ORIGINAL RESEARCH PAPER

Volume-7 | Issue-3 | March-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PRE-OPERATIVE DETECTION OF SAFE LAPAROSCOPIC CHOLECYSTECTOMY IN ACUTE CHOLECYSTITIS

General Surgery

Malika Singh* Junior resident Department of General Surgery, Government Medical College/ Rajindra Hospital, Patiala (Pb). *Corresponding Author

Prem Chand Associate Professor & Unit Head, Department of General Surgery, Government Medical College/ Rajindra Hospital, Patiala (Pb).

D.P.Singh Professor & Head, Department of General Surgery, Government Medical College/ Rajindra Hospital, Patiala (Pb).

Abhinav Singh Junior resident Department of General Surgery, Index Medical College, Indore (MP).

ABSTRACT

The purpose of the study was to assess pre-operative predictors of safe early laparoscopic cholecystectomy (LC) in acute cholecystitis (AC). The study was conducted in the Department of General Surgery Government Medical College/ Rajindra Hospital Patiala. Total of 100 consecutive cases of AC were undertaken for early LC. Excluded were the patients with mass formation, coagulation disorders, pregnancy, unfit for general anaesthesia and not consented for conversion of LC into open cholecystectomy (OC). Various parameters critically analyzed were age more than 65 years, male gender, history of attacks of AC, previous abdominal surgery, previous endoscopic retrograde cholengio-pancreaticography (ERCP), BMI >30, deranged liver function tests (LFTs), contracted or distended gall bladder (GB), pericholecystic collection, multiple stones and gangrenous gall bladder, and accordingly the status of ease of LC was categorized as Easy LC, Reasonably/ Relatively easy LC, Moderately difficult LC, Difficult LC, Very difficult LC and Severely difficult LC as per the locally designed grading system based on three main concerns and observations of the operating surgeon while completing the whole procedure of LC, and these include time taken for completion of LC, injury to artery or duct and the conversion to open cholecystectomy. Out of 100 cases of LC, 69 were easy LC, 18 were reasonably/ relatively easy LC, 9 were moderately difficult LC, 3 were difficult LC and one was very difficult LC. This very difficult LC was due to prolonged operative time, injury to artery and bleeding and the necessity of its conversion to open cholecystectomy because of the obscured Calot's triangle as a result of previous history of attacks of AC, deranged LFTs, multiple stones, pericholecystic collection, gangrenous GB and male gender. Females, absence of history of attacks of AC, no previous abdominal surgery, normal LFTs, non contracted, non distended and non gangrenous GB, single stone, absence of pericholecystic collection and cholecysto-enteric fistula, and clear visualization of Calot's triangle with normal anatomy are all preoperative predictors of early safe LC. Age more than 65 years, obesity and previous ERCP were not predictors for very difficult LC. However, such categorization of LC in a given case is dependent upon the experience and expertise of the operating surgeon.

KEYWORDS

Laparoscopic cholecystectomy. Open cholecystectomy. Safe laparoscopic cholecystectomy. Difficult laparoscopic cholecystectomy. Predictors.

Introduction:

The conventional long sub-costal incision open cholecystectomy (OC) has been replaced by laparoscopic cholecystectomy (LC) and is the most common surgical procedure carried out these days, being a gold standard treatment for symptomatic gall stone disease because of its safety, reliability, cost-effective, negligible mortality, less hospitalization & early return to work, better cosmesis, minimum wound complications and temporary paralytic ileus. Despite being common & gold standard procedure, the LC could be difficult to result into its conversion to OC. Multiple studies have been conducted by different researchers to assess pre-operatively the predictors for safe and difficult LC in acute cholecystitis (AC) depending upon the characteristics of diseased gall bladder and affected patients.

Material and Methods:

The study was carried out in 100 consecutive patients of acute cholecystitis having undergone laparoscopic cholecystectomy by one single senior most laparoscopic surgeon in the department of General Surgery of Government Medical College/ Rajindra Hospital Patiala to know pre-operative predictors of safe early LC in AC to enable better selection with least conversion rates. The diagnosis of AC was made based on history, clinical examination, ultrasound studies, laboratory findings and the histopathology. Excluded were the patients with mass formation, coagulation disorders, pregnancy, unfit for general anaesthesia and not consenting for conversion. Various pre-operative parameters taken into consideration in the present study were age more than 65 years, history of previous attacks of acute cholecystitis, previous abdominal surgery, post ERCP, BMI>30, deranged LFTs, contracted or distended gall bladder, pericholecystic collection, multiple stones and gangrenous gall bladder. Accordingly, local grading of LC was designed like the Easy, Reasonably/ Relatively easy, Moderately difficult, Difficult, Very difficult and Severely difficult LC based on three observations of the operating surgeon like the time taken for completion of LC, injury to duct or artery and the conversion to OC (Table.1).

