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Original Article

Surgery Section

Analytic Study of Laparoscopic Cholecystectomy

MAHESH M. PUKAR, JIGAR VIPULBHAI SHAH, SOHANK G. MEWADA, HRYDAYNATH DESAI

ABSTRACT

Introduction: Gall bladder disease is one of the most common problems affecting the digestive tract. The prevalence of gall stone is related to many factors. Women are three times more likely to develop gall stone than men and first degree relatives of patients with gall stone have a twofold greater prevalence.

Materials and Methods: Patients attending OPD of Dhiraj hospital and clinically diagnosed for gall stone disease were admitted and treated laparoscopically. 50 cases were studied from May 2009 to Oct 2011.

Results: Calculus cholecystitis has its peak incidence in 4th and 5th decade. Female have a higher incidence. Right hypochondriac pain, nausea/vomiting were common complaints.

Discussion: Laparoscopic cholecystectomy is associated with early post-operative recovery, less post-operative stay, early return to work. Except for the common bile duct injury, Laparoscopic cholecystectomy is a safe procedure and has no significant complication. Laparoscopic cholecystectomy has major extra biliary complication as frequent as biliary complications and can be life threatening. An early prevention is critical to their management. Laparoscopic cholecystectomy is preferable treatment for gall bladder disease.

Keywords: Gall bladder disease, Gall stone, Laparoscopic cholecystectomy

INTRODUCTION

The multitude of pathological processes involving gall bladder, are a significant cause of morbidity and mortality all over world. Gallstones are approximately two times more common in females than in males. Overweight women in their middle years constitute the vast majority of patients with gallstones in every racial or ethnic group. An estimated 10% of the general population has gall stones. The prevalence for women between ages 20 & 55 varies from 5 - 20%, and is higher after age 50 (25-30%). The prevalence for males is approximately half that for women in a given age group. Certain people, in particular the Pima tribe of Native Americans in Arizona, have a genetic predisposition to forming gall stones. Scandinavians also have a higher than average incidence of this disease.

There seem to be a strong genetic correlation with gall stone disease. Since stones are more than four times likely to occur among first degree relatives. Since gallstones rarely dissolve spontaneously, the prevalence increases with age. Obesity is a well-known risk factor since overweight cause's chemical abnormalities that lead to increased levels of cholesterol. Gallstones are also associated with rapid weight loss secondary to dieting. Pregnancy is a risk factor since increased estrogen levels results in an increased cholesterol secretion and abnormal changes in bile. However, while an increase in dietary cholesterol is not a risk factor: an increase in triglycerides is positively associated with a higher incidence of gallstones. Diabetes mellitus is also believed to be a risk factor for gallstone development. Cholecystitis is inflammation of gallbladder, and commonly occur secondary to obstruction of cystic duct by cholelithiasis (or gallstones). In fact, upwards of 90% of cases presenting as cholecystitis are due to stone blockage, while the remaining 10% or so are due to acalculous cholecystitis. Risk factors for developing cholecystitis are similar to those of developing cholelithiasis and include increasing age, female gender, obesity and rapid weight loss, drugs, pregnancy, and being of certain ethnic descents.

The process of calculus cholecystitis results when the stone obstructs the cystic duct, leading to distension of gall bladder. As the gallbladder distends, blood flow and lymphatic drainage become compromised, leading to mucosal ischemia and necrosis. Inflammation ensues, leading to cholecystitis. The exact mechanism of acalculous cholecystitis is less clear, but is thought to be related to conditions associated with bile stasis, including debilitation, major surgery, long term TPN, and prolonged fasting. Of the 10-20% of Americans with gallstones, up to one third will develop acute cholecystitis, and as such, cholelithiasis is the major risk factor for disease. Most patients' symptoms will resolve within 1-4 days; however 25-

30% will require surgery or develop some form of complication. Perforation occurs in approximately 10-15% of cases.

