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Intraoperative Intra-Abdominal Complications of Laparoscopic Cholecystectomy- A Prospective Study

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Abstract
Cholecystectomy is the commonest operation of the biliary tract and second most common operative procedure today. Advantages of laparoscopic cholecystectomy are shorter hospital stay, less pain, quick return to normal activities, better cosmetic scar, diminishes contact with patient's blood. The complications of laparoscopic cholecystectomy can be divided into biliary and extra-biliary complications. The extra biliary complications can be further divided into access related and procedure related.
Aim And Objective of the study: *To study the intra operative and intra abdominal complications; and to study the morbidity and mortality associated with laparoscopic cholecystectomy and; to formulate guidelines to prevent intraoperative and intra abdominal complications.*
Material and Methods: *The prospective study was conducted in the Department of General Surgery, Government Medical College, Amritsar, with 50 consecutive patients of symptomatic gall stones. The inclusion criteria was symptomatic gall stone disease in which gall stones were documented on ultrasonography, no clinical, biochemical or ultrasonographic evidence of common bile duct stones or gall bladder mass. Patients of both sexes between 16-75 years were included in the study.*
Observations: *In the present study 3 patients had bleeding during the procedure 2 from gall bladder bed and 1 from cystic artery, which was easily controlled. One patient had liver injury by scissor during separation of gall bladder from its bed. Gall bladder perforation is a common intra operative event. In the present study 2 cases (4%) had perforation. Conversion rate was 2% in the present study due to a CBD injury.*
Conclusion: *Major extra-biliary as well as biliary complications were prevented by strictly following the basic principles of laparoscopic cholecystectomy.*
Keywords: *Intraoperative| Intra-Abdominal| Complications| Laparoscopic Cholecystectomy.*

Introduction

Gall bladder disease is a common occurrence in both sexes, particularly in females. Cholecystectomy is the commonest operation of the biliary tract and second most common operative procedure today. In last two decades the introduction of laparoscopy has revolutionized this procedure (Utpal, 2004)[1]. The first major series of

laparoscopies in human beings is attributed to H.C. Jacobaeus in 1911. In India first laparoscopic cholecystectomy was performed by T.E. Udwadia, 1991.

Advantages of laparoscopic cholecystectomy are shorter hospital stay, less pain, quick return to normal activities, better cosmetic scar, diminishes contact with patient's blood [2]

The complications of laparoscopic cholecystectomy can be divided into biliary and extra-biliary complications. The extra biliary complications can be further divided into access related and procedure related. The major extra biliary complications are due to unclear anatomy, retained stones in common bile duct, bile leak, cystic duct leakage and bleeding. Minor complications include costochondritis, wound infection, fever, prolonged ileus, umblical port site hernia, fluid collection and bleeding from port site. (Peters et al, 1991)[3].

Currently it is estimated that 90% of cholecystectomies are performed by the laparoscopic approach and is gold standard for gallstone disease. [4]

Aim and Objective of the study

To study the intra operative and intra abdominal complications; and to study themorbidity and mortality associated with laparoscopic cholecyste-ctomy and; to formulate guidelines to prevent intraoperative and intra abdominal complications.

Material and Methods

The prospective study was conducted in the Department of General Surgery, Government Medical College, Amritsar, with 50 consecutive patients of symptomatic gall stones. The inclusion criteria was symptomatic gall stone disease in which gall stones were documented on ultrasonography, no clinical, biochemical or ultrasonographic evidence of common bile duct stones or gall bladder mass. Patients of both sexes between 16-75 years were included in the study.

American approach was followed for the laparoscopic procedure.

Complications related to establishment of pneumperitoniumi.e. veress needle/ trocar related injuries, insufflator problem were recorded. Complications related to operative technique like: abnormal duct and arterial anatomy, peritoneal adhesions, calot's triangle adhesions, mucocele, empyema, spillage of bile, bleeding from portahepatis, haemorrhage from cystic artery, wound infection, fever, prolonged ileus, umblical port site hernia, fluid collection and bleeding from port site were considered.

All the results were analysed by applying standard statistical tools.

Observations

Table 1

Age	Male		female		Total	
	No	%	No	%	No	%
0-10	-	-	-	-	-	-
11-20	-	-	2	4.88	2	4
21-30	1	11.11	12	29.27	13	26
31-40	2	22.22	10	24.38	12	24
41-50	3	33.33	9	21.95	12	24
51-60	3	33.33	4	9.76	7	14
61-70	-	-	4	9.76	4	8
71-80	-	-	-	-	-	-
Total	9	100	41	100	50	100
Range	26-60		15-66		15-66	

Table no 1 shows that in the present study majority of the cases were females (82%) and males were only (18%). 74 % females were in the age group of 21-50. The youngest patient in the study was a 15 year female and the oldest was a 66 year female.

Table 2: Symptoms

Symptoms	No.of patients	%age
Pain Abdomen	48	96
Vomiting	4	8
Fever	-	-
Dyspepsia	44	88
Jaundice	-	-

Table 2 shows the symptoms that patients presented. Some patients had more than one symptoms. In the present study majority of the patients presented with pain right upper abdomen 96%, dyspepsia 88%, vomiting 8%. No patient had fever and jaundice.

Table 3: Per operative condition of gall bladder

S.No	Condition of gall bladder	No. of patient	%age
1	Simple gall bladder	28	56
2	Chronic cholecystitis with adhesions to liver and calot's triangle	11	22
3	Distended gall bladder with omental adhesions	5	10
4	Mucocele	3	6
5	Empyema	-	-
6	Contracted gall bladder with adhesions	1	2
7	Dense adhesions with unclear anatomy	1	2
Total		50	100

Table 3 shows that maximum patients had 56% simple gall bladder disease.

