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"Study of Post Cholecystectomy Syndrome in Patients Undergoing Open Cholecystectomy versus Laparoscopic Cholecystectomy"

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ABSTRACT

Objective:, 1) To study the post cholecystectomy syndrome in patients who have undergone open cholecystectomy. 2) To study the post cholecystectomy syndrome in patients who have undergone laparoscopic cholecystectomy.3) To analyze and compare the post cholecystectomy syndrome in patients undergoing open cholecystectomy versus laparoscopic cholecystectomy.

Materials and methods: All patients with symptomatic gallstones from October 2019 to September 2021 were included in this study.154 patients with gallstones admitted through surgery outpatient department / Emergency / transferred from other departments of Subharti medical College, Meerut, were included in the study, out of which 38 and 116 patients underwent open and laparoscopic cholecystectomy respectively and post cholecystectomy syndrome was studied in these patients.

Result: Females were comparatively more as compared to males, with maximum patients with age group of 21-40 years, presented with common symptom was pain , nausea/vomiting and postprandial fullness , clinical finding consistent with tenderness in right hypochondrium Usg finding- Increase CBD diameter in patient undergoing open cholecystectomy. Intraoperatively, adhesion with GB, excessive Fat over Calot's Triangle, bile leakage, bile duct injury and stone spillage was considered and found operation time (in min) was more , Blood loss, Post- op pain (hours), duration of hospital stay (days) return to work (days) , Intra operative bleeding, wound infection , postoperative ileus was found more with open cholecystectomy compared to and laparoscopic cholecystectomy, Incidence of PCS was more in laparoscopic as compared to open cholecystectomy .

Conclusion: Although incidence of PCS was more in laparoscopic as compared to open cholecystectomy, still it is safe and efficacious in the hands of experienced surgeons. There is a definitive learning curve for surgeons and complications rate reduces as surgeons become more and more familiar with this procedure. It offers definitive advantages (e.g. shorter duration of surgery, less intra and post-operative complications, less analgesic use, early discharge and mobilisation) over open cholecystectomy and should be an available option for all patients requiring elective cholecystectomy.

I. INTRODUCTION

The term post cholecystectomy syndrome (PCS) describes the presence of symptoms after cholecystectomy.[1] These symptoms can represent either the continuation of symptoms thought to be caused by gallbladder pathology or the development of new symptoms normally attributed to the gallbladder. PCS also includes the development of symptoms which may sometime occur after removal of the gallbladder (eg, gastritis and diarrhea).[2]

In general, PCS is a preliminary diagnosis and should be renamed with respect to the disease identified by an adequate workup. It would arise from alterations in bile flow due to loss of the reservoir function of the gallbladder. Two types of problems may arise. The first is continuously increased bile flow into the upper gastrointestinal (GI) tract, which may contribute to esophagitis and gastritis. The second is related to the lower GI tract,

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where diarrhea and colicky lower abdominal pain may result.

PCS may occur in 14% of patients. Effective communication between patients and their physicians, with specific inquiry directed at eliciting frequently anticipated postoperative problems, may be necessary to reveal the somewhat subtle symptoms of PCS.[3]

In order to study the causes of the PCS we must know the effects of cholecystectomy and how cholecystectomized patients are different from those with intact gallbladders whether these gallbladders contain gallstones or not. Absence of the gallbladder, on its own, i.e., cholecystectomy per se has not been reported to impair intestinal digestion or absorption. As a matter of fact there is a congenital anomaly known as agenesis of the gallbladder and cystic duct which does occur, although uncommonly , and patients with this anomaly have not been reported to suffer any digestive or absorption problems.[2,3] This study is directed towards the clinical profile, radiological finding, type of surgery weather open cholecystectomy or laparoscopic cholecystectomy , intraoperative findings, postoperative clinical observations and followup of patient to sttuday ansd compare of postcholecystectomy syndrome.

II. AIMS AND OBJECTIVES

- To study the post cholecystectomy syndrome in patients who have undergone open cholecystectomy.
- To study the post cholecystectomy syndrome in patients who have undergone laparoscopic cholecystectomy.
- To analyze and compare the post cholecystectomy syndrome in patients undergoing open cholecystectomy versus laparoscopic cholecystectomy.