AIMS AND OBJECTIVES

1) To evaluate predisposing factors and incidence of gall bladder diseases in various age groups in Dhiraj hospital.
2) To study the patient presentation and manifestation of the gall bladder diseases.
3) To evaluate various clinical and imaging modalities used in diagnosis & management.

a) Post-operative pain
b) Post-operative hospital stay
c) Complication
d) Post-operative recovery
e) Cosmetic value
f) Cost evaluation
g) Operative time
h) Morbidity and mortality

MATERIALS AND METHODS

Patients attending Dhiraj Hospital and clinically diagnosed for gall bladder disease were admitted and investigated for confirmation of gall bladder pathology. Out of these cases selected for laparoscopic cholecystectomy were taken in the study. The 50 cases were studied from May-09 to Oct-11 in randomly and prospectively and the information recorded in a planned set Performa.

Inclusion criteria

- Patient presented with pain and having documented evidence of calculus without common bile duct stone and jaundice was included in this study.
- Patients are operated electively.
- There was no other documented pre-operative intra-abdominal disorders.
- All patients were fit for general anaesthesia.
- All patients were subjected to same routine investigations with minor variation and similar pre-operative preparations were made for all patients.

Exclusion criteria

- Patients with common bile duct stone.
- Obstructive jaundice.

Preoperative preparation

Written and informed consent of the patient was obtained. The procedure was explained to the patients as was the possibility of switching over to open surgery for the sake of patients safety if the need arises. Pre-operative antibiotics in the form of injection ceftriaxone 1 gm. IV one dose were given to each patient on the morning of surgery. Nasogastric tube used in all patients, tube was introduced just after induction. Established operative technique was employed.

Post-operative protocol

- All patients were given analgesic for two days. On 1st day, injection diclofenac sodium given 8 hourly. Second day onwards tablet diclofenac twice a day was given. All patients were reviewed for pain from 3rd day onwards and were given Tablet diclofenac as and when required.
- Till the patients was not taking orally all patients were given injection ceftriaxone 1 gm IV 8 hourly and once patient started orally tablet ceftriaxone 1 gm, IV 8 hourly and once patient started orally tablet cefixime (200 mg) twice a day given according to GB condition.
- All patients were given intravenous fluids for one day. Once patients had started bowel movement, clear liquid were started orally. Once patients had passed flatus, liquid diet was started, once patients had passed stool, routine diet was started.
- Ryle's tube was removed on the same day when patient was out of anaesthesia.
- Drain was removed when it drains less than 30 ml per 24 hrs & serosanguinous in colour.
- Once patient was having no pain and wound infection. After filling the details of Performa master chart was prepared. Detailed analysis of the master chart information was done and various observations were discussed and concluded.

RESULTS AND ANALYSIS

In present study, patient series age range from 13 to 72 years. Peak incidence is in 4th and 5th decade of life [Table/Fig-1]. The present study shows female preponderance and reflects the higher incidences of calculus cholecystitis in females [Table/Fig-1]. All of the patients taken up for present study presented with right upper abdomen pain. While guarding of abdomen was a rarely encountered sign (3 %) Right hypochondriac tenderness was present in all patients. Out of 50 patients 10 of them presented with clinical features of acute cholecystitis which were operated within 72 hrs of presentation and the remaining 40 cases presented as chronic cholecystitis, were operated electively [Table/Fig-3].

In the present study access related complications were encountered in 2% of cases (port side bleeding) that occurred during insertion of umbilical port [Table/Fig-4]. Other known complications such as small bowel laceration, subcutaneous emphysema etc were not encountered in the present study. In the present study, bleeding through cystic artery was seen in 2% of the cases which were managed through liga's clips application which lead to increase in the operative time [Table/

Age range (years)	Number of patients	Percentage
10 - 19	2	4%
20 - 29	4	8%
30 – 39	15	30%
40 - 49	13	26%
50 - 59	9	18%
60 - 69	5	10%
>69	2	4%

[Table/Fig-1]: Distribution of patients according to age group

Sex	Number of patients	Percentage
Male	11	22%
Female	39	78%

[Table/Fig-2]: Distribution of patients according to sex

Clinical features	Total no of patients	Percentage of patients
	Lap cholecystectomy	Lap cholecystectomy
SYMPTOMS		
Right upper abdominal pain Nausea/vomiting Flatulent/Dyspepsia Fever	50 30 16 2	100% 60% 32% 4%
SIGN		
Right hypochondriac pain Guarding Lump	50 3 Nil	100% 6% ---

[Table/Fig-3]: Clinical features in all 50 cases

Fig-5].

