

Predictive Factors for Conversion of Laparoscopic Cholecystectomy to Open Procedure

Dr. Taher Abdullah Hawrame*

Dr. Sirwan Hama Shareef**

Dr. Zanko Sherko ***

ABSTRACT

Background and Objectives: Laparoscopic cholecystectomy is the gold stander surgery for gallbladder diseases, especially symptomatic gall stone disease. to identify the factors that causes the conversion of planed laparoscopic cholecystectomy to an open procedure. Identifying these predictive factors will predict the conversion rate and eventually will help the surgeon, the patient and the hospital in planning the surgery.

Methods: Retrospective study. Between October 2003 and December 2004 hundred and fifty patients with symptomatic gallstone underwent laparoscopic cholecystectomy in Department of Surgery, Sulaimaniyah Teaching Hospital.

Results: ages of the patients were between 11-70 years with a mean of 40, female to male were 5/1, and in 47% the symptoms were present for more than two years. Conversion incidence was 8.7%

Conclusions: The predictive factors for conversion in our study accordingly were duration of the symptoms, abnormal intra-abdominal findings, concurrent illnesses, and intra-operative complications.

Key words: Laparoscopic cholecystectomy, conversion incidence in laparoscopic cholecystectomy, Gallstone.

INTRODUCTION:

Philip Mouret in 1987 was the first to remove the gall bladder successfully through unmagnified mechanical rigid pipe without doing laparotomy. Dubois is credited for popularizing laparoscopic cholecystectomy (LC)¹. Initially, the complication rate with LC was high but as the experience has grown, it has reached a remarkably low level at 2.0-6.0%. Since 1990 many surgeons have attempted LC with reasonable success in difficult cases. Their results indicated that extensive experience with both open and laparoscopic biliary tract surgery is the most important ingredient of a successful outcome in the setting of difficult cases. LC has revolutionized minimally invasive procedures⁵. It decreases postoperative pain, it encourages earlier oral intake, it

esis⁴⁻⁶. There is also a significant reduction in the incidence of wound complications and postoperative ileus in patients undergoing LC^{7,8}. However, a substantial proportions of patients in whom LC cannot be successfully performed are converted to open cholecystectomy (OC) because of technical difficulty or intraoperative complications^{9,10}. The current study aimed at evaluating the predictive factors for conversion of LC to OC in our set-up. Identifying these predictive factors will be extremely useful and it has so many advantages. It significantly decreases surgical trauma to the patient associated with operative procedure like dissection and cauterization; there will be less incidence of complications like common bile duct (CBD) injury; it allows the surgeon to discuss the likelihood conversion incidence with the patient and prepare him / her psychologically; it allow the

*M.B.Ch.B., D.S., (C.A.B.S.), Assistant professor – University of Sulymaniah.

** M.B.Ch.B., D.S., (C.A.B.S.), Assistant professor – University of Sulymaniah.

***M.B.Ch.B., D.G.S., F.I.B.M.S. General Surgery – Koya General Hospital.

ously for the process of conversion¹¹. It decreases the overall hospital coast by decreasing the duration of the operation and minimizing the complication of surgery like CBD injury and finally it will allows a more efficient scheduling of the operating lists and decreases the overall hospital coast by decreasing the duration of the operation and minimizing the complication of surgery like CBD injury which require further coast¹².

PATIENTS & METHODS:

This retrospective study was carried out in Sulaimaniyah Teaching Hospital, an academic and tertiary care hospital from October 2003 to December 2004. During that period, 193 patients were admitted to the hospital with features of symptomatic gallstone. They underwent elective laparoscopic cholecystectomy by two surgeons.

Patients who underwent LC were categorized in to 'converted' and 'not converted'. They were considered as 'converted' if LC was planned but due to a number of reasons converted to open. Several variables are taken into consideration; age, sex, concurrent illnesses, clinical presentation, duration of clinical presentation, intraoperative findings like adhesions and anomalies and intraoperative complications. The data were collected and the causes of conversion were noted in each group. SPSS Version 13 was used for statistical analysis. The frequencies were drawn and association between conversion rate and each of the variables were noted using odds ratio, while p-value (which means non accidental relationships of the variables) of less than 0.05 was considered as significant.

