

THE LEARNING CURVE OF FIRST ONE HUNDRED LAPAROSCOPIC CHOLECYSTECTOMY

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Abstract

Laparoscopic cholecystectomy became gold standard for treatment of symptomatic gall stone disease. Analysis of the first hundred patients who underwent laparoscopic cholecystectomy to study the learning curve and complications. The highest number of patients underwent completed laparoscopic cholecystectomy 54 (90%) and the lowest conversion rate 10% (6/60) with high percentage 22% of patients with complicated gall stone disease during year of 2004. Biliary injury 2%, occurred mainly in the early years. Total conversion rate was 21%. These results were improved with increasing experience, resulting in safe laparoscopic cholecystectomy and minimal complications.

Introduction

Since the introduction of laparoscopic cholecystectomy (L.C.) by Philippe Mouret, French surgeon in 1987^{1,7,9}, laparoscopic cholecystectomy became gold standard for treatment of symptomatic cholecystolithiasis^{1,2,6,11-15,17}. But the publicity about the laparoscopic biliary injuries has threatened the acceptance of this procedure^{2,12,13,15,17}. This is because of wide use of this procedure without training has grown rapidly with increasing complications by less experienced surgeons who are in their early learning curve^{3,4,10,17}. The aim of this study is to analyze the first hundred patients who underwent laparoscopic cholecystectomy to study the learning curve and complications.

Patients and methods

Prospective study of first hundred patients who underwent L.C. from February 2002 to November 2004 was carried out. Data regarding age, sex, clinical presentation, investigations, operative technique, postoperative complications, were reported. All patients received prophylactic anti-

biotics, cefataxime 1g preoperatively, no prophylactic anticoagulant was given to any patient.

Results

Age: Females mean age was 42 years, ranging between 20-70 years. Males mean age was 49 years, ranging between 25-60 years.

Sex: Seventy seven females 77 (77%) and 23 males (23%).

Table I shows the number of patients treated laparoscopically, 15 patients, 25 patients, 60 patients, were increasing each year 2002, 2003, 2004, respectively. Percentage of completed laparoscopic cholecystectomy was increasing 46.6% (7/15), 72% (18/25), 90% (54/60) each year 2002, 2003, 2004, while conversion rate was decreasing 53% (8/15), 28% (7/25), 10% (6/60), each year, with total conversion rate 21% (21/100) and total percentage of completed laparoscopic cholecystectomy 79% (79/100).

Figure 1, shows average of patients with laparoscopic cholecystectomy per month each year is increasing 1(15/12),

2(25/12), 5(60/12) through years 2002, 2003, 2004.

Table II shows total number of patients with completed laparoscopic cholecystectomy through year of 2002, 2003, 2004, were 47%(7/15), 72%(18/25), 90%(54/60). Conversion rate dropping progressively 47% (7/15), 24% (6/25) and 7% (4/60) each year. Patients with complicated gall stone disease with completed laparoscopic cholecystectomy 13% (13/100). Patients with complicated gall stone disease one, Patient with mucocele and one patient with acute cholecystitis both during year 2002, 2003 were converted to open cholecystectomy, while during year 2004 ten patients with acute cholecystitis 17% (10/60), two patients with mucocele and one patient with cholecystostomy all were completed laparoscopically.

During first year we adopt closed technique for creation of pneumo-peritoneum while later years 2003, 2004, we shifted to open technique.

Figure 2 shows percentage of thick wall gall bladder more than three millimeter measured by ultrasound and percentage of conversion each year which shows a drop in percentage of conversion to open cholecystectomy with increasing wall thickness each year, Percentage of patients with thick wall gall bladder during year 2002 was 40% (6/15) and conversion rate 27% (4/15), those with thick wall during 2003 were 24% (6/25), and conversion rate 16% (4/25), during year 2004 percentage of patients with thick wall gall bladder was 37% (22/60), conversion rate was 5%(3/60).

Intraoperative complications

Table III shows, during 2002 three patients developed bleeding from cystic artery and the others from injury to posterior branch of the cystic artery. All of them converted to open cholecystectomy, During 2003 bleeding occurred in two patients from cystic artery, one of them managed

immediately and underwent laparoscopic cholecystectomy, the second converted to open cholecystectomy. During 2004 just three patients had intraoperative bleeding one of them converted to open cholecystectomy, the others were managed intraoperatively and laparoscopic cholecystectomy completed. Two patients had common bile duct injury, both converted, one of them repaired by end to end anastomosis, the other one had lateral injury of common bile duct and was repaired. Liver injury was recorded in 2002 caused by port insertion.

Postoperative complications

During 2002 and 2003, two patients presented with biliary fistula. One patient leaked from port site fourth post operative day and stopped draining on the tenth postoperative day. Other patient had sub-hepatic tube drain continued draining bile for seven days and ceased spontaneously.

Port site infection in one patient.

No hernia occurred at port sites.

