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Original Research Article

Causes and incidence of laparoscopic cholecystectomy conversion to open cholecystectomy in Al Karama teaching hospital

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ABSTRACT

Background: There is no doubt that laparoscopic cholecystectomy replaced open cholecystectomy as standard procedure for the treatment of symptomatic cholelithiasis. Conversion from laparoscopic cholecystectomy to open cholecystectomy is still required in many circumstance, this study aimed at exploring causes and incidence of conversion.
Methods: This is a prospective study of 200 cases of laparoscopic cholecystectomy cases were performed in ALKARAMA Teaching Hospital from January2009 to January 2011. All cases were followed at the time of surgery by obtaining data sheet for the patient's age, sex, time from the introduction of ports till decision of conversion and the cause of conversion if present.
Results: Out of 200 laparoscopic cholecystectomy, 12 cases were converted into open cholecystectomy (6%). The major causes were : dense adhesions (4), bleeding (2), anatomical difficulties (2), impacted stone in Hartmann pauch (2), dilated cystic duct (1) and sever inflammation (1). Two of the conversions are males from 45 male patients underwent laparoscopic cholecystectomy, 10 cases are females from 155 female patients underwent laparoscopic cholecystectomy so the percentage of conversion for male patients is 4.44 % while for female patients is 6.45%.
Conclusions: The conversion rate in this study is 6% and the most common cause for conversion is dense adhesions in the Calot's triangle, no biliary duct injury that need conversion is found in this study and the rate for conversion is higher in female patients.

Keywords: Cholecystectomy, Conversion, Incidence, Laparoscopic

INTRODUCTION

Cholecystectomy was established as the surgical treatment for cholelithiasis in1882, Carl Johan August Langenbuch was the first who performed the procedure.[1]

Open cholecystectomy became the gold standard for the treatment of cholelithiasis till the introduction of laparoscopic cholecystectomy in 1980, when Philip Mouret from France performed the first human laparoscopic cholecystectomy in 1987.[2]

There is no doubt that laparoscopic cholecystectomy replaced open cholecystectomy as a standard for the treatment of symptomatic cholelithiasis, the advantages of this procedure includes: Less postoperative pain, shortened length of stay, earlier return to work, less surgical trauma, improved cosmetics, less wound infections, less pulmonary insult, and reduced costs (Hospital stay and Equipmens).[3]

The spread of the procedure in almost all hospitals and the advancement in surgeon's experience and confidence

has led to decrease the work with the open technique to be performed only in failures of the laparoscopically attempted cases. Conversion from laparoscopic cholecystectomy to open cholecystectomy is still required in certain circumstances.[4]

Conversion is related to patient factors, surgeon factors and equipment failure factors but most are converted because of difficulty in delineating the anatomy clearly or complications arising during the procedure.[5]

Conversion can be elective. i.e. the surgeon decides for one reason or another that the operation is best conducted by the open approach. Or enforced, when the surgeon is forced to convert to open surgery because of the onset of a major or a life threatening intra operative complication, Evidence of the reporting literature indicates that the outcome of patients not influence adversely by elective conversion, the morbidity is higher in those requiring enforced conversion.[6]

Little if none information has been reported from Iraq in regard to causes and incidence of conversion, we carried out this study to assess the incidence of conversion from laparoscopic cholecystectomy to open cholecystectomy and determine possible causes for that.

METHODS

This is a prospective study to assess the incidence and causes of conversion in laparoscopic cholecystectomy from January 2009 to January 2011.

Two hundred cases were recruited in the study that carried out in ALKARAMA Teaching Hospital. All cases which included in the study were diagnosed as symptomatic gall stones disease clinically and by ultrasonic examination. All patients have no previous upper abdominal surgery, those with previous upper abdominal surgery chosen for the open procedure from the start.

Cases that admitted for laparoscopic cholecystectomy were prepared preoperatively by the general investigations: blood sugar, Heamoglobin, renal function tests, liver function tests, ECG, chest x-ray and abdominal ultrasound. Post-operative antibiotics are used routinely.

At the time of surgery, the following data were obtained: age, sex, time from introduction of ports till the decision of conversion and the cause of conversion. Data sheet was prepared, and data recorded by the researcher with the help of other colleagues. Operations carried out by different teams of surgeons.

