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A Spectrum of Benign Gall Bladder Diseases and their Laparoscopic Management: An Experience of 100 Patients

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ABSTRACT

Improvements in the field of diagnostic studies as well as better understanding of various benign conditions affecting gallbladder may explain the rise in the incidence of it, including gallstones rather than the change in the living standards of Indian population. In the present scenario, this study tries to find out the instance of other benign conditions of gallbladder amongst the patients presenting themselves for laparoscopic cholecystectomy. This study will also look through a detailed review of literature whether in these benign conditions of gallbladder, laparoscopic procedure should be the procedure of choice.

All the patients admitted with symptomatic gallbladder diseases are treated with cholecystectomy. After the advent of laparoscopic surgery, laparoscopic cholecystectomy has become the gold standard procedure for gallbladder removal for benign indications and is the preferred mode of surgery now. Many comparative studies between laparoscopic cholecystectomy and open cholecystectomy in developed countries have been discontinued because patients are refusing the open procedure for the superior procedure, i.e., laparoscopic cholecystectomy primarily due to its completeness and safety, better cosmesis and almost no post-operative pain and discomfort.

This study tried to find out the spectrum of the benign diseases/conditions of gallbladder, which necessitate its removal and also keep in mind about the documented premalignant conditions of the gallbladder, which are benign; and evaluate the prognosis of the patients with such conditions over a period of time to understand whether laparoscopic cholecystectomy should be considered to be the proper form of therapy in all these patients.

Keywords*: Benign, Gallbladder, Cholecystectomy, Laparoscopic*

INTRODUCTION

Benign gallbladder conditions, including gallstones are increasingly becoming common in developing countries, including India.[1]Besides cholelithiasis and cholecystitis, the spectrum of benign gallbladder diseases is quite diverse and includes acalculous conditions such as acalculous cholecystitis, cholesterosis, polyposis of gallbladder and others which differ markedly from calculous cholecystitis and at the same time may or may not be associated with gallstones.

While gallstones, as an entity and its clinical presence, have been known since ancient times, cholesterosis and other acalculous conditions have been recognized recently

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in the last century. Not many studies are available on these conditions. Facts pertaining to calculous cholecystitis have been studied so many times that biliary surgery has become synonymous with the gallstone disease and is well expressed by this old dictum of A G Kune, 'Know gall stones and all else will come to you in biliary surgery', whereas Moynihan,[2] after describing cholesterosis of gallbladder, raised the same question raised by Virchow, 'does cholesterosis of the gall bladder produce symptoms or is it merely a pathological curiosity?' which is still being debated.

After the first laparoscopic cholecystectomy in 1985, laparoscopic cholecystectomy has also seen changes over the last two decades. From 4 port laparoscopic cholecystectomy to 3 port laparoscopic cholecystectomy, from micro-laparoscopic cholecystectomy to SILC (Single incision laparoscopic cholecystectomy,and from SILC to NOTES (Natural orifice trans-luminal endoscopic surgery) and NOTUS (Natural orifice trans-umbilical surgery), laparoscopic cholecystectomy has itself become a complete entity now. Introduction of robotic transcontinental laparoscopic cholecystectomy has again opened a new area to look into. In this study the procedure done was through classically described 4-port laparoscopy.[3, 4]

The reasons for preference for laparoscopic cholecystectomy over open surgery are obvious and as follows:

i. Laparoscopic cholecystectomy is associated with less chances of wound infection and there is no risk of wound dehiscence; subsequently antibiotic usage is comparatively lesser than that of open cholecystectomy.[5]
ii. The amount of analgesic requirement is less, as there is minimal post-operative pain or discomfort.[6, 7]
iii. Laparoscopic cholecystectomy patients tolerate oral feeds earlier and are mobilized quicker.[8, 9]
iv. The duration of hospital stay is less and patients can be discharged quickly from the hospital and can resume their work early.[8, 9, 10]
v. Laparoscopic cholecystectomy is associated with significant financial saving to the patients.[10, 11]
vi. There is definite cosmetic advantage in laparoscopic cholecystectomy.[5]

After the first laparoscopic cholecystectomy in 1985, laparoscopic cholecystectomy has also seen changes over the last two decades. From 4 port laparoscopic cholecystectomy to 3 port laparoscopic cholecystectomy, from micro-laparoscopic cholecystectomy[12] to SILC (Single incision laparoscopic cholecystectomy,[13] and from SILC to NOTES (Natural orifice trans-luminal endoscopic surgery,[11] and NOTUS (Natural orifice trans-umbilical surgery),[14] the laparoscopic cholecystectomy has itself become a complete entity now. Introduction of robotic transcontinental laparoscopic cholecystectomy has again opened a new area to look into.

