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**Research Article**


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# Laparoscopic Cholecystectomy

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## Abstract

**Objective :**
Cholecystectomy remains a common operation Laparoscopic management of symptomatic gallstones has rapidly become the new standard for therapy throughout the world. Many patients can undergo this operation in an ambulatory setting.
Is replacing traditional open cholecystectomy in many centers all over the world. Laparoscopic surgery was introduced to our hospital at 2010.We report this collection in order to show the attitude in our hospital with this new advance in laparoscopic procedure and to compare our results with the results of other studies.
**Methods :**
This is a prospective study of 100 cases of LC. Which were performed at baquba Teaching Hospitals from January 2015 to January 2016 . All patients had been subjected to through physical examination, radiological examination and laboratory investigation.
The operation time, conversion rate, intraoperative complications, use of drain, use of N.G.T. hospital stay postoperative analgesia, and postoperative complications and follow up were discussed in details.
**Results:**
The 100 patients in whom L.C was attempted. of which (87) were female patients which forms (87%), and (13) were male patients which form(13%),The average age was 42years,ranging from (18-65years). of those 100patients, (2) patients had acute cholecystitis , another patients with complicated empyema. Of G.B. (97) patients were with chronic calculus cholecystitis.
Five patients were converted to open surgery. Tube drain was used in (68) patients. The main time of operation was (65) minutes. (18) patients develop postoperative complications. Wound infection in ( 4) cases, chest infection in( 2 ) patients, ileus in one patient, vomiting in (4 ) patients, right shoulder pain in (7) patients and fortunately we have no C.B.D. injury.
Most of the patients were discharged within (24) hrs. After operation, and no mortality rate was reported and most of patients return to daily activities within two weeks.
**Conclusion :**
Laparoscopic cholecystectomy Can be performed safely prevention of complication depends on the experience of the surgeon, selection of patients and accepting the attitude towards conversion to OC, Which does not mean a failure but to do safe surgery.

**Keywords:** Cholecystectomy, Laparoscopic management, empyema, physical examination, radiological examination.

## Introduction

Since 1985, laparoscopic cholecystectomy (LC) has developed rapidly and become the gold standard treatment of various gallbladder diseases. Contrary to the early reports of increased complication rates, recent studies suggest that LC can be performed with lower morbidity and mortality,

Compared with the traditional open surgery (OS) 2,3 . Its benefits over open cholecystectomy include less patient discomfort, better cosmetic results, shorter hospitalization, and more rapid return to full activities postoperatively4-6. Nevertheless, conversion to OS may occasionally be obligatory for patients in whom LC cannot be performed safely, and/or because of technical difficulties or intra-operative complications7-10.

The most common reported reasons for conversion have been inability to perform a safe dissection due to obscure anatomy, inflammation, or adhesions, bleeding, and bile duct injuries8,9 . Other infrequent factors to result in conversion include unexpected malignancies, inability to create pneumoperitoneum , multiple tears in the gallbladder, and common bile ductstones10-12.

Conversion from LC to OS should not be considered as a failure or a complication of laparoscopic operation; rather, it should be accepted as a step towards a safer surgery when completion of L.C. is not be possible13 the surgeon can discuss with the patients the likelihood of conversion to open surgery more accurately, and the patient will have adequate emotional preparation. Furthermore, more efficient arrangement and realistic planning of the operating schedule can be done, and the necessity of a consultant laparoscopic surgeon can be considered.

The last significance of the awareness of the risk factors preoperatively is that, if preventable, the reasons of the conversion would be eliminated or, if not, then the decision of exclusion of more challenging cases would be possible, especially in the training situations.

### Historical Aspect

The first biliary tract operation is credited to John Stough Bobb of Indianapolis in 1867. He explored a 32-year-old woman with a large abdominal mass and discovered a massive gallbladder hydrops . Bobb made a cholecystotomy, removed the gallstones, and then sutured the gallbladder. In 1882 Carl Laugenbuch, German Surgeon performed the first successful cholecystectomy.

In 1910 Jacobeus performed the first clinical laparoscopic examination. In1929 Kalk reported the use of an –auxiliary trocar that could be used for placing instrument for liver biopsy

In 1985 Muhe Boblingen, German Surgeon performed the first endoscopic cholecystectomy.

In 1990 this technique has become close to replacing standard open cholecystectomy as the procedure of choice for elective surgical management of symptomatic gallstones.

In 1992 the national institutes of health (NIH) consensus Development conference stated that L.C (provide a safe and effective treatment for most patient with symptomatic gallstones) In 1999 laparoscopic cholecystectomy was introduced to Al-Yarmouk teaching hospital.

### The teams of laparoscopy

1-An experience surgeon
2- First assistant surgeon under training as a camera man
3- second assistant surgeon under training
4- An assistant nurse with experience in this field
5- An experience Anesthetist with laparoscopic procedures
6-An assistant anesthetist .Equipment for laparoscopic cholecystectomy.

| Instrument | No. | Comment |
|---|---|---|
| Laparoscopy | 1 | Available in 0`&30` |
| A traumatic grasping forceps | 2-4 | |
| Large tooth grasping forceps | 1 | |
| Curved dissector | 1 | |
| Scissors | 2-3 | |
| Clip –appliers | 1-2 | Either disposable or reusable |
| High frequency electrical cord | 1 | |
| Dissecting electro cautery hook or spatula | 1 | Available in various shapes |
| Section _irrigation probe | 1 | |
| 10-5 reducer | 2 | Allow use of 5mm instrument in 10mm trocar |
| Endoscopic needle holders | 1-2 | |
| Cholangiogram clamp with catheter | 1 | |
| Veress needle | 1 | |
| Allis or Babcock forceps | 1-2 | A traumatic grasper for bowel or gallbladder |
| Long spinal needle | 1 | Useful for percutaneous aspiration of distended gallbladder |
| Retrieval bag | 1 | To prevent spillage of gallstones |
| Video monitor | 1-2 | Second one is optimal |
| $CO_2$ Supply | 1 | |
| Monitor | 1 | For pressure& liter per min. monitoring |