III. MATERIALS AND METHODS

The present study was conducted in the Department of General Surgery Subharti Medical College, Meerut. Ethical approval was taken from ethical committee prior to commencement of the study. 154 patients with symptomatic gallstones admitted to our institution between October 2019 to September 2021 were enrolled. Patient data was collected from attending, general surgery outdoor patient department, casualty and inpatient departments, irrespective of gender background socioeconomic status. Detailed history of patient was entered in a proforma. Complete hemogram, renal function test, function test (LFT), prothrombin time, bleeding time, viral markers, ultrasound whole abdomen, chest Xray, and Ecg were done. Patients pre-anesthetic workup was done after clearance from them few patient according to preliminary workup, informed consent was taken, preop workup done and posted for surgical intervention , 38 patient underwent open cholecystectomy and 116 underwent laparoscopic cholecystectomy, intraoperative findings were noted , postoperative patient was managed, monitored and follow up after discharge was considered and study of post-cholecystectomy syndrome was done and compared between two groups.

Patient data collected regarding:

Age, gender, complaints, past-surgical history, similar history in past , history of ,diabetes, hypertension, any other co morbid states, any history of biliary tract disorder , jaundice was taken. Patient was examined in detail. If the patient was referred from elsewhere the details of the same was considered at the time of admission, Blood investigations, ECG, X-rays & and other radiological modalities performed were added, Informed consent for surgical intervention, intraoperative finding , postoperative events and Complications if developed were assessed in detail and management of the same and the further were followed up in opd's.

OPERATIVE INTERVENTION: -

1. Open cholecystectomy
2. Laparoscopic cholecystectomy

INCLUSION CRITERIA: -

- Patient giving informed consent for operative intervention
- All manifestations of symptomatic gallstones – biliary colic, history of jaundice, chronic cholecystitis and acute cholecystitis

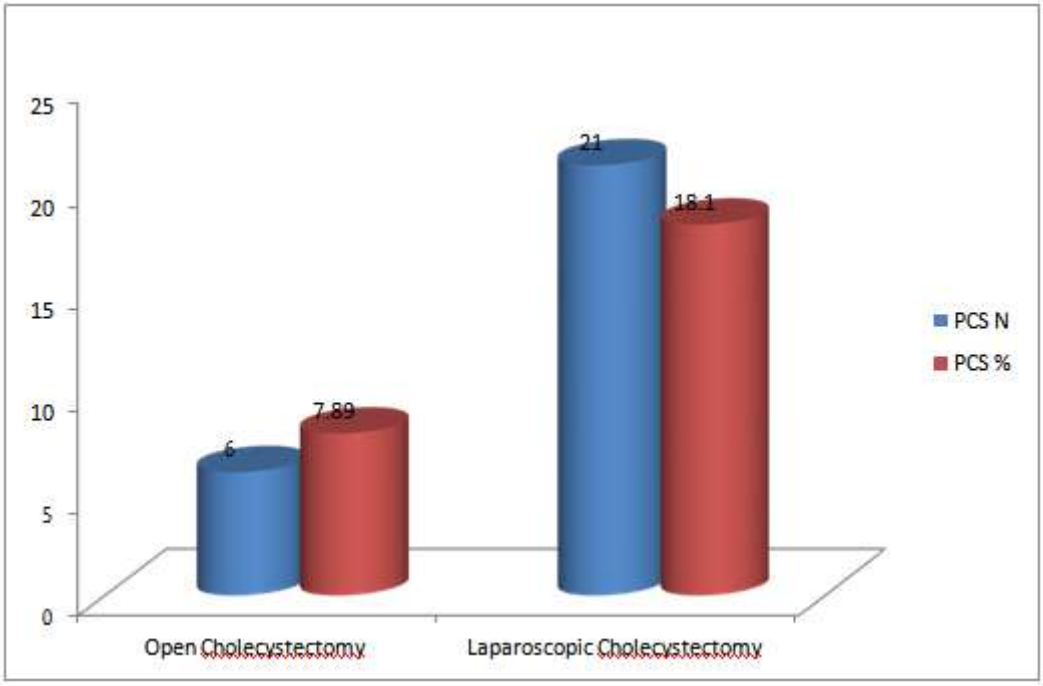
EXCLUSION CRITERIA: -

- Age below 10 years.
- Large gallbladder polyps
- Gallstone pancreatitis
- Pregnancy, cirrhosis and portal hypertension.
- The patients not fit for general anesthesia due to various medical illnesses.
- Bleeding disorders.
- Patient not giving informed consent.

