

Post laparoscopic cholecystectomy exploration: An audit

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ABSTRACT

Objective: This study was conducted to analyse the different causes and factors for exploration and their management after laparoscopic cholecystectomy in 1000 cases of cholelithiasis.

Methodology: This is a prospective study conducted in the department of surgery Liaquat University of Medical and Health Sciences, Jamshoro, Pakistan, from January 2003 to December 2010. Thousand cases of cholelithiasis were operated for laparoscopic cholecystectomy in eight years and were observed for their recovery and complications postoperatively. Those patients who developed major problems were assessed clinically and by different investigations like LFT, Ultrasound, CT scan and HIDA scan to find out the cause. They were operated once absolute indication of exploration was made. All patients were included in study after getting informed consent for first operation as well as for Re-do surgery if any one required exploration.

Results: Out of 1000 cases, 58 patients (5.8%) developed unidentified complications during laparoscopic cholecystectomy who required surgery for one or other reason. The problems which required exploration were bleeding in 2.2%, biliary leak in 1.9% and obstructive jaundice in 1.0% of cases as main reasons. The cases were managed by various open surgical procedures depending upon the pathology found on exploration.

Conclusion: Laparoscopic cholecystectomy though proved as gold standard for cholelithiasis but still is not free of complications and can land up into major problems for patients who had either difficult cholecystectomy or over looked congenital anomalies of biliary tree.

KEYWORDS: Laparoscopic cholecystectomy, Complications, Reasons of exploration, Management.

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INTRODUCTION

Laparoscopic cholecystectomy is an ideal method for treating the gall stone disease but still carries risk of some operative incidents and postoperative complications more frequently than

open procedure.¹ The incidence of complications like CBD injuries, vascular and bowel injuries is relatively more with laparoscopic than open cholecystectomy. However overall total number of complications are fewer with laparoscopic than the open cholecystectomy depending upon the expertise of surgeon.² Also two dimensional view of T.V screen unlike three dimension view of open cholecystectomy restricts the capacity of appreciation of depth of field and various anatomical structures and coordination of instruments. Therefore laparoscopic cholecystectomy may be responsible for specific complications which occur as a result of inadvertent division of common bile duct or hepatic duct identified as cystic duct, inappropriate clipping of CBD or hepatic duct, or liberal use of diathermy involving biliary tree, vessels and bowel.³

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Table-I: Factors and Reasons for exploration (no: 1000).

<i>Reasons of exploration</i>	<i>Facts observed on exploration</i>	<i>No of pts:</i>	<i>%age</i>
Bleeding (No = 22)	(i). Cystic artery (with 5 congenital variations)	11	1.1
	(ii). Gall Bladder bed	6	0.6
	(iii). Port Site (Epigastric & Infra umbilical port)	5	0.5
Bile Leak from Drain (no = 19)	(i).Cystic duct stump	5	0.5
	(ii). Rt: Hepatic duct	2	0.2
	(iii).Common Hepatic Duct	3	0.3
	(iv).Common Bile duct	5	0.5
	(v). Abnormal biliary ducts (congenital)	4	0.4
Biliary Peritonitis (No = 3)	(i).Due to leakage from cystic duct	2	0.2
	(ii). From Common Bile duct injury	1	0.1
Bilioma (not resolving on aspiration): (No = 2)	(i).Leak from gall bladder fossa	1	0.1
	(ii).Leak from cystic duct stump	1	0.1
Obstructive Jaundice (No = 10)	(i).Clipping of CBD	4	0.4
	(ii).Clipping of common Hepatic duct	1	0.1
	(iii). Residual stones in CBD	5	0.5
Duodenal perforation (No = 2)	(i). Diathermy damage	1	0.2
	(ii). Tear due to adhesions	1	0.2

Overall exploration Rate = 5.8%

The important untoward complications following laparoscopic cholecystectomy include bleeding, unrecognized bile duct injuries, retained calculi in CBD and remnant of cystic duct and bowel injuries.² There are number of procedures like re-do laparoscopy, ERCP drainage or retrieval of CBD stones, ultrasound guided drainage and open exploration for management of these problems depending upon the pathology.

This study presents eight years experience of laparoscopic cholecystectomy with the aim to evaluate the major complications which are responsible for re-do surgery after laparoscopic cholecystectomy with the facilities available in our setup in comparison to international standards.

