

Original Research Article

A clinicopathological study and management of cholelithiasis

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Abstract

Background: Gallstones are one of the commonest medical problems leading to surgical intervention. There is recent rise in the incidence of cases due to westernization of diet. This study intends to know the various modes of presentation, its complications and various treatment modalities with their outcomes.

The aim of the study is to study the prevalence of cholelithiasis and to evaluate the advantages and disadvantages of laparoscopic versus open cholecystectomy surgical procedures.

Material and methods: This was a prospective study conducted at tertiary care centre for a period of two years. 100 consecutive cases of cholelithiasis were admitted, investigated and operated during this period and results analysed.

Results: Cholelithiasis was common in the 4th decade with majority of cases occurring in females. The commonest clinical presentation was pain abdomen. All the cases were diagnosed on ultrasonography abdomen. The diet consumed was mixed diet. Laparoscopic cholecystectomy was done in 72 cases and 28 cases underwent open cholecystectomy. The conversion rate was 4%. The complications were minimal. Mean operating time for open cholecystectomy was 96 minutes and laparoscopic cholecystectomy was 90 minutes. Mean duration of hospital stay was 9 days for open cholecystectomy and 4 days for laparoscopic cholecystectomy.

Conclusion: Laparoscopic cholecystectomy is a safe and effective treatment in most of the patients with symptomatic cholelithiasis. In cases of adhesions and inflammation, open cholecystectomy is preferred.

Key words

Cholelithiasis, Laparoscopic Cholecystectomy, Open Cholecystectomy, Complications.

Introduction

Gallstone disease remains one of the major causes of abdominal morbidity and mortality throughout the world [1]. Gallstone disease is a chronic recurrent hepatobiliary disease due to impaired metabolism of cholesterol, bilirubin and bile acids, which is characterized by the formation of gallstones in the hepatic bile duct, common bile duct or gallbladder. Asian populations (5-20%) suffer from gallstones with lowest frequencies being in Black Americans [2, 3].

Aim and objectives

- To study the prevalence of cholelithiasis 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 was a prospective study conducted at tertiary care centre. 100 consecutive cases of cholelithiasis were admitted, investigated and operated during this period. Detailed history of all the 100 cases was taken. Information regarding the age, socioeconomic status, nature of the symptoms, duration of the symptoms, past history of similar complaints, dietary history, alcohol ingestion and diabetes were obtained. All patients underwent detailed examination. Investigations included hemogram, ECG, LFT and blood sugar, blood urea, serum creatinine, urine analysis, blood grouping, chest X-ray and ultrasound abdomen. Risk and complications were explained to the patient with their consent. In the present study, 72 patients underwent laparoscopic cholecystectomy and 28 patients underwent open cholecystectomy. The inclusion criteria were symptomatic gallstone disease with or without complications. Asymptomatic gallstones of size more than 1.5 cm and patients with stone both in the gallbladder and the common bile duct. The exclusion criteria was acalculous cholecystitis, primary CBD stones

without gallstones, cardiac disease, renal failure, asymptomatic gallstones less than 1.5 cm and gallstones with congenital malformation of biliary tree and stricture of CBD. Operative complications, length of hospital stay and postoperative complications were recorded.

Results

In the present study, 100 cases of cholelithiasis were analysed. In the present study, there was increased prevalence of cholelithiasis in the 4th decade, even though no age group was exempted from the disease. The youngest patient was 21 years and eldest was 75 years (**Table - 1**).

Table – 1: Age Wise Distribution of Cholelithiasis.

Age group (Years)	No. of cases	%
11-20	0	0
21-30	17	17
31-40	34	34
41-50	22	22
51-60	17	17
>60	10	10
Total	100	100

The age at presentation in females ranged from 23-68 years with a mean age of 40.20 years. The study showed that the prevalence of gallstones more common in females with male: female ratio of 1:1.5 (**Table - 2**).

Table – 2: Sex Distribution of Cholelithiasis.

Gender	Number of Cases	%
Male	40	40
Female	60	60
Total	100	100

Pain was the commonest presenting symptom in all the patients, 37% had nausea, 21% presented with jaundice and 12% with fever. In the present study, 83 patients had tenderness in the right hypochondrium, 21% had icterus and 4% had mass in the right hypochondrium (**Table - 3**).

Table – 3: Clinical Presentation of Cholelithiasis.

