International Surgery Journal
Mohammed AF et al. Int Surg J. 2018 Mar;5(3):846-849
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20180498

Original Research Article

Risk factors for open conversion of laparoscopic biliary surgery

Asem F. Mohammed*, Moharm A. Abdelshahid, Mohammed A. Elbalshy

Department of General Surgery, Faculty of Medicine, Menofia University, Egypt

Received: 29 January 2018
Accepted: 07 February 2018

***Correspondence:**
Dr. Asem F. Mohammed,
E-mail: Asemfayed10@yahoo.com

ABSTRACT

Background: Conversion rates of laparoscopic to open biliary procedures vary according to different factors such as clinical presentation, co-morbidity, surgical experience and equipment.
Methods: A prospective analysis of 464 laparoscopic cholecystectomies (LC) including 88 laparoscopic common bile duct explorations (LCBDE) over a period of 5 years was carried out in Menofia University Hospitals, between December 2012 to December 2017.
Results: The male to female ratio in the series was 1:3.4 with a Median±SD age 51±16 years. 158 cases (34%) of all patients were admitted as an emergency including jaundice in 60 cases (13%), acute pancreatitis in 27 cases 6% and acute cholecystitis/empyema in 27 cases (6%). 153 cases (33%) had previous abdominal surgery. LCBDE was done in 88 cases. open conversion was necessary in 6/464 cases (1.3%) over 5 years; with no conversions in the last 2 years (130 cases). converted cases had a Median±SD age 53±17 years and 67% were female.
Conclusions: Several risk factors favour conversion from laparoscopic to an open approach in biliary surgeries that has to be identified preoperative to provide a better surgery.

Keywords: Biliary surgery, Conversion, Laparoscopic approach

INTRODUCTION

Conversion rates of laparoscopic to open biliary procedures vary according to different factors such as clinical presentation, co-morbidity, surgical experience and equipment.[1,2] Laparoscopic cholecystectomy is the gold standard management for symptomatic gallstones. Conversion to an open surgery is inevitable in 5-10% of patients, and has an increased morbidity compared to a laparoscopic approach.[3] Mostly conversion due to failure to demonstrate the 'critical view of safety' or the occurrence of an intraoperative complication.[4] Some factors increase the probability of conversion to an open approach, including male sex, cholecystitis, age, obesity and previous ERCP.[4-7] some factors could be used to evaluate the difficulty grade of laparoscopic cholecystectomy table 1 and may be used as indicator for conversion to open surgery. Conversion to open surgery is associated with increased rates of complications including death, bile duct injury, bile leak, or bleeding.[8] It is therefore, better to know the risk factors for conversion to provide safer surgeries.

METHODS

A prospective analysis of 464 laparoscopic cholecystectomies (LC) including 88 laparoscopic common bile duct explorations (LCBDE) over a period of 5 years was carried out. In that time period only two cases were pre-selected for open surgery. The cystic duct was identified and tied as near as possible to the gallbladder neck before intraoperative cholangiography (IOC) was carried out in all cases. If IOC confirmed the

presence of CBD stones, the transcystic approach was the primary method of clearance. Formal choledochotomy was reserved for those patients in whom the transcystic approach had failed or stone size was deemed too large for a satisfactory transcystic clearance. Author evaluated traditional risk factors such as gender, age, acute attacks of cholecystitis and previous abdominal surgery and attempted to determine new ones based on the database. Author also graded difficulty of laparoscopic cholecystectomy using previously peer reviewed and published scoring system.[9]

Table 1: Difficulty grading for laparoscopic cholecystectomy.[9]

	Gallbladder	Cystic pedicle	Adhesions / access
Grade I	Floppy, non-adherent	Clear, thin	Simple, to neck and Hartman's pouch
Grade II	Mucocele, tense. Packed with stones. Deep gallbladder fossa	Fat- ladden. Anterior or accessory artery	Fibrous, up to the body. Left lobe of the liver redundant and obscuring the pedicle
Grade III	Acute cholecystitis. Contracted, Fibrous. Hartman's pouch adherent to CBD or with impacted stone	Cystic duct short, dilated or obscured, Cystic duct stones affecting dissection, ligation or clipping, Abnormal duct anatomy	Dense, up to the fundus. Involving hepatic flexure or duodenum. Not on GB but hinder retraction or exposure of the pedicle
Grade IV	Completely obscured. Empyema/gangrene, mass	Impossible to clarify. Mirizzi syndrome. Cirrhosis, dilated viens	Dense, fibrous, wrapping the GB. Duodenum or hepatic flexure difficult to separate

RESULTS

The male to female ratio in the series was 1:3.4 with a Median±SD age 51±16 years. 158 cases (34%) of all patients were admitted as an emergency including jaundice in 60 cases (13%), acute pancreatitis in 27 cases 6% and acute cholecystitis/empyema in 27 cases (6%). In 153 cases (33%) had previous abdominal surgery. LCBDE was done in 88 cases (Table 2). Open conversion was necessary in 6/464 cases (1.3%) over 5 years; with no conversions in the last 2 years (130 cases). Converted cases had a Median±SD age 53±17 years and 67% were female (4 cases).

