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A comparative study of open cholecystectomy and laparoscopic cholecystectomy in patients with cholelithiasis

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ABSTRACT

Background: Cholelithiasis is a major cause of morbidity among Indians with a female preponderance. Most of the cases of gallstones are asymptomatic. For a long time, open cholecystectomy (OC) used to be the surgical treatment for cholelithiasis. But with the advent of laparoscopic cholecystectomy (LC) there has been a gradual shift in the treatment with most surgeons preferring LC over OC. Apart from the benefits of decreased hospital stay, lesser postoperative pain and earlier return to normal activity LC are also cosmetically better as compared to OC. Longer operative time and increased incidence of biliary leakage are some pitfalls of LC in initial phase of surgical practice.

Methods: A prospective study of 100 patients was carried out in the department of surgery in IQ city medical college and Durgapur city hospital, Durgapur between January 2017 and August 2017 with the aim of comparing open cholecystectomy with laparoscopic cholecystectomy. The patients were randomly assigned into two groups. Group A consisted of patients who underwent laparoscopic surgery while Group B patients underwent open surgery for cholelithiasis.

Results: Duration of surgery was longer in OC than LC (72.4min versus 44.7min.). Mean duration of post-operative pain was 18.3hrs in group A as compared to mean duration of 30.7hrs in group B patients. The mean period of post-operative hospital stay was 1.8 days in group A and 4.8 days in group B. Post-operative resumption of normal diet was possible in 2.1 days in OC while it took lesser time (1.2 days) in LC. The rate of surgical site infection was higher in OC as compared to LC.

Conclusions: Laparoscopic cholecystectomy can be recommended as first choice operative treatment for patients with cholelithiasis as it provides better cosmetic results, lesser pain, lesser post-operative hospital stay and fewer incidence of surgical site infection.

Keywords: Cholelithiasis, Laparoscopic cholecystectomy, Open cholecystectomy

INTRODUCTION

Gall stones are a leading cause of morbidity among Indian patients with prevalence ranging from 10-20%. Open cholecystectomy (OC) has been the mainstay of treatment for cholelithiasis and was first performed in 1882 by a German surgeon Carl August Langenbuch. Various alternative methods like oral dissolution agents

and lithotripsy exists but lack the desired impact on treatment of cholelithiasis and are therefore rarely used in clinical practise.^{3,4} But with the advent of laparoscopic cholecystectomy (LC) there has been a gradual shift in the treatment with most surgeons preferring LC over OC. The first laparoscopic cholecystectomy was performed by Philleppe Mouret in Lyon, France and has now become the most common laparoscopic surgery performed worldwide.⁵⁻⁷

LC is associated with a number of advantages for the patients as it provides early post-operative pain relief, early return to normal activity, decreased hospital stays and reduced cost.⁸

Despite offering significant benefits LC does have its drawbacks. Increased bile duct injuries and longer duration of operation are some of the major pitfalls associated with LC.9 Apart from this, three-dimensional depth perception is limited, and it sometimes becomes difficult to visualise internal structures properly. 10 Open cholecystectomy is preferred over laparoscopic cholecystectomy in cardiac patients as Carbon dioxide insufflations in such patients can lead to cardiac arrhythmias. 11 The initial cost for setup of laparoscopic surgery is high and the time taken to gain expertise over this procedure is also long as compared to open procedures. Taking into consideration the advantages and drawbacks of both open cholecystectomy and laparoscopic cholecystectomy further studies are needed to highlight the superiority of one over the other.

METHODS

A prospective study of 100 patients was carried out in the department of surgery in IQ city medical college and Durgapur city hospital, Durgapur between January 2017 and August 2017. Approval for the study was taken from the Institutional Ethical Committee. This study included all symptomatic patients with cholecystitis who were admitted in the surgery ward. Complete history of the disease was taken from the patient and proper physical examination was done for diagnosing a patient with gall bladder stone. The following investigations were performed before operation-complete blood count, blood sugar level, routine urine examination, liver function test, chest X-ray and abdominal ultrasound.

The patients were randomly assigned into two groups. Group A consisted of patients who underwent Laparoscopic surgery while Group B patients underwent open surgery for cholelithiasis. The patients were explained in detail about both the procedure. Informed consent was taken from those patients who were willing to participate in the study. The patients were evaluated for duration of surgery, duration of post-operative pain, period of post-operative hospital stay, post-operative resumption of normal diet and incidence of postoperative wound infection.

RESULTS

Most of the patients in the study were females (79%). There were 38 females and 12 males in the group of patients who underwent laparoscopic surgery and 41 females and 9 males in the group who were treated with open surgery. The age of the patients ranged from 19 years to 74 years. Majority of the patients belonged to 41-60 years age group.

Pain in right hypochondrium was the most common presenting complain of the patients followed by post prandial fullness, nausea and vomiting, dyspepsia, belching and fever. No patient in either group had complained of jaundice when they were admitted to the hospital for operation. Pain, post prandial fullness and fever were more in patients who underwent LC while dyspepsia and belching was seen more commonly in group B patients than in group A patients. Nausea and vomiting was present equally as a symptom in both the groups.

Table 1: Sex distribution.

Sex	LC (group a)	OC (group b)
Male	12	09
Female	38	41
Total	50	50

Table 2: Age distribution.