IV. RESULTS

The result showed that Females were comparatively more as compared to males in the

present study. Maximum patients were from the age group of 21-40 years. Most common symptom was pain followed by nausea/vomiting and postprandial fullness among the study subjects. Most common clinical finding was tenderness (44.74% in open and 54.31% in laparoscopic cholecystectomy). Single and multiple stone was found in 63.16%, 36.84% and 61.21%, 38.79% of the subjects in open and laparoscopic cholecystectomy respectively. Increase CBD diameter was revealed in all the subjects undergoing open cholecystectomy. Distended GB was reported in 5.26% and 6.03% of the subjects in open and laparoscopic cholecystectomy respectively. Intraoperatively, adhesion with GB, excessive Fat over Calot's Triangle, bile leakage, bile duct injury and stone spillage was found among 10.53%, 13.16%, 10.53%, 10.53%, 5.26% and 9.48%, 11.21%, 5.17%, 5.17%, 10.34% of the subjects in open and laparoscopic cholecystectomy respectively. Mean operation time (in min) was more in open cholecystectomy as compared to laparoscopic cholecystectomy with statistically significant difference as $p<0.05$. Blood loss was significantly more in open as compared to laparoscopic cholecystectomy with statistically significant difference as $p<0.05$.Post- op pain (hours), duration of hospital stay (days) and return to work (days) was significantly more in open as compared to laparoscopic cholecystectomy with statistically significant difference as $p<0.05$. Intra operative bleeding, wound infection and postoperative ileus was found among 10.53%, 15.79%, 13.16% and 2.59%, 3.45%, 4.31% of the subjects in open and laparoscopic cholecystectomy respectively. Incidence of PCS was more in laparoscopic as compared to open cholecystectomy with statistically significant difference as $p<0.05$. **(Graph 1)**



Graph 1: Incidence of PCS between two groups

V. DISCUSSION

The present study was conducted from October 2019 to September 2021 at Subharti Hospital to study POSTCHOLECYSTECTOMY SYNDROME in patients undergoing OPEN CHOLECYSTECTOMY VERSUS LAPAROSCOPIC CHOLECYSTECTOMY. Total 154 were recruited during the study period, out of which 38 and 116 underwent open and laparoscopic cholecystectomy respectively with the following objectives.

1. To study the post cholecystectomy syndrome in patients who have undergone open cholecystectomy.
2. To study the post cholecystectomy syndrome in patients who have undergone laparoscopic cholecystectomy.
3. To analyze and compare the post cholecystectomy syndrome in patients undergoing open cholecystectomy versus

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laparoscopic cholecystectomy.

Females were comparatively more as compared to males in the present study. The reason for high incidence among females could be that pregnancy and childbirth have a definitive influence on biliary tract disease, acting by causal stasis as well as weight gain and consequent hypercholesterolemia. Another reason may be the effect of female hormones i.e. oestrogen and progesterone, especially progesterone reducing motility of gall bladder to cause stasis leading to gall stone formation.

Dhaigude et al[4] in their study found male: female ratio of 1:1.96 while study by Parambil SM et al [5]revealed male to female ratio of 1:2.

Anmol N et al[6] in their study revealed female dominancy too.

47.37%, 34.21%, 18.42% of the subjects in open cholecystectomy were having age of 21-40, 41-60 and >60 years. 59.48%, 24.14%, 16.38% of the subjects in laparoscopic cholecystectomy were having age of 21-40, 41-60 and >60 years. Hence maximum subjects were from the age group of 21-40 years.

Anindita Bhar et al[7] in their study revealed that in Group A 49 (61.25%) patients were in age group of (20 to 40) yrs and in Group B 43 cases (53.75%) were in the first group i.e. 20 to 40 yrs. These findings were similar to our study.

Dhaigude et al[4] in their study found a mean age of 39.03 yrs. in open and 33.13 in laparoscopic cholecystectomy while study by Parambil SM et al[5] revealed mean age as 44 ± 13.33 yrs.