Eighty-three percentage of those needing conversion were emergency admissions (5 cases), presenting with jaundice in 3/6 (50%) and cholecystitis/empyema in one case (17%). In (5/6) had a difficulty grade III or more. 1/6 patients had Mirizzi syndrome. one patient (17%) had abdominal scars resulting from previous abdominal surgery. And the primary cause of conversion was adhesions in that case. Four cases (67%) had suspected CBD stones, 3 (50%) requiring LCBDE (Table 3).

Table 2: Preoperative data.

Items	Laparoscopic		Open		Test of sig. p-value
	No.	Percentage	No.	Percentage	
Gender					
Male	104	23%	2	33%	X^2= 0.38
Female	354	77%	4	67%	P=0.54(>0.05)
Decision of operation					
Elective	305	67%	1	17%	X^2= 6.6
Emergency	153	33%	5	83%	P= 0.01*(<0.05)
Previous abdominal surgery					
Positive	152	33%	1	17%	X^2= 0.73
Negative	306	67%	5	83%	P=0.39 (>0.05)
USS detected contracted GB					
Positive	56	12%	4	67%	X^2= 15.6
Negative	402	88%	2	33%	P= 0.00**(<0.001)
USS detected CBD stones					
Positive	72	16%	2	33%	X^2= 1.4
Negative	386	84%	4	67%	P= 0.37(>0.05)
CBD stone risks present					
Positive	139	30%	4	67%	X^2= 3.7
Negative	319	70%	2	33%	P= 0.06

Table 3: Operative data.

Items	Laparoscopic		Open		Test of sig. p-value
	No.	Percentage	No.	Percentage	
Jaundice					
Positive	57	12%	3	50%	X^2= 7.4
Negative	401	88%	3	50%	P= 0.006*(<0.05)
Empyema					
Positive	26	6%	1	17%	X^2= 1.3
Negative	432	94%	5	83%	P= 0.25(>0.05)
Difficulty grade >III					
Positive	148	32%	5	83%	X^2= 6.9
Negative	310	68%	1	17%	P= 0.008*(<0.05)
Mirizzi's					
Positive	17	4%	1	17%	X^2= 2.7
Negative	441	96%	5	83%	P= 0.1(>0.05)
LCBDE					
Positive	85	19%	3	50%	X^2= 3.8
Negative	373	81%	3	50%	P= 0.051(>0.05)

DISCUSSION

In present study, the male to female ratio was 1:3.4 while according to Yol et al symptomatic gallbladder stones, inflammation, and fibrosis occurred more in men than in women, explaining the higher rate of conversion in male patients.[10] While Schrenk et al claim that male sex does not affect the rate of conversion, findings from other studies, on par with the results, suggest such correlation.[11] Eldar et al and Schafer et al also stated that male patients are susceptible for more operative difficulties (due to the effect of intra-abdominal fat in males compared to women) and conversion of laparoscopic cholecystectomy in acute cholecystitis.[12,13]

In present study the Median±SD age 51±16 years. while Yetkin et al stated that conversion rate for elderly patients was 15% while it was 8% in younger patients.[14]

In present study, 83% of those needing conversion were emergency admissions (5 cases), presenting with jaundice in 3/6 (50%) and cholecystitis/empyema in one case (17%). While Fried et al suggested that acute cholecystitis dissection can be challenging due to a thickened and friable gallbladder wall and dense scarring. The cystic duct may become foreshortened and the gallbladder densely adherent to the common bile duct Fried et al suggested that age is a preoperative risk factor for conversion Simopoulos et al suggested that a long duration of cholelithiasis, and an increased number of cholecystitis attacks (or chronic cholecystitis) may predispose to higher rates of conversion.[14-16]

In present study, open conversion was necessary in 6/464 cases (1.3%) over 5 years while Lai et al had a conversion rate ranging from 11 to 31%.[17]

Alponat et al suggested an association between diabetes and conversion.[18] Goonawardena et al stated it is unclear whether history of previous surgery independently predispose conversion, since previous reports are conflicting.[19]

Goonawardena et al also reported that Body mass index is not independently predict conversion, in contrast other series.[19]

CONCLUSION

Author found significant associations between open conversion and jaundice, choledocholithiasis, difficulty grade III or more, Empyema and Mirizzi syndrome. The conversion rate remained low in spite of the fact that author operate on all comers including emergencies such as empyema, cholangitis, choledocholithiasis and pancreatitis during the same admission.