Clinical Symptoms	No. of Cases	%
Pain	100	100
Vomiting	37	37
Jaundice	21	21
Fever	12	12
Clinical Signs		
Tenderness	83	83
Icterus	21	21
Mass	4	4

Ultrasound abdomen was the main investigation carried out. Isolated cholelithiasis was the commonest finding in ultrasound, 66% had multiple stones and 34% had solitary stone. Cholelithiasis with choledocholithiasis accounted for 16% of cases. Dilated bile duct was seen in 12% of cases and gallbladder wall thickening was seen in 26% of cases (**Table - 4**).

Table - 4: Various Ultrasound Imaging Findings.

Imaging Findings	No. of Cases	%
Stones in gallbladder	100	100
Solitary stone	34	34
Multiple stones	66	66
Gallstone with bile duct stone	16	16
Dilated bile duct	12	12
Gallbladder wall thickening	26	26
Mass	4	4

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. All cases were managed by one or the other surgical procedure as mentioned below. Twenty patients had other comorbid conditions like diabetes mellitus, hypertension and COPD.

Open cholecystectomy was done in a total of 28% of patients in which four patients had common bile duct exploration, while 72%

patients underwent laparoscopic cholecystectomy. In 28 open cholecystectomies, Kocher's right subcostal incision was used in 20 cases. Abdomen was opened in midline for 4 case of acute cholecystitis that didn't improve on conservative management and had developed features of peritonitis and rest of the patients of acute cholecystitis was operated after symptoms subsided.

In 4 cases, laparoscopy was converted to open cholecystectomy due to dense adhesions. Common bile duct stones were managed with cholecystectomy and common bile duct exploration with T-tube insertion in 4 patients following failure of ERCP stone extraction. In 12 cases, ERCP successfully removed the CBD stone and later patient underwent elective laparoscopic cholecystectomy. Intraoperative anomalies found was short and thick cystic duct in 3 cases, 76% cases had fibrosed, contracted and thickened gallbladder, 16% had inflamed gallbladder, 4% had empyema and 4% had perforation.

Out of 40 male patients, 30% cases underwent open and 70% cases underwent laparoscopic cholecystectomy. Out of 60 females, 26.7% cases underwent open and 73.3% underwent laparoscopic cholecystectomy. The median duration of operative procedure was 96 minutes for open cholecystectomies and 90 minutes for laparoscopic cholecystectomy. The difference was not found to be significant. The main complications noted peroperatively were bile leak in 4 patients in laparoscopic cholecystectomy and 2 patients in open cholecystectomy group and stone spillage of 3 cases in laparoscopic cholecystectomy and one case in open cholecystectomy. There is no instance of common bile duct injury in either group.

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. Duration of hospital stay in open cholecystectomy was 9 days and laparoscopic cholecystectomy was 4 days (**Table - 5, 6**).

On histopathology, 76% of cases were chronic cholecystitis, 5% had acute cholecystitis, 4% had gangrenous changes and 15% showed acute on chronic cholecystitis. No case of malignancy was noted (**Table - 7**).

Table – 5: Operative Findings and Complications.

Operative Findings	Laparoscopic Cholecystectomy (n=72)	Open Cholecystectomy (n=28)	P Value
Operating time in minutes	90 mins.	96 mins.	P >0.05 (NS)
Intraoperative Complications			
Bile leak	4	2	P >0.05 (NS)
Stone spillage	3	1	
CBD injury	0	0	
Adjacent organ injury	0	0	
Conversions	4	0	
Postoperative Complications			
Haemorrhage	1	0	P >0.05 (NS)
Wound infection	1	3	
Retained stone	0	0	
Bile leak	2	1	

Table – 6: Post-operative Recovery.

Postoperative Recovery	Open Cholecystectomy	Laparoscopic Cholecystectomy	P Value
Duration of hospital stay in days	9 days	4 days	P <0.001
Time taken to return to normal work	13 days	8 days	P <0.001

Table – 7: Histopathology Report.

Histopathology Report	No. of Cases	%
Acute cholecystitis	5	5
Gangrenous gallbladder	4	4
Acute on chronic cholecystitis	15	15
Chronic cholecystitis	76	76

Discussion

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.

Alok Chandra Prakash, et al. [4] analyzed 180 patients with gallstones were most common in third and fourth decade with mean age being 38 years. Male: female ratio was 1:3. Battacharya, et al. [5] showed 71.4% were female; 28.6% were

male. Similar sex preponderance in the favour of females was observed by Tamhankar, et al. [6]. A study carried out by Sharma showed that 30% were males and 70% were females [7] and Thamil Selvi, et al. [8] showed 20.5% males and 79.5% females were patients of cholelithiasis. In the present study, there was increased prevalence of cholelithiasis in the 4th decade, even though no age group was exempted from the disease. The study shows that the prevalence of gallstones was more common in females with male: female ratio of 1:1.5.

