의학 석사학위 논문

Surgical Outcomes of Laparoscopic Cholecystectomy for Severe Acute Cholecystitis

아 주 대 학 교 대 학 원

의 학 과

김 정 운

Surgical Outcomes of Laparoscopic Cholecystectomy for Severe Acute Cholecystitis

by

Jeong Woon Kim

A Dissertation Submitted to The Graduate School of Ajou University
in Partial Fulfillment of the Requirements for the Degree of

MASTER OF MEDICAL SCIENCES

Supervised by
Wook Hwan Kim, M.D., Ph.D.

Department of Medical Sciences
The Graduate School, Ajou University
August, 2008

김정운의 의학 석사학위 논문을 인준함.

심사위원장 김 욱 환 인

심사위원 김 진 홍 인

심사위원 유 병 무 인

아 주 대 학 교 대 학 원

2008년 6월 23일

- ABSTRACT -

Severe Acute CholSurgical Outcomes of Laparoscopic Cholecystectomy for ecystitis.

The aim of this study was to evaluate surgical outcomes of Laparoscopic cholecystectomy (LC) in patients who were diagnosed with severe acute cholecystitis (SAC) and to clarify useful treatment modalities of SAC. Of 112 patients who presented SAC, we selected 99 paatients and divided them into three groups; 37 patients who underwent preoperative percutaneous transhepatic gallbladder drainage (PTGBD) (Group 1), 62 patients with SAC but not indicated for PTGBD (Group 2) and 59 patients with acute and chronic cholecystitis (Group 3). The conversion rate was 2.7% (1/37) in group 1, 6.5% (4/62) in group 2, and 1.7% (1/59) in group 3. In groups 1 and 2, the postoperative stay and operative time were longer than those in group 3 with significant difference, respectively ($P<0.05$).

In group 2, there was correlation not only between postoperative stay and age but also between postoperative stay and ASA class ($P<0.05$). In group 2, there was nocorrelation between time to operation and operative time and also between time to operation and postoperative stay, however, there was surprisingly significant correlation between time to operation and conversion rate in SAC($P=0.018$). In conclusion, PTGBD should selectively be performed in patients with severe comorbidities rather than improving surgical outcomes

of LC for severe acute cholecystitis. If patients are not indicated for PTGBD, an early laparoscopic cholecystectomy is recommended because it can decrease conversion rate, although it can't decrease operative time and postoperative stay.

Keywords Severe acute cholecystitis, Laparoscopic cholecystectomy

TABLE OF CONTENTS

그림 차례

표 차례

Ⅰ. INTRODUCTION

Acute cholecystitis (AC) is the most commonly encountered disease, caused by obstruction of the cystic duct with or without gallstones. For the treatment of AC, there has been controversy over the advantages of early laparoscopic cholecystectomy (LC) versus delayed surgical treatment after gallbladder drainage such as PTGBD.[17, 21, 23] Recently, early LC is recommended on the basis of randomized studies,[10, 12, 13] since failure of initial conservative treatments has been reported in upto 32% of cases and early cholecystectomy has been proved to reduce total hospital stay.

AC can also be complicated by empyema, gangrene, or perforation. Both gangrenous and empyematous acute cholecystitis can be defined as severe acute cholelecystitis (SAC), and it is present in upto 30% of patients admitted to hospital with acute cholecystitis.[15] Furthermore, SAC has been reported to be associated with increased mortality (15%-50%), especially in elderly or critically ill patients.[24] Higher conversion and morbidity rates have been reported when gangrenous cholecystitis or empyema of the gallbladder were approached by laparoscopy.[4, 7] Moreover, treatment modalities other than LC, such as cholecystostomy or subtotal cholecystectomy have been considered, [3, 5, 19, 23] however, the treatment of SAC has not exactly been specified in most literature.

The aim of this study was to evaluate surgical outcomes of LC in patients who were diagnosed with SAC and to clarify the useful treatment modalities

of SAC.

Ⅱ.PATIENTS AND METHODS

A. PATIENT

1. Selection

From January 2003 to September 2006, total 1330 LC were performed at Ajou University Medical Center. Of 427 patients who were admitted with a clinical diagnosis of AC, 26.2% of patients (112/427) who presented SAC were surgically treated during the study. Among the 112 patients, we selected 99 patients excluding 2 patients who underwent other biliary drainage (percutaneous transhepatic biliary drainage), 2 patients who developed cholecystitis during the evaluation of other problems and 9 patients who underwent initial open cholecystectomy. Forty five patients were male and 54 patients were female, whose age ranged from 31 to 94 years.

