

# A Clinico-Pathological Comparative study in patients undergoing Open Vs Laparoscopic Cholecystectomy.

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## ABSTRACT

**Background:** Laparoscopic cholecystectomy has now replaced open cholecystectomy as the first-choice of treatment for gallstones and inflammation of the gallbladder unless there are contraindications to the laparoscopic approach. The present study is done to know the incidence of cholelithiasis in India with respect to age and sex. To compare and evaluate the advantages and disadvantages of laparoscopic versus open cholecystectomy surgical procedures. **Methods:** This is a comparative study done at tertiary care centre for the period of two years. Hundred cases of cholelithiasis were admitted, examined and operated during this period. Seventy two patients underwent laparoscopic cholecystectomy and twenty eight patients underwent open cholecystectomy. Surgical complications, duration of hospital stay were also recorded. **Results:** Maximum incidence of cases was in the 4th decade with female preponderance. The most common symptom was pain abdomen and commonest sign was tenderness. Ultrasonography is the investigation of choice. After laparoscopic cholecystectomy duration of hospital stay as well as return to normal routine work was significantly less as compared to open cholecystectomy. **Conclusion:** Laparoscopic cholecystectomy is innocuous and actual treatment with early recovery and cosmetic advantage. Open cholecystectomy is preferred if significant adhesions or inflammation are recognized during laparoscopy.

**Keywords:** Cholelithiasis, Cholecystectomy, Open, Laparoscopic.

## INTRODUCTION

In vertebrates, the gallbladder is a small hollow organ where bile is stored and concentrated before it is released into the small intestine. In humans, it lies beneath the liver, although the structure and position of the gallbladder can vary significantly among animal species. It receives and stores bile, produced by the liver, via the common hepatic duct, and releases it via the common bile duct into the duodenum, where the bile helps in the digestion of fats.<sup>[1,2]</sup>

The gallbladder can be affected by gallstones, formed by material that cannot be dissolved – usually cholesterol or bilirubin, a product of haemoglobin breakdown. These may cause significant pain, particularly in the right upper corner of the abdomen, and are often treated with removal of the gallbladder called a cholecystectomy. Cholecystitis, inflammation of the gallbladder, has a wide range of causes, including result from the impaction of gallstones, infection, and autoimmune disease.<sup>[3-5]</sup>

Gallstones are the most common problem to affect the gallbladder. Gallstones generally form when the bile is saturated with either cholesterol or bilirubin. Only a minority of gallstones cause symptoms; most stones are passed along the biliary system. When symptoms occur, severe pain in the upper right part of the abdomen is felt. If the stone blocks the gallbladder, inflammation as cholecystitis may result. If the stone lodges in the biliary system, jaundice may occur; and if the stone blocks the pancreatic duct, then pancreatitis may occur. Gallstones are often managed by waiting for them to be passed naturally. In people with recurrent gallstones, surgery to remove the gallbladder may be considered. Some medication, such as ursodeoxycholic acid, may be used; and lithotripsy, a procedure used to break down the stones, may also be used.<sup>[6-10]</sup>

A cholecystectomy is a procedure in which the gallbladder is removed. It may be removed because of recurrent gallstones, and is considered an elective procedure. A cholecystectomy may be an open procedure, or one conducted by laparoscopy. In the surgery, the gallbladder is removed from the neck to the fundus, and so bile will drain directly from the liver into the biliary tree. About 30 percent of patients may experience some degree of indigestion following the procedure, although severe

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complications are much rarer. About 10 percent of surgeries lead to a chronic condition of postcholecystectomy syndrome as well as more serious complications such as bile duct injury.<sup>[11-15]</sup>

Laparoscopic cholecystectomy has now replaced open cholecystectomy as the first-choice of treatment for gallstones and inflammation of the gallbladder unless there are contraindications to the laparoscopic approach. This is because open surgery leaves the patient more prone to infection. Sometimes, a laparoscopic cholecystectomy will be converted to an open cholecystectomy for technical reasons or safety.<sup>[16,17]</sup>

Laparoscopic cholecystectomy does not require the abdominal muscles to be cut, resulting in less pain, quicker healing, improved cosmetic results, and fewer complications such as infection and adhesions. Most patients can be discharged on the same or following day as the surgery, and can return to any type of occupation in about a week.<sup>[18]</sup>

The present study is done to know the incidence of cholelithiasis in India with respect to age and sex. To compare and evaluate the advantages and disadvantages of laparoscopic versus open cholecystectomy surgical procedures.

## MATERIALS AND METHODS

This is a comparative study done at tertiary care centre for the period of two years. Hundred cases of cholelithiasis were admitted, examined and operated during this period. Detailed history and examination of all the 100 patients was done. Information related to age, economic status, symptoms, duration of illness, dietary history, alcohol, tobacco addiction and hyperglycaemia were obtained. Examinations including haemogram, ECG, LFT and blood sugar, blood urea, serum creatinine, urine analysis, blood grouping, chest x-ray and ultrasound abdomen were done. Written consent was taken from all the patients and all threats and complications were explained to them. In this study, seventy two patients underwent laparoscopic cholecystectomy and twenty eight patients underwent open cholecystectomy. Surgical complications, duration of hospital stay were also recorded.