A standard technique for laparoscopic cholecystectomy was practiced; nasogastric tube was not used routinely but occasionally. After general anesthesia and positioning of the patient and draping, insufflations achieved through a Veress needle. Carbon dioxide used as the insufflation gas. 30 degrees telescope used through 10 mm port. Standard procedures done through four ports technique.

The instruments available could be described as the minimum of the standard that usually available in most other centers in different countries.

Graspers, dissectors, spatula, L-shaped cauterization tool, suction irrigation machine, Babcock forceps, and Veress needle are frequently and mainly used for the procedures. Intra operative cholangiogram is not available.

RESULTS

From January 2009 to January 2011, out of the 200 cases underwent laparoscopic cholecystectomy, 45 cases were males (22.5%) and 155 cases were females (77.5%). The mean age was 59.5 range (20-79 years) and the most age group which had been admitted was (40-49 years). Twelve conversions were obtained yielding a conversion rate of 6%, (Figure 1).

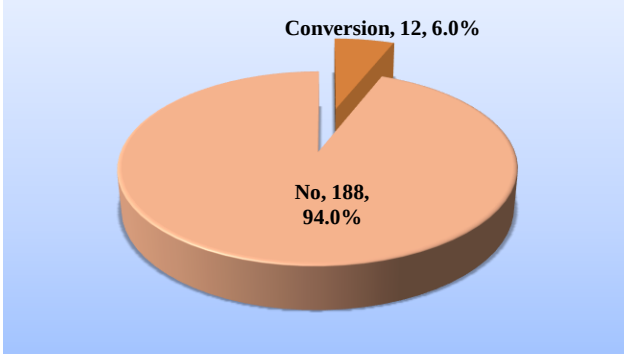

Figure 1: Conversion rate

The conversion rate is more common in patient < 60 year which occurred in 11 patient from 180 patient (6.1%), and less in patient >60 year which occurred in one patient from 20 patient (5%), (Table 1).

Table 1: Relationship between age and conversion rate.

Age	Total patients		Conversion		p
	No	%	No	%	
<60years	180	90.0	11	91.7	0.842
≥60years	20	10.0	1	8.3	
Total	200	100	12	6	

*Significant using Pearson Chi-square test at 0.05 level of significance

Two conversion cases were males and 10 cases were females, so the percentage for conversion in males from the total conversions is16.7%, and for females is 83.3% and the conversion rate for male patients from the total male cases is 4.4% and for female patients from the total female cases is 6.5% (Table 2). The mean time needed

from the introduction of ports till the decision of conversion is 25.8 minutes the longest time is 40 minutes and the shortest time needed is 15 minutes.

Table 2: The relation between gender and conversion rate.

Gender	Total patients		Conversion		p
	No	%	No	%	
Male	45	22.5	2	4.4	0.618
Female	155	77.5	10	6.5	
Total	200	100	12	6	

*Significant using Pearson Chi-square test at 0.05 level of significance

The causes of conversions are distributed as follow: One case dilated cystic duct in that the surgeon was not sure of complete clamping of the cystic duct (8.3%). Two cases the cause is severe bleeding that cannot be controlled by clipping or cautery (16.7%).

Two cases are due to impacted big stone in Hartmann pouch so the gall bladder cannot be grasped (16.7%). Two cases are due to anatomical variation of the cystic duct (16.7%). One case is due to sever inflammation of the gall bladder (8.3%).

The most common cause for conversion in the study is due to dense adhesions and disturbed anatomy in the triangle of Calot that could not guaranteed safe dissection and clipping (33.3%), (Table 3).

Table 3: Causes of conversions.

Cause of conversion	No	%
Dilated cystic duct	1	8.3
Severe bleeding	2	16.
Impacted big stone in Hartmann pouch	2	16.7
Severe inflammation of the gall bladder	1	8.3
Anatomical variation of the cystic duct	2	16.7
Dense adhesions and disturbed anatomy	4	33.3

Commonest site for metastasis was regional lymph node. 8 patients had secondary deposits in liver, 2 were having deposit in anterior abdominal wall and two female were having secondary deposits in both ovaries.

