

POST CHOLECYSTECTOMY SYNDROME: A TWO YEARS STUDY

Ammadudin Nasir, Muhammad Imran*, Saqib Zaheer*, Tajammul Hussain**, Usman Asghar***

Military Hospital/National University of Medical Sciences (NUMS) Rawalpindi Pakistan, *130 Medical Battalion Minimergh Pakistan, **04 Mountain Medical Battalion Pakistan, ***65 Medical Battalion Pakistan

ABSTRACT

Objective: To assess the pattern of symptoms and underlying causes in patients presenting with post cholecystectomy syndrome.

Study Design: Retrospective cross sectional study.

Place and Duration of Study: All the patients who underwent open cholecystectomy from Jan 2014 to Dec 2015 in Military Hospital Rawalpindi under general anaesthesia were included in the study.

Material and Methods: The study was carried out on 626 patients undergoing open cholecystectomy. Data was collected on a specially designed Proforma from hospital management system record. All the patients underwent open cholecystectomy in Military Hospital Rawalpindi under general anaesthesia.

Results: A total of 626 patients were included in the study. About 101 (16.1%) patients presented with post cholecystectomy syndrome as a preliminary diagnosis. The study showed a female predisposition for PCS (18.73%) as compared to males (11.68%). Six (5.94%) patients presented with right hypochondrial pain and jaundice. Fifty nine (58.41%) patients presented with dyspepsia. Three (2.97%) patients presented with painless jaundice. Nine (8.91%) patients presented with diarrhea. Six (5.94%) patients presenting with pain right hypochondrium with no jaundice and 18 (17.82%) patients presenting with right hypochondrial pain and dyspepsia.

Conclusion: A thorough preoperative evaluation is important before offering cholecystectomy to a patient. Moreover, good operative techniques and better endoscopic evaluation will further lessen the peroperative and postoperative biliary complications. However, gastritis leading to dyspepsia and psychiatric disorders make a large percentage of the cause of post cholecystectomy syndrome.

Keywords: Cholecystectomy, Dyspepsia, Post cholecystectomy syndrome.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Cholecystectomy is the most common major abdominal surgery performed in the world¹. Although it has been largely replaced by laparoscopic surgery in western countries², open cholecystectomy is still widely performed in our country for definitive management of gall stones. Post cholecystectomy syndrome (PCS) is the name given to a spectrum of signs and symptoms experienced after cholecystectomy³. The incidence of PCS ranges from very low to 47%³. The wide range can be attributed to the spectrum of causes which are labeled as post cholecystectomy syndrome. The causes of post cholecystectomy syndrome can be biliary,

extrabiliary or intestinal in origin. They can be related to pathologies which were present preoperatively, as a consequence of peroperative complications or by the effects of cholecystectomy itself. Post cholecystectomy syndrome is a preliminary diagnosis and all the patients presenting with PCS should be thoroughly investigated and a definitive diagnosis should be made and treated accordingly.

Since laparoscopic cholecystectomy has replaced open cholecystectomy as the standard procedure, the incidence of post cholecystectomy syndrome with laparoscopic cholecystectomy has been reported to be higher than open cholecystectomy^{4,5}. This study can further be used as a baseline to compare open cholecystectomy with the incidence of PCS in laparoscopic cholecystectomy.

Correspondence: Dr Muhammad Imran, 130 Medical Battalion Minimergh Pakistan (Email: imrangul915@gmail.com)

Received: 29 Nov 2016; revised received: 19 Mar 2017; accepted: 21 Mar 2017

We studied the different presentations of PCS with their underlying causes, thus giving us a better understanding and subsequently helping in management of post cholecystectomy syndrome.

Operational Definition

Post-cholecystectomy syndrome (PCS) is defined as a complex of heterogeneous symptoms, consisting of upper abdominal pain and dyspepsia, which recur and/or persist after cholecystectomy⁶.