Most common symptom was pain followed by nausea/vomiting and postprandial fullness among the study subjects. Least common symptom among the study subjects was heartburn followed by fever in this study. In our study, most common clinical finding was tenderness (44.74% in open and 54.31% in laparoscopic cholecystectomy). Lump and jaundice was reported among 5.26% and 15.79% of the subjects in open cholecystectomy. Lump and jaundice was reported among 5 6.03%, 11.21% of the subjects in laparoscopic cholecystectomy respectively. **(Table 1)**

M Khanday et al[8] in their study found that the main clinical presentations in their series of patients were right upper quadrant pain in 140 (100%), nausea and or vomiting in 140 (100%), temperature >100ºF in 112 (80%), tenderness in the right hypochondrium in all (100%), and tender lump in 20 (14.28%) patients.

Anmol N et al[9] in their study revealed that pain was the most common symptom.

Symptoms	**Open Cholecystectomy**		**Laparoscopic Cholecystectomy**	
	N	**%**	**N**	**%**
Pain	32	84.21	103	88.79
Nausea	22	57.89	79	68.10
Vomiting	22	57.89	79	68.10
PostprandialFullness	20	52.63	47	40.52
Fever	9	23.68	38	32.76
Dyspepsia	16	42.11	55	47.41
Heartburn	7	18.42	26	22.41

Table 1: Symptoms among the study groups

Single and multiple stone was found in 63.16%, 36.84% of the subjects in open cholecystectomy. Single and multiple stone was found in 61.21%, 38.79% of the subjects in laparoscopic cholecystectomy. Increase CBD diameter was revealed in all the subjects undergoing open cholecystectomy. Distended GB was reported in 5 6.03% of the subjects in laparoscopic cholecystectomy respectively.

M Khanday et al[8] in their study showed that gallstones were seen in all patients; stones were multiple in 36 (25.71%) cases and single in

104 (74.28%) cases.

Adhesion with GB, excessive Fat over Calot's Triangle, bile leakage, bile duct injury and stone spillage was found among 10.53%, 13.16%, 10.53%, 10.53%, 5.26% of the subjects in open cholecystectomy. Adhesion with GB, excessive Fat over Calot's Triangle, bile leakage, bile duct injury and stone spillage was found among 9.48%, 11.21%, 5.17%, 5.17%, 10.34% of the subjects in laparoscopic cholecystectomy respectively.

Similarly Anindita Bhar et al[7] in their study reported that intra-operative complication is more in open cholecystectomy (15%) compared to laparoscopic cholecystectomy (11.25%), but this is not statistically significant.

Mean operation time (in min) was 78.13±7.08 in open cholecystectomy respectively. Mean operation time (in min) was 62.89±6.41 in laparoscopic cholecystectomy respectively. When mean operation time was compared statistically among open and laparoscopic cholecystectomy, it was found to be statistically significant as $p<0.05$ in this study.

Study by Waldner H et al[10] revealed that there was no significant difference in duration of surgery in laparoscopic and open cholecystectomy, while studies by several other authors such as Pramod Singh et al[11] (44.7 versus 72.4 min), Pessaux P et al[12] (103.3 min vs. 149.7 min) Doke A. et al[13] and Jaswant Jain et al[14] found a shorter duration of surgery in laparoscopic cholecystectomy compared to open cholecystectomy which was in agreement with our study56.

In this study; Blood loss >50ml, >50ml was reported among 23.68% and 76.32% of the subjects in open cholecystectomy. Blood loss >50ml, >50ml was reported among 79.31%, 20.69% of the subjects in laparoscopic cholecystectomy. When blood loss was compared statistically among open and laparoscopic cholecystectomy, it was found to be statistically significant as $p<0.05$.

Post- op pain (hours), duration of hospital stay (days) and return to work (days) was significantly more in open as compared to laparoscopic cholecystectomy with statistically significant difference as $p<0.05$ in our study.

Similar to our study Hardy KJ et al[15] in their study revealed a significant longer mean hospital stay of 6.5±0.3 days in open cholecystectomy group compared laparoscopic cholecystectomy group (2 ± 0.2 days).

Intra operative bleeding, wound infection and postoperative ileus was found among 10.53%, 15.79%, 13.16% of the subjects in open cholecystectomy. Intra operative bleeding, wound infection and postoperative ileus was found among 2.59%, 3.45%, 4.31% of the subjects in laparoscopic cholecystectomy. Hence complications were more in open as compared to laparoscopic cholecystectomy with statistically significant difference as $p<0.05$. These findings can be explained from the fact that a sub costal incision was used in open group and presence of which with associated pain inhibits respiratory movement leading to atelectasis and pulmonary infection again hematoma associated with such incision can act as nidus for infection leading to wound infection. **(Graph 2)**

Similar to our study several authors such as Karim T et al[16], Ajay Gangji et al[17], and Lujan JA et al[18] showed a higher rate of complication in open cholecystectomy group compared to laparoscopic group. Though Lujan et al[18] found that the association of lesser complications in laparoscopic cholecystectomy group was not statistically significant ($p=0.06$) [7].