In the present study the longest time taken to perform laparoscopic cholecystectomy was 90 minutes initially but with experience and team work the mean operative time was reduced considerably. In our study conversion rate was 4%. The two cases in which laparoscopic cholecystectomy had to

Case no. 12	Male / 30 years	Severe adhesions with inflammation in calot's triangle and small fibrotic contracted gall bladder.
Case no. 39	Female / 60 years	Short cystic duct with adhesion and pre-op. Blood pressure increased with respiratory distress due to Pneumoperitoneum.

be converted into open were as follows:

Our protocol for Analgesic: All patients were given analgesic for two days on 1st day injectable & when patients' bowel started functioning well and patient is able to take orally then we give oral analgesic as and when required. Only 32 (64%) patients required analgesic on 3rd day. Only 3 (6%) patients required on 4th day and 1(2%) patient on 5th day and none on 6th day [Table/Fig-6].

In present study, follow-up of patient was done regularly and data suggested that patients' returned to their work within 2 weeks. In present study 2% of cases presented with surgical site infections which were managed with regular dressing under appropriate antibiotic coverage.

Complication	No. of patients	Percentage
Port site bleeding	1	2%
Small bowel laceration	0	0%
Subcutaneous emphysema	0	0%
Small bowel puncture	0	0%
Ascending colon laceration	0	0%
Retained stone in port tract causing sepsis	0	0%

[Table/Fig-4]: Operative complications access related complications

Complication	No. of patients	Percentage
Sub-capsular liver haematoma	0	0%
Duodenal perforation	0	0%
Bleeding through Gall bladder bed	0	0%
Colon perforation	0	0%
Spillage of stones in to peritoneal cavity	0	0%
Bleeding through cystic artery	1	2%

[Table/Fig-5]: Procedure related complications

Days	Laparoscopic cholecystectomy	
	No. of patients	Percentage of patients
Day-2	50	100%
Day-3	32	64%
Day-4	3	6%
Day-5	1	2%
Day-6	0	0%
Day-7	0	0%

[Table/Fig-6]: Post operative pain and analgesia requirements

DISCUSSION AND CONCLUSION

The Multitude of pathological processes involving Gall bladder is significant cause of morbidity and mortality all over world. Gallstones are approximately two times more common in females than in males. Overweight women in their middle years constitute the vast majority of patients with gallstones. The prevalence for women between ages 20 and 55 varies from 5–20%, and is higher after age 50 (25-30%). The prevalence for males is approximately half that for women in a given age group. This correlates with this study that gall stones are more common in fatty females in their 4th & 5th decade of their lives.

In this study:

- Commonest presentation was right upper abdominal pain and nausea/vomiting.
- Commonest sign was right hypochondriac tenderness.
- Around 20% of the cases presented with signs and symptoms of acute cholecystitis and were operated

within 72 hrs of presentation.
- We have subjected patients randomly, so no significant conclusion of presentation can be made.