2. Division

We also divided the patients into two groups, depending on whether preoperative gallbladder drainage was performed (group 1) or not (group 2). To compare the length of hospital stay and outcomes of surgery of the SAC with that of other cholecystitis, patients who were diagnosed with acute and chronic cholecystitis (group 3) were also reviewed in a retrograde order.

3. Modality of Diagnosis and Treatment

The diagnosis of AC was based on clinical signs (fever, right upper quadrant abdominal pain, or right-sided abdominal tenderness) and computed tomography findings (thickening of gallbladder wall and pericholecystic fluid collections). Both gangrenous and empyematous acute cholecystitis were defined as severe acute cholelecystitis. SAC was confirmed by operative findings, inspection of gallbladder changed from wall color to dark green or gray and infected bile or pus contained. Finally, SAC was confirmed by postoperative pathologic findings.

Abdominal computed tomography was the initial imaging modality of choice in all patients. Patients with CT findings of severe cholecystitis (a hypoechogenic band in the gallbladder wall and/or a pericholecystic fluid collection and/or thickening of the gallbladder wall to 8mm or more), with critically ill combined medical disease (diabetes mellitus, cardiovascular disease, old CVA), and/or with septic condition, who were suspected of severe cholecystitis, were treated with the emergency PTGBD. Following the resolution of acute attack and medical treatment of any diseases associated with cholecystitis, patients were considered for cholecystectomy. Patients with preoperative hyperbilirubinemia [serum bilirubin higher than twice the normal value and/or dilated common bile duct (>8mm)] underwent endoscopic retrograde cholangiopancreatography (ERCP). Laparoscopic cholecystectomy was performed using the standard four-trocar technique.

B. METHODS

We collected consecutive identification of patients who underwent LC for SAC or who underwent LC after PTGBD for SAC. We retrospectively reviewed the medical records of all patients and analyzed data including demographic information, clinical presentation, results of laboratory studies, operative records, postoperative complications and pre-/postoperative hospital stay. On preoperative assessment, patients were classified into the American Society of Anesthesiologists (ASA) score. The time to operation was defined as interval between admission and operation.

Statistical analysis was performed with Fisher's exact test, independent t-test, and Spearman's correlation. P-value<0.05 was considered statistically significant.

Ⅲ. RESULTS

A. Clinical Findings

Thirty seven patients had preoperative gallbladder drainage. PTGBD was performed successfully in all patients, and complication of PTGBD did not occur. The demographic and preoperative laboratory data for each group are compared in Table 1. Patients in group 1 were significantly older than other groups ($P<0.05$). On the otherhand, there was no significant difference in gender and laboratory findings between group 1 and 2 ($P>0.05$). In group 3, WBC count was significantly lower than that of other groups ($P<0.05$). Preoperative CT findings and hyperbilirubinemia yielded a diagnosis of common bile duct stones in 19 patients; and preoperative endoscopic sphincterotomy and stone extraction were performed completely.

Hypertension (n= 56) and diabetes mellitus (n=35) were present in most patients of three groups. There were other associated diseases such as ischemic heart disease (n=8), cerebrovascular disease (n=10), liver cirrhosis (n=1), and bronchial asthma (n=4). Diabetes mellitus was present in 15 patients in group 1(37.5%), 12 patients in group 2(17.9%) and 8 patients in group 2(13.6%); it was statistically significant in the three groups ($P<0.05$), respectively(data not shown).

Table 1. Clinical characteristics of the three groups on admission.

	group 1 (n=37)	group 2 (n=62)	group 3 (n=59)
Age[P]	66.8±11.7	60.5±13.4	50.2±14.4
Sex (M/F)	13/24	32/30	32/27
Symptom duration (days)	2.8±1.7	5.2±5.8	3.6±3.3
Fever (℃)	37.6±0.8	37.2±0.8	36.8±0.5
Laboratory findings			
WBC count (/㎣)	15551.3±6485.6	13281.4±4930.4	9743±4157.0
Total bilirubin (㎎/㎗)	2.4±2.4	1.7±1.5	1.8±1.9
AST (IU/l)	89.6±132.0	56.5±107.4	59.9±85.9
ALT (IU/l)	109.3±176.6	60.4±101.1	84.5±104.6
Associated disease[P]	7	4	12
CBD stone	4 (10.8%)	4 (6.5%)	11 (18.6%)
Sepsis	3 (8.1%)		
Acute cholangitis	1 (2.7%)		1 (1.7%)

Severity of illness in the three groups of patients was assessed preoperatively by comparing their ASA classification. The mean ASA score was 1.27±0.6 in group 1, 0.89±0.54 in group 2 and 0.59±0.69 in group 3. There was significant difference in ASA class between the three groups ($P<0.05$): The number of ASA Ⅰ patients increased (3, 13, and 30 patients in group 1, 2, and 3 respectively), where as the number of ASA Ⅲ patients decreased (13, 6, and 5 patients in group 1, 2, and 3 respectively). Comorbid conditions were significantly more common in the PTGBD group (Figure 1).