INTERVENTION:

Standard laparoscopic techniques with carbon dioxide as insufflator gas and metallic clips for ligation of the cystic duct and cystic artery were the standard technique in all.

RESULT:

Total number of cases was 150 patients. Female to male ratio was 5:1; (82.66%) were females and (17.33%) were males (Figure 1).

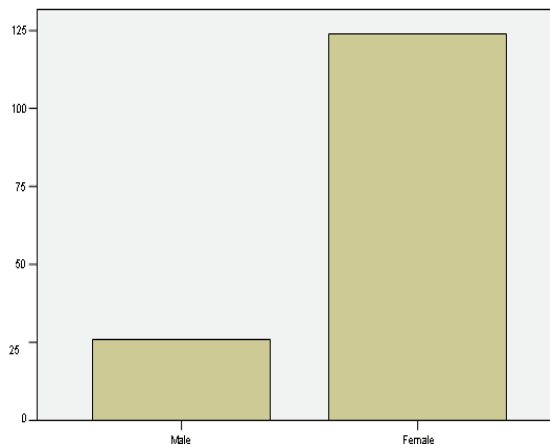


Figure 1: Sex distribution of the patient with gallstone.

The age range of patients was (11 – 70 years) with a mean of 40 years: The most common symptoms of symptomatic gallstone in order of frequency were right hypochondrial pain (123 patients), epigastric pain (22 patients), dyspepsia (4 patients) (Figure 2).

Regarding duration of the clinical presentation; about 47% had symptoms more than two years and about 28% presented within the first month. The other 25% are in between these two groups (Figure 3).

Patient's concurrent illnesses were also recorded; about 80% of the patients did not have any concurrent illness; 5.3% were hypertensive; 2.7% were asthmatic and 2% were diabetic (Figure 4).

Duration of the operation ranged from (8-80 minutes), but it was not taken in to consideration for the conversion to open procedure (Figure 5).

Intraoperative findings were: 46.7% of the patients had normal intraoperative findings; the others had the following findings:

the Calot's triangle in 42.7%, short cystic duct in 5.3%, inflamed gallbladder in 2%, and unclear anatomy in 1% (Figure 6). Regarding intraoperative complications: 72% of the patients had no intraoperative

complication, but 15.3 % of them gallbladder perforation happened and in the last 4% bleeding happened but was controlled intraoperatively (Figure7).