PATIENTS AND METHODS

A retrospective cross sectional study was done at Military Hospital Rawalpindi for two years, from Jan 2014 to Dec 2015. A sample size of 626 patients was studied. All patients who underwent elective open cholecystectomy in the above mentioned period were included in the study by non-probability convenience sampling technique. The indications for open elective cholecystectomy were

- One episode of acute biliary pancreatitis
- One episode of acute cholecystitis
- Multiple episodes of biliary colic

Patients having a history of acute/chronic pancreatitis, pancreatic tumor, hepatitis, acid peptic disease, oesophagitis, diverticulitis, mesenteric ischemia were excluded from the study.

Patients having a history of undergoing hepaticojejunostomy, choledochoduodenostomy, CBD exploration and any other extrabiliary surgical procedure along with cholecystectomy were also excluded from the study. The above mentioned conditions were excluded to prevent bias in the study results.

All patients who presented with PCS were initially screened with USG Abdomen and Liver Function tests. All patients who either had CBD stones, dilated or narrowed CBD were further evaluated by ERCP, Those having suspicion of Malignancy underwent Triphasic CT and EUS.

After approval from the hospital's ethical and research committee, data was collected on a specially designed Proforma from hospital management system record. All the patients underwent open cholecystectomy in Military Hospital Rawalpindi under general anaesthesia. The surgeries were performed by three classified surgeons in the above mentioned hospital. Data for each patient was recorded on a patients proforma. Statistic analysis was performed by SPSS 19 for Windows. The quantitative data like age is expressed as mean \pm standard deviation (SD). Frequencies and percentages were calculated for incidence of postcholecystectomy syndrome in male and female predisposition, pattern of symptoms and causes of post cholecystectomy syndrome. To know significant difference between incidence of post cholecystectomy syndrome in male and female gender chi-square test was used with a 0.05 level of significance.

RESULTS

A total of 626 patients were included in the study. A total of 101 (16.1%) patients presented with post cholecystectomy syndrome as a preliminary diagnosis. The mean age of the sample is 45 ± 20 .

The study showed a female predisposition for PCS (18.73%) as compared to males (11.68%). The *p*-value is 0.02. The result is significant at $p < 0.05$ (figure).

All patients presenting with PCS, underwent abdominal ultrasound and liver function tests. Nine (8.9%) patients presenting with jaundice and had deranged Liver function tests.

Out of these 09 patients, 06 (66.6%) patients presented with right hypochondrial pain and jaundice, 04 were diagnosed to have retained stones on usg abdomen. Three of them were treated by Endoscopic Retrograde Cholangio Pancreatography (ERCP) and stones were extracted, 01 had large stone more than 1 cm which was treated by choledochotomy. Remaining 02 patients had biliary stricture diagnosed on MRCP. One pt was treated by repeated

stenting while the other underwent hepatico-jejunostomy.

Three (33.3%) of the patients presenting with painless jaundice, 01 had periampullary carcinoma and 02 had carcinoma head of pancreas diagnosed on contrast enhanced CT scan abdomen.

Out of the 59 patients presenting with dyspepsia, 46 (77.96%) patients responded to Proton pump inhibitors, rest 13 (22.03%) patients underwent gastroduodenoscopy. Seven had chronic inflammation of the antrum and 02 being positive for *H. pylori*. Four patients with dyspepsia did not have any findings on endoscopy.

rest of the 13 (72.22%) patients underwent gastro-duodenoscopy with 05 having chronic inflammatory changes and 02 positive for H pylori.

A total of 13 patients (12.87%) presenting with PCS had normal radiological, endoscopic and chemical findings.

DISCUSSION

Post cholecystectomy syndrome encompasses all complications possible after cholecystectomy except for surgical site infection⁶. The complications may be related to anatomical or functional disruption of the hepatobiliary system, or extra biliary symptoms which are aggravated after cholecystectomy. Due to the wide range of signs and symptoms, its incidence varies in