## Aim of the study

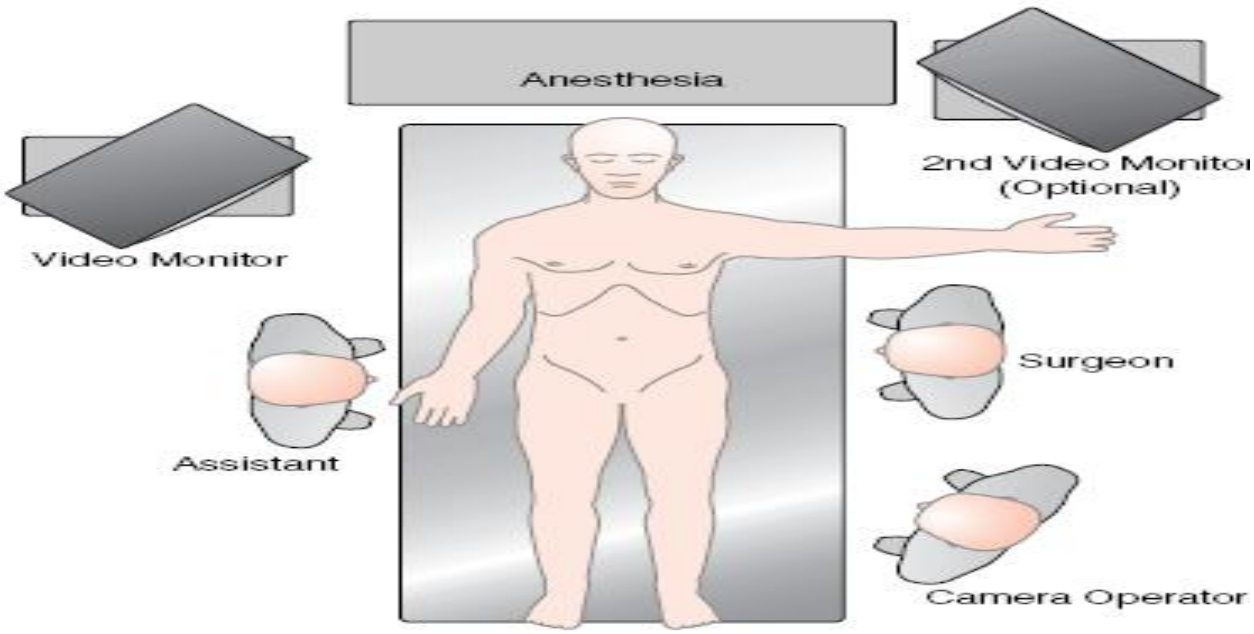
Evaluation of the results of laparoscopic cholecystectomy

To show the safety, feasibility and advantages of laparoscopic cholecystectomy

To compare our result with result of other studies

### Procedure .

The patient is placed supine on the operating table with the surgeon standing at the patient's left side.with the camera person on his left side and the assistant and scrup nurse on the other side of the operating table. Nasogastric tube used in three patients to deflate the distended stomach after creation of pneumoperitoneum and the insertion of the camera inside the Peritoneal cavity.



## Step one

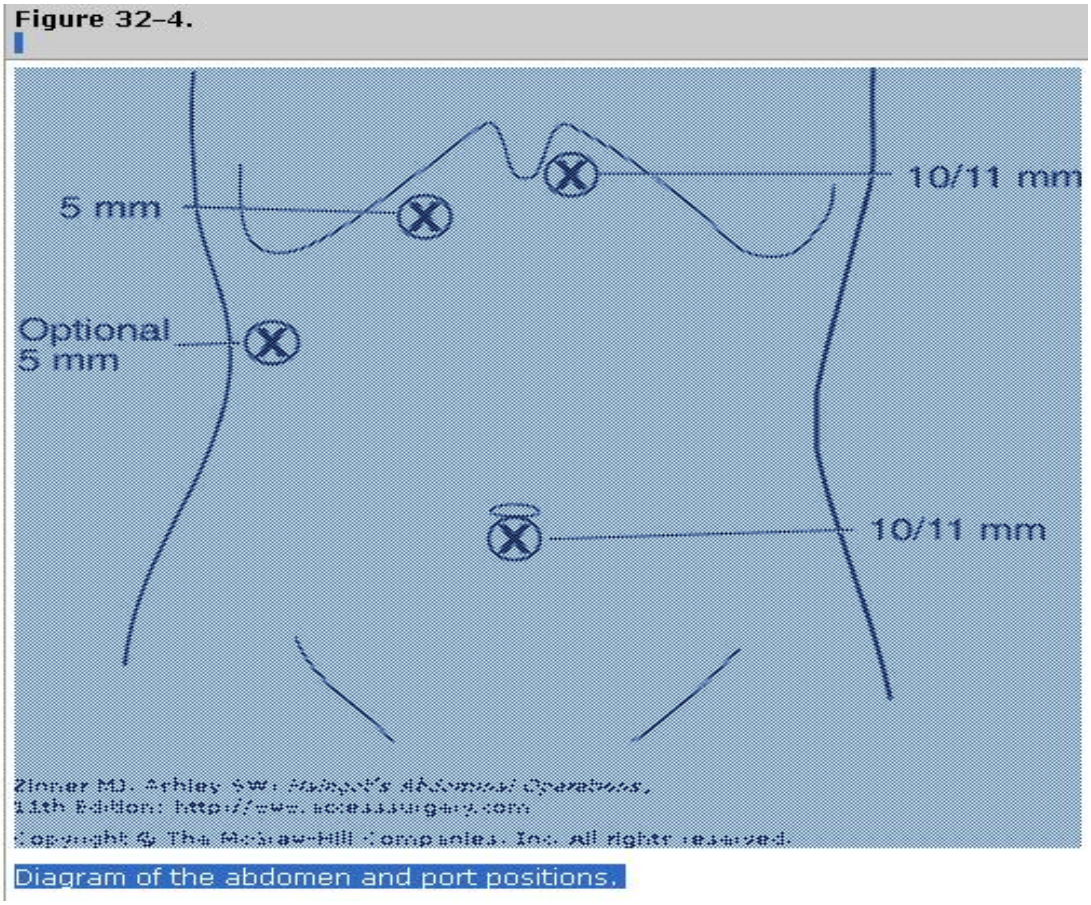
The pneumoperitoneum is created with carbon dioxide gas to a maximum (15) mm hg, by insertion of veress needle in the immediate sub umbilical area by closed needle technique .which is safe for patient with peripheral scar .open technique is preferred for central incisions.

## Step two

The 10-mm optical ports is inserted through the sub umbilical region.

The laparoscope with the attached video camera is passed through the umbilical port and the abdomen inspected. An initial 360 degree scan of the entire abdomen to exclude injury (bleeding) during the insertion of needle and creation of pneumoperitoneum and to identify any gross macroscopically additional disease.

Three additional ports are placed under direct vision.one for grasping (5mm) in anterior axillary line below level of gallbladder.2nd for traction of Hartmann's pouch just beneath the right costal margin(5mm).operating port (10) placed midline right or left of falciform ligament.