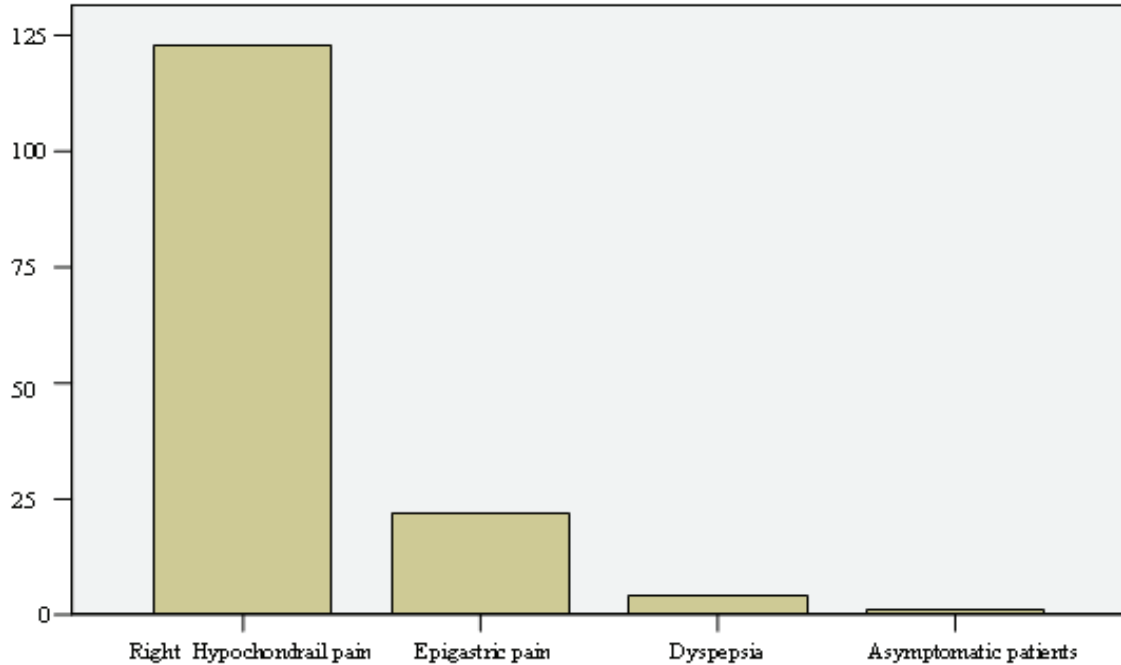


Figure 2: Clinical presentation of patient with gallstone.

