

Is Early Laparoscopic Cholecystectomy Feasible for Acute Cholecystitis in the Elderly?

Takahisa Fujikawa, Seiichiro Tada, Toshihiro Abe, Yasunori Yoshimoto, Hisatsugu Maekawa, Norihiro Shimoike, Akira Tanaka

Takahisa Fujikawa, Seiichiro Tada, Toshihiro Abe, Yasunori Yoshimoto, Hisatsugu Maekawa, Norihiro Shimoike, Akira Tanaka, Department of Surgery, Kokura Memorial Hospital, Kitakyushu, Fukuoka 802-8555, Japan

Correspondence to: Takahisa Fujikawa, MD, PhD, FACS, Department of Surgery, 3-2-1 Asano, Kokurakita-ku, Kitakyushu, Fukuoka 802-8555, Japan. fujikawa-t@kokurakinen.or.jp

Telephone: +81-93-511-2000 Fax: +81-93-511-3240

Received: June 8, 2012 Revised: August 3, 2012

Accepted: August 5, 2012

Published online: November 21, 2012

ABSTRACT

AIM: We reviewed our experience with laparoscopic cholecystectomy (LC) in patients with acute cholecystitis to assess feasibility of early LC (within 72 hours of the onset of symptoms) in the elderly.

METHODS: A total of 111 consecutive patients with acute cholecystitis who intended to undergo LC between 2004 and 2008 were reviewed. We used our therapeutic strategy flowchart in accordance with the severity of acute cholecystitis and concomitant surgical risks to select patients suitable for early LC. The severity of acute cholecystitis, presence of preoperative surgical risk, American Society of Anesthesiologists score and other preoperative surgical risk scores, feasibility of early LC done, and outcome of both early and delayed LC in patients 70 years of age and older (Group 1) were compared to those in patients younger than 70 years (Group 2).

RESULTS: The severity of acute cholecystitis in Group 1 and Group 2 were as follows; Grade I: 31% vs 45%, Grade II: 49% vs 44%, Grade III: 20% vs 11%, $p=0.17$). Patients in Group 1 had higher occurrence of preoperative surgical risk, including high rate of antithrombotic use (35%), than those in Group 2 (53% vs 24%, $p=0.002$). The rates of early LC were similar between the groups (55% vs 47%). Concerning early LC, There were no differences between the two groups, in the conversion rates (4% vs 5%), duration of surgery (120 min vs 125 min), estimated blood loss (81 g vs 88 g), length of postoperative stay (8.0 d vs 6.0 d). There was neither operative death nor severe biliary injury in each group.

CONCLUSION: Our results showed that early LC was intended and performed in 55% of elderly patients suffering from acute

cholecystitis, with minimal postoperative complications and low conversion rate to open cholecystectomy. Early LC is a safe, effective treatment for acute cholecystitis even in the elderly if an appropriate patient selection is secured.

© 2012 Thomson research. All rights reserved.

Key words: Acute cholecystitis; Elderly patients; Early laparoscopic cholecystectomy; Surgical risks

Fujikawa T, Tada S, Abe T, Yoshimoto Y, Maekawa H, Shimoike N, Tanaka A. Is Early Laparoscopic Cholecystectomy Feasible for Acute Cholecystitis in the Elderly? *Journal of Gastroenterology and Hepatology Research* 2012; 1(10): 247-251 Available from: URL: <http://www.ghrnet.org/index./joghr/>

INTRODUCTION

Acute cholecystitis is a common cause of inflammatory acute abdomen. Although laparoscopic cholecystectomy (LC) is initially contraindicated in acute cholecystitis, LC is shown to be a feasible, safe and effective treatment of choice with laparoscopic experience accumulated, and is currently considered as the standard treatment option^[1-3]. LC for acute cholecystitis has the advantages of less pain, shorter hospital stay, early return to work, and minimal invasiveness compared with open cholecystectomy^[2,4-7].

Acute cholecystitis in the elderly is a serious condition with high operative mortality and morbidity^[7-11]. Both acute cholecystitis and high age are significant risk factors for mortality and prolonged hospital stay after cholecystectomy^[2,9,12,13]. Recently, some studies have confirmed that early LC (within 24-72 hours of the onset of symptoms) is feasible and reduces total length of hospital stay as compared to delayed LC^[8,14,15], but the data about the impact of early LC on the outcome of elderly patients with acute cholecystitis are limited. The purpose of the current study was to assess the impact of early LC on the management of acute cholecystitis in elderly patients.

