

## Laparoscopic Cholecystectomy Report of 30 Cases

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### ABSTRACT

Laparoscopic cholecystectomy (LSC) was attempted in 30 patients and was accomplished in 29 during the nine months between March and November 1991. Twenty eight patients had cholelithiasis with or without adenomyosis, and two had adenomyosis of the gall-bladder. Mean operative time was 219 min and postoperative pain was slight. Two complications (6.9%), including necrosis of the common hepatic duct and subcutaneous emphysema, were encountered. Patients with subacute and severe chronic cholecystitis were included in the cases. Thus this technique is recommended for almost all patients who require the removal of the gall-bladder for benign diseases.

**Key words:** *Laparoscopic cholecystectomy, Laparoscopy, Cholecystectomy*

Since laparoscopic cholecystectomy (LSC) was first established in Europe<sup>2,9)</sup> and the United States<sup>10,14)</sup>, the technique has become a popular method for removal of the diseased gall-bladder. The advantages of LSC are the minimal invasiveness of the procedure, early return to normal activity and improved cosmetic results<sup>4,12,13)</sup>, thus contributing to an improvement in the patient's quality of life.

The cases of thirty patients who underwent LSC in Okayama Central Hospital during the nine months between March and November of 1991 are here reviewed.

### PATIENTS AND METHODS

**Patients** The patients who averaged 41 years of age (range 14-73), consisted of fourteen men and sixteen women (Table 1). Twenty eight patients had cholelithiasis and four had adenomyosis of the gall-bladder. Four patients (case 7, 17, 23 & 25) had gross anatomical and histologic evidence of marked chronic inflammation of the gall-bladder, and one (case 20) showed evidence of subacute cholecystitis. One patient who had been jaundiced (case 23) underwent endoscopic sphincterotomy (EST) two days before LSC. Ultrasonographic examination was done in all cases and demonstrated a thickened wall (4 mm or more) in the gall-bladder in 8 patients (case 15, 17, 20, 23, 25, 27, 28 & 29). Preoperative cholangiography using intravenous drip infusion of Biliscopin® (DIC) was performed

in 29 patients and endoscopic retrograde cholangiography (ERC) was done in 4 patients. In seven patients preoperative DIC failed to demonstrate the gall-bladder; three patients had a visible cystic duct and in four (case 20, 23, 25 & 28) the cystic duct was invisible. Prior lower abdominal and pelvic surgery had been done in five patients. Two patients were in a hemodialysis program because of chronic renal failure and one patient had controllable bronchial asthma.

During the same period, LSC was not attempted in two patients who had severe acute cholecystitis with localized peritonitis.

**Equipment** The equipment used was as follows: pressure-controlled CO<sub>2</sub> insufflator (Cabot Medical Corp.), laparoscope (10mm, 0° , Olympus, A5214), xenon light source (Fujinon Eve Processor, EPX-302), television monitor (SONY, PVM-1442Q), endoscopic videocamera and its connector (Fujinon EM, F-10Z) and titanium clip applicator (Auto Suture). 11-mm and 5-mm trocars, laparoscopic grasping forceps, dissectors, scissors and hook-shaped electrocauter were supplied by Cabot Medical Corp., sucker/ irrigator by WISAP, and 10-mm trocar by Olympus.

**Operative technique** The operative technique was almost the same as that reported by Reddick and/or Olsen<sup>8,10)</sup>. Briefly, a 10-mm trocar for the videolaparoscope was placed at the umbilicus of the patient under general anesthesia whose legs were wrapped by an elastic bandage. An 11-mm trocar,