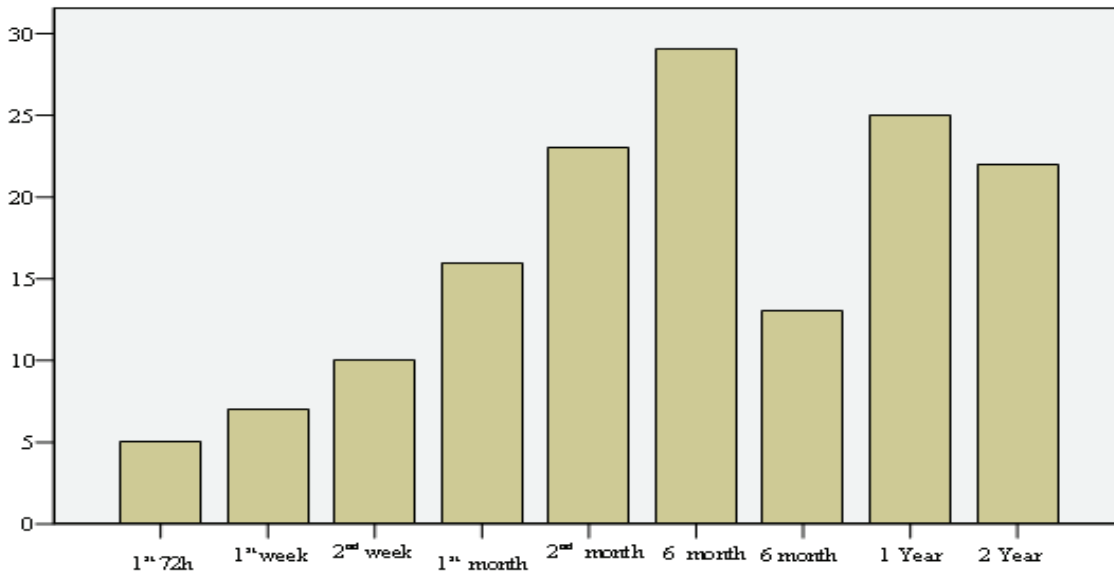


Figure 3: Duration of the clinical presentation

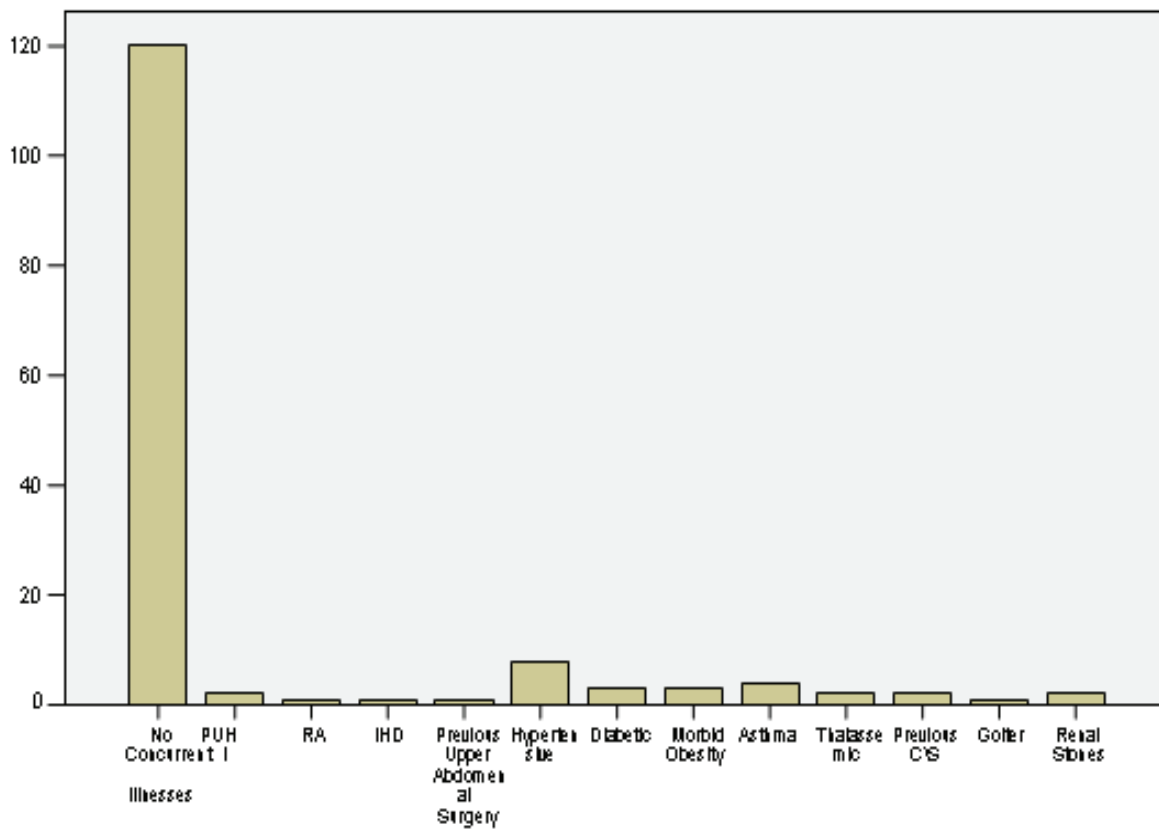


Figure 4: Concurrent illnesses of the patients.

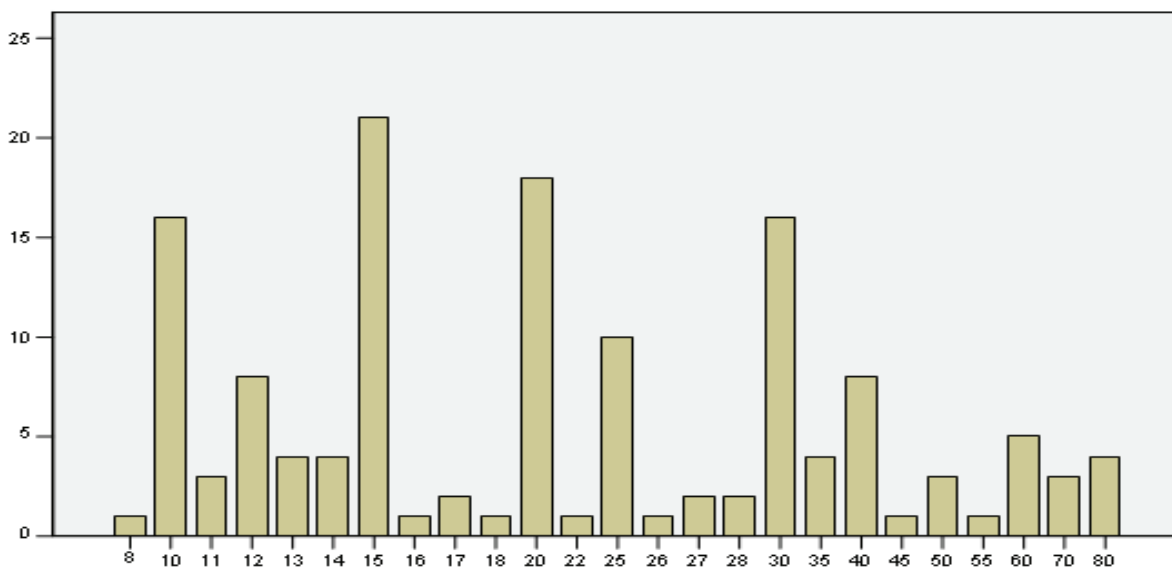


Figure 5: Duration of operation (in minutes).