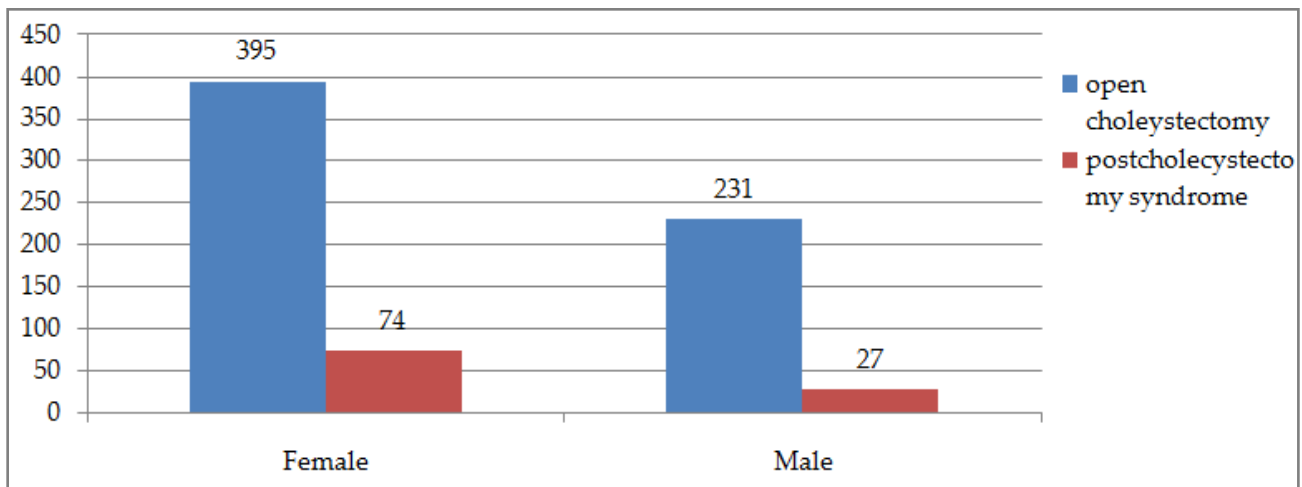


Figure: Male female predisposition.

Nine (8.19%) patients presented with diarrhea which responded to cholestyramine and resolved over a period of about six months.

Out of 06 (5.94%) patients presenting with pain right hypochondrium and no jaundice, 03 (50%) patients had post operative bile leakage from drain which was attributed to liver bed bile leakage in 02 patients and cystic duct ligature slip in one pt. Rest of the 03 (50%) had no bile leak or any abnormal radiological finding.

Out of the 18 (17.84%) patients presenting with right hypochondrial pain and dyspepsia, 05 (27.77%) patients responded to PPI and were labeled as having acid peptic disease. The

different studies⁶. The incidence quoted in most international studies is upto 40% which is significant for the procedure^{7,8}.

Out of the 101 patients presenting with post cholecystectomy syndrome, the study showed a female predisposition. A review article by Jaunoo *et al* referenced a study which showed the incidence of recurrent symptoms among female patients was 43%, compared to 28% among male patients⁹

Fifty nine patients presented with dyspepsia only and 18 patients presented with dyspepsia and pain right hypochondrium. Out of these 77 patients, 51 responded well to proton pump

inhibitors with 42 patients becoming asymptomatic after six months. The symptoms of these patients can be attributed to gastrointestinal hormonal changes after cholecystectomy, disruption of various reflexes regulated by the gall bladder resulting of reflux of bile into the stomach causing gastritis. Considering the overwhelming number of patients diagnosed with PCS having gastritis, it is important to treat dyspepsia before elective cholecystectomy as it can be aggravated after surgery because of the above mentioned mechanisms. The same

goes on to show that Gastro intestinal hormonal disturbances and disrupted refluxes take about six months to adapt to the new gall bladderless anatomy of the gastrointestinal tract. Kim *et al* also observed the sameduration in the setting of colonic symptoms^{9,10}.

Two patients presenting with biliary stricture might be due to ischemia of the common bile duct due to over zealous dissection. Among the 03 patients, presenting with biliary leak, two had bile leak direct from the liver bed and one pt

Table-I: Pattern of symptoms.

S No.	Symptom	Total	Percentage (%)
1.	Right hypochondrial pain without jaundice	6	5.94
2.	Right hypochondrial pain with jaundice	6	5.94
3.	Dyspepsia	59	58.41
4.	Jaundice	3	2.97
5.	Diarrhea	09	8.91
6.	Right hypochondrial pain with dyspepsia	18	17.82

Table-II: Causes of PCS.