MATERIALS AND METHODS

In this study, 100 consecutive patients with a diagnosis of gallbladder disease that underwent laparoscopic cholecystectomy from July 2010 to June 2011 were included. These patients were studied in regard to age, sex, clinical presentation, sonographic findings, operative findings, length of hospital stay, symptomatic relief during follow up, complications and histopathological reporting.

OBSERVATION AND RESULT

AGE DISTRIBUTION

The average age of the patient included in this study was 37.06 years and the range was from 14 years to 70 years. While the average age of a male patient was 42.11 years, the average age in females was 34.45 years (**Table 1)**.

Table 1 Age wise distribution of cases

Age groups	No. of patients			
in years	Male	Female	Total	Percentage
11-20	02	08	10	10%
21-30	04	18	22	22%
31-40	10	27	37	37%
41-50	09	06	15	15%
51-60	05	03	08	08%
61-70	04	04	08	08%
Total	34	66	100	100%

As we can see in the following bar chart, while the highest number of cases was recorded in the 4th decade of life, next highest number of cases was noted in 3rd decade. In the present study, the youngest patient was a girl of 14 years and the oldest was a man of 70 years (case no 61 and 30, respectively). The number of female patients were more in younger age group but the sex ratio was almost reversed or else became equal in 5th, 6th and 7th decade of life.

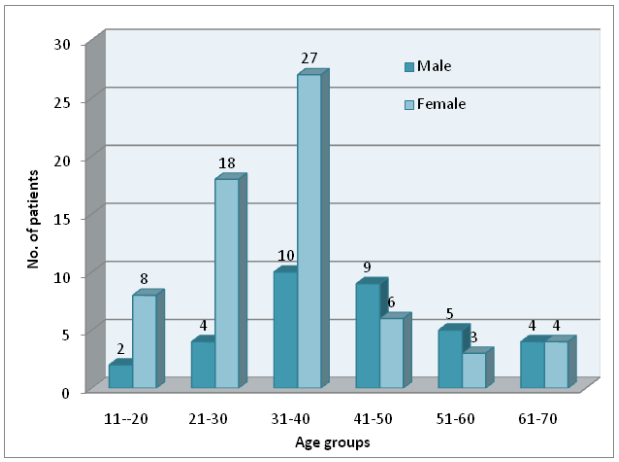

Figure 1 Bar chart depicting age distribution according to sex ratio

SEX DISTRIBUTION

As shown in **Table 2** female patients are more commonly presenting the disease at least till the 4th decade after which the male to female ratio is either reversed or becomes equal. The overall male to female ratio in this study is 1:1.94.

Table 2 Sex wise distribution of cases

Sex	No. of patients	Percentage
Male	34	34%
Female	66	66%

CLINICAL PRESENTATION

Symptomatology of the patients was observed under following headings (**Table 3**):

Abdominal pain: In this study of 100 patients, all of them had history of pain in the abdomen at some or other time before admission as was the inclusion criteria for laparoscopic cholecystectomy.

The pain was dull-aching or colicky in nature. It was mild type in most of the cases but sometimes severe as well. The pain started or was felt in the right hypochondrium of the abdomen, epigastric region, in left hypochondrium or whole abdomen. The radiation of pain was towards the back, right shoulder or right scapular region. Duration of the pain ranged from few months to several years.

Dyspepsia: 62 patients out of 100 (62%) presented complaints of flatulent dyspepsia in their history, being the second commonest symptom. They complained of epigastric discomfort after, a feeling of fullness so that tight clothes were loosened, eructation with temporary relief, and regurgitation sour fluid to the mouth with heartburn.

Nausea and vomiting: In this study 39 patients (39%) gave history of nausea and/or vomiting during the course of disease, mostly during an attack of pain in the abdomen.

Fever: There was history of fever in 11 cases (11%). Fever ranged from 99p -104p F and usually was associated with mild chill and/or rigor.

