

Study Of Non-Biliary Complications Of Laparoscopic Cholecystectomy

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Abstract

Background: Laparoscopic cholecystectomy gained wide acceptance as treatment of choice for cholelithiasis. However, major complications may still account for high morbidity. The most important complications of laparoscopic cholecystectomy are biliary tract injuries. Non-biliary complications can be equally devastating and troublesome. Objectives: To determine the incidence and nature of non-biliary complications of laparoscopic cholecystectomy. Materials and Methods: This study presents a retrospective and prospective analysis of non-biliary complications occurring during 500 laparoscopic cholecystectomies performed in various surgical units of SMHS Hospital (a tertiary care centre) from June 2008 to May 2011. The study population included all the patients with symptomatic gallbladder disease. The non-biliary complications were divided into three distinct categories: (i) Access-related (ii) Procedure-related and (iii) postoperative port-site complications. Results: The mean age in our study was 42.79 ± 11.35 years (range 21-87) with a male:female-ratio of 1:4. The mean operating time was 67.97 ± 32.70 minutes (64.30 ± 27.70 min. in the laparoscopic group and 145.57 ± 32.23 min. in the conversion group). The incidence of access-related complications in our study was 6.4%, that of procedure-related complications was 9% and that of postoperative port-site complications was 1.8%. In 23 (4.6%) patients the procedure was converted to open surgery due to different complications. The mean postoperative hospital stay for patients who underwent successful laparoscopic cholecystectomy was 1.55 ± 0.670 days (range 1-5) while for the conversion group it was 5.30 ± 1.428 days (range 3-9). Conclusion: Non-biliary complications are frequent and can be life-threatening. Proper preoperative selection and adherence to proper laparoscopic techniques can prevent fatal complications.

INTRODUCTION

Laparoscopic cholecystectomy remains the gold standard treatment for gall stone disease as the intact gall bladder leads to gall stone recurrence and does not eliminate the risk of developing gall bladder carcinoma¹. The advantages of laparoscopic cholecystectomy over traditional open cholecystectomy in terms of limited postoperative pain, shorter hospitalization, earlier resumption of activity and improved cosmesis have been readily apparent². The most important advantage of laparoscopic cholecystectomy is that it abolishes the trauma of access as well as transient ileus that follow the open abdominal surgery³. Reduced incidence of adhesion formation, wound dehiscence and incisional hernia are other advantages. Progress in materials and techniques over the past fifteen years resulted in gradually improved results. Major complications may still account for morbidity as high as 2-9%⁴. Biliary complications represent a vastly studied group of complications of laparoscopic cholecystectomy. However, non-biliary complications are

another potential group of complications which can be distressing and troublesome but have received less attention in literature.

MATERIALS AND METHODS

This study was conducted in the Department of Surgery at SMHS Hospital (a tertiary care hospital in Northern India with bed strength of 700 beds) and performed as a retrospective study of one year from June 2008 to May 2009 and a prospective study of two years from June 2009 to May 2011. The study population included all the patients with symptomatic gallbladder disease regardless of their gender. The selection of patients was made preoperatively on the basis of history, physical examination and radiological and laboratory diagnostic evidence of gall bladder disease. Patients with acute cholecystitis, gallbladder malignancy, choledocholithiasis, previous upper abdominal surgery, jaundice in recent past and coagulopathies were excluded from the study. Patients were operated using the classical

four-port technique by seven surgeons with different levels of experience in laparoscopy. The pneumoperitoneum was created using closed technique in all patients. Details of each patient were recorded on a proforma. Careful note was made of intra-operative findings and complications, operative time, pain score and analgesic requirement in each patient.

RESULTS

The mean age in our study was 42.79 ± 11.35 years (range 21-87) with a male:female-ratio of 1:4. The majority of the patients (64.2 %) were in the 3rd and 4th decade of life.

Figure 1

TABLE I: AGE-SEX CROSS TABULATION

AGE GROUP	MALE	FEMALE	TOTAL
21-30	9	68	77
31-40	32	106	138
41-50	35	148	183
51-60	27	38	65
61-70	9	24	33
71-80	0	3	3
81-90	0	1	1
TOTAL	112	388	500

The commonest symptom was dyspepsia (45.6%) while 34.8% of the patients were symptom-free at the time of surgery; 432 (86.4%) patients had no significant abdominal findings on examination; 466 (93.2%) patients had ultrasound-documented cholelithiasis while acalculous cholecystitis and gallbladder polyp were present in 1.6% and 0.4%, respectively.

Figure 2

TABLE II: DISTRIBUTION OF CASES ACCORDING TO ULTRASONOGRAPHIC FINDINGS

USG Findings			No. of Patients	Percentage
Cholelithiasis	Single	<1.5cm	119	23.8
		>1.5cm	17	3.4
	Multiple		330	66.0
Acalculous cholecystitis			8	1.6
GB polyp > 1cm			2	0.4
Mucocele			24	4.8

The mean operating time was 67.97 ± 32.70 minutes (64.30 ± 27.70 min. in the laparoscopic group and 145.57 ± 32.23 min. in the conversion group). The incidence of access-related complications in our study was 6.4%, that of procedure-related complications was 9% and that of postoperative port-site complications was 1.8%.