## Step 3.

Through the lateral-most port a grasper is used to grasp the gallbladder fundus and pulled away from the liver by maintaining lateral and inferior traction on hartmann's pouch. This maneuver allowing more precise identification of both structures. The dissection starts at the junction of the gallbladder and the cystic duct. A helpful anatomic landmark is the cystic artery lymph node.

The peritoneum, fat , and loose areolar tissue around the gallbladder and the cystic duct-gallbladder junction is dissected off toward the bile duct. The next step is the identification of the cystic artery, which usually runs parallel to and somewhat behind the cystic duct

.

## Step 4

After exposure of the cystic duct and artery, they are clipped and divided using titanium(metal)clips(two proximal and one distal for the cystic duct, one proximal and distal diathermy for the cystic artery) A wide cystic duct may be too big for clips, requiring the placement of a prettied loop ligature to close. The cystic artery is then clipped and divided.

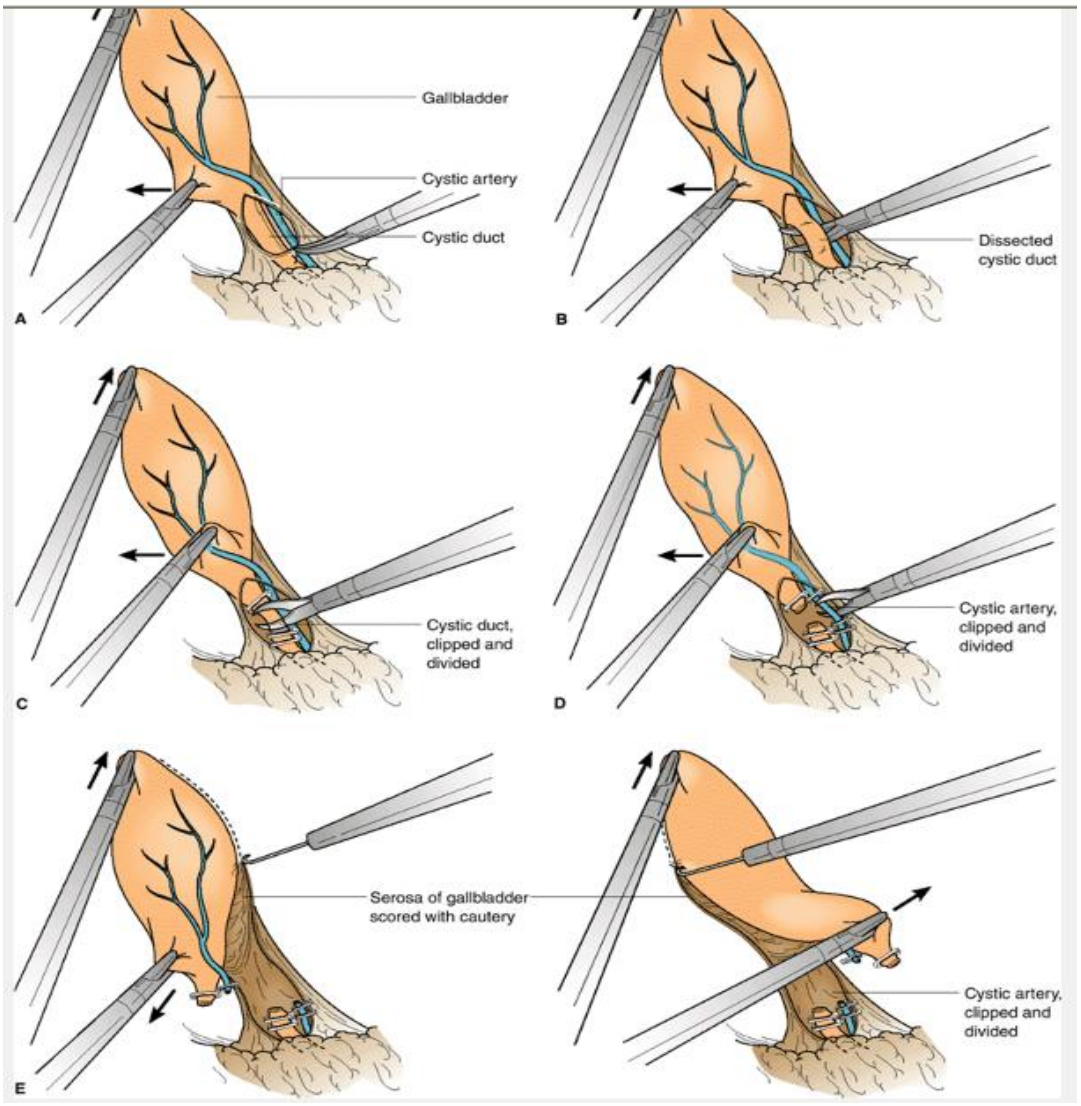
## Step 5

The gallbladder is dissected out of the gallbladder fossa, using either a hook or scissors with electro cautery.

## Step 6

The gallbladder is removed through the umbilical incision. If the gallbladder is acutely inflamed or gangrenous, or if the gallbladder is perforated, it is placed in a retrieval bag before it is removed from the abdomen.

A closed suction drain can be placed through one of the (5) mm ports and left underneath the right liver lobe close to the gallbladder fossa . Ports are removed under vision to ensure no abdominal wall bleeding .deflation as complete as possible to overcome postoperative shoulder pain. The wound is closed by full thickness stitches.




(A) The peritoneum overlying the cystic duct gallbladder junction is opened with blunt dissection. (B) The cystic duct is isolated. (C) The cystic duct is clipped proximal and distal and divided with the hook scissors. (D) The cystic artery is dissected, clipped and divided. (E) The gallbladder is dissected from the liver by scoring the serosa with electro cautery.

### Investigation

All the patients are subjected to the following preoperative investigation

1. Complete blood count.
2. Blood group and Rh.
3. Liver function tests including total serum bilirubin and enzymes.
4. Chest X-ray and ECG.
5. Good ultrasound of the abdomen.

Most patients are admitted to hospital at the same day of operation unless they need special preparation

Data collected include. Age, Sex, cause, duration of operation, conversion, drain insertion, post-operative analgesia, postoperative oral intake, early postoperative complications and period of hospitalization.

Most patients were seen (7-10) days after operation to review their wounds and for removal of stitches and follow up.

## Patients and Methods

From January 2015 to January 2016 (100) patients underwent Laparoscopic cholecystectomy. All patients had routine general investigations including. GUE, CBP , BL. urea and S. creatinine , LFT . Also chest X-ray, abdominal ultrasound, and ECG were done for all patients.

Most patients were admitted to the hospital on same day of operation unless they need special preparation. (consultation of anesthetic one day before operation).

Data collected include. Age . Sex . cause , duration of operation, conversion, drain insertion, post- operative analgesia, postoperative oral intake, early postoperative complications and period of hospitalization.