Abdominal tenderness: Mild abdominal tenderness was elicited in the right upper quadrant (RUQ) in 29 patients (29%) at the time of admission. The following table and chart illustrate the incidence of different clinical presentation of the patients included in this study:

Table 3 Clinical presentations

Symptomatology	No. of patients	Percentage
Abdominal pain	100	100%
Dyspepsia	62	62%
Nausea and/or vomiting	39	39%
Fever	11	11%
RUQ tenderness	29	29%

SONOGRAPHIC FINDINGS

All the 100 cases were subjected to ultrasound study of abdomen prior to admission to the hospital for laparoscopic cholecystectomy. This study revealed gallbladder pathology in all the cases. The detailed results of US examination of the abdomen were(**Table 4)**: cholelithiasis in 94 patients (94%), gallbladder sludge in 4 patients (4%), cholesterosis and adenomyomatosis in 1 patient each. Multiple stones of variable size and shape were found in 61 cases (61%), double stones in 10 cases (10%) and solitary stone was found in 23 cases (23%). Gallbladder was also reported to be contracted in 34 cases (34%) and distended in 12 cases (12%).

Table 4 Sonographic findings

Sonographic findings	No. of patients	Percentage
Multiple calculi	61	61%
Two calculi	10	10%
Single calculus	23	23%
Gallbladder sludge	04	04%
Cholesterosis GB	01	01%
Adenomyomatosis GB	01	01%
Contracted GB	34	34%
Distended GB	12	12%

OPERATIVE FINDINGS

All the 100 cases were treated by laparoscopic cholecystectomy under general anesthesia and received prophylactic dose of a broad spectrum injectable antibiotic, a 3rd generation cephalosporin at the time of induction. Intra-operative findings of these cases differed from each other based mainly on the following points.

Pneumoperitoneum

Creation of pneumoperitoneum was primarily done by open method using Hasson's trocar system while closed method using Veress needle was used in some cases only (5 patients).

MACROSCOPIC EXAMINATION OF GALLBLADDER

On macroscopic examination, gallstones were found in 89 cases (89%); multiple in 70 cases (78.65%) while solitary stones were found in 10 cases (21.35%). Other operative findings are shown in **Table 5**.

Table 5 Macroscopic examination of gallbladder

Macroscopic findings	No. of patients	Percentage
Gallstones	89	89%
Adhesions	64	64%
Shrunken GB	47	47%
Distended GB	32	32%
Strawberry GB	25	25%
Thickened GB	10	10%
Inflamed/Edematous GB	05	05%
GB sludge	03	03%

Drainage

No drain was given during the procedure in this study, except in 3 cases (3%), where it was removed on the 1st post-operative day in all 3 patients after observation of the output.

Length of hospital stay

Out of 100 patients, 91 patients (91%) were discharged on the 1st post-operative day and remaining 9 patients were discharged on the 2nd post-operative day; the average length of post-operative hospital stay was 1.09 days.

Symptomatic relief during follows up

All the patients (100%) reported definite improvement in their symptoms during the follow up with regard to their pre-operative complaints.

Histopathological examination of the gallbladder (Table 6)

Routine histopathological examination of all the excised gallbladder was done and recorded during the follow up in the OPD. Out of 100 patients included in the study histopathological report of 77 patients (77%) showed chronic cholecystitis, though gallstones were present in 89 patients (89%).

Table 6 Histopathological reporting of the gallbladder

HPE	No. of patients	Percentage
Chronic Cholecystitis	77	77%
Cholesterosis GB	06	06%
Cholecystitis Glandularis Proliferans	04	04%
Cholesterol Polyp	03	03%
Adenomyomatosis GB	03	03%
Adenomyomatous Polyp	02	02%
Xanthogranulomatous Cholecystitis	04	04%
Porcelain GB	01	01%

Complications

No complication was observed or reported during post-operative hospital stay or during the follow up. Patients whose histopathological report showed Porcelain gallbladder, Polyposis of gallbladder or Xanthogranulomatous Cholecystitis was followed up to six months till now and no suggestive findings of malignancy or any other complication were noted.

DISCUSSION

The present study comprises of 100 consecutive patients with clinically and radiologically diagnosed benign conditions of gallbladder treated by laparoscopic method, during the period from 1st July 2010 to 30th June 2011.

