

Cholecystectomy in sickle cell disease, laparoscopic Vs. open: What is justified

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Abstract

Objective: To compare laparoscopic with open cholecystectomy in patients with sickle cell disease, with special reference to post-operative pain, hospital stay, and intraoperative technical difficulties. **Design:** Prospective clinical study. **Setting:** Government medical college, Nagpur. **Subjects:** 39 patients of sickle cell disease (SCD) with cholelithiasis had undergone open cholecystectomy, and 51 patient of SCD with cholelithiasis had undergone laparoscopic cholecystectomy. Each patient was matched for age, sex, age at the time of operation, and number of preoperative transfusions with sickle cell disease who had cholecystectomy. **Main outcome measures:** Postoperative stay in hospital, analgesia requirement, incidence of complications, intraoperative technical difficulties and conversion to open operation. **Results:** Complications occurred in of (11/51) the patients in the laparoscopic group and in (16/39) of the patients in the open group. The mean length of stay in hospital was 11.87 days in the open group and 4.77days in the laparoscopic group. There were no intraoperative difficulties found different laparoscopic cholecystectomy. **Conclusions:** Laparoscopic cholecystectomy resulted in a shorter hospital stay with fewer postoperative complications and no intraoperative difficulties than open operation in patients with sickle cell disease and may be the procedure of choice in the treatment of cholelithiasis in SCD.

Keywords: cholelithiasis, laparoscopic cholecystectomy, sickle cell disease, complications.

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INTRODUCTION

Cholelithiasis is a common complication of sickle-cell disease (SCD). The frequency is variable, ranging from 4% to 55% depending on the age of the patients and the diagnostic method used^{1,5,10,13,14}. A frequency of 10% to 17% has been reported in children less than 10 years of age¹⁰. Conventional (Open) cholecystectomy in patients with sickle cell anemia is associated with an increased morbidity and mortality². These patients need meticulous attention regarding fluid balance, blood transfusion, control of the ambient temperature, prophylaxis against infection, and anesthesia. Reduced respiratory effort as a

result of incisional pain often leads to poor pulmonary ventilation and relative hypoxia. In addition, patients with sickle cell disease remain at particular risk for development of postoperative complications such as pneumonia or acute respiratory distress syndrome, while transient hypoxia, hypothermia, dehydration, and acidosis may result from vaso-occlusive complications. Laparoscopic surgery has generally been greeted enthusiastically, primarily because it reduces postoperative pain, hospital stay and postoperative ileus³. However, the role of laparoscopic cholecystectomy in patients with sickle cell disease is still debated because many surgeons claim that the dissection may be more difficult (cholecystitis, adhesions, or emergency cholecystectomy), which can therefore increase the rate of complications.¹⁸ Because we thought that patients with sickle cell disease might benefit from laparoscopic cholecystectomy, we compared the results of laparoscopic with those of open operation.

MATERIAL AND METHODS

During a 2-year period, 41 patients with sickle cell disease had standard four port laparoscopic

cholecystectomy and 39 patients undergone open cholecystectomy. Age at operation, sex, diagnostic methods, blood transfusions, duration of operation, postoperative complications, postoperative analgesia, hospital stay, and conversion rate from laparoscopic to open cholecystectomy were recorded for each patient. Each patient was matched for age, sex, year of operation, and number of preoperative transfusions with a patient with sickle cell disease who had cholecystectomy during these 2 years. The surgical technique used for the open operation was through a Kocher’s subcostal incision. Preoperative assessment included a complete blood count

and a sonogram of the gallbladder, liver function test to evaluate the biliary system and document the existence of stones. Before cholecystectomy all patients in each group were hydrated with intravenous fluids at 1.5 times the maintenance rate on the night before operation, and given a single dose of an antibiotic prophylactically at induction of anesthesia. All patients were followed up in outpatient department for next six months.

RESULTS

The results of the study are shown in following table 1.