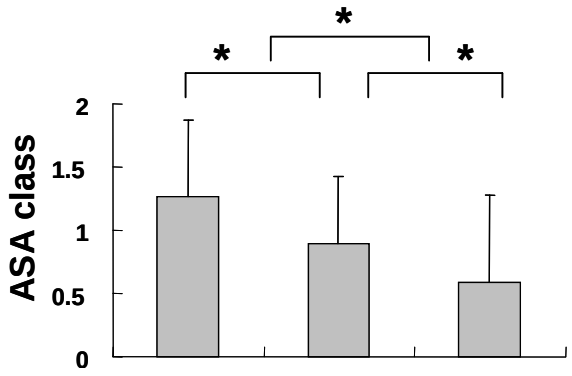

Fig. 1. Comparison of severity of illness between the three groups. The mean ASA was 1.27±0.6 in group 1, 0.89±0.54 in group 2 and 0.59±0.69 in group 3. There was significant difference between the three groups ($P<0.05$). Comorbid conditions were significantly more common in the PTGBD group. (Þ; $P<0.05$).

B. Conversion and Complications

Of 112 patients, LC was the initial surgical approach in 99 patients, and was successfully completed in 94 patients (94.9%), whereas conversion to open procedure was necessary in 5 patients (5.1%). The conversion rate to open cholecystectomy was 2.7% (1/37) in group 1, 6.5% (4/62) in group 2, and 1.7% (1/59) in group 3. Eight patients underwent open cholecystectomy (OC). Moderate to severe adhesion around the gallbladder was observed in all cases; however, the adhesion could be dissected with careful manipulation. One patient (2.7%) of group 1 and two of group 2 were converted to open cholecystectomy because of a severe adhesion around the gallbladder. One patient each of group 2, 3 was converted to open cholecystectomy because of a super intense Calot's triangle. Other one patient of group 2 was converted to open cholecystectomy because of injury of small bowel: Perforated small bowel was primarily repaired immediately by 3-0 black silk, and this patient was discharged at postoperative day 8 after wound seroma managed.

The complication rates after LC was 8.1% (3/37) in group 1, 11.3% (7/62) in group 2, and 5.1% (3/59) in group 3. Intraoperative uncontrolled bleeding did not occur in any patient of the three groups. Postoperative wound infection occurred in three patients in group 2 and one in group 3. A transient biliary leakage occurred in one each patient of group 2 and 3, and it was managed by endoscopic therapy. One patient in group 1 showed bile leakage at the puncture site of PTGBD after LC. This patient underwent

emergency operation, since general condition was then aggravated, however, finally expired by multiple organ failure. The mortality rate was 1.7% (2/112) in SAC.

C. Operative Time

The operative time for LC was 74.86±35.42 min in group 1, 82.18±26.69 min in group 2, and 61.27±22.60 min in group 3. In group 3, the operative time was shorter than in groups 1 and 2 with significant difference ($P<0.05$). Interestingly, however, the operative time of group 1 was shorter than that of group 2 with no significant difference ($P>0.05$) (Figure2).

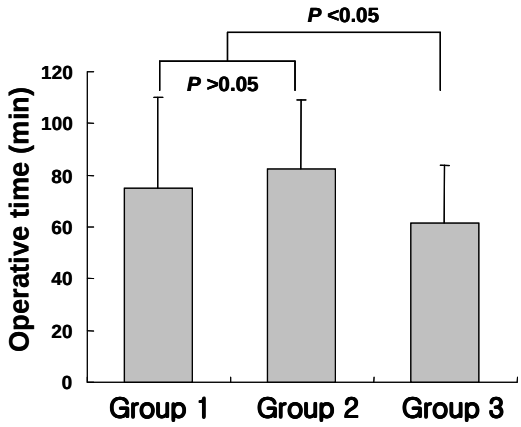

Fig. 2. Comparison of operative times between the three groups. There was no significant difference between group 1 and 2 (P>0.05). The operative time of both PTGBD group and severe cholecystitis group was significant longer than acute and chronic cholecystitis (P<0.05).