Results:

The maximum number (73%) of patients were in the age group of 31 to 60 years and the age factor was not found statistically significant because none of the patients above 65 years of age had very difficult laparoscopic cholecystectomy. Also the AC was more common (79%) in females but the difficult cholecystectomy was more common in males. Out of 100 patients of AC, only one (1.00%) male aged 48 years with history of previous attacks of AC, deranged liver function tests, contracted and gangrenous gall bladder with pericholecystic collection and multiple stones had very difficult LC requiring conversion to OC following prolonged operative time as a result of obscured Calot's triangle and bleeding, however previous ERCP was not the predictor for difficult LC. Majority (87%) of cases required up to 45 minutes for completing the procedure. There were 69 easy, 18 relatively easy, 9 moderately difficult, 3 difficult and one very difficult, and this very difficult LC only required conversion in to open cholecystectomy.

Discussion:

Even the expert laparoscopic surgeon encounter difficulty in doing LP in the presence of dense adhesions, fibrotic and contracted gall bladder, acutely inflamed or gangrenous gall bladder or in the presence of cholecysto-enteric fistula [1]. The various risk factors mentioned in the literature are old age, male sex, attacks of acute cholecystitis, fever and leucocytosis, obesity, previous abdominal surgery, signs of acute cholecystitis and the ultrasound findings like thick walled gall bladder, distended gall bladder, pericholecystic collection and impacted stones. Different researchers had reported different findings & observations in their studies to pre-operatively assess the risks of conversions to open cholecystectomy.

Kanaan et al [2] and Gabriel et al [3] reported in their studies that the patients of more than 65 years of age had difficult LC, but these were contrary to the findings of the present study and also not in accordance to the studies of Gupta et al [4] and Fried et al [5]. Although the cholelithiasis is more common in females but the males had higher risks of having difficult LC due to more intense inflammation or

fibrosis to result into difficult dissection in the Calot's triangle and the gall bladder bed as was reported by Lein and Huang et al [6]. Studies conducted by Rosen et al [7] and Nachnani and Supe [8] had shown higher rate of conversion in obese with BMI > 30 kg/m2, but it was not consistent with the findings of the present study and the study of Gupta et al [4]. Like the present study, many researchers like Gabriel et al [3], Gupta et al [4], Nachnani and Supe [8] and Kama et al [9] had found that history of previous hospitalization was a predictor for difficult cholecystectomy and higher conversion rate due to dense fibrotic adhesions, bleeding and ductal injuries. There were controversial findings about having difficult LC in those patients who previously had undergone upper abdominal surgery [4,8,10], but it was a significant factor in the present study, because adhesiolysis, difficult exposure, difficult placement of ports and difficulty in creating pneumo-peritoneum all require more time for completing LC. However all these depend upon the experience of the operating surgeons. Similarly the past history of ERCP was detected as an important predictor for difficult LC due to inflammation and adhesions to cause difficult dissection in the region of Calot's triangle, but this was not significant factor in the present study, again due to the vast experience of the operating surgeon. The deranged liver function tests and elevated serum amylase (ongoing cholangitis, hepatitis, and pancreatitis) were significant predictor for difficult LC in the present study due to difficult dissection because of oedema, and this finding was in accordance with the study of Alponat et al [10]. The USG findings like contracted gall bladder, distended gall bladder, multiple stones, pericholecystic collection to result into difficult grasping of the friable and oedematous walled gall bladder including injury to cystic artery and or ductal system were observed significant risk factors to compel the surgeon for doing conversion of LC to OC in the present study, and it was in concurrence with the findings of Singh and Ohri [11].