Table: 1

Sr. No.	Variables	OPEN cholecystectomy	LAPAROSCOPIC cholecystectomy	Results
1.	Mean Age (years)(range)	11.63 (4-25)	15.30 (4-25)	-
2.	Sex (Male/ Female)	21/18	27/22	-
3.	Preoperative Hemoglobin (gm./dl)	8.78	8.43	-
4.	Postoperative analgesia required (on day 2 in number of patients)	39	8	$\chi^2= 59.63.p<0.001$
5.	Mean hospital stay (days)	11.87	4.77	$t=8.181 p<0.001$

Table 1 The mean age of the laparoscopic group was 15.30 years (range 4–25) and of the open group 11.63 years (range 4-25). There were 21 men and 18 women in open cholecystectomy group and 27 males and 22 females in laparoscopic cholecystectomy. The preoperative hemoglobin concentration was 8.78 g/dL and 8.43 g/dL in open and laparoscopic group, respectively. On postoperative day 1 patients from both the groups required analgesia. All patients who had open operations required analgesia on postoperative day 2 and onwards whereas 8 out of 51 patient required analgesia on post-operative day 2 in laparoscopic cholecystectomy

group. Statistically p value found to be <0.001 which is statistically significant, implies requirement of postoperative analgesia required in open cholecystectomy procedure is much more compared to laparoscopic cholecystectomy. The mean hospital stay was 4.77 days (range 2–5) in the laparoscopic group and 11.87 days (3–9) in the open group. The p value was found to be < 0.001 which is statistically significant implies that patient with laparoscopic cholecystectomy has recovered to early routine activity and discharged as compared to open cholecystectomy. Post-operative complications. (Figures are no. of patients)

Table: 2

Sr. No.	Complications	OPEN Cholecystectomy (n=39)	LAPAROSCOPIC Cholecystectomy (n=51)	P value
1.	Wound infection	5	4	0.33
2.	Sickle crises	1	2	0.6
3.	Biliary leak	1	1	0.68
4.	Biliary peritonitis	1	0	0.43
5.	Hospital death	1	0	0.43

Table 2 In the laparoscopic group there were 7 (13.72%) postoperative complications while in the open group there were 9 (23.07%). Wound infection, Sickle crises, Biliary leak, Biliary peritonitis, Hospital death were consider as postoperative complication in our study. We found proportionately higher rate of complications overall in the open group than in the laparoscopic group but this was not found to be statistically significant.

STATISTICAL ANALYSIS

Complication rates in the two groups were compared using Fisher’s exact tests for proportions. A probability of 0.05 or less was considered significant. For comparison

of means, Student’s t test or an analysis of variance (ANOVA) were applied where appropriate.

DISCUSSION

There are known potential benefits of laparoscopic cholecystectomy compared with conventional surgery^{4,6,7}. Firstly, the postoperative pain that result from the small abdominal incision is less than after a standard subcostal incision. Secondly, the absence of postoperative ileus allows the patients to return quickly to normal dietary habits and activity, thereby reducing the duration of hospital stay. Thirdly the small incisions give better

looking scars. The advantages of laparoscopic cholecystectomy may be even more pronounced in patients with sickle cell disease, because the reduced pain, avoidance of an upper abdominal incision and the speedy return to normal activities allows rapid recovery and minimizes the chance of a postoperative infection⁸. The prevalence of asymptomatic cholelithiasis in patients with sickle cell disease ranges from 4% to 55%⁹. Surgeons have avoided operations on these patients unless absolutely necessary, because of the high morbidity. However, careful preoperative preparation and precise management has produced an acceptably low morbidity and mortality when operation is required¹¹. Several recently published studies on laparoscopic cholecystectomy in patients with sickle cell disease have shown a significant reduction in the rate of complications and an improvement in the outcome^{12,15,16}. These studies were in small series and without controlling variables such as age, sex, time of operation, and number of preoperative transfusions, which influence the outcome. In our study, after controlling for these variables, we found that laparoscopic operations reduced postoperative time in hospital and discomfort, and allowed the patients to return to routine activities faster than open operations. As studies mentioned that, the role of laparoscopic cholecystectomy in patients with sickle cell disease is still debated because many surgeons claim that the dissection may be more difficult (cholecystitis, adhesions, or emergency cholecystectomy), which can therefore increase the rate of complications¹⁸. We don't found no special technical difficulty in doing laparoscopic cholecystectomy in SCD patients.

CONCLUSION

Laparoscopic cholecystectomy is justified to open cholecystectomy operation in patients with sickle cell disease. It results in a shorter hospital stay, offers the patient a more comfortable postoperative time and has proportionately low rate of complications, than open cholecystectomy. and we didn't find any technical difficulty in doing laparoscopic cholecystectomy in SCD patients. The reduced postoperative morbidity after laparoscopic cholecystectomy may encourage surgeons to reduce the number of erythrocyte transfusions before operation and thereby to minimize the risk of infective agents¹⁷.

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