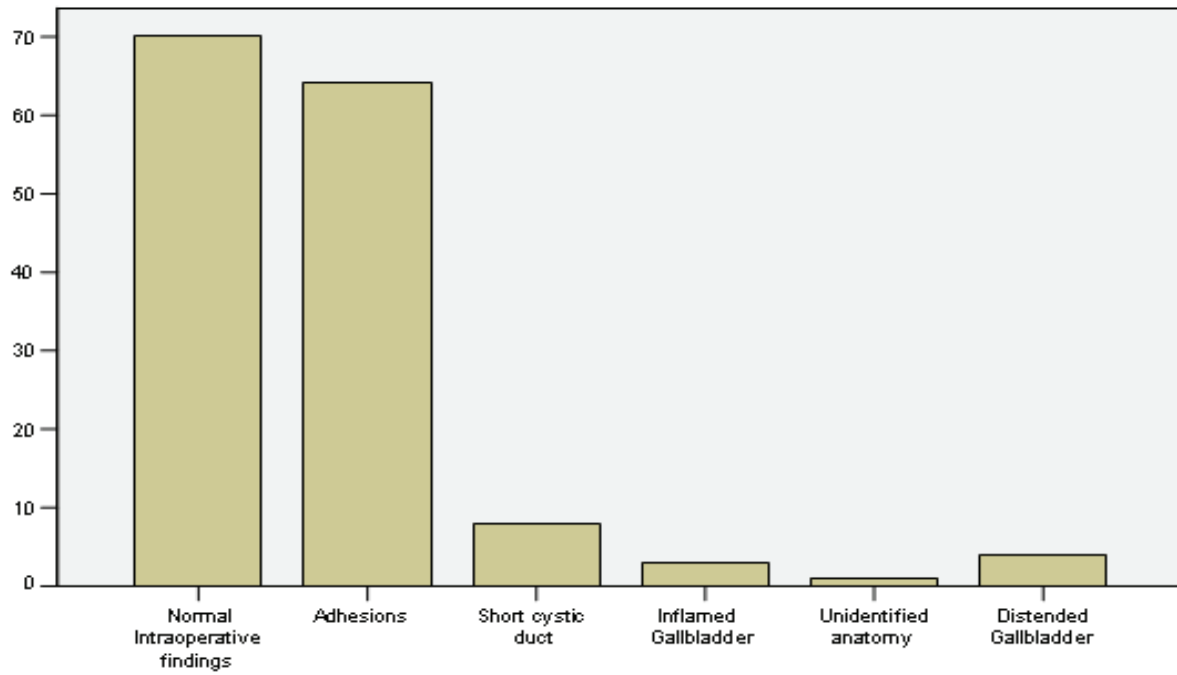


Figure 6: Intraoperative findings.