### Inclusion criteria

- Symptomatic gallstone disease with or without complications.
- Asymptomatic gallstones of size more than 1.5 cm.
- Patients with stone both in the gallbladder and the common bile duct.

### Exclusion criteria

- Acalculous cholecystitis
- Primary CBD stones without gallstones.
- Cardiac disease
- Renal failure.
- Asymptomatic gallstones less than 1.5 cm.

- Gallstones with congenital malformation of biliary tree and stricture of CBD.

## RESULTS

In the present study, 100 cases of cholelithiasis were analysed. There was increased prevalence of cholelithiasis in the 4th decade, even though no age group was exempted from the disease. The youngest patient was 22 years and eldest was 76 years [Figure 1]. The study shows that the prevalence of gallstones more common in females with male:female ratio of 1:1.5 [Figure 2].

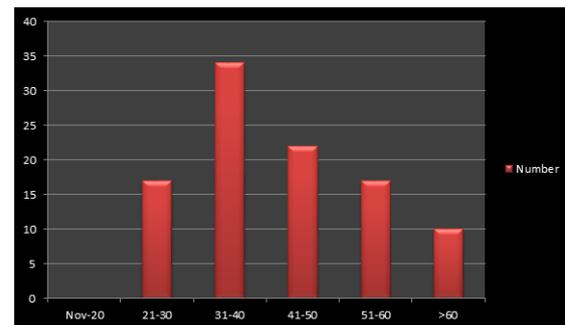


Figure 1: Age Wise Distribution of Cholelithiasis.

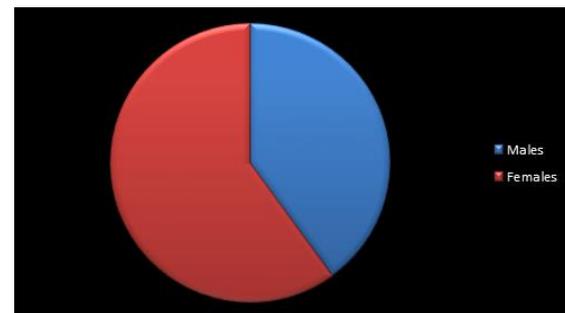


Figure 2: Sex Distribution of Cholelithiasis.

Pain was the most common symptom in all the patients, 33% had nausea, 20% presented with jaundice and 16% with fever. In the present study, 79% patients had tenderness in the right hypochondrium, 26% had icterus and 7% had mass in the right hypochondrium [Figure 3].

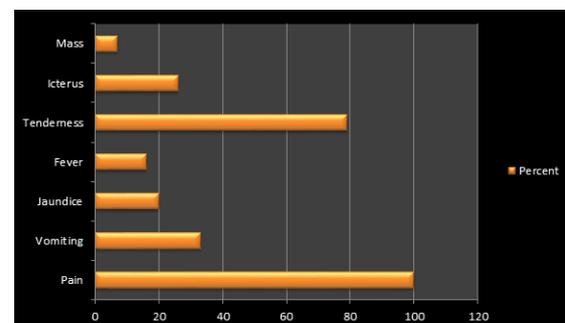


Figure 3: Clinical Presentation of Cholelithiasis.

The main investigation carried out was ultrasonography of abdomen. Isolated cholelithiasis

was the most common outcome in ultrasound, 61% had multiple stones and 38% had solitary stone. Cholelithiasis with choledocholithiasis was present in 16% of cases. Dilated bile duct was appreciated in 18% of cases and gallbladder wall thickening was seen in 29% of cases [Figure 4].

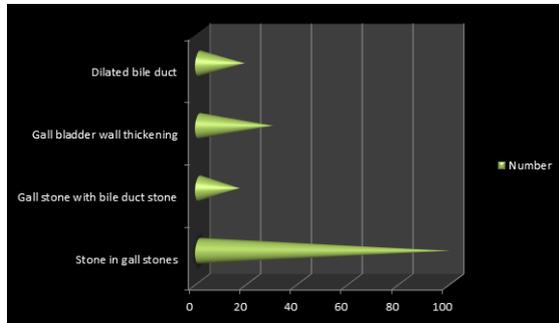


Figure 4: Various Ultrasound Imaging Findings.

Complications of cholelithiasis observed in the present study were chronic cholecystitis in 76% of cases, 24% had features of acute cholecystitis of which 4% had empyema and 4% had perforation. Twenty patients had other comorbid conditions like diabetes mellitus, hypertension and COPD.

Postoperative complications were minimal. Postoperative haemorrhage is seen in one case of laparoscopic cholecystectomy and nil in open cholecystectomy. One patient in laparoscopic cholecystectomy and 3 patients in open cholecystectomy had surgical site infection. Two cases in laparoscopic procedure and one patient in open procedure had prolonged bile leak were managed conservatively.