Table 4: Per operative complications

S.No	Complications	No. of patients	%age
1	Veress needle injury	Nil	Nil
2	Trocar injury	Nil	Nil
3	Bleeding		
A	Cystic artery	1	2
B	Right hepatic artery	Nil	Nil
C	Gall bladder bed	2	4
D	Major vessel	Nil	Nil
E	Port site bleeding	Nil	Nil
4	Visceral bleeding	1 liver	2
5	Bowel injury	Nil	Nil
6	Biliary complications		
A	Hepatic duct injury	Nil	Nil
B	Cystic duct injury	Nil	Nil
C	Cbd injury	1	2
7	Rupture of gall bladder		
A	Gall bladder perforation, stone & bile spillage	2	4
B	Pus/ mucus spillage	Nil	Nil
8	Technical complications	Nil	Nil

Table 4 shows that 1 patient had cystic artery, visceral (liver) injury and CBD injury. 2 patients had bleeding from gall bladder bed and spillage of stones and bile.

Table 5: Morbidity and mortality

Complications	No of patients	%age
Cystic artery injury	1	2
Gall bladder bed bleed	2	4
Visceral injury	1 liver	2
CBD injury	1	2
Rupture of gall bladder	2	4
Total	7	14
MORTALITY		
Yes	Nil	0
No	50	100

Table 5 shows that overall complication occurred in 7 (14%) cases and only 1 case of CBD injury was converted to open and rest were managed without open procedure.

Discussion

The increasing acceptance of surgical therapy for gall stone disease and its consequences over past 100 years is the result of availability of accurate methods of diagnosis, the safety and ease with which the operations are accomplished and the satisfactory long term relief of sypmtoms and interruption of pathological process involved.[5]

The surgical expertise has come a long way since Langenbach's first cholecystectomy in 1882. Laparoscopy cholecystectomy is considered to be the procedure of choice for elective cholecystectomy.[6]

In the present study majority of the patients are in age group of 21-50 years, range between 15-66 years. In Bailey et al, Wolfe et al, Southern Surgeon Club, Schimmer, Peters et al, most of the patients were in the age group of 18-70 years, mostly being in around 45 years.[7.8.9.10,11]

In the present study 82% females and 18% males underwent surgery. In other previous studies like Bailey et al, Peters et al, Schimmer et al, females undergo cholecystectomy in more number.[7,11,10]

Most of the patients in our study presented with pain right hypochondrium 95% and dyspepsia. In Bailey et al series 90% of the patient had cholelithiasis, with similar symptoms.[7]

Closed method was used in creating the pneumoperitonium with verees needle and no injury was reported. The incidence of such injuries ranges between 0.1% to 0.4%. The incidence reported by other series Scott et al-6%, Baird et al-0.3%, Deziel et al-0.14%, Go et al-0.15%.[12,13,14,15]

In the present study 3 patients had bleeding during the procedure 2 from gall bladder bed and 1 from cystic artery, which was easily controlled. Other series reporting major bleeding are Cuschieri et al-0.9%, Southern Surgeon Club-0.3%, Vagenas et al-1.55% and Deziel et al-0.25%.[16,9,17,14]

One patient had liver injury by scissor during separation of gall bladder from its bed. Malik et al reported-0.86% of cases of sub-capsular liver haematoma during their study on extra biliary complications of laparoscopic cholecystectomy.[18]

In the present study 1 case had CBD injury and the procedure was converted to open. Massimoet al-0.58% bile duct injuries, De Werra noted-0.75% bile duct injuries, Ahmed J et al found-0.2%, Denjalic et al found-0.1-0.42% bile injuries and largest being 2.6% in Malik et al. [19,20,21,22,18]

Gall bladder perforation is a common intra operative event. In the present study 2 cases (4%) had perforation. Soper and Dunnegan 30 %, Cuschieri 16%, Philps et al 30%, Kok et al 12%, Manukyan et al17%. [23,16,24,25,26]

Conversion rate was 2% in the present study due to a CBD injury. Bailey et al 5%, Berci et al 5%, Cuschieri et al 3.6%, Wolfe et al 3%, Scott et al 4.3%, Sourthen Surgeon Club 4.7%, Vagenas et al 1.88% and Malik et al 2%. [7,27,16,8,12,9,28,15,23,25,17,18].

Conversion rate of 5-10% do not reflect the surgeon's endoscopic inability but rather his sound judgement.[12]

Peters et al reported 8% morbidity, Wolfe et al reported 6%, Kok et al reported 5%. [11,8,25]. Present study reports 2% morbidity and 0% mortality.

Conclusion

This prospective study conducted in the Department of General Surgery, Government Medical College, Amritsar, with 50 consecutive patients of symptomatic gall stones reveals major complication rate as 2%, minor complication as 12% and conversion rate as 2%. Minor per operative complication included bleeding from cystic artery 2%, gall bladder bed bleeding 4%, injury to liver 2%, gall bladder perforation with spillage of bile/stone 4%. This data of our study suggests that laparoscopic cholecystectomy is safe procedure with low complications, low morbidity and zero mortality.

The essentials of safe laparoscopic cholecyst-ectomy were maintained- thorough knowledge of anatomy, dissecting close to the neck of gall bladder, meticulous dissection of calot's triangle, confirming the cystic artery and duct.

Patience and low threshold for conversion in difficult cases substantially decreases morbidity and mortality.

Finally it is concluded that the major extra-biliary as well as biliary complications were prevented by strictly following the basic principles of laparoscopic cholecystectomy.

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