DISCUSSION

The well-documented advantages and safety of laparoscopic cholecystectomy have made it standard for careof the management of patients with symptomatic gallstones. Despite these advantages, conversion to open procedure is required in a varying proportion of patients which ranges from 2% to 15% in different studies.[7]

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.

There are general principles in laparoscopic cholecystectomy which are not different from open cholecystectomy that should be considered in the procedure:

- Gaining safe access to the abdominal cavity,
- Ensuring adequate exposure before proceeding with the operation.
- Careful and meticulous dissection with maintenance of hemostasis. No blind clipping or cauterization of bleeding sites.
- Positive identification of the anatomy before any structure ligated or divided.[8]

Rigorous attention to hemostasis is paramount to good exposure because relatively small amount of bleeding can obscure the laparoscopic view. Absolute identification of the anatomy of porta hepatis and triangle of Calot before ligation of any structure is the only safe way to reduce the risk of injury.

The risk of conversion to open cholecystectomy is related to surgeon factors, patient factors and possibly, equipment factors that include inadequate or dysfunctional light source, broken fiber optics, camera malfunction, inadequate insufflations, and fogging as well as poorly placed ports.

In our study the conversion rate is 6% which is within the usual rates of conversions in different studies for example from Tehran it was found to be 9%, Saudi Arabia was 2.8%, Texas hospital was 7.5% while from northern Iraq it was 8.7% and from Turkey was 3.16%.

This approximate rate of conversion in our study with those from different studies may indicate increasing in the skills of our doctors and a success in laparoscopic surgery in our centers.[9]

The results showed higher rate of conversion in female patients where a study carried out at Texas University and North Texas Health Center between 2003-2004 show high percentages of the conversion is in male patient, and they consider male sex as risk factors for conversion.[10]

This is actually due to the highest percentage of the calculus cholecystitis in female patients and the highest no. of the female patient, in this study, (77.5%) compared with the male patient (22.5%).

In our study, the patient age is not significant factor of the conversion because the lower age incidence (4th decade) of patient subjected to laparoscopic cholecystectomy in our hospital. Another study done conducted at the department of surgery, Aga Khan University, Karatchi, Pakistan (1997-2001) show that increase age >60 year associated with increased risk of conversion because of the complication of the metabolic decompensation.[11]

The results of this study is similar to a study carried out at northern Iraq Al-Jumhoory Hospital of Mousl (2004-2005). The conversion rate was 8.7% and two of 9 converted cases are due to bleeding from cystic artery and excessive oozing from liver bed, so the result is similar to our study.[12] Regarding the causes of conversions in the study the major cause of conversion in our study is dense adhesions and frozen triangle of Calot. Adhesions are the most common cause for conversion, many techniques practiced to deal with this problem.

A study carried out at Georgia between 1989 and 1991 by the Georgia Baptist Medical Center, with the conversion rate which is 2.3%, then dense adhesion was the main cause for conversions and they consider dense adhesions as a technical cause.[7] The study from Texas has reported a conversion rate was 5% and they consider male sex, severe obesity and acute cholecystitis as the major risk factors for conversion.[10] Another study reported from Pakistan at Aga Khan Hospital in Karachi between 1997 and 2001, conversion rate is 7.5% and also dense adhesions were the main cause for conversion (56.3%) and the second cause was empyema of the gallbladder.[11]

Between 1992 and 1996 a study reported conversion rate from the RIPAS Hospital in Brunei to evaluate the efficacy of laparoscopic cholecystectomy as a new procedure in their country, conversion rate was 4% and adhesions from acute cholecystitis were the main cause for conversion.[13] We attribute the acceptable rate of conversion to the fact that we follow the basic rules of surgical technique strictly-like use of Veress needle, adequate vision, minimal use of electrocautery at the triangle of Calot, displaying the structures at the triangle of Calot before clipping, adequate traction in proper direction, use of gauge dissection in difficult cases and reconfirming the anatomy from time to time.[14]

CONCLUSION

Major cause for conversions in the study is due to disturbed anatomy either from dense adhesions or anatomical variations. The rate of conversion with the absence of bowel and biliary ducts injury reflects improvement in the conduct of the procedure.

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