D. Pre/ Post-operative Hospital Stay

The total hospital stay was 12.5±4.3 days in group 1, 7.6±4.0 days in group 2 and 4.6±3.7 days in group 3. An average preoperative stay was 8.3±3.1 days in group 1, 3.2±2.6 days in group 2. In group 3, the preoperative stay was shorter than other two groups (2.6±2.8 days) (data not shown). The mean hospital stay after LC was 3.9±2.6 days in group1, 3.7±2.8 days in group 2, and 2.1±1.8 days in group 3. In groups 1 and 2, the mean postoperative stay was significantly longer than that in group 3, respectively (P<0.05). However, there was no difference between group 1 and 2 (P>0.05)

(Figure3).

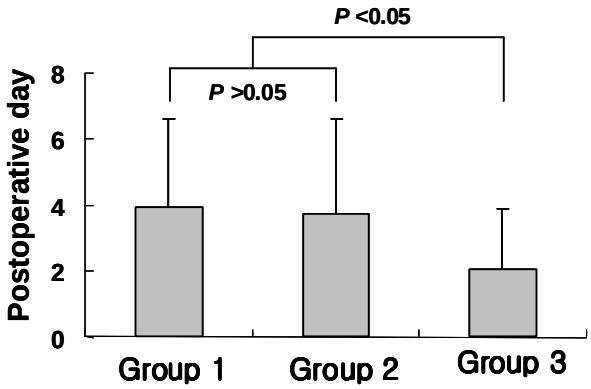

Fig. 3. Comparison of postoperative hospital stay between the three groups. The postoperative stay of both PTGBD group and severe cholecystitis group was significant longer than acute and chronic cholecystitis ($P<0.05$). However, there was no significant difference between groups 1 and 2 ($P>0.05$).

In group 2, there were significant correlations between postoperative stay and age ($r= 0.254$, $P<0.05$), between postoperative stay and ASA class ($r= 0.311$, $P<0.05$), and between operative time and postoperative stay ($r= 0.322$, $P=0.011$) (Table2, Figure4).

Table 2. Correlations between postoperative stay and other factors in group 2.

	Postoperative stay in group 2	
	Correlation Coefficient	P value
Age	0.254	0.046
Symptom duration	0.168	NS
ASA class	0.311	0.014
Time to operation	0.043	NS
Operative time	0.322	0.011
Conversion to open	0.417	0.001