Summary and conclusions:

The study was conducted on 100 consecutive cases of acute cholecystitis in the Department of General Surgery of Government Medical College/ Rajindra Hospital Patiala to assess pre-operatively the predictor of safe early laparoscopic cholecystectomy. Maximum number of cases were between the age of 31 to 60 years. They were categorized as Easy, Relatively easy, Moderately difficult, Difficult, Very difficult and Severely difficult according to the time taken, injury to artery or duct and the conversion to open cholecystectomy. Statistically the significant pre-operative predictors for difficult LC were the male gender ($p=0.0001$), previous attacks of acute cholecystitis ($p<0.00001$), previous surgery ($p<0.00001$), deranged liver function tests ($p<0.00001$), contracted and distended gall bladder ($p<0.001$) and multiple stones ($p<0.001$). Elderly patients, obesity and previous history of ERCP were not associated with difficult LC in the present study, that could be due to experience of the surgeon. Therefore predicting safety in LC is feasible and the predictors are useful bench marks to predict safe cases.

Therefore it can be concluded that females, absence of previous repeated attacks of acute cholecystitis and hospitalizations, no upper abdominal surgery in the past, normal liver function tests, normal amylase levels, un-distended and un-contracted gall bladder, absence of pericholecystic collection, afebrile and single stone are the safe pre-operative predictors for safe LC in early AC. However these are not strict predictors, because everything ultimately depends upon the experience of the laparoscopic surgeon, i.e., dense adhesions could be a problem for less experienced surgeon and this might not be a matter for an experienced laparoscopic surgeon.

Table.1. Local grading.

1	Easy	Time taken <45 minutes, no injury to duct or artery, no conversion to open cholecystectomy.
2	Reasonably easy	Time taken 45-60 minutes, no injury to duct or artery, no conversion to open cholecystectomy.
3	Moderately difficult	Time taken >60 minutes, no injury to duct or artery, no conversion to open cholecystectomy.
4	Difficult	Time taken >60 minutes or obscured Calot's triangle or injury to cystic artery or cystic duct friable and no conversion to open cholecystectomy.
5	Very difficult	Time taken >60 minutes or obscured Calot's triangle or injury to cystic artery and conversion to open cholecystectomy.
6	Severely difficult	Time taken >60 minutes, injury to cystic duct and conversion to open cholecystectomy.

References:

1. Planivelu C. History of management of gall stone disease, In: Text book of surgical laparoscopic (1st edn.). Gem Digestive disease Foundion 2004:169-73.
2. Kanaan SA, Murayama KM, Merriam LT, Dawes LG, Pystowsky JB, Rege RV et al. Risk factors for conversion of laparoscopic to open cholecystectomy. J Surg Res 2002;106(1):20-4.
3. Gabriel R, Kumar S, Shrestha A. Evaluation of predictive factors for conversion of laparoscopic cholecystectomy. Kathmandu Univ Med J (KUMJ) 2009;7(25):26-30.
4. Gupta N, Ranjan G, Arora MP, Goswami B, Chudhary P, Kapur A et al. Validation of a scoring system to predict difficult laparoscopic cholecystectomy. Int J Surg 2013; 11(9):1002-06.
5. Fried GM, Barkun JS, Sigman HH, Joseph L, Clas D, Grzon J et al. Factors determining conversion to laparotomy in patients undergoing laparoscopic cholecystectomy. Am J Surg 1994;167(1):35-41.
6. Lein HH, Huang CS. Male gender: risk factor for severe symptomatic cholelithiasis. World J Surg 2002;26(5):598-601.
7. Rosen M, Brody F, Ponsky J. Predictive factors for conversion of laparoscopic cholecystectomy. Am J Surg 2002;184(3):254-8.
8. Nachnani J, Supe A. Preoperative prediction of difficult laparoscopic cholecystectomy using clinical and ultrasonographic parameters. Indian J Gastroentral 2005;24(1):16-8.
9. Kama NA, Kologlu M, Doganay M, Reis E, Atli M, Dolapci M. A risk score for conversion from laparoscopic to open cholecystectomy. Am J Surg 2001;181(6):520-5.
10. Alponat A, Kum CK, Koh BC, Rajnakova A, Goh PM. Predictive factors for conversion of laparoscopic cholecystectomy. World J Surg 1997;21(6):629-33.
11. Singh K, Ohri A. Difficult laparoscopic cholecystectomy: A large series from north India. Indian J Surg 2006;68(4):205-08.