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Laparoscopic cholecystectomy and Open cholecystectomy – A comparison of complications in a single center experience

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Abstract
Introduction: *Open cholecystectomy was the treatment of choice for symptomatic gallstone disease till the early 90's. Laparoscopic cholecystectomy slowly replaced it owing to the advantages like shorter hospital stay, less postoperative pain and smaller scars. Although comparison of the two techniques is inappropriate owing to wide variation in the technique, this study is aimed at comparing the complications with the two techniques in our center.*
Objectives: *To study the complications with laparoscopic cholecystectomy. To study the complications with open cholecystectomy. To compare the complications with both the techniques.*
Results: *A total of 121 patients underwent cholecystectomy during the study period of which 99 patients underwent laparoscopic surgery while 22 patients underwent open procedure. Out of the 99 patients who underwent laparoscopic surgery, 42 were male and 57 were female and out of the 22 patients who underwent open surgery, 6 were male and 16 were female.*
Conclusion: *Laparoscopic cholecystectomy has higher intraoperative complications compared to open cholecystectomy while the overall complication rate and postoperative morbidity being less compared to open cholecystectomy.*

Introduction

Open cholecystectomy was the treatment of choice for symptomatic gallstone disease till the early 90's. Laparoscopic cholecystectomy slowly replaced it owing to the advantages like shorter hospital stay, less postoperative pain and smaller scars. The surgeons initially adopted the procedure considering the patient factors inspite of the complication rate being more especially of common bile duct injuries. As the expertise increased, the complications with laparoscopic cholecystectomy decreased. Although comparison of the two techniques is inappropriate owing to wide variation in the technique, this study is aimed at comparing the complications with the two techniques in our center.

Objectives

1. To study the complications with laparoscopic cholecystectomy.
2. To study the complications with open cholecystectomy.
3. To compare the complications with both the techniques.

Materials and Methods

A retrospective analysis of patient data compiled by assessment of follow up recorded over the period encompassing from January 2010– July 2016 at RL Jalappa hospitaland research centre, in department of General surgery, Tamaka, Kolar. The comparison of the incidence of complications with the two procedures was done using logistic regression model. The complications were graded into three categories and results were evaluated based on this grading system[1] (Table 1).

Table 1. Classification of complications

Grade 1	Non life threatening with no lasting disability and require only bedside procedures
Grade 2	Potentially life threatening with no lasting disability which may or may not require surgical correction
Grade 3	Residual disability, persistence of life threatening conditions

Inclusion criteria

- Patients who underwent cholecystectomy during the study period in our center.

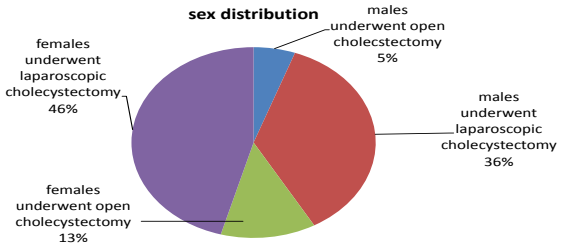
Exclusion criteria

- Patients with common bile duct stones.

Results

A total of 121 patients underwent cholecyste-ctomy during the study period of which 99 patients underwent laparoscopic surgery while 22 patients underwent open procedure. Out of the 99 patients who underwent laparoscopic surgery, 42 were male and 57 were female and out of the 22 patients who underwent open surgery, 6 were male and 16 were female.

Fig.1



2 among the open cholecystectomies mentioned above were started as laparoscopic procedures and had to be converted to open procedures on both accounts due to extensive adhesions.

Indications for cholecystectomy for open and closed techniques during the study period is mentioned below:

Total number procedures of laparoscopic cholecystectomy done : 99

Total	99
Acute cholecystitis	30
Cholelithiasis	62
Others	7

Others include: chronic pain abdomen, cystic cholelithiasis, pyocele, GB polyp, Gallbladder colic, mucocele of Gallbladder.

Total	22
Acute cholecystitis	7
Cholelithiasis	13
Others	2

Others include: Gallbladder sludge, choledocholithiasis

A total of 7 complications were noted in the open cholecystectomy group of which 4 patients had Grade 1 complications and 3 patients had Grade 2 complications with no one having Grade 3 complications. Similarly a total of 15 complications were noted in the laparoscopic cholecystectomy group of which 8 patients had Grade 1 complications, 5 patients had Grade 2 complications and 2 patients had Grade 3 complications. No deaths were observed in either of the groups.

Table 2. Overall complication rates

Complications	Open cholecystectomy (n=22)	Laparoscopic cholecystectomy (n=99)
Total	7 (31.8%)	15 (15.2%)
Grade 1	4 (18.2%)	8 (8.1%)
Grade 2	3 (13.6%)	5 (5.1%)
Grade 3	0	2 (2%)

The 12 patients who developed Grade 1 complications from both the groups required only bedside procedures like regular dressings, secondary suturing etc. Of the 8 patients who developed Grade 2 complications, 3 patients (1 from open group and 2 from lap group) had postoperative hemorrhage and 3 patients (2 from open group and 1 from lap group) had bile leak which had to be corrected surgically. The other two patients (both from lap group) had obstructive jaundice due to CBD stones which were not detected preoperatively. These patients had to be referred to a Gastroenterologist for ERCP due to the non availability at our center. Both patients were successfully treated by ERCP. The 2 patients who developed Grade 3 complications had residual disease as only partial cholecystectomy could be performed due to extensive adhesions. The postoperative morbidity and length of hospital stay was significantly less with laparoscopic procedure than open procedure as expected. Further it was observed that laparoscopic procedure was associated with higher intraoperative complications like hemorrhage due to slippage of staples, injury to the CBD or liver bed, missing of CBD stones etc.

Discussion

Laparoscopic cholecystectomy has become the standard therapy for symptomatic gallstone disease particularly in elective setting. The change over from open cholecystectomy to laparoscopic cholecystectomy being the procedure of choice occurred mainly due to the latter's advantages in patient related factors like faster recovery, smaller scars and shorter hospital stay inspite of the complications being more like CBD injuries. Through the years, as the expertise of the surgeons increased in this field, the complication rate reduced. Also owing to the technological advancements in the laparoscopic instruments, the incidence of life threatening complications has reduced and the number of cases that have to be converted to open technique have reduced. In this present situation the main factor influencing the choice of procedure in a rural setup like ours is the cost of the procedure. Inspite of the cost of open procedure being less, the overall expenses incurred by the patient tend to be equal or slightly less owing to the higher incidence of morbidity, higher requirement of analgesics and longer length of hospital stay. Thus the comparison of complication rates and resulting morbidity between the two procedures gains significance. There are several trials comparing the two but such studies in a rural setting as ours are lacking. Thus we have attempted to compile the results in our centerin this retrospective study.

The overall complication rate with laparoscopic procedure is 15.2% as compared to 31.8% with open procedure. The incidence of Grade 1 and Grade 2 complications was also significantly high with open procedure as compared to laparoscopic procedure. Whereas the incidence of Grade 3 complications was only seen in laparoscopic group in this study possibly due to the small number of patients in open group.

Thus from the data observed we can safely conclude that laparoscopic cholecystectomy is better and economical to the patient.

Conclusions

Laparoscopic cholecystectomy has higher intraoperative complications compared to open cholecystectomy while the overall complication rate and postoperative morbidity being less compared to open cholecystectomy.

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