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Original Research Article

Is early conversion of laparoscopic to open cholecystectomy helpful in preventing iatrogenic injuries: a retrospective study from a single unit of a tertiary care centre

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ABSTRACT

Background: Gall stone disease is the commonest hepatobiliary problem which is tackled by either laparoscopic or open technique. Since the advent of laparoscopic cholecystectomy by Eric Muhne in 1985, it has become gold standard for gall bladder removal. But a surgeon must be competent enough to convert it into open procedure, provided there are on table complications. Moreover, since laparoscopic surgery has a learning curve, open procedure for any surgery is must for safety of the patient as well as the surgeon.
Methods: A retrospective study is done over a period of 4 years (January, 2015 to December, 2018) and data of 469 patients undergoing laparoscopic cholecystectomy in a single unit of Safdarjung Hospital, New Delhi, India has been collected and evaluated for conversion to open procedure on the basis of intraoperative findings. The complications noted and the intraoperative findings and the reasons of conversion to open cholecystectomy have been compared to the previous studies done.
Results: Out of total 469 cases, M:F ratio was 1:3.51. Total 40 underwent conversion to open cholecystectomy (8.54%) with M:F ratio of 1:2.07. Most common cause of conversion was dense adhesions in Calot's triangle along with omentum and bowel. Single patient had agenesis of gall bladder. There was no iatrogenic injury to common bile duct, common hepatic duct and there were no postoperative mortalities.
Conclusions: Early conversion to open cholecystectomy is associated with lower intraoperative iatrogenic injuries and hence, lowers postoperative morbidity.

Keywords: Laparoscopic cholecystectomy, Open cholecystectomy, Calot's triangle

INTRODUCTION

Laparoscopic cholecystectomy is a gold standard procedure for symptomatic gall bladder stone disease with its established advantages of less postoperative pain, early return of bowel function, minimal scarring and lower cost. With advancement in surgical techniques and increasing experience in laparoscopy, complicated gall bladder surgeries like due to acute cholecystitis, empyema gall bladder, cirrhotic liver, previous abdominal surgeries, etc. are no longer considered to be contraindication to laparoscopic cholecystectomy.[1,2] However in these cases, conversion to open technique is considered a wise decision rather than considering it to be a failure. Conversion rates vary from 2.6 to 5.2% in elective and 12 to 37% in emergency surgeries.[2,3] Rates have been noted higher in Asian population as compared to western world.[4] Various reasons for conversion to open

cholecystectomy mentioned in literature are injury to bowel, injury to major blood vessels, hepatobiliary system, obscured Calot's anatomy, respiratory acidosis, equipment failure, etc.[2-4]

Aim of our study is to calculate rate of conversion as well as reason of conversion of the procedures performed at our institute in a single unit.

METHODS

A retrospective study done on a total of 469 patients operated over 4 years (January 2015 to December 2018) tenure is done in Safdarjung Hospital, New Delhi, India. All patients were prepared for laparoscopic cholecystectomy and the criteria which were followed are mentioned below.

Inclusion criteria

All the patients with prior attack of cholecystitis (at least 6 weeks period of asymptomatic disease) and proven on ultrasound in the form of wall echogenic shadow with normal common bile duct diameter and normal alkaline phosphatase (ALP). Previous attack of cholelithiasis induced pancreatitis is not a contraindication.

Exclusion criteria

All those who willingly gave consent for open cholecystectomy, <6 weeks duration of last attack.

All patients were followed up till the time of discharge and intraoperative findings, complications and reason of conversion from laparoscopic to open cholecystectomy were noted and mentioned in tabular form. Indication of conversion was based upon the on table decision taken in view of the complications which were faced by the operating surgeon and the advice of the senior consultants who were supervising the case.

RESULTS

Standard procedure was followed and pneumoperitoneum was created as per surgeon's preference of open method or Verres needle technique. Procedure was started and plan to convert to open decision was made on Table 1.

Table 1: Total gender wise patients.

Male	Female
104	365

Out of total 469 patients ratio is 1:3.51. Hence conversion rate is higher in males (12.50%) than females (7.39%) (Table 2).