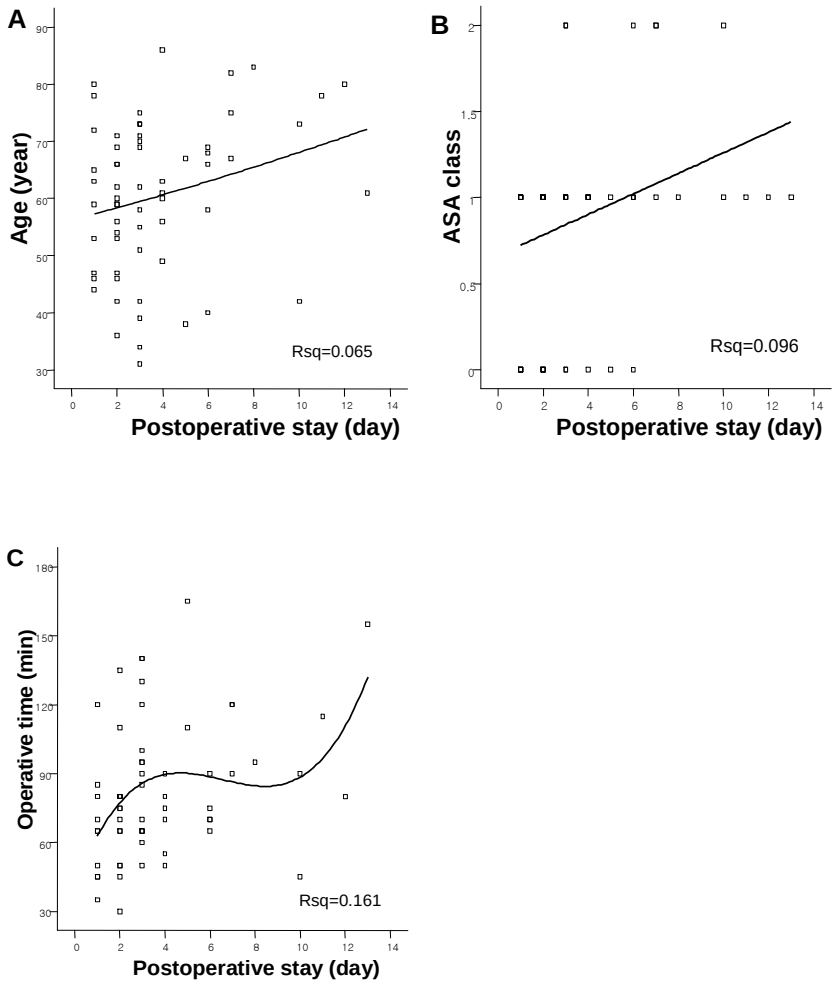

Fig. 4. Correlations among postoperative stay, age and ASA class in severe cholecystitis. A. There was correlation between postoperative stay and age (r=0.254,P<0.05). B. There was significant correlation between postoperative stay and ASA class (r=0.311,P<0.05). C. There was significant correlation between postoperative stay and operative time (r=0.322, P<0.05).

F. Time to Operation

After PTGBD, the mean duration of drainage was 7.1±3.5 days. The catheter was removed in all patients at the time of cholecystectomy. There was no correlation between time to operation after drainage and conversion ($P>0.05$) (data not shown).

In group 2, there were no correlations between time to operation and operative time and also between time to operation and postoperative stay. The old aged patients with high ASA class spent more time before operation. Surprisingly, there was a significant correlation between time to operation and conversion rate in group 2 ($r=0.299$, $P=0.018$) (Figure 5) : The longer the interval between admission and operation, the higher the conversion rate.

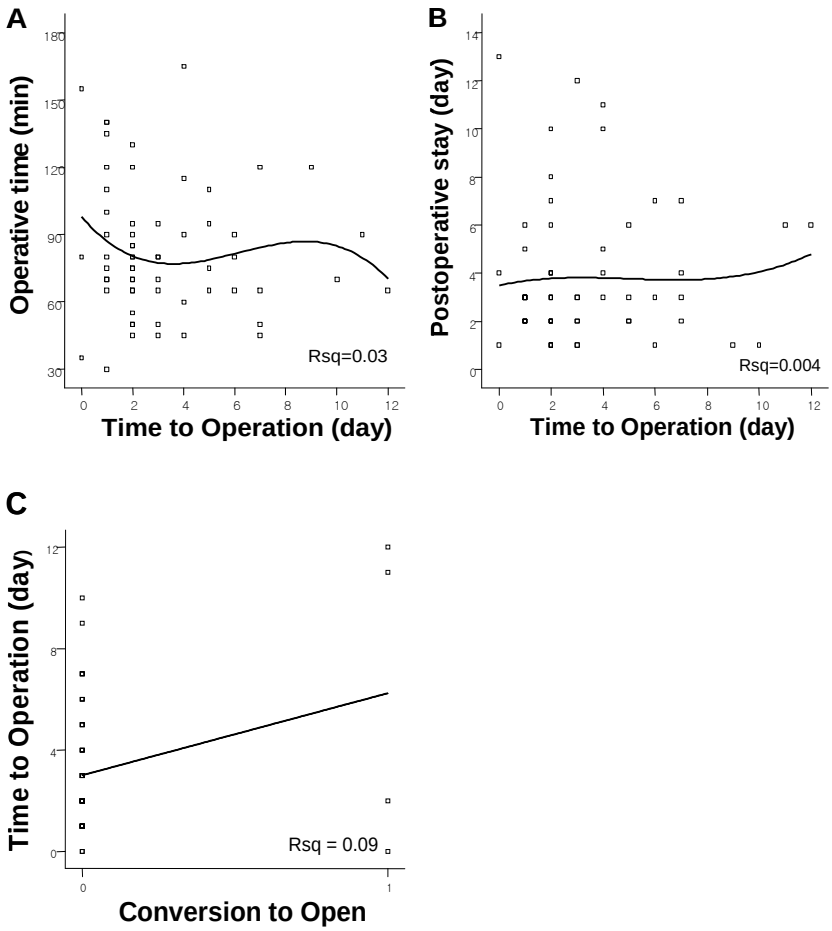

Fig. 5. Correlation between time to operation and surgical outcomes in severe cholecystitis. A. There was no correlation between time to operation and operative time (r=-0.070, P>0.05). B. There was no correlation between time to operation and postoperative stay (r=0.043, P>0.05). C. There was significant correlation between times to operation and conversion rate in severe acute cholecystitis (r=0.299, P=0.018). As time to operation is delayed,

conversion to open cholecystectomy increased.