PATIENTS AND METHODS

Between January 2004 and December 2008, 111 patients (73 female

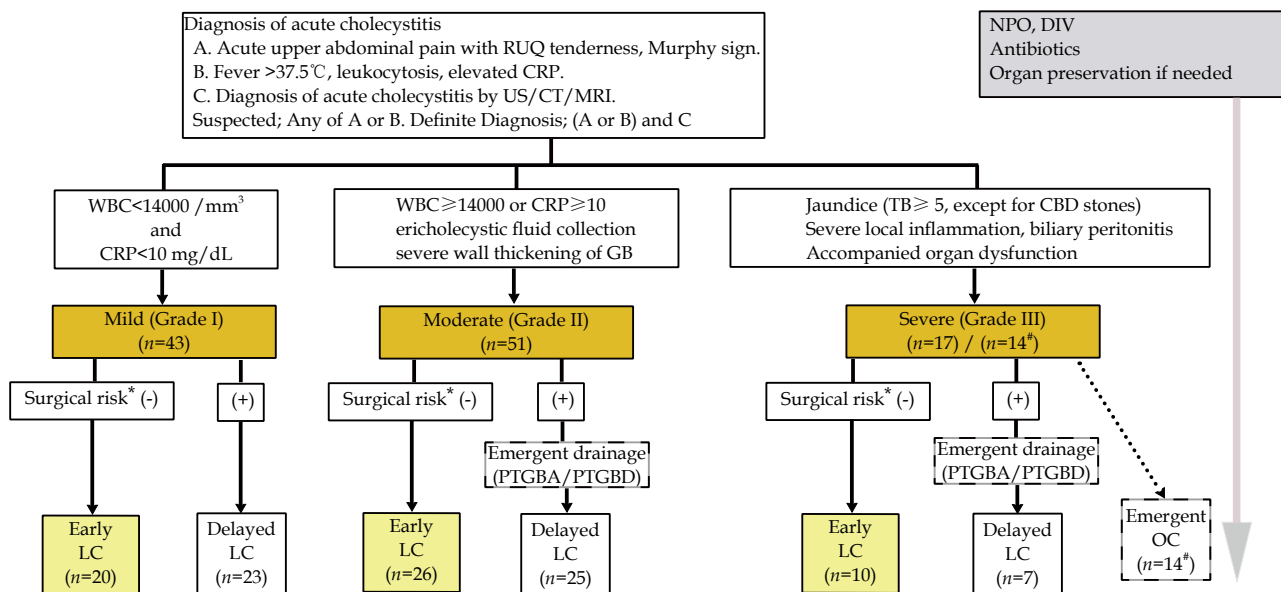


Figure 1 A flowchart for the management of acute cholecystitis in our institute. Early cholecystectomy, especially early laparoscopic approach if possible, is recommended for most patients. If surgical risks were presented, conservative management (intravenous antibiotics and fluids), with percutaneous gallbladder drainage if needed, and subsequent delayed LC were an alternative therapy for those patients. *Preoperative surgical risks; (1) severe organ failure (cardiopulmonary and/or renal failure) presented, (2) performance status level 2 or more, (3) those with acute cholangitis and/or common bile duct stones, and (4) patients under anti-thrombotics (anticoagulation or antiplatelet agents). #Patients with acute severe cholecystitis which were not improved by percutaneous transhepatic gallbladder drainage and needed to undergo open cholecystectomy (*n*=14) were excluded in this study. RUQ: right upper quadrant; CRP: C-reactive protein; WBC: white blood cell; GB: gallbladder; TB: total bilirubin; CBD: common bile duct; LC: laparoscopic cholecystectomy; OC: open cholecystectomy; NPO: non per os; DIV: drip infusion in vein.

and 38 male) who admitted to our hospital for acute cholecystitis and intended to undergo LC were identified and reviewed. The patients in this retrospective study were those with acute cholecystitis on presentation, confirmed by pathological analysis of an operative sample. Patients with gallbladder carcinoma were excluded from the current study. Patients with acute severe cholecystitis which were not improved by percutaneous transhepatic gallbladder drainage and needed to undergo open cholecystectomy (*n*=14) were also excluded in this study. The included patients were divided into two groups according to age: age 70 or older (Group 1, *n*=49) and younger than 70 years (Group 2, *n*=62). Early LC was defined when patients received LC within 72 hours of the onset of symptoms, whereas performing LC more than 7 days (usually about four weeks) after the onset of symptoms were regarded as delayed LC.