Age group	LC (group A)	OC (group B)
< 20 years	1	1
21-40	17	13
41-60	30	37
61-80	2	3
Total	50	50

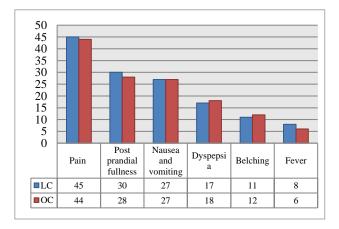


Figure 1: Symptom profile of patients in both groups.

The time taken for completion of surgery was significantly longer in OC than LC. Duration of surgery for open cholecystectomy was 55-80 min (mean-72.4 min) while the same for laparoscopic cholecystectomy was 40-55 min (mean 44.7 min.).

Table 3: Operative time.

Operative time	LC (group A)	OC (group B)
Less than 40 mins	2	-
41-50 mins	39	-
51-60 mins	9	11
61-70 mins	-	17
71-80 mins	-	22

The patients who had undergone Laparoscopic cholecystectomy experienced relief from pain earlier than those who underwent Open cholecystectomy. It was observed that mean duration of post-operative pain was 18.3 hrs in group A as compared to mean duration of 30.7 hrs in group B patients. The time period of post-operative hospital stay was shorter in group A than in group B. The mean period of post-operative hospital stay was 1.8 days in group A and 4.8 days in group B.

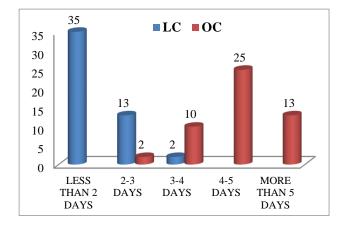


Figure 2: Duration of hospital stay after surgery.

Early resumption of diet was seen in those patients who were in the laparoscopic cholecystectomy group. In group A post-operative resumption of normal diet was possible within 2 days (mean 1.2 days) while group B required longer time (mean 2.1 days). Apart from surgical site infection no other surgery related complications were seen in either of the two groups. In fact, infection rate in group B patients was almost double than that observed in group A patients. The rate of surgical site infection was 6.5% in OC and 3% in LC respectively.

DISCUSSION

Carl Langenbuch, the pioneer of open cholecystectomy had very famously stated that "gall bladder should be removed not because it contains stones, but because it them". 12 The purpose of both cholecystectomy and laparoscopic cholecystectomy is to provide relief to the patient by safely removing the diseased gall bladder. The indications for surgery are same for both the procedure. Hence, the choice of operation depends on the patients' preference, cost of hospital stay, lesser incidence of post-operative complication and surgeons' expertise. More number of patients and surgeons are now inclined to LC as operation of choice for cholelithiasis because of better cosmetic results, reduced main and early mobilisation. 13,14

In the present study there was a female preponderance (79%) amongst the patients and majority of them were in 41-60 years age group. These findings are consistent with results of similar studies. The time taken for Laparoscopic surgery was less than that taken to

complete open cholecystectomy (44.7 min. versus 72.4 min) in our study. Similar findings were also observed by Pessaux P et al who in their study on 139 patients found that duration of surgery was shorter in LC group than OC group (103.3 min versus 149.7 min).¹⁷ Waldner H et al, found that there was no significant difference in the duration of surgery among both the procedure 18. However, most of the other studies which evaluated the time taken by both the procedures reported OC to take lesser time than LC.^{16,19,20} LC requires special training and longer learning curve. The more a surgeon gains experience the lesser the time taken by him to complete the surgery.

Pain is an inevitable outcome of any surgical procedure and early relief from pain is one of the primary goal of treatment. Early relief from post-operative pain was seen in group A as compared to group B patients in the present study. Duration of postoperative pain was 18.3 hrs and 30.7 hrs in group A and group B patients respectively. In a similar study by Shukla A et al duration of postoperative pain was 14.68 hours in LC Group and 27.92 hours in OC Group.16 It was also demonstrated that patients undergoing open cholecystectomy required more than those undergoing analgesic laparoscopic cholecystectomy.²¹ Laparoscopic surgery is a minimal invasive surgery and affects only a limited area resulting in early pain relief postoperatively.

In this study a correlation was seen between the type of surgery and duration of post-operative hospital stay. The mean period of post-operative hospital stay was 1.8 days in group A and 4.8 days in group B. In a study by Anmol N et al the median duration of hospital stay was three days for LC and seven days for OC which is in concordance with our study.²² Among the 100 patients studied by Karim T et al, OC was associated with a mean post-operative hospital stay of 5.46 days, considerably greater than 3.7 days seen in patients undergoing LC.²³

In group A post-operative resumption of normal diet was possible within 2 days (mean 1.2 days) while group B required longer time (mean 2.1 days). A similar finding was observed by Shukla A et al with a mean time of 11.68 hours in LC Group and 17.24 hours in OC Group for restoration of oral feeds. The rate of surgical site infection was higher in OC (6.5%) as compared to LC (3%). Karim T et al reported wound infection rate in open procedure to be 3 times the laparoscopic procedure.

CONCLUSION

Cholelithiasis is a very common problem in India and hence an effective management for this is very essential. Open cholecystectomy and laparoscopic cholecystectomy are two modalities of treatment offered to patients suffering from symptomatic gall stones. The present study was conducted with the aim of comparing Open cholecystectomy and laparoscopic cholecystectomy as a treatment option. Laparoscopic cholecystectomy can be

recommended as first choice operative treatment for patients with cholelithiasis as it provides better cosmetic results, lesser pain, lesser post-operative hospital stay and fewer incidence of surgical site infection.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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