystectomy is a standard and minimally invasive method and most people treated go home same day and soon return to normal activities.

Keywords: Cholecystitis; Gallstones; Laparoscopic Cholecystectomy

Introduction

The gallbladder is an organ the shape and size of a small pear and located below the liver in the upper right part of abdominal cavity. It stores a substance called bile made by the liver. It keeps the bile until the body needs it to digest fatty foods. Cholecystitis (inflammation of the gallbladder) is mainly caused by (i) gallbladder stones (90 – 95% of all cases) and other causes like trauma, bacterial infection, tumors and blockage of bile ducts due to adhesion etc. (See figure). Gallstones are common with prevalence as high as 60% to 70% in American Indians and 10% to 15% in white adults of developed countries [1,2]. They were more prevalent in females as compared with males between the ages of 25 and 34 years [3]. More than 25 million people in the United States have gallstones, and 65% to 75% of them are women. Fortunately, for most people, gallstones are 'silent' [4].

Types, Causes and Risk Factors of Gallstone Formation

Gallstones are hardened deposits and there are two types of gallstones-cholesterol stones (yellow in color) and pigment stones (dark brown or black in color). Gallstones formation occurs when bile contains too much cholesterol or too much bilirubin (a substance normally produced by breakdown of red blood cells) or gallbladder does not empty well resulting in overly concentrated bile and then stone formation. Factors that may increase the risk of gallstones are being female, age 40 or older; a Native American, a Hispanic of Mexican origin, overweight or obese, diabetic, sedentary in lifestyle, pregnant; eating a high-fat diet, a high-cholesterol diet, a low-fiber diet; having a family history of gallstones, diabetes and certain blood disorders such as sickle cell anemia or leukemia or liver disease; dyslipidemia; losing weight very quickly; and taking medications that contain

estrogen such as oral contraceptives or hormone therapy drugs⁵, Fibrates, Ceftriaxone and Somatostatin analogues in long term use. Certain conditions associated with gallbladder stasis are prolonged fasting/parenteral nutrition and spinal cord injury [3].

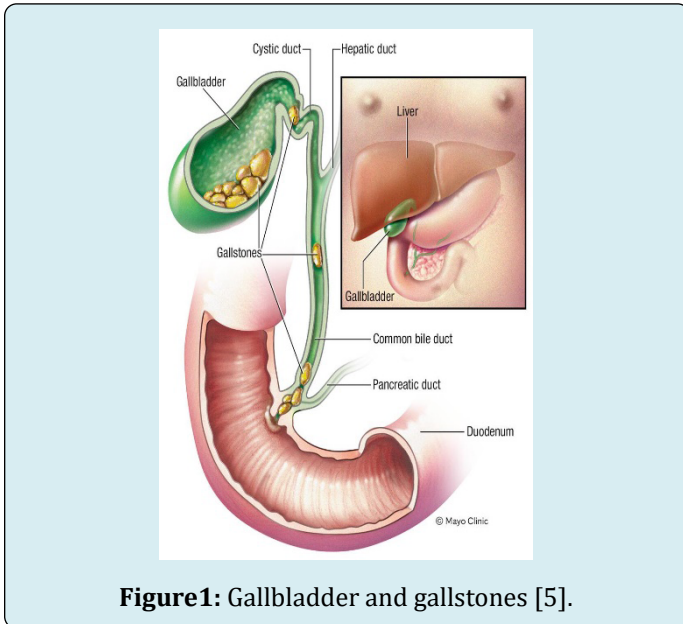


Figure 1: Gallbladder and gallstones [5].

Symptoms and Complications

Some people have no signs and symptoms although they have gallstones. The gallstone(s) can block the bile ducts any times and its symptoms follow such as feeling bloated, fever, jaundice (yellow-looking skin), nausea and pain in the right side of the abdomen, which may reach the back or the shoulder. If untreated, due to pressure within gallbladder, limited or lack of blood flow occurs leading to gallbladder perforation and severe infection within abdomen (peritonitis) and/or of blood (sepsis). This peritonitis and sepsis can also lead to death in 5-50% of cases. As complications, cholecystitis; blockage of common bile duct leading to severe pain, jaundice and bile duct infection; blockage of pancreatic duct leading to pancreatitis and rarely gallbladder cancer occurs [1,5,6].

Prevention of Gallstone Formation

Gallstone risk can be reduced by the following [3,7,8]

- Maintain a healthy weight. Lose weight slowly if necessary [i.e. one or two pounds (about 0.5 to 1 kilogram) a week]. Rapid weight loss can increase the risk of gallstones.
- Eat healthfully: Stick to healthy fats (i.e., mono- and polyunsaturated fats found in olive oil, canola oil, and omega-3 fatty acids, which are found in avocados, canola, flaxseed, and fish and beneficial in preventing gallstone disease). Eat more high-fiber foods such as fruits,

vegetables and whole grains. Do not skip meals. Skipping meals or fasting can increase the risk of gallstones. It is not necessary to shy away from coffee. Avoid sugars, carbs and fatty foods. Keep oneself properly hydrated.

