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Conversion from Laparoscopic to Open Cholecystectomy

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ABSTRACT

Introductions: With the advent of newer technology, the era of open surgery for gall bladder diseases has been preferably taken over by laparoscopic cholecystectomy. However, certain cases still require conversion to open surgery. In this review we aim to analyze the reason for conversion.

Methods: This retrospective study was conducted at Patan Hospital, Patan Acdemy of Health Sciences, Nepal. All patients who underwent laparoscopic cholecystectomy from February 2009 to July 2012 were included in the study. File numbers of all the patients were obtained from operation room register. The patient files were analyzed for age, sex, duration of symptoms, liver function tests, ultrasound findings and the description in operation note for reason for conversion.

Results: The age ranged from 12 to 81 years with mean age of patients 32.76 years and male to female ratio 1:2.9. The mean operating time was 65 minutes and average post operative hospital stay was 1.61 days. Out of 305 patients, 34 (11.14%) required open conversion. Factors responsible for open conversion were dense fibrosis at Calots in 11 (3.6%), adhesions due to previous abdominal surgery in 6 (1.9%), uncontrollable bleeding in 5 (1.6%), bile duct injury in 4 (1.3%) cholecystoenteric fistula in 3 (0.9%), Mirizzi's syndrome 2(0.6%).

Conclusions: Adhesions at the calot's triangle was the common reason for conversion from laparoscopic to open cholecystectomy.

Keywords: adhesions, conversion, gallstone, laparoscopic cholecystectomy

Plain Language Summary

This study was conducted to determine the predictive factors for conversion of laparoscopic cholecystectomy. The study found that dense adhesion around calot's triangle and adhesions pertaining to previous abdominal surgery were the main reasons for conversion to open surgery. So, before embarking on laparoscopic cholecystectomy, it is essential to take detail history and examination, to rule out the probable cause of conversion beforehand and minimize; morbidity, duration of surgery and cost.

INTRODUCTIONS

Since its introduction in 1987 by Philip Mouret, laparoscopic cholecystectomy (LC) as minimally invasive procedure has become the gold standard. However, for various reasons there are conditions to convert to open cholecystectomy (OC). Inability to correctly identify the anatomy of the Calot's triangle due to inflammation, adhesion, or anatomical variations are some common conditions for coversion. This study was conducted to analyze the conversion cause and rate for conversion to open surgery in patients who underwent laparoscopic cholecystectomy at Patan Hospital (PH).

METHODS

This retrospective cross sectional, descriptive study was conducted at Patan Hospital, Patan Acdemy of Health Sciences, Nepal. All patients who underwent laparoscopic cholecystectomy or conversion to open surgery from February 2009 to July 2012 were included in the study. File numbers were obtained from operation room register and patient files retrieved from record section. Patients age, sex, duration of symptoms of gallstones (acute or chronic cholecystitis), liver function tests (LFTs including serum alanine transaminase, aspartate transaminase, alkaline phosphatase and bilirubin), ultrasound findings, types of anesthesia and the operation notes (for number of ports, anatomy of Callot's triangle, size of common bile duct(CBD)) were analyzed for reason of conversion from laparoscopic to open surgery and mortality. Ethical approval was taken from ethical review committee of Patan Acacdemy of Health Sciences (PAHS).

RESULTS

There were 305 patients charts available (out of total 316 patients registered in operation theater record book, 11 files were not found in record section) for analysis. There were 70 (22.95%) males and 235 (77.05%) females, age 12 to 81 years (mean 32.76 years), chronic calculus cholecystitis in 276 (90.5%), acute calculus cholecystitis in 17 (5.6%), gall bladder polyp in 12 (3.9%). Thirty four (11.14%) patients required conversion to open method. Of them 22 (64.70%) were male and 12 (35.30%) female.

The most common reason for conversion was fibrosis around calot's triangle (figure 1), four (1.3%) had bile duct injury- two due to diathermy injury in CBD, and two CBD injury during dissection) and five (1.6%) had bleeding (one each from cystic artery and hepatic artery and three from gallbladder bed). Post operative hospital stay ranged from 1 to 18 days (mean 1.61 days) as per our existing policy. 205 (67.21%) patients were discharged on 1st postoperative day. Remaining 65 (21.31%) on 2nd post operative day, 21 (6.88%) on 3rd post operative day as patient preference. Six (1.96%) patients developed postoperative fever, three each had chest infection and urinary tract infection. All patients with fever were managed conservatively and discharged within 6th post operative day. Eight (2.62%) patients had postoperative bile leak recovered after conservative management and were discharged on 7th (3 patient), 8th (2 patient), 12th (1 patient), 17th(1 patient) and 18th(1 patient) day respectively. There was no mortality in this series.

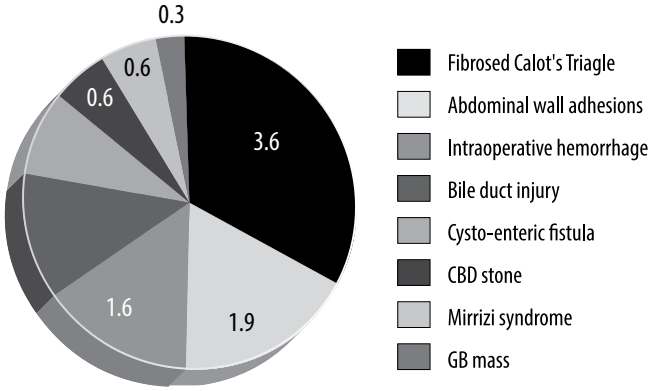

Figure 1. Causes for rate of conversion from laproscopic to open cholecystectomy

DISCUSSIONS

The conversion rate in our study was 11.14% (34 of 305), which compares well with the incidence reported in the literature, which varies from 2% to 15%. In developed countries less than 20% of total cholecystectomies are performed by open method. In developing countries the open method is still common due to lack of skill and apparatus.

We had 11 patients with unclear Calots triangle anatomy and six had adhesions associated with previous abdominal surgery. Among five uncontrolled bleeding, majority (three) were due to cystic artery injury, and one each because of hepatic artery bleed and liver bed bleed. We noticed bile duct injury in two patients who required conversion. Similar findings of difficulty dissection of Calot's triangle, adhesions, bleeding and bile duct injury as cause of conversion has been described. Precise identification of cystic duct junction with gall bladder at one end and CBD at other end before and avoiding blind use of cautery and clips are useful to prevent bileduct injury.

In our study, we had no difficulty in creation of pneumoperitoneum. Situations, where difficulty in gallbladder extraction or instrument failure necessitated

conversion did not arise. There were no deaths reported. The limitation of our study was, we have not quantified the thickness of the gallbladder wall as the ultrasound data available were incomplete. Many other parameters such as obesity; diabetes mellitus; body mass index and preoperative Endoscope retrograde cholangiopancreatography (ERCP), which have been studied in other studies, could not be included in this study because of retrospective nature of data collection.

Several possible factors responsible for conversion have been studied. In particular, prediction of conversion through the analysis of preoperative factors responsible for conversion has been studied. These include age; sex; obesity; diabetes mellitus; body mass index; duration of symptoms; total leukocyte count; LFT; ultrasound; acute cholecystitis; history of biliary diseases such as jaundice, cholangitis, history of pancreatitis and preoperative endoscopic retrograde cholangiopancreatography.[5,6]

CONCLUSIONS

The most common cause of conversion of LC to OC was adhesion at calot's triangle which results difficulty in delineating biliary anatomy. Though, conversion rate in our study is comparable, we can minimize intraoperative complication with low threshold for conversion.

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