These cases were studied regarding the wide spectrum of conditions affecting gallbladder and their incidence, clinical presentation, investigations, surgical treatment, complications within the short term follow up and results. Laparoscopic procedure as an effective treatment for all these diseases/conditions was also noted. Pain in the abdomen was the principal presenting symptom associated with or without flatulent dyspepsia, nausea and vomiting, fever and right upper quadrant tenderness.

A meticulous clinical examination, radiological investigations in the form of ultrasonography, intra-operative macroscopic findings of gallbladder pathology and lastly, histopathological examination of the specimen paved the way to understanding of a spectrum of diverse variety of conditions affecting the gallbladder in these patients, which included both calculous and non-calculous origin which may or may not be associated with each other.

Out of 100 patients included in the study histopathological report of 77 patients (77%) showed chronic cholecystitis, though gallstones were present in 89 patients (89%). Other diagnosis reported in histopathological examination included Cholesterosis GB (6%), Cholecystitis Glandularis Proliferans (4%), Cholesterol polyp (3%), Adenomyomatosis GB (3%), Adenomyomatous polyp (2%), Xanthogranulomatos Cholecystitis (4%) and Porcelain GB (1%). The published lierature has revealed 2-28.6% incidence of cholesterosis of the gallbladder in various studies.[15, 16] However, another study had documented a much higher incidence of 62% in their study of 55 patients.[17] Overall incidence of Cholecystoseses, which includes Cholesterosis GB, cholesterol polyp, Cholecystitis Glandularis Proliferans, Adenomyomatosis GB and adenomyomatous polyp, was 18% of total 100 patients. This incidence is in accordance with above-mentioned wide range of incidences for the same.

Concomitant gallstones with Cholecystoses were found in 8 cases (44%). A study has reported 90 patients with cholesterolosis, in the retrospective study of 636 cases. In the same series 53 (58.8%) individuals with cholesterosis were found to have concomitant gallstones, whereas 37 (41.2%) cases had acalculous cholesterolosis. Another study in 2004 also reported 63.4% calculous and 36.6% acalculous cholesterosis with overall incidence of cholesterol in laparoscopic cholecystectomies of 13.4%.[15,17] In a randomized clinical trial of **open cholecystectomy v/ s laparoscopic cholecystectomy for acute cholecystitis** analyzed that there was no significant difference in the rate of postoperative complications, pain score at discharge and sick leave and that the direct medical costs were equivalent while postoperative hospital stay was significantly shorter in the laparoscopic cholecystectomy group.[18, 19]

The average post-operative hospital stay for this study was 1.09 days, which was comparable to previous studies presented by many authors.[20, 21, 22]

There was no complication noted during the postoperative stay in the hospital or during the follow up which is comparable to observations made by many.[23, 24]

All the patients (100%) reported definite improvement in their symptoms during the follow up with regard to their pre-operative complaints, which is comparable to observations made by many authors.[25, 26, 27, 28] Patients diagnosed with Porcelain gallbladder, Xanthogranulomatous cholecystitis and Polyposis of gallbladder were followed till two years and no findings suggestive of malignancy or any other complications were noted.

It has been noticed in this study that there is rise in the incidence of Cholesterosis, Adenomyomatosis and Polyposis of gallbladder in the patients undergoing laparoscopic cholecystectomy.

Laparoscopic cholecystectomy was the treatment modality in this study and there was almost complete symptomatic improvement during the follow up with the patients. No incidences of post operative complications were reported in these cases. Cases diagnosed with premalignant benign conditions like Porcelain gallbladder, Polyposis of gallbladder and Xanthogranulomatous cholecystitis has been followed up to two years and no evidence of malignancy or any complication are noted.

CONCLUSIONS

A clinical study on benign diseases/conditions of gallbladder was carried out in a series of 100 consecutive patients admitted for laparoscopic cholecystectomy with a history of abdominal pain with proven gallbladder pathology on ultrasonography. Benign gallbladder conditions including calculous cholecystitis are a common form of biliary pathology that a surgeon has to encounter frequently in a woman in her middle age, though incidence is increasing in males and extremes of ages. This study although consisted of limited number of cases and a shorter follow up, revealed no drawback. It can safely be suggested that besides gallstone diseases, all other benign diseases also can safely be taken up for laparoscopic surgery for gallbladder removal.

Conflict of interest: None

Ethical clearance: Taken

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