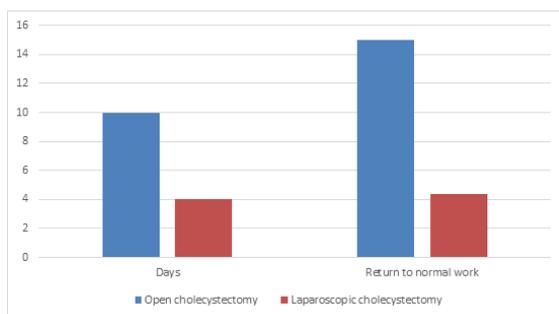


Figure 5: Postoperative Recovery (days).

After laparoscopic cholecystectomy duration of hospital stay as well as return to normal routine work was significantly less as compared to open cholecystectomy [Figure 5].

## DISCUSSION

Cholesterol gallstones develop when bile contains too much cholesterol and not enough bile salts. Besides a high concentration of cholesterol, two other factors are important in causing gallstones. The first is how often and how well the gallbladder

contracts; incomplete and infrequent emptying of the gallbladder may cause the bile to become over-concentrated and contribute to gallstone formation. This can be caused by high resistance to the flow of bile out of the gallbladder due to the complicated internal geometry of the cystic duct. The second factor is the presence of proteins in the liver and bile that either promote or inhibit cholesterol crystallization into gallstones. In addition, increased levels of the hormone estrogen, as a result of pregnancy or hormone therapy, or the use of combined (estrogen-containing) forms of hormonal contraception, may increase cholesterol levels in bile and also decrease gallbladder movement, resulting in gallstone formation.<sup>[5,9,11]</sup>

Diseases of the gallbladder commonly manifest as gallstones and gallbladder cancer. To identify risk factors in a given population, epidemiological studies must first define the frequency of disease. Ultrasonography is an ideal means to quantitate the frequency of gallstone disease being a noninvasive and safe imaging technique that accurately can detect the point prevalence of gallstones in a defined asymptomatic population.<sup>[14,19]</sup>

Open cholecystectomy is performed via an abdominal incision (laparotomy) below the lower right ribs. Recovery typically requires 3–5 days of hospitalization, with a return to normal diet a week after release and to normal activity several weeks after release.<sup>[20,21]</sup>

Laparoscopic cholecystectomy, introduced in the 1980s, is performed via three to four small puncture holes for a camera and instruments. Post-operative care typically includes a same-day release or a one night hospital stay, followed by a few days of home rest and pain medication. Laparoscopic cholecystectomy patients can, in general, resume normal diet and light activity a week after release, with some decreased energy level and minor residual pain continuing for a month or two. Studies have shown that this procedure is as effective as the more invasive open cholecystectomy, provided the stones are accurately located by cholangiogram prior to the procedure so that they can all be removed.<sup>[22]</sup>

Some studies observed that 52 (29%) patients had acute onset of pain while the remaining patients had chronic pain. Similar result were found by Ganey et al and Sharma et al.<sup>[1,5,7,12]</sup> Vomiting was spontaneous and occurred mostly during the attacks of pain. This was also seen by Ganey et al.<sup>[12]</sup> In the present study, pain was the commonest presenting symptom in all the patients. Tenderness in right hypochondrium was present in 83% of patients, which was comparable with Kapoor et al,<sup>[13]</sup> and Karl et al.<sup>[14]</sup> In the study by Prakash et al,<sup>[4]</sup> ultrasound scanning revealed gallbladder calculus only in 175 patients and 5 patients had stones both in gallbladder and common bile duct. Solitary calculus was found in 65 (36%) patients on sonography, but on intraoperative correlation, three of these patients

were found to have multiple calculi. Thus, the USG percentage of accuracy of solitary calculus is 92.1%. In the present study, ultrasound abdomen was the main investigation carried out. Isolated cholelithiasis was the commonest finding in ultrasound. Cholelithiasis with choledocholithiasis accounted for 16% of cases. Dilated bile duct was seen in 18% of cases and gallbladder wall thickening was seen in 29% of cases. Prakash et al study,<sup>[4]</sup> 155 patients had laparoscopic cholecystectomy and 25 patients underwent open cholecystectomy, 7 patients had CBD calculus, of which all patients underwent open cholecystectomy with CBD exploration. In the present study, 72% had undergone laparoscopic cholecystectomy and 28% open cholecystectomy. Karim T et al in open cholecystectomy group, largest number of complications were due to wound infections higher as compared with laparoscopic cholecystectomy.<sup>[15]</sup> Postoperative ileus was present in 5 patients of open cholecystectomy group necessitated the need for continuation of nasogastric decompression. Four patients from open group developed chest infection postoperatively. Wound infection in open procedure is 3 times the laparoscopic procedures.<sup>[16-22]</sup>

## CONCLUSION

This study concluded that maximum incidence of cases was in the 4th decade with female preponderance. The most common symptom was pain abdomen and commonest sign was tenderness. Ultrasonography is the investigation of choice. Laparoscopic cholecystectomy is innocuous and actual treatment with early recovery and cosmetic advantage. Open cholecystectomy is preferred if significant adhesions or inflammation are recognized during laparoscopy.

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