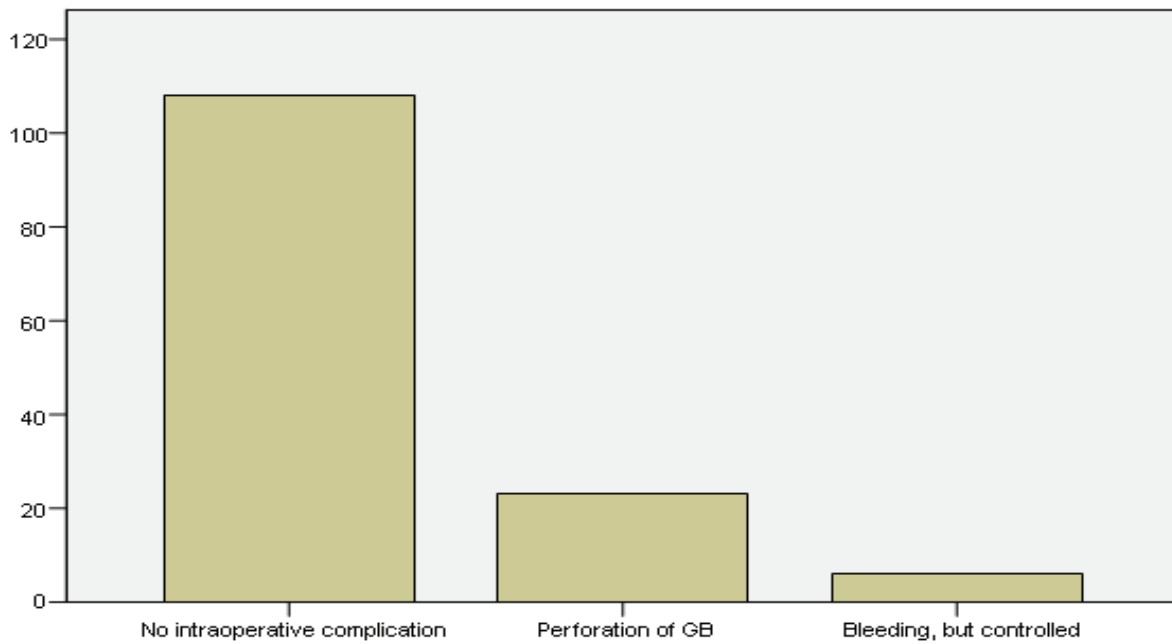


Figure 7: Intraoperative complications that occurred during surgery.

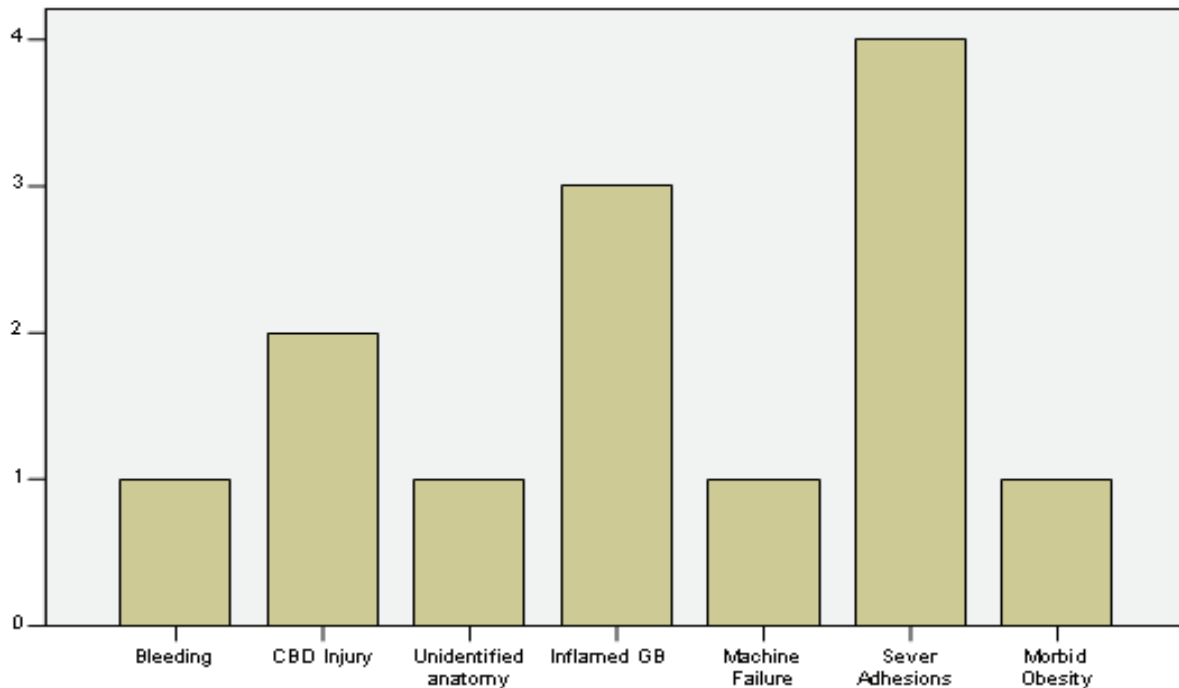


Figure 8: Causes of conversion laparoscopic cholecystectomy to open procedure.