Author have optimized the technique of laparoscopic cholecystectomy and common bile duct exploration by developing a specialist biliary team in the general surgery department and accepting all elective and emergency referrals from other surgeons and hospitals. Moreover, author use blunt dissection for dissection in the Hartman's pouch and also to remove gall bladder. A specialized unit in a district hospital can optimize the conversion rate in high risk patients. Traditional risk factors such as gender, previous abdominal surgery, acute cholecystitis and old age should not necessarily influence the decision to convert.

Funding: No funding sources
Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. 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.
2. 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. Surg. 1999;126:680-6.
3. Goonawardena J, Gunnarsson R, de Costa A. Predicting conversion from laparoscopic to open cholecystectomy presented as a probability nomogram based on preoperative patient risk factors. Am J Surg. 2015;210:492-500.
4. Rosen M, Brody F, Ponsky J. Predictive factors for conversion of laparoscopic cholecystectomy. Am J Surg. 2002;184:254-8.
5. Lipman JM, Claridge JA, Haridas M, Martin MD, Yao DC, Grimes KL et al. Preoperative findings predict conversion from laparoscopic to open cholecystectomy. Surg. 2007;142:556-3.
6. Ballal M, David G, Willmott S, Corless DJ, Deakin M, Slavin JP. Conversion after laparoscopic cholecystectomy in England. Surg Endosc. 2009;23:2338-44.
7. Reinders JS, Gouma DJ, Heisterkamp J, Tromp E, van Ramshorst B, Boerma D. (2013) Laparoscopic cholecystectomy is more difficult after a previous endoscopic retrograde cholangiography. HPB. 2013;15:230-4.
8. Wolf AS, Nijsse BA, Sokal SM, Chang Y, Berger DL. Surgical outcomes of open cholecystectomy in the laparoscopic era. Am J Surg. 2009;197(6):781-4.
9. Nassar AH, Ashkar KA, Mohamed AY, Hafiz AA. Is laparoscopic cholecystectomy possible without video technology?. Mini Invasive Therap. 1995;4(2):63-5.
10. Yol S, Kartal A, Vatansev C, Aksoy F, Toy H. Sex as a factor in conversion from laparoscopic cholecystectomy to open surgery. JSLS. 2006;10(3):359-63.
11. Schrenk P, Woisetschlager R, Wayand WU. Laparoscopic chole-cystectomy. Cause of conversion in 1300 patients and analysis of risk factors. Surg Endosc. 1995;9:25-8.
12. Eldar S, Sabo E, Nash M. Laparoscopic cholecystectomy for acute cholecystitis: prospective trial. World J Surg.1997;21:540-5.
13. Schafer M, Krahenbuhl L, Buchler MW. Predictive factorsfor the type of surgery in acute cholecystitis. Am J Surg. 2001;182:291-7.
14. Yetkin G, Uludag M, Oba S, Citgez B, Paksoy I. Laparoscopic cholecystectomy in elderly patients. J Soc Laparoendosc Surg. 2009;13(4):587-91.
15. Fried GM, Barkun JS, Sigman HH. Factors determining conversion to laparotomy in patients undergoing laparoscopic cholecystectomy. Am J Surg. 1994;167:35-9.
16. Simopoulos C, Botaitis S, Polychronidis A, Tripsianis G, Karayiannakis AJ. Risk factors for conversion of laparoscopic cholecystectomy to open cholecystectomy. Surg Endosc Other Interv Tech. 2005;19(7):905-9.
17. Lai PB, Kwong KH, Leung KL. Randomized trial of early versus delayed laparoscopic cholecystectomy for acute chole-cystitis. Br J Surg. 1998;85:764-7.
18. Alponat A, Kum CK, Koh BC. Predictive factors for conversion of laparoscopic cholecystectomy. World J Surg. 1997;21:629-33.
19. Goonawardena J, Gunnarsson R, de Costa A. Predicting conversion from laparoscopic to open cholecystectomy presented as a probability nomogram based on preoperative patient risk factors. Am J Surg. 2015;210:492-500.

Cite this article as: Mohammed AF, Abdelshahid MA, Elbalshy MA. Risk factors for open conversion of laparoscopic biliary surgery. Int Surg J 2018;5:846-9.