There are many other authors such as Doke A et al[13] and Medeiros AC et al[19]found a statistically significant ($p<0.05$) lower rate of complications in laparoscopic group compared to that in open group [7].

According to Anmol N et al[9], the complications observed were bile leak (OC-0, LC-3), blood loss (OC-1, LC-2) and wound infection (OC-2, LC-0) which were found to be comparable in both the groups.

Doke A et al[13] showed in their study 28% complication (bleeding-3, wound infection- 4) in Open group compared to 16% (bleeding -3, wound infection-1) in laparoscopic Cholecystectomy while Medeiros AC et al[19] found 2.9% complication in laparoscopy group (wound infection -6, bile duct injury-1) and 5.13% in open group (wound infection – 13, Bile duct injury-2 and chest infection 2).

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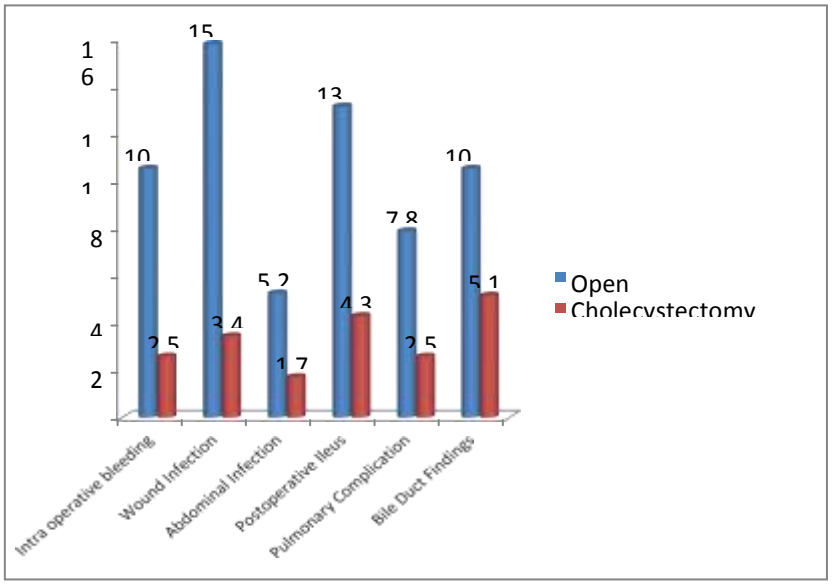

Graph 2: Intraoperative findings among the study groups

In our study; incidence of PCS was reported among 7.89% of the subjects in open and laparoscopic cholecystectomy while 18.19% of the subjects in laparoscopic cholecystectomy. Hence incidence of PCS was more in laparoscopic as compared to open cholecystectomy with statistically significant difference as $p<0.05$.

Aldama López et al[20] in their study found frequency of post-cholecystectomy syndrome among 23.1% of the cases.

Anmol N et al[9] in their study revealed PCS among 0 and 2 subjects who underwent open and laparoscopic cholecystectomy respectively.

The earlier report of Anand et al[21] who followed up 171 patients prospectively for nearly 3 years had an incidence of 18.13% whereas a more recent study from India reported an incidence of 27%.

There seems to be a large lacuna in the understanding of post cholecystectomy symptoms, especially from India and there is a need for larger series or multicentric trials to understand in a better way, the physiology of altered bile flow and symptoms after LC and the cause of persistent, long term symptoms in such patients.

VI. V. CONCLUSION

Although incidence of PCS was more in laparoscopic as compared to open cholecystectomy, still it is safe and efficacious in the hands of experienced surgeons. There is a definitive learning curve for surgeons and complications rate reduces as surgeons become more and more familiar with this procedure. It offers definitive advantages (e.g. shorter duration of surgery, less intra and post-operative complications, less analgesic use, early discharge and mobilisation) over open cholecystectomy and should be an available option for all patients requiring elective cholecystectomy.

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