DISCUSSION:

The well-documented advantages and safety of LC have made it a standard way of dealing with symptomatic gall stones, but still conversion to open procedure is required in a varying proportion of patients which ranges from 2% to 15% in different studies¹³. Recent reports also indicate that LC could be a safe and effective treatment option for patients with acute cholecystitis, although the procedure tends to be more difficult with a higher risk of conversion¹⁴. It is important to realize that the need for conversion to laparotomy is neither a failure nor a complication, but an attempt to avoid complication and ensure patient safety and indicates a sound clinical judgment¹⁵. In our study the conversion rate was 8.7% (13 patients). The causes included adhesions in 30.77% (4 patients), the second was inflamed gallbladder in 23.08% (3 patients), others were bleeding (1 patient) 7.7%, unclear anatomy 7.7 % (one patient), machine failure 7.7 % (one patient) and morbid obesity 7.7 % (one

The predictive factor for conversion i.e. *p*-value less than 0.05 was as follow:

- 1-Duration of the clinical presentation: the longer the duration, the higher incidence of conversion.
- 2- Intraoperative findings; the more the abnormal findings the higher the conversion rate.
- 3- Concurrent illnesses: they carry a higher rate of conversion.
- 4- Intraoperative complications: higher incidence of conversion in patients with intraoperative complication.

The importance of factors predisposing to conversion from laparoscopic to open cholecystectomy has been emphasized in several studies reported from the developed countries^{16,17}. A study from Hong Kong showed that the statistically significant cause to increase the risk of conversion were age older than 65 years, obesity, interval elective LC in acute cholecystitis, thickened gall bladder wall found ultrasonically, during the early learning phase, and in patients when the surgery was performed by senior surgeons¹⁹, while the risk

of conversion was not increased by sex, previous lower abdominal; surgery, history of acute pancreatitis or cholangitis impaired liver function test on presentation, and when LC was done as emergency in cases of acute cholecystitis²⁰. Another study from Pakistan found the increases risk of conversion to be also age over 60 years and inflamed gall bladder detected ultrasonically²¹. Previous studies had emphasized on recurrent attacks of cholecystitis and diseased biliary tracts in elderly patients to be the causes which increase the risk of conversion^{20, 21}. Concomitant diseases may be the cause which increases the risk of conversion in elderly patients²⁵. A study by Lwes et al in China shows that conversion rate was not affected by concurrent illness, but it has correlation with duration of clinical illness²². Our study concludes that the longer the history of the symptomatic gallstone the greater the risk of conversion to open is, as well as other findings which warrant conversion include elderly, especially if there were other factors which increase the risk. Obesity with body mass index of more than 30kg/m² as a cause of conversion was stressed upon by others^{22,23}; other variables like sex, clinical presentation and time of the operation were not found to increase the liability of conversion in our study, and proper patient selection is

REFERENCES:

needed to avoid conversion.

1. Cuschieri A, Dubois F, Mouiel J, Mouret P, Becker H, Buess G, et al. The European experience with laparoscopic cholecystectomy. *Am J Surg* 1991;161:385-7.
2. Southern Surgeons Club. A prospective analysis of 1518 laparoscopic cholecystectomies. *N Engl J Med* 1991;324:1073-8.
3. Liu CL, Fan ST, Lai EC, Lo CM, Chu KM. Factors effecting conversion of laparoscopic cholecystectomy to open surgery. *Arch Surg* 1996;135:98-101.
4. Livingston EH, Rege RV. A nationwide study of conversion from laparoscopic to open cholecystectomy. *Am J Surg* 2004;188:205-11.
5. Williams LF Jr, Chapman WC, Bonau RA, McGee EC Jr, Boyd RW, Jacobs JK. Comparison of

cholecystectomy in a single center. *Am J Surg* 1993;165:459-65.