We used our therapeutic strategy in accordance with the severity of acute cholecystitis and concomitant surgical risks. A flowchart for the management of acute cholecystitis in our institute is shown in Figure 1 (2007 Tokyo guidelines were referred with some modification^[16]). Early cholecystectomy, especially early laparoscopic approach if possible, is recommended for most patients. We defined following situations as preoperative surgical risks for acute cholecystitis; (1) severe organ failure (cardiopulmonary and/or renal failure) presented, (2) performance status level 2 or more, (3) those with acute cholangitis and/or common bile duct stones, and (4) patients under anti-thrombotics (anticoagulation or antiplatelet agents). If surgical risks were presented, conservative management (intravenous antibiotics and fluids), with percutaneous gallbladder drainage if needed, and subsequent delayed LC were an alternative therapy for those patients^[17,18]. The number of early and delayed LC in each grade was as follows; 20 and 23 in Grade I, 26 and 25 in Grade II, 10 and 7 in Grade III, respectively.

LC was performed using a standard 4-trochar technique. Aspiration of gallbladder content was performed in case of

gallbladder distension. Retrograde dissection of the gallbladder from the fundus was attempted in case of severe inflammation and anatomical difficulty of the pericyclic space. Inability to identify the structures in Calot's triangle led us to conversion to open surgery. A plastic bag was used for gallbladder removal from the abdomen for prevention of wound infection and falling of stones. All procedures were performed by or under the guidance of one of the attending surgeons in our institute.

Using the current study cohort, we investigated the severity of acute cholecystitis, preoperative surgical risks, American Society of Anesthesiologists (ASA) score and other surgical risk scoring systems (POSSUM score^[19] and E-PASS score^[20]), and feasibility of early LC between the two groups. In patients undergoing early and delayed LC, outcome of surgery (conversion rate to open cholecystectomy, operative time, estimated blood loss, morbidity and mortality, and length of postoperative hospital stay) were compared between the groups, respectively.

The categorized data in each group were compared by chi-square or Fisher's exact probability test. Continuous variables in the characteristics were expressed as mean±standard deviation and compared by one-way ANOVA or Kruskal-Wallis test. Non-parametric variables were also compared using Kruskal-Wallis test with Scheffe's F test. Statistical significance was set a priori at *p* < 0.05. Data were analyzed using the SPSS package software.

RESULTS

Table 1 shows background clinical data and laboratory results in Group 1 and 2. Median age in Group 1 and 2 were 77 years (range, 70-88) and 60 years (range, 30-69), respectively. There was no significant difference in gender, body mass index, the occurrence of concurrent diseases, and preoperative laboratory data, except in the rate of concurrent cardiovascular diseases, which is more prevalent in

the elderly group (55% vs 27%, $p=0.003$).

Table 1 Background clinical data and laboratory results in each group.

	Group 1 (Age \geq 70) (n=49)	Group 2 (Age<70) (n=62)	p
Age (years, median (range))	77 (70-88)	60 (30-69)	0.004*
Gender (male/female)	32 / 17	41 / 21	0.93
Body mass index (kg/m ²)	23.2 \pm 3.2	25.6 \pm 3.8	0.52
Concurrent diseases			
Cardiovascular diseases	27 (55%)	17 (27%)	0.003*
Diabetes mellitus	8 (16%)	10 (16%)	0.98
Respiratory disease	1 (2%)	0	0.26
Chronic renal failure	1 (2%)	1 (2%)	0.87
WBC (max, 10 ⁹ /L)	13100 \pm 4700	12600 \pm 5100	0.88
C-reactive protein (max, mg/dL)	13.1 \pm 8.9	11.1 \pm 9.5	0.27
ALT (max, IU/L)	194 \pm 270	103 \pm 154	0.33
Total bilirubin (max, mg/dL)	1.9 \pm 1.3	1.9 \pm 1.5	0.91

SD: standard deviation; NS: not significant; * Statistically different.