Ⅳ. Discussion

The etiology of gallbladder gangrene is related mainly to vascular compromise secondary to continuing obstruction of the cystic duct, which causes the intraluminal pressure within the gallbladder to activate and increase an immediate inflammatory reaction.[9] Gangrenous cholecystitis, the last stage of gallbladder inflammation, is a severe form of acute cholecystitis and is associated with significantly greater morbidity and mortality relative to other forms of acute cholecystitis, especially in elderly, immunocompromised or diabetic patients.[15, 24] In our cases, patients in group 2 were older than other cholecystitis group (60.5 vs. 50.2 years). Moreover, the rate of diabetes mellitus in group 1 was higher than that of group 2. However, there was no significant difference in gender between the three groups.

The rate of conversion to open surgery in cases of severe cholecystitis has been reported to be between 8.7% and 75%,[2, 8, 11, 15, 19] In many studies, the rate of complications in cases of severe cholecystitis, including severe complications such as bile duct injury or bleeding, is between 0% and 40%,[7, 8, 15, 16, 19] and early consideration of conversion to open cholecystectomy has been advocated by Cox et al,[6] although Merriam et a[12] reported a 65% success rate with the laparoscopic approach: They contended that a swift conversion to an open cholecystectomy maybe warranted if gangrenous cholecystitisis found

In the present study, the rate of conversion to open surgery in group 2

was 6.5%, being lower than that of other reports. Moreover, even though there was one case of bile leakage at the cystic duct stump, the rate of complications was 11.3% without severe complications. Noticeably, there was no significant difference in the rate of conversion and complications between the three groups.

According to some literature, LC after PTGBD as another treatment modality for severe cholecystitis may decrease the conversion and complication rates. Chikamori et al[5] reported that early scheduled LC following PTGBD is a safe and effective therapeutic option for patients with acute complicated cholecystitis, especially in elderly patients and patients with poor general condition. Tseng et al[18] reported that the complications related to PTGBD were noted in 2 patients (1.4%). However, the conversion rate to open cholecystectomy in LC was 27 % (32/117) with a mean of 4 days after PTGBD. On the other hand, zero conversion rate was reported in 34 days of interval to operation after PTGBD.[23]

In our study, patients with PTBGD were significantly older and comorbid conditions were significantly more common than other groups. There was one complication related to PTGBD: bile leakage at the puncture site after LC. The rate of complications was 8.1% and lower than other studies. In addition, there was no correlation between time to operation after drainage and conversion, even though there was one case of conversion to open.

The results from recent randomized trials have shown that early cholecystectomy is superior to delayed surgery because of shorter hospital

stay and economic benefits.[13, 14] For patients with severe acute cholecystitis, delayed surgery after initial conservative therapy or open cholecystectomy has been selected, because of difficulties associated with early laparoscopic treatment. However, technical advances and increased experience have gradually led surgeons to attempt laparoscopic surgery in cases of acute gangrenous cholecystitis.[8, 11, 15] Tsushimi et al[20] reported that there were no postoperative complications. Thus, early laparoscopic cholecystectomy seems to be appropriate for acute gangrenous cholecystitis. Wang et al[22] reported that the timing of urgent laparoscopic cholecystectomy had no impact on the conversion rate. In the present study, there was significant correlation between the time to operation and conversion rate in group 2. Indeed, early LC for severe cholecystitis decreased the conversion to open cholecystectomy.

There are many reports that the operative time was longer in patients with SAC because of dense adhesion to calot's triangle. Tsumura et al[19] reported that surgical duration was 124 min in PTGBD group and 107 min in non-PTGBD group with significant difference. On the other hand, Chikamori et al[5] found that the duration of surgery was shortened when LC was performed as soon as possible after PTGBD.

In our study, the operative time of group 1 was shorter than that of group 2; however, it was not significant. This might have been due to the fact that much operative time was spent in group 2 because of edematous, tense and hypervascular tissue. Other reason for short operative time of PTGBD group was laparoscopic subtotal cholecystectomy; 9 patients in group 1 and 5

patients in group 2. Beldi et al[1] observed that laparoscopic subtotal cholecystectomy for AC offers a simple and safe solution that prevents bile duct injuries and decreases the rate of conversion in anatomically difficult situations.