S No.	Cause	No.	Percentage (%)
1.	Retained stones in common bile duct	04	3.96
2.	Common bile duct stricture	02	1.98
3.	Carcinoma head of pancreas	02	1.98
4.	Periampullary ca	01	0.99
5.	Bile leak	03	2.97
6.	Responded to PPI (bile induced gastritis?)	51	50.49
7.	Gastritis on endoscopy without h.pylori	12	11.88
8.	h.pylori positive gastritis on endoscopy	04	3.96
9.	Bile salt induced diarrhea	09	8.91
10.	No organic cause	13	12.87

conclusion was made by Kim *et al*¹⁰. However, the incidence of bile acid induced gastritis cannot be predicted preoperatively and varies with every individual after cholecystectomy¹⁰. Bile induced gastritis warrants a study of its own with regular post operative gastroduodenoscopy after six month intervals to calculate bile reflux index and its subsequent clinical symptoms¹¹.

Nine patients presented with diarrhea. All of them responded to cholestyramine. And most probably have the same pathophysiology as bile acid induced gastritis. All patients became asymptomatic after six months T this

had a post operative cystic ligature slip. All the patients were treated conservatively with out any significant long term morbidity. Three patients presented with carcinoma, which might have been missed in the initial evaluation of cholecystectomy.

In 13 patients, no cause of PCS was found after clinical and radiological evaluation. These patients predominantly presented with dyspepsia and pain right hypochondrium. Out of 13 patients, 08 were females. The cause of right hypochondrial pain can be attributed to cystic stump scarring, sphincter of oddi dysfunction¹²

and psychiatric conditions¹³. Sphincter of oddi dysfunction is difficult to diagnose as manometric studies are not readily available. Nitrates and calcium channel blockers have not proven their efficacy in this regard^{14,15}. With a large number of patients having no significant findings, this goes on to show that a psychiatric evaluation of the patient preoperatively is also necessary. Mertens *et al* concluded the same from his study¹⁶.

In our study we observed that due to adequate preoperative evaluation, the incidence of biliary causes of PCS was less. With the increasing radiological investigation like MRCP, ERCP and endoscopic ultrasound, it has become easier to diagnose common bile duct stones preoperatively, however stones can be spilled into the common bile duct during cholecystectomy during retraction at the Hartmann's pouch as might be the case in 04 patients in our study.

On the basis of our study it is recommended that prior to performing a cholecystectomy a thorough history and physical examination of the patient should be carried out as to make certain whether gall stones is the underlying cause or not. 70% of gallstone are asymptomatic¹⁷ with 1 to 2% of those diagnosed become symptomatic each year. Dyspepsia should be thoroughly evaluated preoperatively before attributing it to gallstones.

There was a limitation to this study in terms of time period, as PCS can present from 2 days to 25 years¹⁸. Our two years study could not include patients presenting with late PCS, some of the causes of which are recurrent stones in common bile duct and rarely in cystic stump remnant^{19,20} and also late strictures caused by mild injury to the common bile duct during surgery leading to fibrosis overtime. Moreover with the advent of laparoscopic surgery, it is important to compare post cholecystectomy syndrome between the two procedures as the incidence of common bile duct injury and cystic duct remnant stone is more in laparoscopic cholecystectomy than in open cholecystectomy²⁰⁻²².

CONCLUSION

A thorough preoperative evaluation is important before offering cholecystectomy to a patient. Moreover, good operative techniques and better endoscopic evaluation will further lessen the preoperative and postoperative biliary complications. However, gastritis leading to dyspepsia make a large percentage of the cause of post cholecystectomy syndrome, which presently, cannot be ruled out effectively before surgery.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