Table 2 Surgical risk and rate of early laparoscopic cholecystectomy (LC) done in each group.

	Group 1 (Age \geq 70) (n=49)	Group 2 (Age<70) (n=62)	p
High ASA score (III or IV)	13 (26%)	7 (12%)	0.038*
POSSUM morbidity rate (%)	25 \pm 5.2	18 \pm 4.3	0.021*
POSSUM mortality rate (%)	4.8 \pm 1.5	2.2 \pm 1.8	0.092
E-PASS preoperative risk score	0.59 \pm 0.08	0.41 \pm 0.10	0.039*
Surgical Risk	26 (53%)	15 (24%)	0.002*
Severe organ failure	1 (2%)	3 (5%)	0.43
Performance status \geq 2	3 (6%)	1 (2%)	0.21
Acute cholangitis / CBD stones	13 (27%)	5 (8%)	0.009*
Use of antithrombotics	17 (35%)	9 (15%)	0.012*
Early LC done (%)	27 (55%)	29 (47%)	0.38

ASA: American Society of Anesthesiologists; NS: not significant; CBD: common bile duct; LC: laparoscopic cholecystectomy; * Statistically different.

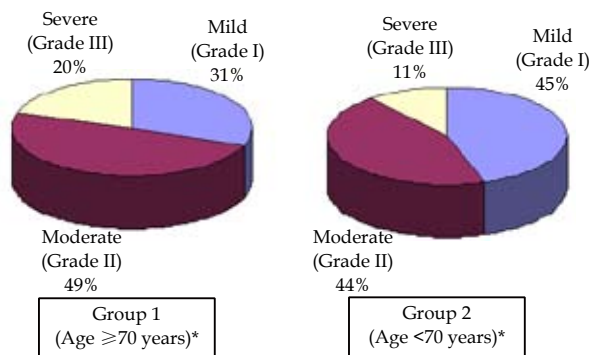


Figure 2 Severity of acute cholecystitis in each group. A tendency toward a higher frequency of severe cholecystitis in the elderly group compared with the younger, although statistical difference is not achieved. * Statistically no difference ($p=0.17$).

Figure 2 shows the severity of acute cholecystitis in both groups. The rate of Grade I, II, and III in Group 1 and 2 were as follows; Grade I: 31% vs 45%, Grade II: 49% vs 44%, Grade III: 20% vs 11% ($p=0.17$). Although statistical difference is not achieved, a tendency toward a higher frequency of severe cholecystitis in the elderly group was observed.

Surgical risk and rate of early LC done in each group were shown in Table 2. Most of elderly patients looked healthy like younger patients, although there were significant differences in the rate of high ASA score (III or IV), POSSUM morbidity rate, and E-PASS preoperative risk score between Group 1 and 2 (26% vs 12%, 25% vs 18%, and 4.8% vs 2.2%, $p<0.05$). Concerning surgical risk for acute cholecystitis, patients in Group 1 had higher occurrence of acute cholangitis/CBD stones (27% vs 8%, $p=0.009$)

and higher rate of antithrombotic therapy (35% vs 15%, $p=0.012$). The rates of early LC were similar between the groups (55% vs 47%, $p=0.38$).

Table 3 and 4 show outcome of patients undergoing early and delayed LC, respectively. In patients undergoing early LC, there were no differences between the two groups in the conversion rates (7% vs 10%), duration of surgery (134 min vs 123 min), estimated blood loss (88 g vs 85 g), length of postoperative stay (7.3 d vs 6.0 d). In both groups, the reason of conversion to open surgery was high risk tendency of bile duct injury due to severe adhesion around the Calot's triangle. In patients undergoing delayed LC, outcome is also identical between the groups, except for length of postoperative hospital stay (10.7 d vs 7.8 d, $p=0.038$), which resulted mainly from the higher incidence of anticoagulation use in the elderly group. There was neither operative death nor severe biliary injury in each group.

Table 3 Outcome of patients undergoing early laparoscopic cholecystectomy in each group.