Alok Chandra Prakash, et al. [4] showed that 90% patients had mixed stones, 4% pigment stones and 6% had cholesterol stones out of 180 patients of gallstones. While a study done in Haryana by Chandran, et al. [9] showed 26%, 38% and 36%, respectively. In Haryana region, study by Pundir, et al. [10] showed the prevalence 14.2%, 68.6% and 17.2%, respectively. Mixed stones are the most commonly encountered stones in North and eastern India. In the present study also, mixed stones were the commonest.

In the study by Alok Chandra Prakash, et al. [4], 128 out of 180 patients consumed a mixed diet (predominantly non-vegetarian diet) and the rest 52 out of 180 patients consumed a vegetarian. Non-vegetarians were found to be more commonly involved with cholelithiasis than vegetarians. Cholelithiasis is more in non-vegetarians. The cause could be due to the consumption of high protein and fat. The findings were similar with the findings in a study done by Maskey, et al. [11]. In the present study, majority of the patients consumed mixed diet.

Alok Chandra Prakash, et al. [4] observed that 52 (29%) patients had acute onset of pain while the remaining patients had chronic pain. Similar result was found by Ganey, et al. [12] and Sharma, et al. [7]. Vomiting was spontaneous and occurred mostly during the attacks of pain. This was also seen by Ganey, et al. [12]. In the present study, pain was the commonest presenting symptom in all the patients, 37% had

nausea, 21% presented with jaundice and 12% with fever. Tenderness in right hypochondrium was present in 83% of patients, which was comparable with Kapoor, et al. [13] and Karl, et al. [14].

In the study by Alok Chandra Prakash, et al. [4], 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, 66% had multiple stones and 34% had solitary stone. Cholelithiasis with choledocholithiasis accounted for 16% of cases. Dilated bile duct was seen in 12% of cases and gallbladder wall thickening was seen in 26% of cases.

Alok Chandra Prakash, et al. [4] study, 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.

In the study by Karim T, et al. [15], the mean operation time for laparoscopic cholecystectomy was significantly longer than for open cholecystectomy. The median (range) operation time for laparoscopic cholecystectomy was 50-175 mins (mean=103.98 mins.) and 35-95 mins (mean=70 mins.) for open cholecystectomy. The mean postoperative hospital stay was 3.7 days after laparoscopic cholecystectomy and 5.46 days after open cholecystectomy. Conversion of laparoscopic to open cholecystectomy occurred in three of the fifty patients. Two cases of laparoscopic cholecystectomy were converted to open surgery due to common bile duct injury and one due to intraoperative haemorrhage. Lujan, et

al. [16] mean operative time for open cholecystectomy was 77 minutes and laparoscopic cholecystectomy was 88 minutes. The postoperative hospital stay was 8.1 days in open cholecystectomy and 3.3 days in laparoscopic cholecystectomy. In the present study, the median duration of operative procedure was 96 minutes for open cholecystectomies and 90 minutes for laparoscopic cholecystectomy. The difference was not found to be significant. In 4 cases, laparoscopy was converted to open cholecystectomy due to dense adhesions. The duration of hospital stay was 9 days for open cholecystectomy and 4 days for laparoscopic cholecystectomy.

Karim T, et al. [15] in open cholecystectomy group, largest number of complications were due to wound infections higher as compared with laparoscopic cholecystectomy. 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 [16-19].

In the present study, the main complications noted peroperatively were bile leak in four patients in laparoscopic cholecystectomy and two patients in open cholecystectomy group and stone spillage of three cases in laparoscopic cholecystectomy and one case in open cholecystectomy. There is no instance of common bile duct injury in either group. Postoperative complications were minimal. Postoperative hemorrhage is seen in one case of laparoscopic cholecystectomy and nil in open cholecystectomy. One patient in laparoscopic cholecystectomy and three patients in open cholecystectomy had surgical site infection.

Conclusion

From the present study, we conclude that highest prevalence of cases was in the 4th decade with

female preponderance. The commonest symptom was pain abdomen and sign being tenderness. Ultrasonography is the imaging modality of choice. Laparoscopic cholecystectomy is safe and effective treatment with early recovery and cosmetic advantage. One should not hesitate to convert to open cholecystectomy, if significant adhesions or inflammation are identified during laparoscopy.

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