**Table 1.** Patients and operation details

No	Sex	Age	Disease	Risk factors	Operative cholangiography	Operation details	Operative time (min)	Outcome	Analgesics
1	M	63	GB stone			CBD cannulation	212	Laparotomy	Pentazocine Opiate
2	M	42	"			Normal	450		Suppo Pentazocine
3	M	47	"			"	347		Suppo
4	F	40	"	HD-CRF	"	"	235		Suppo Pentazocine
5	M	56	"			"	237		Suppo
6	F	33	GB stone Adenomyosis			Failed cannulation	262	Peritonitis Laparotomy 4 days later	Suppo Pentazocine
7	F	50	GB stone Hydrops GB	Ope scar in LA	DIC*	Bile leak from GB	247		Suppo Pentazocine
8	F	14	Adenomyosis Limy bile		DIC		229	Subcutaneous emphysema	Suppo
9	M	57	GB stone	Asthma	Normal		181	Attack of athma	Suppo
10	F	23	"			"	259		
11	M	46	"			"	143		Suppo
12	M	43	"	Ope scar in LA	"	"	244		Suppo
13	M	29	Adenomyosis			"	89		Suppo Pentazocine
14	F	33	GB stone Limy bile			"	160		Suppo
15	F	45	GB stone			"	138		Suppo Pentazocine
16	F	31	"			"	155		Suppo
17	M	46	GB stone Limy bile Hydrops GB			DIC Normal	263		Suppo
18	M	36	GB stone			DIC Normal Failed cannulation	182		Suppo Pentazocine
19	M	70	"	HD-CRF Chronic hepatitis Pan- cytopenia	Normal	Adhesion Bleeding from liver bed	280		
20	F	19	Subacute cholecystitis GB stone	Ope scar in LA	"	Marked swelling of GB	203		Suppo
21	F	49	GB stone	Ope scar in LA	"	Bile leak from GB	182		Suppo Pentazocine
22	F	38	"			"	263		
23	F	73	GB stone CBD stone	Ope scar in LA	Not done	Adhesion Marked chronic cholecystitis Bile leak from GB	300		Suppo
24	F	40	GB stone			Normal	107		Suppo

No	Sex	Age	Disease	Risk factors	Operative cholangiography	Operation details	Operative time (min)	Outcome	Analgesics
25	M	40	GB stone		Normal	Adhesion	250		Suppo Pentazocine
26	M	26	"		"	Chronic cholecystitis Large infundibulum Bleeding from posterior branch of cystic artery	205		Suppo Pentazocine
27	M	34	"		"		201		
28	F	33	"		"		172		Suppo Pentazocine
29	F	37	"		"	Bile leak from GB	207		Suppo
30	F	42	GB stone Adenomyosis		"		156		Suppo Pentazocine

Abbreviations used are as follows: CBD (common bile duct), GB (gallbladder), HD-CRF (hemodialysis, chronic renal failure)

LA (lower abdomen), Suppo (suppository of 50mg ketoprofen)

\* DIC was done as operative cholangiography.

the operating port, was placed in the mid-line 5 to 7 cm below the xyphoid process, and two 5-mm trocars were placed along the anterior axillary line and the mid-clavicular line just below the costal margin. The gall-bladder was grasped both at the fundus and at the Hartman's pouch by the grasping forceps through the two 5-mm trocars. Dissection, cutting, clipping and irrigation were done through an 11-mm operating trocar. Blunt dissection of the Calot's triangle was started and both the cystic duct and the cystic artery were clipped and divided. Before the division of the cystic duct, intraoperative cholangiography was performed. "Cystic duct" cholangiography was performed by inserting an ERCP tube, which was equipped with a 5-mm bronchofiberscope (Olympus, P20), into the incised cystic duct. In some cases, intravenous cholangiography was performed. Dissection of the gall-bladder off the liver bed was performed using cautery. After coagulating and cutting the serosal attachment, blunt dissection was carried out using the back of a hook-shaped electrode, and the remaining tissues were coagulated and cut using the electrode. The gall-bladder was brought out through the epigastric port and thorough irrigation and aspiration were performed before inserting a penrose drain to the Morrison's fossa.

## RESULTS

LSC was attempted in 30 patients and was accomplished successfully in 29 (Table 1). Conversion to open cholecystectomy in case 1 was due to the misdissection of the common bile duct and a small incision on it for cholangiography. Primary repair of the incisional site and cholecystectomy were performed and a T-tube was not used.

The operative time was gradually decreased

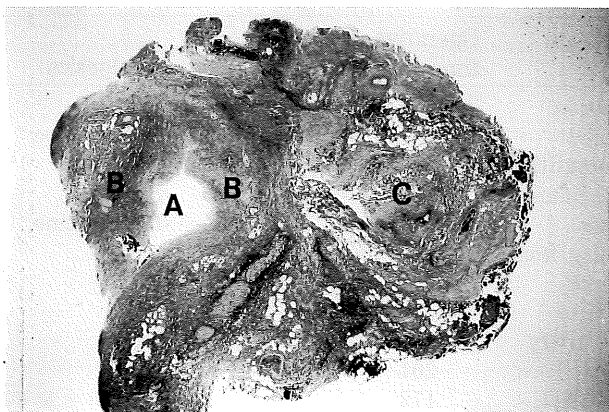
**Table 2.** Operative time and postoperative recovery. Results from 29 cases in which LSC was accomplished.

