ORIGINAL ARTICLE

MINILAPAROTOMY CHOLECYSTECTOMY VERSUS LAPAROSCOPIC CHOLECYSTECTOMY: A PROSPECTIVE RANDOMIZED STUDY

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Abstract

Background and Aim: Minilaparotomy cholecystectomy (MC) and laparoscopic cholecystectomy (LC) are commonly applied surgical techniques in the management of non-complicated symptomatic gallstone disease. We compared both MC and LC in a randomized trial.

Patients and Method: Forty three patients underwent LC were compared to forty five patients who underwent MC (It is defined in this study as open cholecystectomy through incision less than 8 cm length). The items of comparison were operative duration, operative and post-operative complications and success of the procedure as one day surgery.

Results: Both groups were comparable as regarding age, sex, BMI and ASA status. The operation time was statistically significant shorter for MC group when compared to LC group (P= 0.001). In LC group; 2 patients out of 43 patients (4.65%) were converted into the classic open method (one patient was due to massive adhesion in the area of Calot's triangle and the second patient was due to injury of CBD), while in MC group; 3 cases out of 45 cases (6.67%) required a more generous incision to use larger retractors to obtain a clearer view of Calot's triangle. The hospital stay for the LC group ranged between 12-24 hrs which is shorter than the 1-2 days of the MC group. There were no significant late postoperative complications apart from 3 cases of superficial surgical site infections among LC group and 2 cases among the MC group. LC was successful as one day surgery in 40 patients out of 43 patients (the failure were due to; CBD injury and patients couldn't tolerate oral fluid intake due to post-operative nausea and vomiting not respond to the ordinary prokinetic drugs) while it was successful in 44 patients out of 45 patients among the MC group (the failure was due to intolerable postoperative pain required 2 days admission for parenteral analgesic).

Conclusion: MC was a better alternative to LC because of its shorter operative time, lower complication rates and it didn't require learning curve or special instruments. LC had a faster post-operative recovery.

Keywords: Minilaparotomy, laparoscopic cholecystectomy, one day surgery.

INTRODUCTION

The first to describe cholecystectomy through a minilaparotomy was probably Dubois, in 1982.[1] It appears that the term "minicholecystectomy" (MC) was coined by Goco and Chambers in 1983.[2]

Minicholecystectomy refers to an operation performed through a short right subcostal incision (4-10cm), offering the currently much-spoken-about advantages of minimally invasive surgery.[3] The benefits of this procedure are well documented in a substantial number of papers and abstracts published since.[4-7]

Unfortunately, because of the "laparoscopic fever" which has recently struck the international surgical community, most surgeons feel compelled to adopt the apparently more "glamorous" laparoscopic cholecystectomy (LC). Consequently, MC remains at present a relatively obscure and unpractised procedure.[4]

The aim of this study was to compare the results of the laparoscopic (LC) and mini-laparotomy (MC) approach to cholecystectomy, performed in Qena University Hospital, South Valley University and in Assiut University Hospital, Assiut University.

PATIENTS AND METHODS

All patients with gallstone disease were evaluated:

- Clinical history and examination,
- Abdominal US.
- Preoperative respiratory function tests.
- Routine investigations: CBC, Renal function tests, Random blood sugar, Liver function tests, ECG, and chest X ray.
- Investigations may be required as MRCP.

Inclusion criteria:

- Adults between 18 years and 50 years.
- BMI: < 30 kg/ m2.
- ASA: I or II.
- Normal pre-operative liver function tests.
- No history of Jaundice.

Patients were assigned randomly in one of the 2 groups:

- **Group LC:** patients were operated by the classic 4 ports laparoscopic cholecystectomy (12 mm port at the umbilicus, 12 mm port at the epigastric region, 5 mm subcostal port at mid-clavicular line, 5 mm subcostal port at anterior axillary line).
- **Group MC:** patients were operated on through a subcostal incision which in not more than 8 cm length (Fig 1), medial retraction of rectus muscle was required (without cutting of rectus muscle) in some cases. Retrograde cholecystectomy "fundus down technique" was performed if there was any difficulty to identify safely the cystic duct or the artery by the classic method.

Conversion was considered (for both groups) if the operation was completed by the classic long subcostal incision.

The following items were compared between the 2 groups:

- Operative duration: from skin incision to skin closure, including the time required to set up the laparoscopic tubes, cables and instruments in LC group.
- Operative Complications: as bleeding, CBD injury…
- Hospitals stay (the number of nights in the hospital after surgery plus nights during any readmission).
- Short term follow up "up to 6 months": for wound infection, bile or blood collection, CBD stricture, jaundice.

The criteria for discharge were strict. It included:

1. Stable vital data.
2. Tolerable pain.
3. No nausea, nor vomiting.
4. Tolerate light oral intake.
5. Self-care parameters: patient can walk to toilet unsupported, can pull a sheet to cover himself.

Fund: The research was funded by the resources of Qena University Hospital and Assiut University hospital.

Ethical Considerations: Written consent is signed by each patient pre-operatively after complete simplified clarification of the procedure to each one.

Statistical analysis: The results are expressed as the mean ± SD& number (%). Statistical analysis was performed with the software SPSS version 12, using student T. test to determine significant for numeric data, using Chi. square to determine sign for non-parametric data. P value was determined as significant ($P<0.05$).