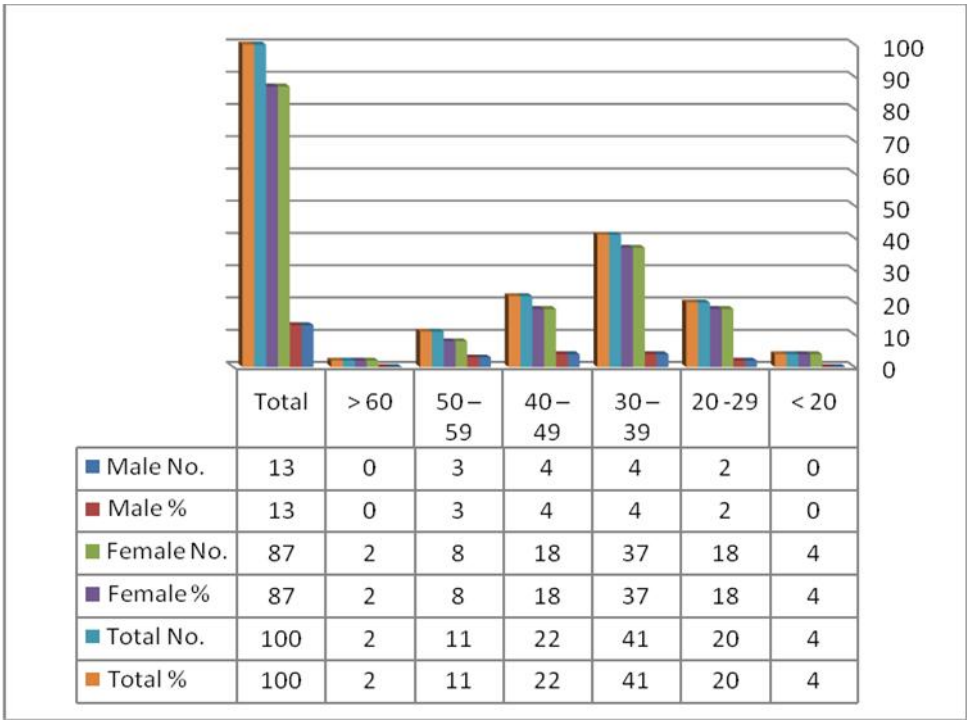
Most patients were seen (7-10) days after operation to review their wounds and for removal of stitches and follow up.

## Results

The total selected subjects in our study was 100.Their mean age group was 42 ranging from 18 – 65 years, 87 were females and 13 were males.

Most of the cases for both sexes were between 30 – 39 years as shown in table (4-1).

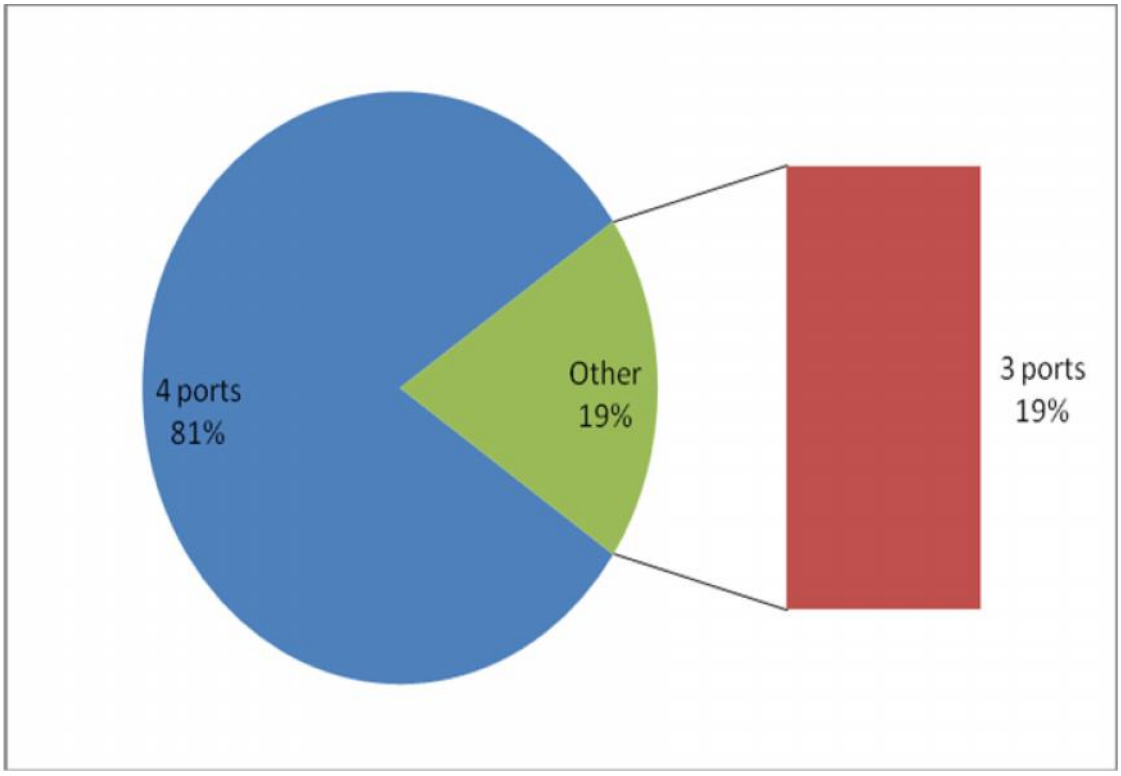
Table (4 – 1): age and sex distribution




| | Total | > 60 | 50 – 59 | 40 – 49 | 30 – 39 | 20 -29 | < 20 |
|---|---|---|---|---|---|---|---|
| Male No. | 13 | 0 | 3 | 4 | 4 | 2 | 0 |
| Male % | 13 | 0 | 3 | 4 | 4 | 2 | 0 |
| Female No. | 87 | 2 | 8 | 18 | 37 | 18 | 4 |
| Female % | 87 | 2 | 8 | 18 | 37 | 18 | 4 |
| Total No. | 100 | 2 | 11 | 22 | 41 | 20 | 4 |
| Total % | 100 | 2 | 11 | 22 | 41 | 20 | 4 |