Figure 3

TABLE III: DISTRIBUTION OF VARIOUS COMPLICATIONS REPORTED IN OUR SERIES

COMPLICATION	No. of Patients	Percentage
ACCESS-RELATED (n=32)		
Intra-operative port-site bleeding	18	3.6
Subcutaneous emphysema/pneumo-omentum	13	2.6
Small-bowel laceration	1	0.2
Colon laceration	Nil	0.0
Major vessel injury	Nil	0.0
PROCEDURE-RELATED (n=45)		
Cystic artery bleeding	12	2.4
Liver bed bleeding	14	2.8
Gall-bladder perforation with stone spillage	16	3.2
Colon/duodenal/diaphragmatic injury	Nil	0.0
Liver laceration/subcapsular liver hematoma	3	0.6
POSTOPERATIVE PORT-SITE (n=9)		
Port-site bleeding	1	0.2
Port-site infections	7	1.4
Port-site hernia	1	0.2
Port-site metastasis	Nil	0.0

In 23 (4.6%) patients the procedure was converted to open surgery due to different complications.

Figure 4

TABLE IV: DISTRIBUTION OF CASES ACCORDING TO REASONS FOR CONVERSION TO OPEN CHOLECYSTECTOMY (n=23).

REASONS FOR CONVERSION	No.	Percentage
Dense adhesions with unclear anatomy	7	1.4
Wide cystic duct packed with calculi with choledocholithiasis	3	0.6
Empyema	1	0.2
Anomalous cystic artery or uncontrolled cystic artery bleeding	3	0.6
Accessory cholecysto-hepatic duct	1	0.2
Uncontrolled liver bed bleeding	4	0.8
GB malignancy	2	0.4
Uncontrolled port-site bleeding	1	0.2
Small-bowel laceration	1	0.2
TOTAL	23	4.6

Conversion in all these cases was done because of the operative difficulty to cope with the situation and the learning curve for surgeons.

The mean analgesic requirement in the successful laparoscopic group was much less than in the conversion group (0.68 ± 0.937 doses versus 4.39 ± 1.406 doses; p-value <0.05). The mean postoperative hospital stay in the present series was 1.72 ± 1.06 days. The mean postoperative hospital stay for patients who underwent successful laparoscopic cholecystectomy was 1.55 ± 0.670 days (range 1-5) while for the conversion group it was 5.30 ± 1.428 days (range 3-9).

DISCUSSION

The non-biliary complications can be troublesome and distressing as can be biliary complications. In our series,

non-biliary complications were divided into access-related, procedure-related and postoperative port-site complications. Among access-related complications, trocar injuries take a huge account, especially the first trocar insertion. Numerous risk factors have been implicated in increasing the incidence of access-related complications. These risk factors include postoperative adhesions, insufficient gastric emptying, full bladder, downwardly displaced liver, insufficient pneumoperitoneum, poor muscle relaxation, emaciate patients and careless angle or force of trocar insertion⁵. Some studies report the open technique of pneumoperitoneum creation to be advantageous over the closed technique¹⁷; however, in our series we concluded that the closed technique can give similar results while adhering to proper laparoscopic principles and proper pre-operative assessment and selection of patients^{18,19}. In our series, port-site bleeding and subcutaneous emphysema were the commonest access-related complications occurring in 3.6% and 2.0%, respectively. Port-site bleeding, in most cases, can be prevented by trans-illumination of the anterior abdominal wall at the time of trocar insertion and trocar insertion through avascular planes⁶. Mayo et al. have made similar recommendations in their study⁷. Bleeding was controlled by applying pressure at the port site, tamponade, by diathermy coagulation or applying deep sutures in most of the patients and rarely required conversion to open surgery. Champault et al. reported 25 small-bowel lesions with 23 patients requiring conversion to laparotomy. The small bowel was most frequently injured organ in that series⁵. Deziel et al.² reported retroperitoneal major vessel injuries in 36 patients (0.05%) with 31 patients requiring laparotomy for hemostasis. There was a single small-bowel injury in our series requiring conversion to formal laparotomy; however, there was no major vessel injury or colonic injury in present series. Lifting-up of the abdominal wall, staying away from previous incision sites, insufflations at Palmer's point in the left hypochondrium, directing the Veres needle at 45 degree to the spine towards the pelvis and use of saline drop test all help in reducing the number of complications⁸. We report 9% procedure-related complications in our series, gallbladder perforation with stone spillage being most common in 3.2%. Cystic artery bleeding and liver bed bleeding occurred in 2.4% and 2.8%, respectively. These complications are more common while operating on patients with acute cholecystitis⁶. Similar results have been reported by Duca et al. in their study⁹. Visceral injuries occur in 0.1 to 0.3% of all laparoscopic surgeries¹⁰. However, there was no duodenal or diaphragmatic injury in our series. Proper pre-

operative selection of patients, adherence to proper laparoscopic techniques and patience are important steps to prevent fatal complications. Some authors report the incidence of port-site hernias to be around 1%¹¹. The incidence of port-site hernias in the present series was 0.2% and can be reduced with proper fascial closure of port sites. Conversion to open cholecystectomy should be considered early when faced with a difficult situation. The threshold for conversion should be low to prevent fatal complications. In some series, conversion rates of 1.2%¹², 2.0%⁶, 5%¹³⁻¹⁴ and 8.5%¹⁵ have been reported. In the present series, we report a conversion rate of 4.6%, dense adhesions and liver bed bleeding being most common reasons for conversion. Mrksic et al. reported a similar conversion rate in their series¹⁶. The mean postoperative hospital stay for patients who underwent successful laparoscopic cholecystectomy was 1.55±0.67 days (range 1-5 days) while for the conversion group it was 5.30±1.428 days (range 3-9 days). The mean hospital stay in our series correlates with other studies in literature. Thus it can be concluded that laparoscopic cholecystectomy reduces the analgesia requirement and the duration of sick leave in properly selected patients.

CONCLUSION

Non-biliary complications of laparoscopic cholecystectomy can be troublesome and distressing at times. Adherence to proper laparoscopic principles and proper pre-operative selection of patients can reduce the number of these complications and the conversion rate to open surgery.

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