	Group 1 (Age \geq 70) (n=27)	Group 2 (Age<70) (n=29)	p
Duration of surgery (mins)	134 \pm 37	123 \pm 34	0.81
Estimated blood loss (g)	89 \pm 111	94 \pm 141	0.73
Conversion to open surgery	2 (7%)	3 (10%)	0.70
Morbidity			
None	26 (96%)	27 (93%)	0.60
Wound infection	0	1	
Subhepatic abscess formation	0	1	
Cholangitis/pancreatitis	1	0	
Length of postoperative stay (days)	7.3 \pm 4.1	6.0 \pm 3.2	0.21

Table 4 Outcome of patients undergoing delayed laparoscopic cholecystectomy in each group.

	Group 1 (Age \geq 70) (n=22)	Group 2 (Age<70) (n=33)	p
Duration of surgery (min)	119 \pm 44	123 \pm 34	0.86
Estimated blood loss (g)	88 \pm 165	94 \pm 141	0.78
Conversion to open surgery	0	3 (10%)	0.15
Morbidity			
None	21 (95%)	30 (91%)	0.52
Wound infection	1	0	
Intraabdominal bleeding	0	1	
Pulmonary thromboembolism	0	1	
Congestive heart failure	0	1	
Length of postoperative stay (days)	10.7 \pm 6.9	7.8 \pm 7.0	0.038*

* Statistically different.

DISCUSSION

The main goal of managing acute cholecystitis in the elderly is to provide them the best surgical treatment concomitant with possible quality of life. Recently some studies suggest that early cholecystectomy is indicated for most patients with acute cholecystitis, and early LC is preferred for experienced surgeons^[1-3, 21]. Therefore, it is requisite to consider the impact of early LC on the elderly patients with acute cholecystitis. In our institute, with accumulated laparoscopic experience and availability of dedicated operating staffs in emergent situation, early LC for acute cholecystitis has become the accepted standard approach for selected candidate. Our results confirmed that early LC for acute cholecystitis in the elderly is safe and practical if an appropriate patient selection is applied.

High risk patients defined by POSSUM score, E-PASS score, or ASA score, can be a potential candidate of operative morbidity and mortality^[7,19,20,22]. In our study, it is indicated that preoperative risk scores and related comorbidity rates were higher in the elderly group, which suggested that elderly patients were at higher risk than the

younger. However, these high-risk patients had not hemodynamically changed during operation under adequate hemodynamic monitoring, and there was no significant difference in the operative time or blood loss between the elderly and younger groups. Of course, it is needless to say that preoperative assessment of cardiopulmonary risk factors and active modification of deranged function are mostly important for successful performance of early LC.

In case of early LC, the rate of conversion to open cholecystectomy in elderly patients was 7% and there was no difference between the elderly and the younger in the current study. The conversion rate of elderly patients in our study was identical to or even lower than that reported by other similar studies (2% to 16%)^[8,11,23-25]. We thought that the relatively lower conversion rate in our institute is mainly due to a strict patient selection for early LC and meticulous operative procedures. Of course, conversion of LC to open surgery should not be regarded as a complication, but rather as an approach to prevent severe complications such as bile duct injury. Since elderly patients have more prevalence of having a long history of gallstone disease and suffering from frequent acute attacks, dense adhesions in the area of Calot's triangle are more likely to occur in this group. Another concerning preoperative risk factor for early LC in the elderly population is use of antithrombotics (antiplatelet and/or anticoagulation agents). The aging group is more likely to use antithrombotics for the purpose of thromboembolic prevention, and risk of bleeding complication is thought to be high in these cases. Thus, sufficient preoperative assessment and appropriate patient selection for early LC in the elderly should be warranted.

In our study, the incidence of intraoperative and postoperative complications was similar between elderly and younger groups. There was neither operative death nor severe biliary injury experienced in each group. The mortality after LC in the elderly is reported to be between 0% and 4%^[8,12,26-28], suggesting that our data demonstrated identical and even better results compared with other reports. Mortality after LC is mainly attributed to coexisting cardiorespiratory disease and systemic septic complications related to acute or complicated cholecystitis. If surgical risks are presented in acute cholecystitis, percutaneous gallbladder drainage and subsequent delayed cholecystectomy should be considered as an alternative therapy. Again, appropriate preoperative assessment and patient selection for early LC, using a standardized managing flowchart like that in the current study, is of paramount importance.