According to some studies, postoperative stay after LC for severe cholecystitis ranges from 3.2 days to 8.6 days.[5, 8, 15, 20] In our present cases, postoperative stay was similar or shorter than other reports ; 3.7 days in group 2. In group 2, there was significant correlation among postoperative stay, age, and ASA class. Elderly patients with high ASA class stayed in hospital longer postoperatively.

Ⅴ. CONCLUSION

In SAC not indicated for PTGBD, there were no correlations between time to operation and operative time, and between time to operation and postoperative stay. However, there was a significant correlation between time to operation and conversion rate. Moreover, the old aged patients with high ASA class took longer time to operation and stayed in hospital longer postoperatively.

In conclusion, PTGBD should selectively be performed in patients with severe comorbidities rather than to improve surgical outcomes of LC for severe acute cholecystitis. If patient was not indicated for PTGBD, we recommend early laparoscopic cholecystectomy, because it can decrease conversion rate, although it can't decrease operative time and postoperative stay.

REFERENCES

1. Beldi G, Glattli A.: Laparoscopic subtotal cholecystectomy for severe cholecystitis. *Surg Endosc* 17:1437-9, 2003

2. Bingener J, Stefanidis D, Richards ML, Schwesinger WH, Sirinek KR.: Early conversion for gangrenous cholecystitis: impact on outcome. *Surg Endosc* 19:1139-41, 2005

3. Borzellino G, de Manzoni G, Ricci F, Castaldini G, Guglielmi A, Cordiano C.: Emergency cholecystostomy and subsequent cholecystectomy for acute gallstone cholecystitis in the elderly. *Br J Surg* 86:1521-5, 1999

4. Brodsky A, Matter I, Sabo E, Cohen A, Abrahamson J, Eldar S.: Laparoscopic cholecystectomy for acute cholecystitis: can the need for conversion and the probability of complications be predicted? A prospective study. *Surg Endosc* 14:755-60, 2000

5. Chikamori F, Kuniyoshi N, Shibuya S, Takase Y.: Early scheduled laparoscopic cholecystectomy following percutaneous transhepatic gallbladder drainage for patients with acute cholecystitis. *Surg Endosc* 16:1704-7, 2002

6. Cox MR, Wilson TG, Luck AJ, Jeans PL, Padbury RT, Toouli J.: Laparoscopic cholecystectomy for acute inflammation of the gallbladder. *Ann Surg* 218:630-4,1993

7. Eldar S, Sabo E, Nash E, Abrahamson J, Matter I.: Laparoscopic cholecystectomy for the various types of gallbladder inflammation: a

prospective trial. *Surg Laparosc Endosc* 8:200-7, 1998

8. Habib FA, Kolachalam RB, Khilnani R, Preventza O, Mittal VK.: Role of laparoscopic cholecystectomy in the management of gangrenous cholecystitis. *Am J Surg* 181:71-5, 2001

9. Indar AA, Beckingham IJ.: Acute cholecystitis. *Bmj* 325:639-43, 2002

10. Johansson M, Thune A, Blomqvist A, Nelvin L, Lundell L.: Management of acute cholecystitis in the laparoscopic era: results of a prospective, randomized clinical trial. *J Gastrointest Surg* 7:642-5, 2003

11. Kiviluoto T, Siren J, Luukkonen P, Kivilaakso E.: Randomised trial of laparoscopic versus open cholecystectomy for acute and gangrenous cholecystitis. *Lancet* 351:321-5, 1998

12. Kolla SB, Aggarwal S, Kumar A, Kumar R, Chumber S, Parshad R, Seenu V.: Early versus delayed laparoscopic cholecystectomy for acute cholecystitis: a prospective randomized trial. *Surg Endosc* 18:1323-7, 2004

13. Lo CM, Liu CL, Fan ST, Lai EC, Wong J.: Prospective randomized stud of early versus delayed laparoscopic cholecystectomy for acute cholecystitis. *Ann Surg* 227:461-7, 1998

14. Madan AK, Aliabadi-Wahle S, Tesi D, Flint LM, Steinberg SM.: How early is early laparoscopic treatment of acute cholecystitis? *Am J Surg* 183:232-6, 2002

15. Merriam LT, Kanaan SA, Dawes LG, Angelos P, Prystowsky JB, Rege

RV, Joehl RJ.: Gangrenous cholecystitis: analysis of risk factors and experience with laparoscopic cholecystectomy. *Surgery* 126:680-5, 1999; discussion 685-6