Operative time	219 ± 72 min		
Analgesics	none	4	cases
	suppository* alone	13	"
	suppository + pentazocine (inj.)	12	"
Postoperative oral feeding	1st day	23	"
	2nd day	5	"
	3rd day	1	"
Postoperative ambulation	1st day	16	"
	2nd day	11	"
	3rd day	2	"

\* Suppository of 50mg ketoprofen.

throughout the series (Table 1) and the mean operative time was 219 min (Table 2). Four patients did not need any analgesics postoperatively and 13 needed suppositories of ketoprofen alone. Postoperative oral feeding and ambulation were commenced in almost all cases on the first or second day after operation. The mean postoperative hospital stay for the 28 patients, excluding cases 1 and 6, was 11.4 days.

One severe complication was encountered in the whole series (case 6). This patient was operated for acute abdomen 4 days after the LSC, and laparotomy revealed a partially necrotic common hepatic duct with bile spillage and bile peritonitis. The necrotic part was resected and hepatico-jejunostomy was performed. The pathologic finding of the resected necrotic tissue was consistent with cautery injury (Fig. 1). Subcutaneous emphysema, which was observed in case 8, was absorbed within 24



**Fig. 1.** Histological features of the resected common hepatic duct. Coagulation necrosis with no inflammatory reaction in the restricted area (B) is consistent with that caused by surgical cautery.

A: Lumen of the common hepatic duct

B: Necrotized muscle layer and epithelium of the duct

C: Connective tissue

hours without any sequelae.

Case 4 and 19 had chronic renal failure and had been undergoing hemodialysis. Hemodialysis was done on the day before operation and on the first and second day after operation. No complications were met in case 4. In case 19, a patient who also had chronic hepatitis C and pancytopenia, the operation was complicated by oozing of blood from the liver bed. Bronchial asthma in case 9 was controlled preoperatively by corticosteroids. Wheezing began just after extubation but was controlled both by inhalation of  $\beta$ -blocker and an injection of corticosteroid.

LSC was performed in one patient with subsided acute cholecystitis that was treated medically two weeks before operation (case 20). The gallbladder was hard and swollen due to an incarcerated stone in the neck, but it was not difficult to dissect the Calot's triangle. Case 23 had had an acute attack superimposed on chronic cholecystitis and had common bile duct stones which were removed by EST two days before operation. The gallbladder was buried in the omentum with marked adhesions and the anatomy of the Calot's triangle was very obscure. The operative time in this case was 300 min.

## DISCUSSION

LSC has several advantages including reduced postoperative pain, early return to normal activity, early discharge and improved cosmetic results<sup>4,12,13</sup>. In this series four patients needed no analgesics and 13 needed only suppositories. Reduction in the use of analgesics is further expected as operative time gets shorter. The operative time for LSC is slightly longer than traditional cholecystectomy, with the mean time ranging from 70 to 155

min<sup>1,4,5</sup>. In our initial 30 cases, the mean operative time was 219 min. With increasing experience, the duration of the procedure is expected to decline to within 90 min except in difficult cases.

The major reasons for conversion to open procedure are reported to be bile duct injury, uncontrollable bleeding and obscure anatomy of Calot's triangle<sup>6,7,14</sup>. We experienced two bile duct injuries; one was the first case in which the common bile duct was dissected and incised for cholangiography, and the other was case 6 in which the use of a hook-electrode in the Calot's triangle during dissection caused necrosis of the common hepatic duct. In the latter case peritonitis occurred on the fourth day. Excess pulling of the Hartman's pouch should be avoided and the dissection of the Calot's triangle must start bluntly. From the fact that no complications were encountered in the last 15 cases, a learning curve<sup>7,12</sup> is probably present.

From our experience in cases 4, 9 and 19, we suggest that; patients with controllable bronchial asthma or chronic renal failure managed by hemodialysis can be candidates for LSC.

Contraindications to LSC are becoming fewer depending on the experience of the surgeon<sup>4</sup>. Reddick and his colleagues<sup>11</sup> and Flowers and his colleagues<sup>3</sup> demonstrated satisfactorily that complicated gall-bladder diseases such as acute cholecystitis could be managed laparoscopically. We will therefore continue to try LSC in difficult situations such as in cases 20 and 23, with special attention to safety. We consider that contraindications to LSC are: severe bleeding disorders, severe liver cirrhosis, pregnancy and poor risk states intolerant to general anesthesia.

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