REFERENCES

1. Litwin DE, Cahan MA. Laparoscopic cholecystectomy. *Surg Clin North Am* 2008; 88(6): 1295-313.
2. Gallstones and laparoscopic cholecystectomy. NIH Consensus statement. September 14-16, 1992.
3. Schofer JM. Biliary causes of postcholecystectomy syndrome. *J Emerg Med* 2010; 39(4): 406-10.
4. Chowbey P, Sharma A, Goswami A, Afaq Y, Najma K, Baija M et al. Residual gallbladder stones after cholecystectomy: A literature review. *J Minim Access Surg* 2015; 11(4): 223-30.
5. Selvaggi F, Di Bartolomeo N, De Iuliis I, Del Ciotto N, Innocenti P. Laparoscopic treated so-called reformed gallbladder in patient with postcholecystectomy chronic pain. *G Chir* 2011; 32(6-7): 335-6.
6. Girometti R, Brondani G, Cereser L, Como G, Del Pin M, Bazzochi M, et al. Post-cholecystectomy syndrome: Spectrum of biliary findings at magnetic resonance cholangiopancreatography. *Br J Radiol* 2014; 83(988): 351-61.
7. Zhou PH, Liu FL, Yao LQ, Qin XY. Endoscopic diagnosis and treatment of postcholecystectomy syndrome. *Hepatobiliary Pancreat Dis Int* 2003; 2(1): 117-20.
8. Hassan H, Vilmann P. Insufficient cholecystectomy diagnosed by endoscopic ultrasonography. *Endoscopy* 2004; 36(3): 236-8.
9. Jaunoo SS, Mohandas S, Almond LM. Post Cholecystectomy Syndrome. *Int J Surg* 2010; 8(1): 15-7.
10. Kim GH, Lee HD, Kim K, Jeong Y, Homg YJ, Kang SE, Han JH. Fate of dyspeptic or colonic symptoms after laparoscopic cholecystectomy. *Surg J Neuro gastroenterol Motil* 2014; 20(2): 253-60.
11. Aprea G, Canfora A, Ferronetti A, Giugliano A, Guida F, Braun A. Morpho-functional gastric pre-and post-operative changes in elderly patients undergoing laparoscopic cholecystectomy for gallstone related disease. *BMC Surgery* 2012; 12(1): S5.
12. Madacsy L, Fejes R, Kuruasai G, et al. Characterization of functional biliary pain and dyspeptic symptoms in patients with sphincter Oddi dysfunction: effect of papillotomy. *World J Gastroenterol* 2006; 12(42): 6850-56.
13. Larmi TK, Mokka R, Kempainen P, Seppälä A. A critical analysis of the cystic duct remnant. *Surg Gynecol Obstet* 1975; 141(1): 48-52.
14. Pasricha PJ, Miskovsky EP, Kalloo AN. Intrasphincteric injection of botulinum toxin for suspected sphincter of Oddi dysfunction. *Gut* 1994; 35(9): 1319-21.

15. Rehman A, Affronti J, Rao S. Sphincter of Oddi dysfunction: An evidence-based review. *Expert Rev Gastroenterol Hepatol* 2013; 7(8): 713-22.
 16. Mertens MC, Roukema JA, Scholtes VPW, Jolanda DV. Trait Anxiety predicts unsuccessful surgery in gallstone disease. *J Behav Med* 2010; 72 (1): 198-205.
 17. Sakorafa GH, Milingos D, Peros G. Asymptomatic Cholelithiasis: Is cholecystectomy really needed? A critical reappraisal 15 years after the introduction of laparoscopic cholecystectomy. *Dig Dis Sci* 2007; 52(5): 1313-25.
 18. Venu RP, Geenen JE. Post cholecystectomy syndrome. *Text book of gastroenterology*. 2nd ed. Philadelphia: Lippincott 1995; 2265-77.
 19. Shaw C, O'Hanlon DM, Fenlon HM, McEntee GP. Cystic duct remnant and the "post-cholecystectomy syndrome". *Hepato-gastroenterology* 2004; 51(55): 36-8.
 20. Perera E, Bhatt S, Dogra VS. Cystic duct remnant syndrome. *Clin Imaging Sci* 2011; 1: 2.
 21. Parmar AK, Khandelwal RG, Mathew MJ, Reddy PK. Laparoscopic completion cholecystectomy: A retrospective study of 40 cases. *Asian J Endosc Surg* 2013; 6(2): 96-9.
 22. Thapa BB, Shah KB, Rawal SB, Mall S. Post Cholecysectomy Syndrome in a patient due o multiple biliary pathologies. *Med J Shree Birendra Hosp* 2012; 11(1): 52-4.
-