METHODOLOGY

Data of patients operated for laparoscopic cholecystectomy were prospectively collected in the department of surgery Liaquat University of Medical & Health Sciences, Jamshoro from January 2003 to December 2010. Study lasted for 8 years in which 1000 cases of cholelithiasis were included and submitted for surgery. All patients were explained advantages and possible disadvantages of procedure and informed consent taken for first as well as Re-do surgery if required for any major complication.

Those patients who developed postoperative problems were assessed clinically and by different investigations like LFT, Ultrasound abdomen, HIDA scan and CT scan abdomen to find out the cause. ERCP was not utilized for diagnostic or therapeutic purpose because facility was not available in our hospital.

However patients were initially managed by conservative treatment or other simpler methods like aspiration under ultrasound or CT guidance depending upon the cause. Once absolute indication of exploration was established then the patients were operated for laparotomy and managed according to pathology.

We did not utilized the minimally invasive technique as used worldwide because of the following reasons.

- * Reluctance of Re-do Laparoscopy due to fear of postoperative adhesions and other problems encountered as usual in every 2nd surgery.
- * Unavailability of ERCP for retrieval of CBD stones.
- * Lack of proper training for laparoscopic exploration of CBD.
- * Unavailability of choledochoscope to assess the CBD stones on 2nd exploration.

The data of first surgery and re-exploration was recorded on specially designed proforma. The results were compiled by SPSS version 17 & analysed for frequencies and percentages. Chi-square test was used for statistical analysis and p value <0.05 was considered significant. The patients who were managed conservatively were excluded from study.

Table-II: Investigation to assess the cause of complications (no: 1000).

<i>Investigation</i>	<i>No: of patients</i>	<i>%age</i>
U/S Abdomen	58	5.8
L.F.T	35	3.5
CT Scan Abdomen	23	2.3
HIDA Scan	10	1.0
Serum Amylase	25	2.5

Table-III: Management of cases after exploration (no: 1000).

<i>Treatment option</i>	<i>No: of pt:</i>	<i>%age</i>
(i). Suturing of bleeding and biliary leak points in gall bladder bed	7	0.7%
(ii). Ligation of cystic artery bleeding	11	1.1%
(iii). Control of bleeding from port site	5	0.5%
(iv). Repair of CBD over T-Tube	3	0.3%
(v). Hepatico-jejunostomy (Roux-en-Y)	6	0.6%
(vi). Choledocho duodenostomy	1	0.1%
(vii). Choledocho-Jejunostomy (Roux-en-Y)	4	0.4%
(viii). CBD Exploration with T-Tube drainage	3	0.3%
(ix). Repair of Duodenum	2	0.2%
(x). Ligation of abnormal biliary ducts	3	0.3%
(xi). Removal of clips	5	0.5%
(xii). Ligation of cystic duct stump	8	0.8%

RESULTS

Out of 1000 patients 85.7% were females and 14.3% males with female to male ratio of 6:1. Majority of patients presented with pain in right hypochondrium (64.9%) or pain in right hypochondrium and epigastrium (24.3%) along with dyspepsia (12.2%) and heart burn (10.7%) as main clinical symptoms. Highest number of cases was found in 3rd, 4th and 5th decade (67.2%) with mean age of 46.75 years.

Fifty eight patients (5.8%) required exploration for one or other reason not manageable by conservative treatment. Bleeding (2.2%), biliary leak (1.9%) and obstructive jaundice (1%) were main indications for exploration (Table-I). These patients were assessed by various investigations (Table-II) and managed accordingly by different surgical options depending upon the cause as given in Table-III. Biliary duct injuries were most difficult problems & therefore required major surgical procedures in form of Roux-en-Y Hepatico-jejunostomy (0.6%) or choledochojejunostomy (0.4%) and choledochoduodenostomy (0.1%).

When comparison was made between early phase of learning curve and later period with experience of laparoscopic surgery, the complication rate was found more in early phase period as compared to late period (Table-IV).

DISCUSSION

Laparoscopic cholecystectomy has definite advantages over open method and is certainly less

invasive but the question is "Are we safe enough" to carry out the procedure.⁴ As the risk of intraoperative complications during laparoscopic procedure is higher as compared to open technique⁵ and therefore the rate of conversion and postoperative exploration is also high. The postoperative complication rate of laparoscopic cholecystectomy is 5.0-6.0%.⁶ This study has mainly focused on those major laparoscopic complications which required postoperative exploration and were not possible to manage by conservative methods.