Some limitations of this study include the relatively small sample size and confounding bias due to a retrospective design, which weakens the statistical analysis and conclusions. This limitation will be mitigated in later follow-up studies as we examine more patients. In addition, as we continue to manage both elderly and younger patients with acute cholecystitis using the same selection protocol and operative policy, we will accumulate more patients to help us understand the feasibility and safety of early LC on this challenging patient population.

In conclusion, the elderly patients with acute cholecystitis still represent a challenging group and need to be carefully managed. Although co-morbidities in elderly patients are much greater than in younger patients, early LC is safe and effective even in the elderly group if an appropriate patient selection is secured.

REFERENCES

- 1 Garber SM, Korman J, Cosgrove JM, Cohen JR. Early laparoscopic cholecystectomy for acute cholecystitis. *Surg Endosc* 1997; **11**: 347
- 2 Kiviluoto T, Sirén J, Luukkonen P, Kivilaakso E. Randomised

- trial of laparoscopic versus open cholecystectomy for acute and gangrenous cholecystitis. *Lancet* 1998; **351**: 321-325
- 3 Lam CM, Yuen AW, Chik B, Wai AC, Fan ST. Variation in the use of laparoscopic cholecystectomy for acute cholecystitis: a population-based study. *Arch Surg* 2005; **140**: 1084-1088
- 4 Eldar S, Sabo E, Nash E, Abrahamson J, Matter I. Laparoscopic versus open cholecystectomy in acute cholecystitis. *Surg Laparosc Endosc* 1997; **7**: 407-414
- 5 Golden WE, Cleves MA, Johnston JC. Laparoscopic cholecystectomy in the geriatric population. *J Am Geriatr Soc* 1996; **44**: 1380-1383
- 6 Kanaan SA, Murayama KM, Merriam LT, Dawes LG, Prys-towsky JB, Rege RV, Joehl RJ. Risk factors for conversion of laparoscopic to open cholecystectomy. *J Surg Res* 2002; **106**: 20-24
- 7 Massie MT, Massie LB, Marrangoni AG, D'Amico FJ, Sell HW. Advantages of laparoscopic cholecystectomy in the elderly and in patients with high ASA classifications. *J Laparo-endosc Surg* 1993; **3**: 467-476
- 8 Cui W, Zhang RY, Sun DQ, Gong RH, Han TQ. Early laparoscopic cholecystectomy for acute gallbladder disease in Chinese elderly. *Hepatogastroenterology* 2010; **57**: 409-413
- 9 do Amaral PC, Azaro Filho Ede M, Galvão TD, Ettinger JE, Silva Reis JM, Lima M, Fahel E. Laparoscopic cholecystec-tomy for acute cholecystitis in elderly patients. *JLS* 2006; **10**: 479-483
- 10 Moyson J, Thill V, Simoens Ch, Smets D, Debergh N, Mendes da Costa P. Laparoscopic cholecystectomy for acute chole-cystitis in the elderly: a retrospective study of 100 patients. *Hepatogastroenterology* 2008; **55**: 1975-1980
- 11 Pessaux P, Tuech JJ, Derouet N, Rouge C, Regenet N, Arn-aud JP. Laparoscopic cholecystectomy in the elderly: a pro-spective study. *Surg Endosc* 2000; **14**: 1067-1069
- 12 Bingener J, Richards ML, Schwesinger WH, Strodel WE, Sirinek KR. Laparoscopic cholecystectomy for elderly pa-tients: gold standard for golden years? *Arch Surg* 2003; **138**: 531-535
- 13 Hazzan D, Geron N, Golijanin D, Reissman P, Shiloni E. Laparoscopic cholecystectomy in octogenarians. *Surg Endosc* 2003; **17**: 773-776
- 14 Chandler CF, Lane JS, Ferguson P, Thompson JE, Ashley SW. Prospective evaluation of early versus delayed laparoscopic cholecystectomy for treatment of acute cholecystitis. *Am Surg* 2000; **66**: 896-900
- 15 Lau H, Lo CY, Patil NG, Yuen WK. Early versus delayed-in-terval laparoscopic cholecystectomy for acute cholecystitis: a metaanalysis. *Surg Endosc* 2006; **20**: 82-87
- 16 Miura F, Takada T, Kawarada Y, Nimura Y, Wada K, Hirota M, Nagino M, Tsuyuguchi T, Mayumi T, Yoshida M, Stras-berg SM, Pitt HA, Belghiti J, de Santibanes E, Gadacz TR, Gouma DJ, Fan ST, Chen MF, Padbury RT, Bornman PC, Kim SW, Liau KH, Belli G, Dervenis C. Flowcharts for the diagnosis and treatment of acute cholangitis and cholecysti-tis: Tokyo Guidelines. *J Hepatobiliary Pancreat Surg* 2007; **14**: 27-34
- 17 Chopra S, Dodd GD, Mumbower AL, Chintapalli KN, Schwesinger WH, Sirinek KR, Dorman JP, Rhim H. Treat-ment of acute cholecystitis in non-critically ill patients at high surgical risk: comparison of clinical outcomes after gallbladder aspiration and after percutaneous cholecystos-tomy. *AJR Am J Roentgenol* 2001; **176**: 1025-1031
- 18 Sugiyama M, Tokuhara M, Atomi Y. Is percutaneous chole-cystostomy the optimal treatment for acute cholecystitis in the very elderly? *World J Surg* 1998; **22**: 459-463
- 19 Copeland GP, Jones D, Walters M. POSSUM: a scoring sys-tem for surgical audit. *Br J Surg* 1991; **78**: 355-360
- 20 Haga Y, Ikei S, Wada Y, Takeuchi H, Sameshima H, Kimura O, Furuya T. Evaluation of an Estimation of Physiologic Ability and Surgical Stress (E-PASS) scoring system to pre-dict postoperative risk: a multicenter prospective study.