Fig 1. Subcostal minilaparotomy incision.

RESULTS

Eighty eight patients were included in this study; 43 patients were included in LC group while the MC group included 45 patients.

There were no statistical significant differences between the two groups in terms of gender, age, body mass index (BMI), or American Association of Anesthesiologist (ASA) physical fitness classification. (Table 1).

Table 1. Data of the patients.

	LC (43 pt.)	MC (45 pt.)	P value
Age (years)	20-61(36.2)	22-60 (37.2)	.4
Sex (M:F)	5:38	5:40	.601
BMI range (mean)	20:29 (23.2)	19:30 (24)	.45
ASA Status: I;II	22;21	22;23	.5
Conversion rate	2 / 43 (4.65 %)	3 / 45 (6.67 %)	.52
Operating time (min)	35-160 (75±27)	25-120 (52±16)	.001
Operative complications	1 / 43	0 / 45	.49
Hospital Stay (days)	12-24 hrs	1-2 days	.376
Late complications	3 / 43	2 / 45	.47

In LC group; 2 patients out of 43 patients (4.65%) were converted into the classic open method; one patient was due to massive adhesion in the area of Calot's triangle while the second patient was due to injury of CBD which required open surgery to repair the injury on T shaped tube. In MC group; 3 cases out of 45 cases (6.67%)

required a more generous incision to use larger retractors to obtain a clearer view of Calot's triangle.

The operating time for patients of LC group (75±27 mins) was significantly longer than the operating time for MC group (52±16 mins) (P value = 0.001).

The hospital stay for the LC group ranged between 12- 24 hours which is shorter than the 1-2 days of the MC group (we excluded the single case of LC which suffered CBD injury and required 9 days of post-operative hospital stay).

There were no significant late postoperative complications apart from 3 cases of superficial surgical site infections among LC group and 2 cases among the MC group. They were treated by Antibiotics and repeated dressings.

LC was successful as one day surgery in 40 patients out of 43 patients (the failure were due to; CBD injury and patients couldn't tolerate oral fluid intake due to post-operative nausea and vomiting not respond to the ordinary prokinetic drugs) while it was successful in 44 patients out of 45 patients among the MC group (the failure was due to intolerable postoperative pain required 2 days admission for parenteral analgesic).

DISCUSSION

During the past 15 years, LC has been established as a dominant cholecystectomy procedure despite studies showing MC to be very comparable.[8-14]

There may be several reasons that favor laparoscopy without firm scientific evidence. Companies that sell laparoscopic instruments also may influence surgeons' attitudes. Both patients and surgeons often have the attitude that laparoscopy is a modern and more advanced technique than open surgery, which may influence patient recovery.[8]

In earlier studies comparing LC and MC operations, there was great variation in the MC technique, especially concerning whether the rectus muscle was cut or not and the maximum size of an incision. We believe that the incision technique plays a major role in the MC procedure. In our opinion, cutting the rectus muscle means conversion to conventional laparotomy. The variation in incision technique might explain the differences in results between MC and LC studies.[8]

In several earlier studies, the operating time 'from skin incision to closure' was shorter for the MC group than for the LC group,[10,13,15-17] which also was seen in our study. The operating time for the LC group was rather long, may be because the time required for setting up laparoscopic tubes, cables and instruments.

The postoperative hospital stay was slightly shorter for the LC group in some studies,[15,16,18] but some studies showed no difference in the postoperative hospital stay between MC and LC.[10,11,13,14] In our study, the postoperative hospital stay for LC group looked prolonged when compared to MC group because one case sustained CBD injury that needed a longer hospital stay. This is an important result for health care administrators because of limitations in health care resources.

There are several reports in the literature that compare complication and bile duct injury rates after LC and Open Cholecystectomy (OC). Buanes and Mjaland.[19] in a prospective comparative study between LC and OC, reported significantly higher complication rates in the open group (16% vs 9%). Similar results have been reported by McIntyre et al. (20), who presented lower morbidity after LC than after OC (3% vs 7%) and by Williams et al.[21] who also reported lower complication rates in the laparoscopic group (3.1% vs 7.5%), but in this study fewer bile duct injuries occurred in the open group.

However, McMahon et al.[16] and Ros et al.,[17] in randomized trials that compared LC and MC, presented similar rates of morbidity and bile duct injury between the two groups. On the other hand, Targarona et al.,[22] in a retrospective comparative study that focused on bile duct injuries among 3,051 OCs and 1,630 LCs, reported significantly higher rates of such complications in the laparoscopic group. In our study, CBD injury rate was significantly higher in the LC group.

As regarding to the minor complications, there were two wound infections in the MC group as compared with three in the LC group; the difference was not statistically significant.

The instrumentation for the MC procedure is rather easy. No disposable instruments are needed, whereas for the LC procedure, disposable instruments often are used. The cheaper instrumentation and the shorter operating time combined with a similar recovery implies a cost advantage for MC. The MC technique was a new procedure compared with LC. However, it seems that there is no remarkable learning curve for the MC procedure.

In conclusion; Minilaparoscopic cholecystectomy is a faster technique and has lower complication rates when compared to laparoscopic cholecystectomy. Although LC had a shorter post-operative hospital stay than MC, MC may be performed as one day procedure in some patients.

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