6. Kane RL, Lurie N, Borbas C, Morris N, Flood S, McLaughlin B, et al. The outcomes of elective laparoscopic and open cholecystectomies. *J Am Coll Surg* 1995;180:136-45.
7. Brodsky A, Matter I, Sabo E, Cohen A, Abrahamson J, Elder S. Laparoscopic cholecystectomy for acute cholecystitis: Can the need for conversion and the probability of complications be predicted? A prospective study. *Surg Endosc* 2000;14:755-60.
8. Alponat A, Kum CK, Koh BC, Rajnacova A, Goh PM. Predictive factors for conversion of laparoscopic cholecystectomy. *World J Surg* 1997;21:629-33.
9. Krahenbuhl L, Sclabas G, Wente MN, Schafer M, Schlumpf R, Buchler MW. Incidence, risk factors, and prevention of biliary tract injuries during laparoscopic cholecystectomy in Switzerland. *World J Surg* 2001;25:1325-30.
10. Merriam LT, Kanaan SA, Dawes LG, Angelos P, Prystowsky JB, Rege RV, et al. Gangrenous cholecystitis: Analysis of risk factors and experience with laparoscopic cholecystectomy. *Surgery* 1999;126:680-6.
11. Kumar A, Thombare MM, Sikora SS, Saxena R, Kapoor VK, Kaushik SP. Morbidity and mortality of laparoscopic cholecystectomy in an institutional setup. *J Laparoendosc Surg* 1996;6:393-7.
12. Kama NA, Kologlu M, Doganay M, Reis E, Atli M, Dolapei M. A risk score for conversion from laparoscopic to open cholecystectomy. *Am J Surg* 2001;181:520-5.
13. Rosen M, Brody F, Ponsky J. Predictive factors for conversion of laparoscopic cholecystectomy. *Am J Surg* 2002;184:254-8.
14. Lo CM, Fan ST, Liu CL, Lai CS, Wong J. Early decision for conversion of laparoscopic to open cholecystectomy for treatment of acute cholecystitis. *Am J Surg* 1997;173:513-7.
15. Kologlu M, Tutuncu T, Yuksek YN, Gozalan U, Daglar G, Kama NA. Using a risk score for conversion from laparoscopic to open cholecystectomy in resident training. *Surgery* 2004;135:282-7.
16. Hannan EL, Imperato PJ, Nenner RP, Starr H. Laparoscopic and open cholecystectomy in New York State: Mortality complications, and choice of procedure. *Surgery* 1999;125:223-31.
17. Peters JH, Krailadsiri W, Incarbone R, Bremner CG, Froes E, Ireland AP, et al. Reasons for conversion from laparoscopic to open cholecystectomy in an urban teaching hospital. *Am J Surg* 1994;168:555-9.

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18. Ros A, Gustafsson L, Krook H, Nordgren CE, Thorel A, Wallin G, et al. Laparoscopic cholecystectomy versus mini laparotomy cholecystectomy. *Annals Surg* 2001;234:741-9.
 19. Teixeira JP, Saraiva AC, Cabral AC, Barros H, Reis JR, Teixeira A. Conversion factors in laparoscopic cholecystectomy for acute cholecystitis. *Hepatogastroenterology* 2000;47:626-30.
 20. Kama NA, Doganay M, Dolapci M, Reis E, Atli M, Kologlu M. Risk factors resulting in conversion of laparoscopic cholecystectomy to open surgery. *Surg Endosc* 2001;15:965-8.
 21. Bingener J, Richards ML, Schwesinger WH, Strodel WE, Sirinek KR. Laparoscopic cholecystectomy for elderly patients: Gold standard for golden years? *Arch Surg* 2003;138:531-6.
 22. Magnuson TH, Ratner LE, Zenilman ME, Bender JS. Laparoscopic cholecystectomy: Applicability in the geriatric population. *Am Surg* 1997;63:91-6.
 23. Richards C, Edwards J, Culver D, Emori G, Tolson J, Gaynes R. Does using a laparoscopic approach to cholecystectomy decrease the risk of surgical site infection? *Ann Surg* 2003;237:358-62.