- Do physical exercise regularly. Regular physical activity of at least 150 minutes per week, or 30 minutes five times a week, can improve health outcomes and prevent weight gain.
- If necessary, take preventive medications, for examples, gallstone dissolution agents and cholesterol-lowering agents only prescribed by physician. Vitamin C supplementation may have protective effect on gallstone formation.

Treatment of Gallstones

Generally, treatment for gallstones is not needed unless they produce pain. Sometimes gallstones pass without being noticed by person. If in pain, doctor will likely recommend surgery. Treatment includes surgical, non-surgical and other treatments [9].

Surgical Treatment

Cholecystectomy is the surgery to remove gallbladder and a common treatment of symptomatic gallstones and other gallbladder conditions. There are three methods of cholecystectomy.

- **Open cholecystectomy:** It is a traditional surgical method in which a 10- 15 cm incision is made under right ribs. At present, doctors use this method in the patient whose inflammation is quite severe, if gallbladder is perforated or if there are contraindications for a minimally invasive method.
- **Laparoscopic cholecystectomy:** It is minimally invasive surgery to remove the gallbladder. The surgery involves a few small incisions, and most people go home the same day and soon return to normal activities. This method is considered the standard treatment and has replaced open surgery since early 1990s. It is currently indicated for the treatment of acute or chronic cholecystitis, symptomatic cholelithiasis, biliary dyskinesia, acalculous cholecystitis, gallstone pancreatitis, and gallbladder masses or polyps. It requires special surgical instruments and specific skill and expertise of an operating doctor.
- **Robotic-assisted cholecystectomy:** It is also a minimally invasive method using a computer-operated robotic arm that is controlled by a well-trained operating doctor [1,9,10].

Nonsurgical Treatment

- **Oral dissolution therapy:** It can be used if surgery cannot be performed, for example, as if the patient is a

much older individual. Two bile acids - ursodeoxycholic acid and chenodeoxycholic acid are often prescribed to dissolve smaller gallstones. It may take up to two years for bile acids to treat gallstones. Gallstones may re-form when the medication is discontinued.

- **Shock wave lithotripsy:** It is another option. A lithotripter is a machine that generates shock waves that pass through a person. These shock waves can break gallstones into smaller pieces.
- **Percutaneous drainage of the gallbladder:** It involves placing a sterile needle into the gallbladder to aspirate (draw out) bile. A tube is then inserted to help with additional drainage. This procedure is not typically a first line of defense and tends to be an option for individuals who may not be suited for other procedures [9].

Other Treatments

They include several methods majority of which are not scientifically studied [9].

➤ Gallbladder cleanse

- A gallbladder cleanse is a specialized diet for keeping a person from getting gallstones or for treating existing gallstones. Some people call it a 'liver flush'. Some people try a gallbladder cleanse to avoid surgery. There is little research that supports using a gallbladder cleanse as an alternative to medical treatments. Some natural and alternative medicine proponents recommend a gallbladder cleanse to reduce gallstones. They claim the gallbladder cleanse causes the gallbladder to release the gallstones. Different gallbladder cleanse types exist. There are several 'recipes' and folk remedies on the internet from alternative medicine practitioners.
- Lemon juice and olive oil. This method involves not eating for 12 hours during the day and then, at 7 PM, drinking four tablespoons of olive oil and one tablespoon of lemon juice-eight times every 15 minutes.
- Apple juice and vegetable juice. This method involves drinking only apple juice and vegetable juice until 5 PM. After 5 PM, drink 18 milliliters (ml) of olive oil and 9 ml of lemon juice every 15 minutes until eight ounces of olive oil has been consumed.
- Consumption of combination of olive oil, juice and herbs for two or more days. During that time, they are not supposed to consume anything other than the oil mixture. There is no standard mixture or recipe. This mixture can be dangerous for people with diabetes, or those who experience low blood sugar.
- Others are consumption of apple juice and apple cider

vinegar, doing yoga, consumption of milk thistle and artichoke, consumption of gold coin grass extract (it is known to be linked with reduced gallstone formation), application of castor oil pack on the site of pain, and treatment by acupuncture (it just relieves the pain but more research is needed).

- **Sleeping position:** When patient is experiencing gallbladder pain, he should sleep on his left side. Sleeping or resting on the left side allows him gallbladder to freely contract and expand until the blockage of his bile duct has cleared. The theory is that this can help resolve pain. There is currently no research that compares the pain level of different reclining positions when gallbladder pain occurs. If he is experiencing any type of gallbladder pain, he may want to avoid sleeping on his right side. Sleeping on the right side can constrict the gallbladder and can make it harder for a gallbladder stone to pass. He may also want to avoid sleeping on his back or stomach.

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