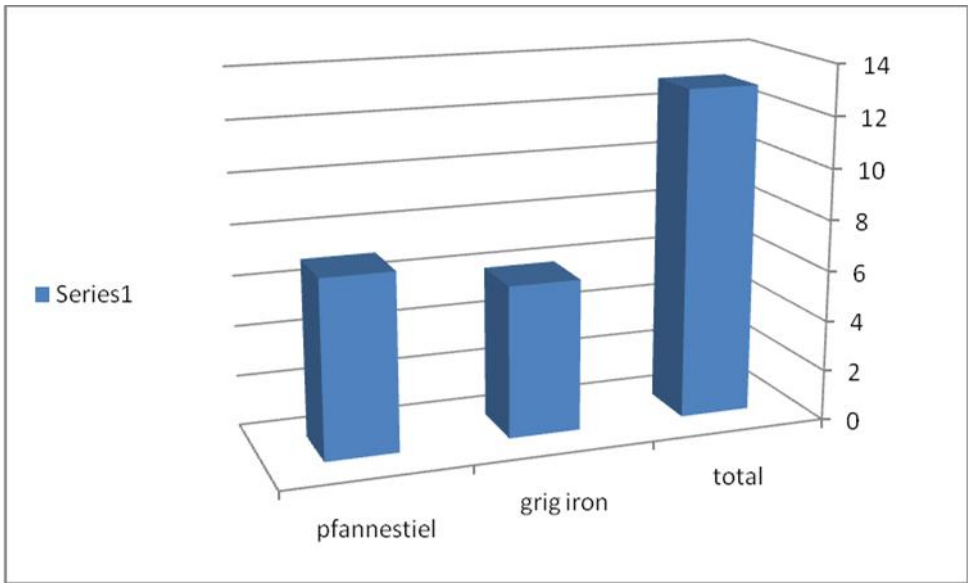
## 4-2 Number of Ports:

In most of the cases (81%) the 4 ports technique was used, while the rest (19%) we have used 3 ports as shown in figure (4-2).




## Previous surgical operation.

There were 14 patients with previous surgical operation including pfannestiel and grid iron incisions all were done successfully without need for conversion to open choelcystectomy as shown in figure (4-3)



### 4-3 Complicated cases:

We have only three complicated cases, successfully operated on by laparoscopic cholecystectomy , two of them had acute calculus cholycystitis , had one of them had empyma of GB as shown in figure (4-4).

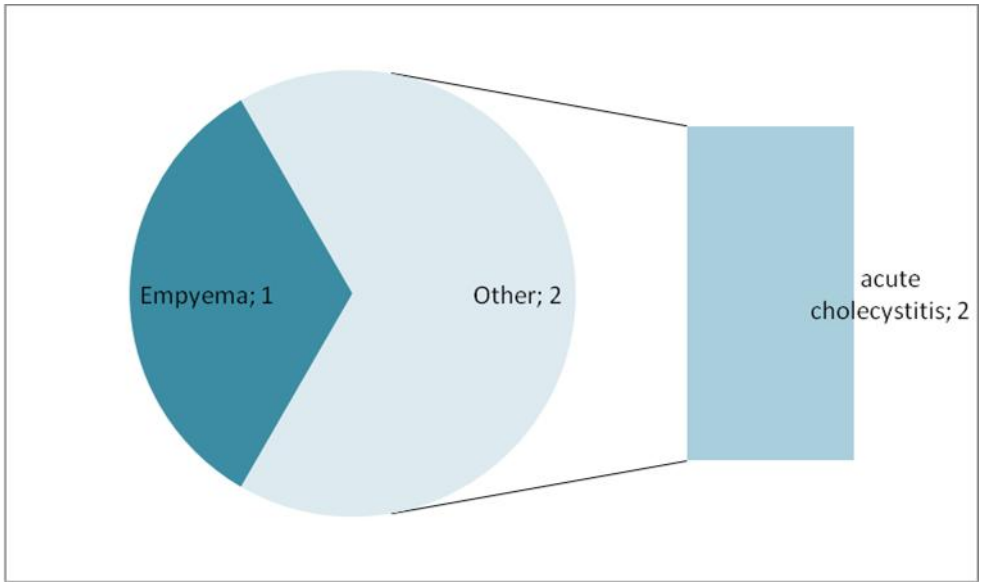



Figure (4-4): complicated cases

### 4-4 Clips and ligatures:

The classical clipping was successfully used, for cystic duct (100) patients, and cystic artery (89 %) two proximal and one clips distal. Cauterization was used for control of cystic artery in (11) patients.

### 4 – 5 Conversion rate

Our conversion rate was 5%, two of them was converted to open cholecystectomy because of anatomical difficulty in extensive adhesion and another three were converted to open surgery because of spillage of multiple stones inside the peritoneal cavity (figure 4-5).

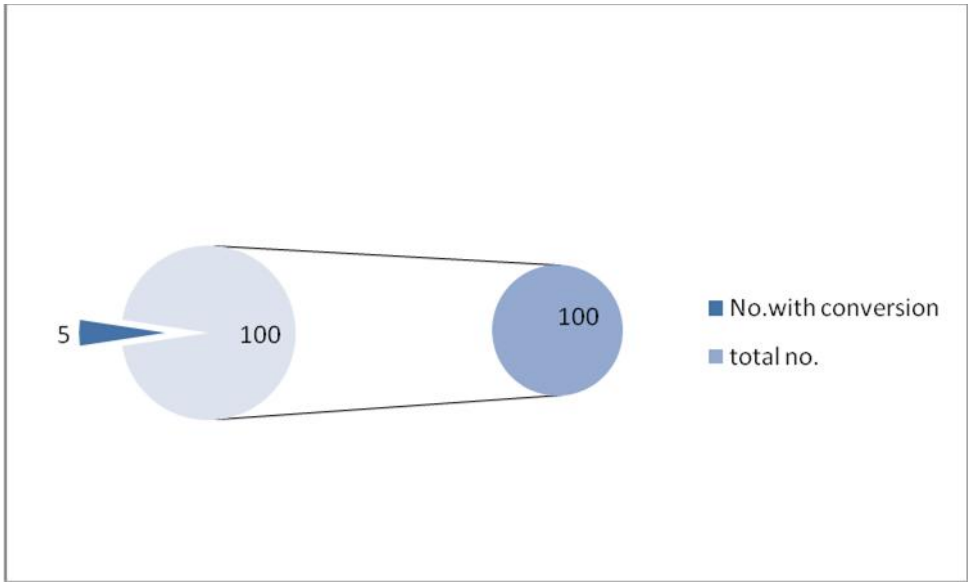
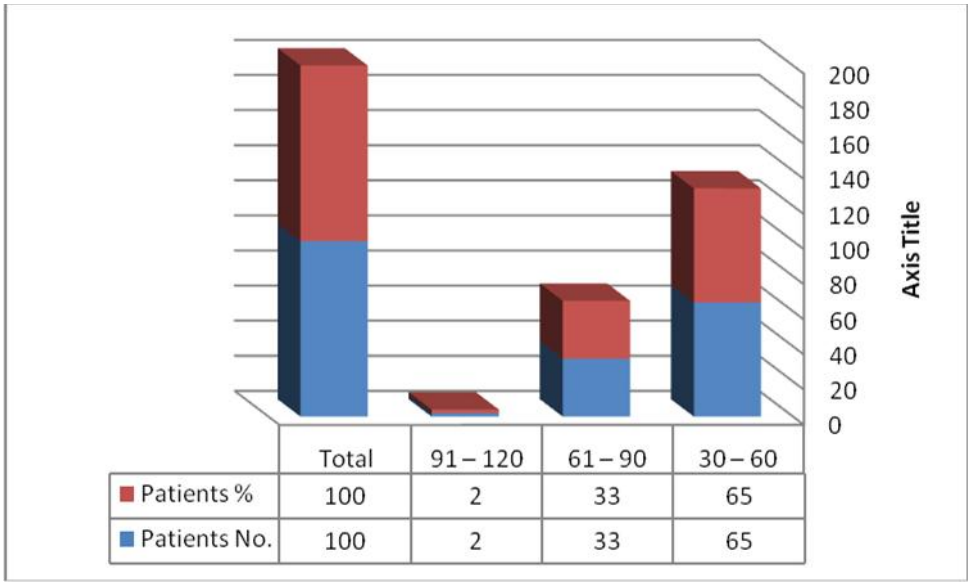