Comparing the access related complications at Dhiraj Hospital, Gujarat, India & Liaqat institute of health and medical science Hydrabad, Pakistan, the following is seen. Complications in present study were 2% and Liaqat institute were 3.77%. Procedure related complications in our study was 2% and in Liaqat institute it was 6.02%. Small bowel laceration occurred in 2 patients where access was achieved by closed techniques. Five cases of duodenal and two cases of colonic perforation were the major complications encountered during dissection at Calot's triangle. In 2% cases the procedure was converted to open surgery due to different complications [1]. There are, however, other studies which report an increased rate of complications during laparoscopic cholecystectomy compared to open cholecystectomy [2-5]. Biliary complications are reported in many studies [3-13]. The extra-biliary complications do occur with almost the same frequency and severity but tends to be under reported in literature.[14] The extra biliary complications can be access related or procedure related. Different techniques of abdominal access are described but none has been found to be superior in terms of preventing access-related injuries [15]. Fullarton et al., [16] reported laparoscopic cholecystectomy as a procedure most frequently associated with both fatal and non-fatal trocar-related injuries. Gaining access by closed technique has a complication rate in range of 0.2% - 0.3% as reported by Cagir et al., [17] On the other hand, open technique of trocar insertion has promising results and seems to have reduced the access related major vessel injury and mortality rate [17,18]. Mayo et al., [19] have made similar recommendation in their study. In present study the complication rate is 2% which is significantly less compare to other study. Initially there was concern about potential dangers of performing an operations on an acutely inflamed gallbladder with instruments that lacked the feedback, dexterity, and precision of human hands [20,21] Studies within the last ten years, however, have determined that laparoscopic cholecystectomy for patients with acute cholecystitis within three days of admission is not only safe but also associated with fewer post-operative complications, decreased morbidity, decreased length of hospital stay, and decreased overall cost when compared to delayed or interval LC [21-25] large series from Nottingham [18] and Scotland [18] reported conversion rates of 15-20% and this probably a closer reflection of general surgical practice.While it has been suggested that conversion rate may fall with increasing experience [17].

CONCLUSION

If the operation is being attempted laparoscopically and if there is any doubt about the safety of dissection, the operation must be converted to an open approach. Laparoscopic cholecystectomy is associated with less operative time as Compared to other technique. Laparoscopic cholecystectomy is associated with less post-operative pain and less use of post operative analgesics as compared to other studies. Selection of patients, co morbidities associated with gall bladder diseases, operative complications have a significant effect over the mean hospital stay of the patient. Laparoscopic cholecystectomy is associated with early post-operative recovery, less post operative stay, early return to work as compared to other studies. In laparoscopic cholecystectomy major extra-biliary complications are as frequent as biliary complications and can be life threatening, an early prevention is critical to their management.

SUMMARY

In our study calculous cholecystitis has its peak incidence in 4th and 5th decade of life. Females have higher incidence of calculous cholecystitis. Right hypochondriac pain and nausea/vomiting were commonest presenting symptoms. Commonest sign was right hypochondriac tenderness (Murphy's sign positive). The mean operative time in laparoscopic cholecystectomy was 72 minutes. The post-operative peristalsis for laparoscopic cholecystectomy was resumed in 8.56 hrs. Mean post-operative stay in laparoscopic cholecystectomy was 2.06 days. The days of return to work was 13.02 days for laparoscopic cholecystectomy. No mortality were recorded in laparoscopic cholecystectomy. If the operation is being attempted laparoscopically and if there is any doubt about the safety of dissection, the operation must be converted to an open approach. Laparoscopic cholecystectomy is preferred method for calculous cholecystitis.

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AUTHOR(S):
1. Dr. Mahesh M. Pukar
2. Dr. Jigar Vipulbhai Shah,
3. Dr. Sohank G. Mewada,
4. Dr. Hrydaynath desai

PARTICULARS OF CONTRIBUTORS:
1. Professor, Department of Surgery, SBKSMI & RC Piparia, Vadodara, India.
2. Associate Professor, Department of Surgery, SBKSMI & RC, Piparia, Vadodara, India.
3. Resident, Department of Surgery, SBKSMI & RC, Piparia, Vadodara, India.
4. Assistant Professor, Department of Surgery, SBKSMI & RC, Piparia, Vadodara, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Mahesh M. Pukar
Professor, Department of Surgery, SBKSMI & RC Piparia, Vadodara, India.
E-mail: maheshpukar@yahoo.com

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