16. Navez B, Mutter D, Russier Y, Vix M, Jamali F, Lipski D, Cambier E, Guiot P, Leroy J, Marescaux J.: Safety of laparoscopic approach for acute cholecystitis: retrospective study of 609 cases. *World J Surg* 25:1352-6, 2001

17. Patterson EJ, McLoughlin RF, Mathieson JR, Cooperberg PL, MacFarlane JK.: An alternative approach to acute cholecystitis. Percutaneous cholecystostomy and interval laparoscopic cholecystectomy. *Surg Endosc* 10:1185-8, 1996

18. Tseng LJ, Tsai CC, Mo LR, Lin RC, Kuo JY, Chang KK, Jao YT.: Palliative percutaneous transhepatic gallbladder drainage of gallbladder empyema before laparoscopic cholecystectomy. *Hepatogastroenterology* 47:932-6, 2000

19. Tsumura H, Ichikawa T, Hiyama E, Kagawa T, Nishihara M, Murakami Y, Sueda T.: An evaluation of laparoscopic cholecystectomy after selective percutaneous transhepatic gallbladder drainage for acute cholecystitis. *Gastrointest Endosc* 59:839-44, 2004

20. Tsushimi T, Matsui N, Takemoto Y, Kurazumi H, Oka K, Seyama A, Morita T.: Early laparoscopic cholecystectomy for acute gangrenous cholecystitis. *Surg Laparosc Endosc Percutan Tech* 17:14-8, 2007

21. Van Steenbergen W, Ponette E, Marchal G, Pelemans W, Aerts R, Fevery

J, De Groote J.: Percutaneous transhepatic cholecystostomy for acute complicated cholecystitis in elderly patients. *Am J Gastroenterol* 85:1363-9, 1990

22. Wang YC, Yang HR, Chung PK, Jeng LB, Chen RJ.: Urgent laparoscopic cholecystectomy in the management of acute cholecystitis: timing does not influence conversion rate. *Surg Endosc* 20:806-8, 2006
23. Watanabe Y, Sato M, Abe Y, Iseki S, Sato N, Kimura S.: Preceding PTGBD decreases complications of laparoscopic cholecystectomy for patients with acute suppurative cholecystitis. *J Laparoendosc Surg* 6:161-5, 1996

24. Weiss CA, 3rd, Lakshman TV, Schwartz RW.: Current diagnosis and treatment of cholecystitis. *Curr Surg* 59:51-4, 2002

— 국문요약 —

중증 급성 담낭염 치료에 있어 복강경 담낭 절제술의 유용성

아주대학교 대학원 의학과

김 정 운

(지도교수: 김 욱 환)

연구목적 : 이 연구는 중증 급성 담낭염 환자의 복강경 담낭 절제술 후 수술 결과 및 이에 대한 분석을 토대로 중증 급성 담낭염 환자에 있어 복강경 담낭절제술이 유용한 치료방법이 될 수 있는지 알아보기 위하여 시행되었다.

재료 및 방법 : 112명의 중증 급성 담낭염 환자중 99명을 선택하여 37명의 수술전 경피경간 담낭 배액술을 시행받은 군 (group 1)과 62명의 수술전 경피경간 담낭 배액술을 시행받지 않은 군 (group 2)으로 나누고 59명의 급성 및 만성 담낭염 환자 군 (group 3)을 비교군으로 선정하였다.

결과 : 개복술로의 전환율은 1군 (group 1) 2.7% (1/37), 2군 (group2) 6.5% (4/62), 3군 (group 3) 1.7% (1/59)이었다. 수술후 입원기간 및 수술시간은 1군과 2군이 3군에 비해 유의하게 차이가

있었다. 2군에서 수술후 입원기간과 나이, 수술후 입원기간과 ASA class 사이에는 각각 서로 상관관계가 있었으나 수술까지 걸린 시간 과 수술 시간, 수술까지 걸린 시간과 수술후 입원 기간 사이에는 각각 상관관계가 없었다. 그러나 중증 급성 담낭염 환자에 있어 수술까지 걸린 시간과 개복술로의 전환율은 높은 상관관계를 보였다.

결론 : 중증 급성 담낭염 환자 치료에 있어 경피 경간 담낭 배액술은 중증의 중복 이환자에게 선택적으로 시행되어야 하며, 경피 경간 담낭 배액술이 적용되지 않는 중증 급성 담낭염 환자의 경우, 조기 복강경 담낭 절제술은 개복술로의 전환율을 낮추는 유용한 수술방법이다.

핵심되는 말: 중증 급성 담낭염, 복강경 담낭 절제술