Figure (4-5) conversion rate.

### 4 – 6 Duration of Operation.

The mean duration of operation was 65 mins. Ranging from 30 – 120 min, as shown in table (4-2).

Table (4 – 2): Duration of operation




### 4- 7 Drain insersion:

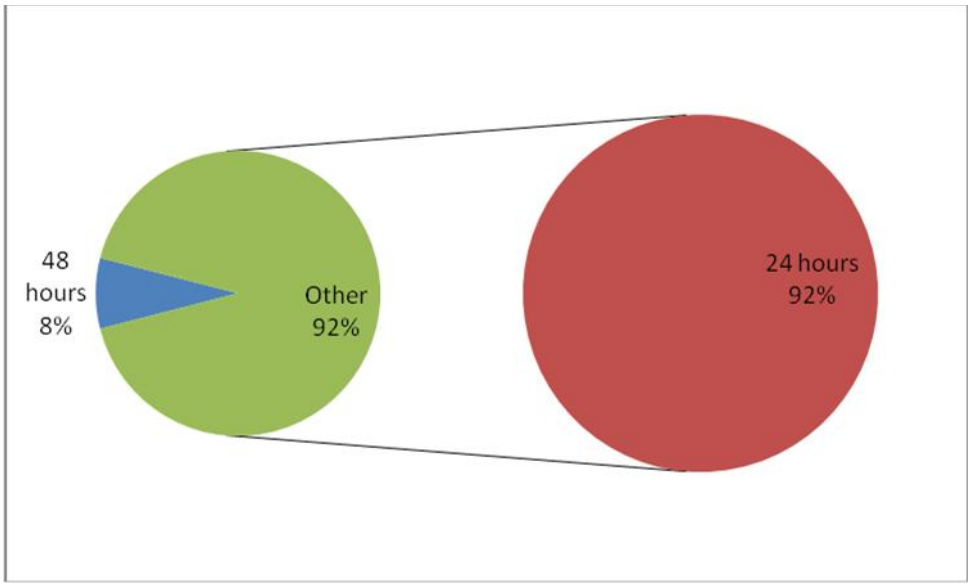
We have used a drain in 68 patients, three of them with complicated cholecystitis and in the remaining number , the reason for drain insersion was due to perforation of GB or for simple ooze from GB bed.

### 4 – 8 N.G.T. Insertion

We have used N.G.T. in only three patients for decompression of the distended stomach

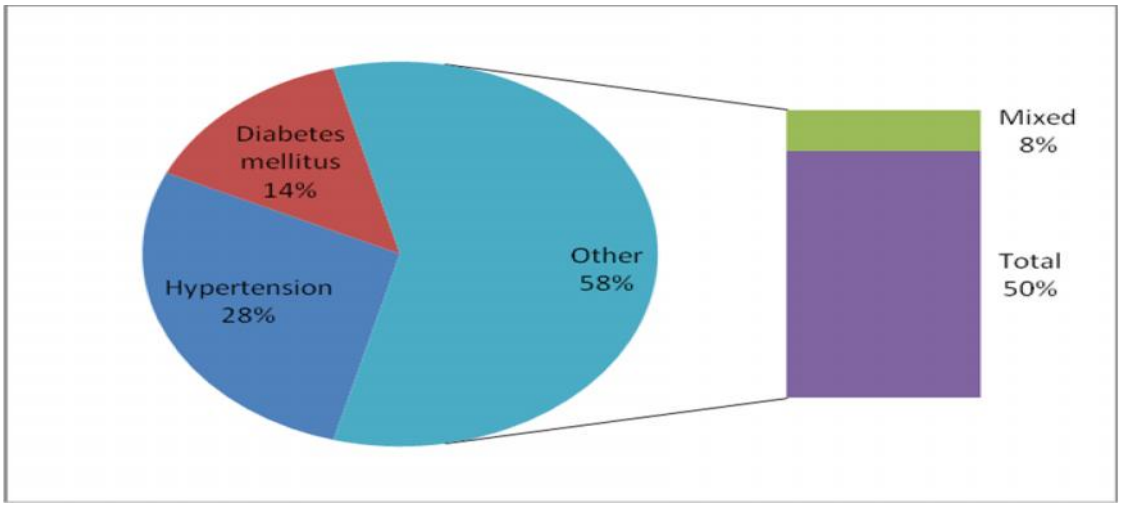
### 4- 9 Hospital Stay:

The majority of patients stayed for 24 hour in the hospital while the rest (8) stayed for 48 hours in the hospital as shown in figure (4-8) .



### 4 – 10 Concomitants disease.

There were 18 patients with associated medical illness as shown in figure (4-9).Patients with associated medical disease.