- Surg Today* 2001; **31**: 569-574
- 21 Zargar-Shoshtari K, Short H, Poole GH, Hill AG. Acute laparoscopic cholecystectomy: preferred treatment for acute biliary disease. *ANZ J Surg* 2008; **78**: 771-774
 - 22 Cheng SP, Chang YC, Liu CL, Yang TL, Jeng KS, Lee JJ, Liu TP. Factors associated with prolonged stay after laparoscopic cholecystectomy in elderly patients. *Surg Endosc* 2008; **22**: 1283-1289
 - 23 Brunt LM, Quasebarth MA, Dunnegan DL, Soper NJ. Outcomes analysis of laparoscopic cholecystectomy in the extremely elderly. *Surg Endosc* 2001; **15**: 700-705
 - 24 Firilas A, Duke BE, Max MH. Laparoscopic cholecystectomy in the elderly. *Surg Endosc* 1996; **10**: 33-35
 - 25 Uecker J, Adams M, Skipper K, Dunn E. Cholecystitis in the octogenarian: is laparoscopic cholecystectomy the best approach? *Am Surg* 2001; **67**: 637-640
 - 26 Chau CH, Siu WT, Tang CN, Ha PY, Kwok SY, Yau KK, Li AC, Li MK. Laparoscopic cholecystectomy for acute cholecystitis: the evolving trend in an institution. *Asian J Surg* 2006; **29**: 120-124
 - 27 Decker G, Goergen M, Philippart P, Mendes da Costa P. Laparoscopic cholecystectomy for acute cholecystitis in geriatric patients. *Acta Chir Belg* 2001; **101**: 294-299
 - 28 Macrì A, Scuderi G, Saladino E, Trimarchi G, Terranova M, Versaci A, Famulari C. Acute gallstone cholecystitis in the elderly: treatment with emergency ultrasonographic percutaneous cholecystostomy and interval laparoscopic cholecystectomy. *Surg Endosc* 2006; **20**: 88-91

Peer reviewers: Susumu Hijioka, Department of Gastroenterology, Aichi Cancer Center Hospital, 1-1 Kanokoden, Chikusa-ku, Nagoya, Aichi 464-8681, Japan; Fethi Derbel, Professor, Department of general and digestive surgery, university hospital Sahloul. 4056. SOUSSE. Tunisia; Bum Soo Kim, Department of Surgery, Kyung Hee University School of Medicine and the Kyung Hee University Hospital at Gangdong, 149 Sangil-dong, Gangdong-gu, Seoul 134-727, Korea.