The main reasons for Re-do surgery were bleeding, biliary leak, obstructive jaundice and duodenal perforation, due to some unidentified reasons. Bleeding is one of the most frequent and dangerous complication of laparoscopic cholecystectomy⁷ and in this series it was encountered in 2.2% of cases which was, due to trocar trauma in 0.5%, slipping of clips from cystic artery in 1.1% and oozing in cirrhotic patients from gallbladder bed in 0.6% of cases. However the incidence of bleeding from various sources such as trocar site (9.97%), vascular injury in calot's triangle (16.23%) and liver bed (11.11%) given by Rooh-ul-Muqim et al⁸ is quite high as compared to our study because they have included preoperative and postoperative complications. Overall incidence of bleeding given by Arain GM et al is 3.18% which is also higher than this study.⁹

Bile duct injuries after laparoscopic cholecystectomy remains serious problem with major implications for patient outcome.^{3,10,11} Overall incidence of bile duct injuries is approximately twice as high as

Table-IV: Showing Comparison of Complications During early Learning curve & late period (no: 1000).

<i>Problems</i>	<i>In early phase of learning curve (2003-2004)</i>		<i>In later period (2005-2010)</i>		
	<i>No. of pt:</i>	<i>%age</i>	<i>Problems</i>	<i>%age</i>	<i>p-value</i>
Bleeding	15	1.5	7	0.7	0.003
Biliary leak	16	1.6	8	0.8	
Obstructive Jaundice	7	0.7	3	0.3	
Duodenal Perforation	2	0.2	0	0	

open cholecystectomy.¹² However from the world-wide database record the incidence of major bile duct injuries varies from 0.16 to 2.35% as compared to open cholecystectomy .07-9%.¹³⁻¹⁶ Bile duct injuries leading to biliary leak were seen in 1.9% of cases in this study, consisting of cystic duct stump leak 0.5%, right hepatic duct injury 0.2% common hepatic duct injury 0.3%, common bile duct injury 0.5% and abnormal ducts injury 0.4%. However Vegenas K et al reported cystic duct leak in 0.24%, CBD injury in .16%, leak from gall bladder bed 0.24% in their study.⁷ These injuries were managed by simple repair of CBD over T tube (0.3%) or major surgical procedures like choledochoduodenostomy (0.1%), Roux-en-Y choledochojejunostomy (0.4%) and Roux-en-Y hepatico-jejunostomy (0.6%) depending upon site of injury. Same has been recommended by Holtek et al¹⁰, Lien H et al¹⁷, Neuhaus et al¹⁸, Connor S & Gorden OJ¹⁹ in their studies.

Obstructive jaundice either due to clipping of major biliary ducts (5 cases) or retained CBD stones (5 cases) was seen in 1% of cases in this study. Occlusion of CBD by clips was also seen in 5 cases by Schmidt et al in their study.³ Upto 18% of patients undergoing for laparoscopic cholecystectomy may have concurrent choledocholithiasis²⁰ but the reported incidence of retained stones in CBD is between 0.5-2.5%^{2,6} which also coincides with this study. ERCP is useful diagnostic and therapeutic modality for retained CBD stones,²¹ however no one patient was managed by ERCP due to unavailability of facility in our setup. All our patients with retained CBD stones were treated by open exploration of CBD.

Biliary peritonitis was seen in 0.3% of cases in this series where as Cawich SO et al²² found this problem in 2.02% of cases which is higher than this study. Duodenal injury was revealed in 0.2% of cases in this study, however it accounts for 0.8% as given in various studies.^{7,16} Overall incidence of visceral injuries during laparoscopic cholecystectomy varies from 0.09-1.01%.^{9,22}

CONCLUSION

Laparoscopic cholecystectomy though considered to be gold standard for cholelithiasis but still carries risk of complications in the cases who had either difficult cholecystectomy or overlooked congenital anomalies during procedure leading to increased morbidity of patients. However they can be minimized and well managed by proper pre-operative assessment of patients and availability of other modern minimally invasive facilities.

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Authors Contribution:

AHT: Study, design & writing of manuscript.

AMM: Collection of data.

AKS: Tabulation of the results & data analysis.

AAL: Literature search.

JNQ: Critical review of manuscript.

CS: Literature search & writing of references, review of manuscript.