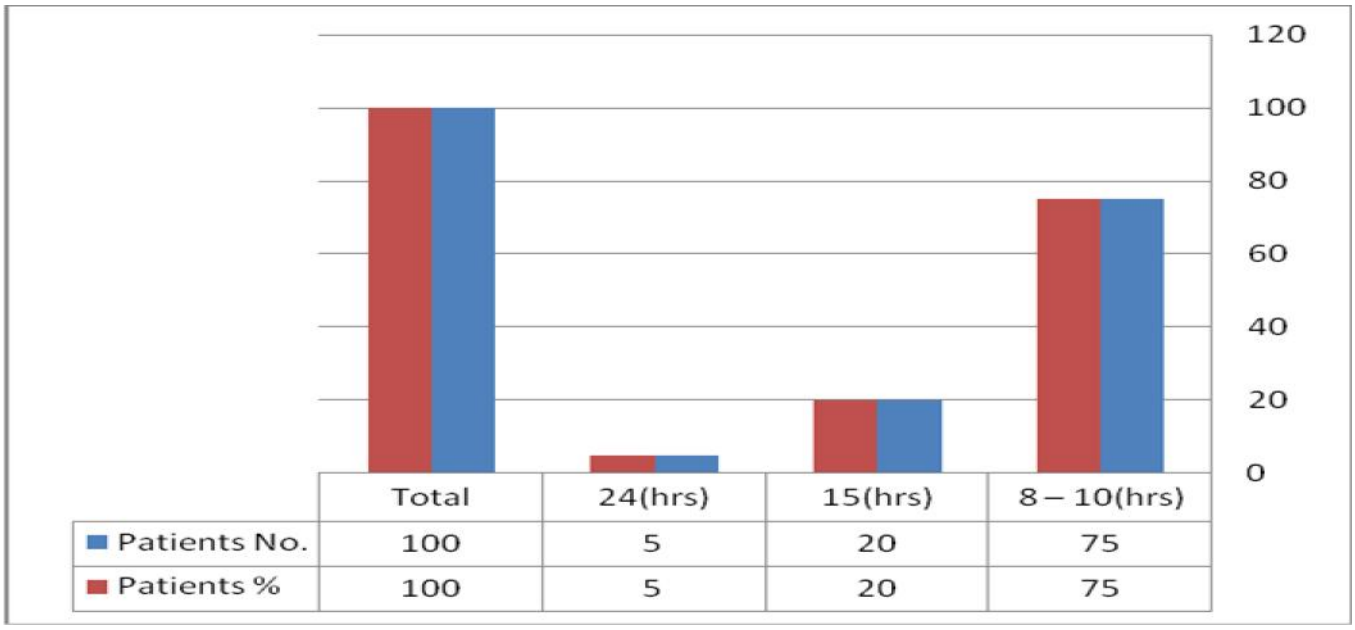

### 4-11 Postoperative analgesia:

Two doses of I.M. Diclofenac Na. 75 mg was used in most patients which constituted 98%. While a single dose of I.M. Voltaren was used only 2 patients, there was no need to use opiates, as shown in the figure (4-10).

### 4-12 Postoperative oral intake:

Most patients started oral intake of water 8-10 hours postoperatively. Full breakfast was taken the next morning just before discharging them home as shown in table (4-3).

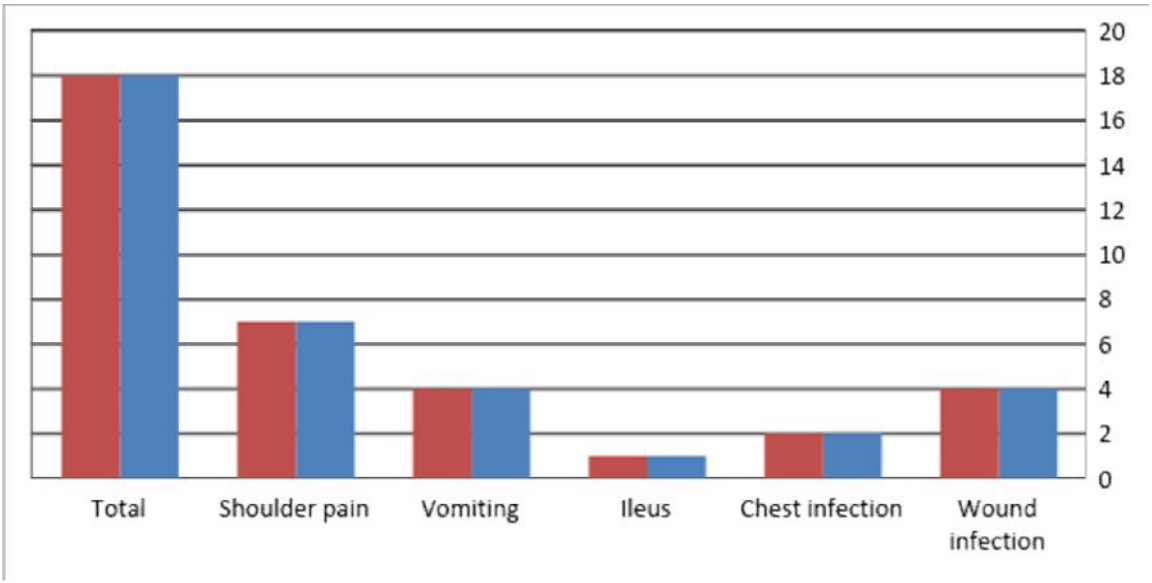
Table (4 – 3): Postoperative oral intake.



## 4-13 Postoperative Complication.

Table (4-5) shows the complications after removal of GB the most frequent complication was shoulder pain (7%).

Table (4 – 4): Postoperative complications.




## Postoperative return of dialy activities.

Most of the patients retained full activities after 14 days (84%).(7) patients after 10days & (9) patients more than 20 days postoperatively.

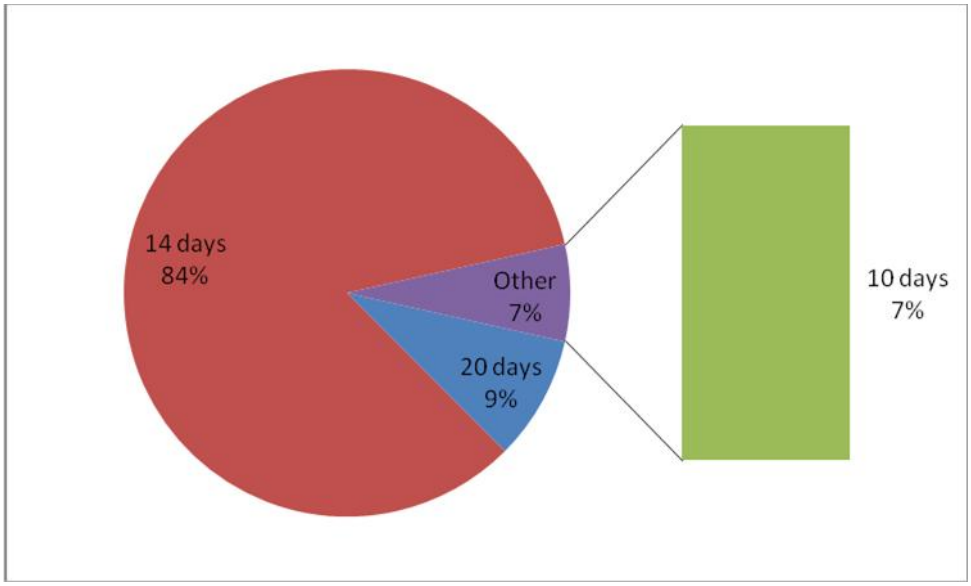



Figure (4-11).