Discussion

The adoption of open technique in creation of pneumo-peritoneum as it is safe^{12,15}, result more patients with previous abdominal surgery or umbilical hernia pneumo-peritoneum underwent laparoscopic cholecystectomy safely. The highest number of patients underwent completed laparoscopic cholecystectomy 54 (90%)⁶ and the lowest conversion rate was 10% (12) (6/60) was during year of 2004 Also more patients with complicated gall bladder stone disease 22% (13/60) and those with thickened gall bladder wall more than three millimeter¹¹ underwent laparoscopic cholecystectomy safely, with lower conversion rate 5% (3/60). This because as the experience grew up the learning curve will improve. The learning curve results in more patients with complicated gall bladder stone disease underwent laparoscopic chole-

cystectomy safely with lower conversion rate^{11,15}. The incidence of biliary injury was 2% two patients only were discovered intraoperatively, one with friable cystic duct with excessive traction^{1,5}, the cystic duct avulsed near the junction with the common hepatic duct, while the other with a common bile duct transection, these injuries occurred during early years^{3,4,10,17}, while no biliary injury occurred during 2004¹³. The total conversion rate was 21%^{2,6}, this is high because more patients with

laparoscopic cholecystectomy converted to open technique during early experience^{2,5,8,12}, with conversion rate 53%, 28% during 2002, 2003. These figures reflect ascendancy of the learning curve and should improve as surgeon develops greater expertise in laparoscopic cholecystectomy.

We conclude that increasing experience and proper selection of patients result in an increase in number of laparoscopic cholecystectomy with minimal complications and conversions.

Table I: Patients underwent laparoscopic cholecystectomy and the conversion rate

Years	2002	2003	2004	Total
Total	15	25	60	100
Completed Lap.chole(LC)	7	18	54	79
[%]	[46.6%]	[72%]	[90%]	[79%]
Conversion	8	7	6	21
[%]	[53%]	[28%]	[10%]	[21%]

Table II: Patients with gall stone disease treated laparoscopically and their conversion rate

	2002		2003		2004		Total	
Total	15		25		60		100	
	L.C conversion		L.C conversion		L.C conversion		L.C conversion	
Symtomatic cholecystolithiasis	7	7	18	6	41	4	66	17
	47%	47%	72%	24%	68%	7%	66%	17%
Acute cholecystitis				1	10	2	10	3
				4%	17%	3%	10%	3%
Mucocele		1			2		2	1
		6%			3%		2%	1%
Cholecystostomy					1		1	
					2%		1%	

Fig. 1: The average number of patients with laparoscopic cholecystectomy per month

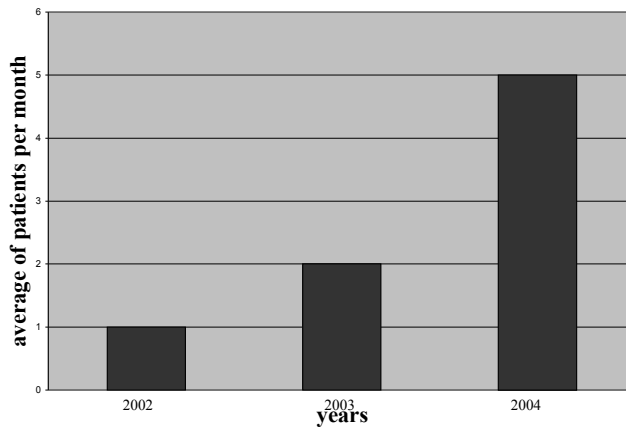


Fig. 2: The percentage of patients with thick gall bladder wall and conversion rate

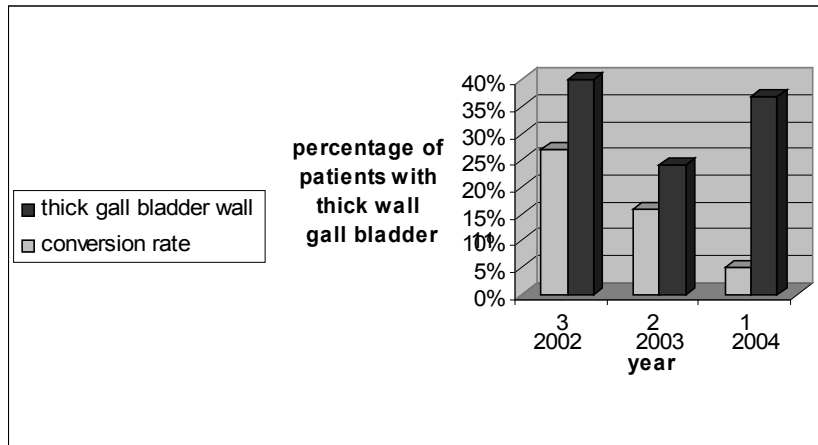


Table III: The intraoperative complications during laparoscopic cholecystectomy leading to conversion

Year	2002		2003		2004	
Total	15		25		60	
Bleeding Arterial:	L.C.	Conversion	L.C.	Conversion	L.C.	Conversion
Bed :		1	1	1	2	1
Biliary injury		1		1		
Liver injury		1				

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