Hence, out of all causes, most common and most frequently seen was frozen Calot's with dense adhesions with nearby structures like omentum and bowel.

Table 2: Total patients which underwent conversion to open cholecystectomy.

Male	Female
13	27

Table 3: Indications and frequency of conversion to open cholecystectomy.

Indication	Number of patients
Dense adhesions to omentum and bowel with Calot's frozen	30
Thick walled distended gall bladder	15
Contracted gall bladder with loss of interface/ intrahepatic gall bladder	12
Dilated common bile duct	6
Short and wide cystic duct (sessile gall bladder)	6 (1)
Pyocele/ empyema gall bladder	8
Mucocele of gall bladder	2
Common hepatic duct/common bile duct calculi	2
Gall bladder not visualized laparoscopically	3
Aberrant vessel going anterior to cystic duct	1
Iatrogenic injury to surroundings	2
Diverication of recti repaired	1
Cholecystogastric/colic fistula	2

Out of the three cases of non visualization of gall bladder laparoscopically, two were due to dense adhesions of omentum to liver surface and one was due to agenesis of gall bladder. This is one of the rarest findings as, even though on ultrasound, wall echogenic complex was given, there was no gall bladder on table and nor was any see on MRCP done post operatively.

There were only two cases of iatrogenic injury. Average stay of patients at hospital was 1 day post operatively for all laparoscopic cases and 2-3 days for open cases.

DISCUSSION

Laparoscopic cholecystectomy is the gold standard procedure for gall bladder removal with currently over 90% of procedures performed laparoscopically. On comparison with various studies performed in past, following findings were noted (Table 4).

Hence, in our study after comparing the results in other studies enlisted in Table 4, it is seen that there was no mortality and no postoperative morbidity associated with any type of biliary system injuries. There were two cases of common bile duct and common hepatic duct stones which were removed after conversion to open and T- tube was placed in situ for which cholangiogram was done after 10 days and then the tube was removed.

Table 4: Various studies and their comparison with our study.

Previous studies	No. of patients	% conversion	% bile duct injuries	% mortality	Agenesis of gall bladder
Cruscheri et al[9]	1236	3.6	0.3	0	Nil
Larson et al[14]	1983	4.5	0.3	0.1	Nil
Croce et al [15]	6865	3.1	0.3	0.06	Nil
Newman et al[16]	1525	2.5	0.00	0.26	Nil
Magee et al[17]	443	10	-	-	Nil
Soper et al[2]	1165	2.1	0.2	0.1	Nil
Vecchio et al[7]	114005	2.2	-	-	-
Kama et al[10]	1000	4.8	-	-	-
Hasaniah et al[13]	2750	3.8	-	-	-
Guraya et al[6]	549	2.9	-	-	-
Tarcovenau et al[8]	6985	3.2	-	-	-
Lim et al[12]	149	11.2	-	-	-
Dohlia et al[5]	443	11.5	-	-	-
Butt et al[11]	300	4	-	-	-
Memon et al[1]	216	4	-	-	-
Bakos et al[18]	1535	5.7	-	-	-
Afzal et al[3]	450	1.6	0.2	0.2	Nil
Current study	469	8.54	Nil	Nil	One

There was one case of cystogastric and cystocolic fistula each which after separating from gall bladder, were repaired primarily and then patient was discharged after starting orally in 3-4 days.

Out of the three cases of non visualization of gall bladder laparoscopically, one case was found to be of agenesis of gall bladder. The patient's ultrasound showed wall echogenic shadow but postoperative MRCP was done after 2 weeks and showed no gall bladder. This is one of the rarest findings and one of the rarest causes of laparoscopic converted to open cholecystectomy.

There were only two iatrogenic injuries which were non life threatening to the patient. One was liver bed penetration with about 500 ml of blood loss and the second was non expanding haematoma of transverse mesocolon vessel.

CONCLUSION

From this study it can be concluded that even though laparoscopic cholecystectomy is standard approach to gall bladder stone removal, a surgeon should not hesitate in converting to open procedure as it will prevent iatrogenic injuries which may add up to morbidity as well mortality of the patient. In our study even though the rate of conversion is on higher side but there were only two iatrogenic injuries which were not life threatening to the patient.

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