## Discussion

The total no, of patients was 100 patients in our study, eighty seven were females which constituted (87%) and thirteen (13) patients were male, the average age of our patients was (42) years ranging from (18-65) years.

This is comparable with a study by M.kaplan et al. were females form(82.5%), but it is less comparable considering the average age which was around (48.5) years .

Three patients in our study were operated on successfully by laparoscopic cholecystectomy they have complicated cholecystitis ; acute cholecystitis (2), empyema of gall bladder (1) patients they constituted 3% , and this percentage seems to be small in comparison with studies by M. Kaplan et al., Jensen et al., and ferzli et al, who reported high percentage of acute cholecystitis (9%), (13%) and (19%) respectively.

This small no. of complicated cases may be attributed to careful selection of patients and early experience to deal with such cases laparoscopic ally.

Five patients were converted to open cholecystectomy (5%) and this is seems to be higher than studies by Fullarton et al. (1994) , perssat et al. (1992), soper et al. (1998) who reported conversion rate of (2,7%), (2.2%), (1.2%), respectively.

The conversion is less than K.Marshal were reported (15%) in3rd year of studies.

tube drain was used in (68) patients which is much higher in comparison with studies by Huang et al., Belloso et al., Szego et al. were reported (14%), (12%), (15%) respectively.

The use of tube drain was determined by surgeon preference.

In our study the main time of operation was (65) mints, ranging from (30-120) mints. which is comparable with a study by Majeed et al. (1996), were 65 mints. but it is lower than that reported by Trondsen,et al. (1993) who reported (100) mints. and it is much less than that reported by K.Marshal who reported a decrease in time through three years study(133)mints,(123)mints,(115)mints, respectively.

We have been successful in using 4 (ports) in (86) patients while 3(ports) technique was used in the rest (14) patients, this seems to be large to the results of a large study done at Baghdad teaching Hospital by Dr. Hisham I. Ahmed in October 1999. who reportd the use of 3 ports in (78%) and 4 ports in the rest (22%) .and comparable to the result of Gaziantep AV. Who reported (60).

The majority of patients which constitute (92%) discharged at the morning after surgery and this is below the discharge time reported by Berggren, et al., (1994) and McMahon et al. (1994)

Fisher et al., were all of them reported a two days of hospitalization. And below Royal Australian college which reported only (30%) discharge on(24)hrs.

Eighteen patients develops postoperative complication

Wounds infections of the infra umbilical port develop in 4 patients (4%) which is comparable with the study by Manger et al., Frazee et al .who reported (4%) and (3%) respectively.

Chest infections occurred in (2) patients. Which is comparable to the study by M.Kaplan et al, (2%) and high in comparison with study by Jones et al., (0.5%).

All other complications (repeated vomiting, ileus, right shoulder pain were mild and were treated conservatively were reported in most of other series.

Injury to C.B.D & hepatic ducts injury were not reported in our study.

The most common serious complications had been reported by many studies like a study by collett, et al., and cuschieri, et al., were reported (0.6%) , (0.3%) respectively.

Again ,visceral injury such as duodenal perforation which is another serious complications had been reported by Wilson et al., Manger and Peters, in the percentage of (0.5%), (1%), (0.5%) respectively.

The non –occurrence of such serious complications was due to :

1-strict selection of patients for L.C
2-Most the operations were done by specialist surgeons.

3.The surgeon decision to convert to O.C. at the proper time and situation.

No mortality was reported in our study which might be attributed to the strict surgeons strategy in patient selection. Studies have shown that advanced age, longer duration of procedure, and acute cholecystitis significantly increase both postoperative morbidity and the length of stay

The combination of endoscopic retrograde cholangio-pancreatography (ERCP) and endoscopic sphincterotomy (ES) with Lap. chole. offer treatment of cholithiasis and choledo-cholithiasis without the need for more morbid surgery.

## Conclusion

1- Minimally invasive surgery represents a great step forward in the field of general surgery. Cholecystectomy remains a common operation. Laparoscopic management of symptomatic gallstones has rapidly become the new standard for therapy throughout the world.

2-The conversion rates from laparoscopic to open operation in most series range from 1.8–7.8% and generally is greater early in the surgeon's experience with the procedure.

3-) That a learning curve existed and once a particular surgeon performed 25 - 50 laparoscopic cholecystectomies the incidence of common bile duct injuries greatly decreased.

4-) That routine x-rays of the bile duct (cholangiography) was not a necessary part of this procedure.

5-) That conversion to an open procedure from a laparoscopic procedure should be done whenever there is any question concerning anatomy.

3-occasionally anatomical or physiological considerations will preclude the minimal access approach, and conversion to an open operation in such cases reflects sound judgment and should not be considered a complication

4. Postoperative analgesia requirements were reduced and return to normal activities and to work were faster after LC.

5-consultation with more experienced surgeons should be made

6-Laparoscopic cholecystectomy in our hospital in extention and continuing medical education related to laparoscopic surgery should be required as part of the periodic renewal of privileges. still in need for extensive training to all our surgeons even for complicated cases.

7- The first assistant to the surgeon should be a trained individual who is actively assisting as part of good working team.

8-Hospital could improve their capacity to supervise surgeons by requiring videotaping & using the tapes as mean to proctor.

9-Individual hospitals were left with the responsibility of monitoring and regulating surgeons at their individual facilities. Hence significant differences exist from institution to institution concerning requirements for credentialing for individual surgeons to do specific laparoscopic procedures.

10-Laparoscopic cholecystectomy is associated with lees pain ,early mobilization, shorter hospital stay, early return to full activity.

## Acknowledgments

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I'm grateful to everyone who shared in any way to complete this study.

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## List of abbreviations

| | |
|---|---|
| L.C | Laparoscopic cholecystectomy |
| G.B. | Gallbladder |
| Mins. | Minutes |
| C.B.D | Common Bile Duct |
| G.A. | General Anasthesia |
| Post.op. | Postoperative |
| ERCP | Endoscopic RetrogradeCholangiopancreatography |
| ECG | Electrocardiogram |
| I.M. | Intramuscular |
| mmHg | Millimeter Mercury |
| cm | Centimeter |
| mm | Millimeter |
| Rh | Rhesus |
| No. | Number |


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