AN EXPERIENCE WITH EARLY LAPAROSCOPIC
CHOLECYSTECTOMY IN ACUTELY INFLAMED GALL BLADDER:
A REVIEW OF 116 CASES
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ABSTRACT

OBJECTIVE: To see the outcome of early laparoscopic Cholecystectomy in acutely inflamed gall bladder.

STUDY DESIGN: A prospective interventional study.

PLACE & DURATION: Surgery unit-I of Fauji Foundation Hospital, Rawalpindi from 1st January 2005 to 30th June 2009.

METHODOLOGY: Patients admitted with acutely inflamed gall bladder within 72 hrs of symptoms were subjected to early laparoscopic Cholecystectomy. All operative findings, per-operative and post operative complications and follow up details were recorded meticulously on a Performa and analyzed.

RESULTS: Laparoscopic Cholecystectomy on acutely inflamed gallbladder was performed in 116 patients. Among them 70.68% patients had acute cholecystitis, 22.43% empyema gall bladder and 6.89% gangrenous gall bladder. The overall conversion to open cholecystectomy was 11.20% and it was highest (14.28%) in gangrenous GB, followed by empyema GB (7.69%). Pus or infected fluid collection found in 6.89% patients and 1.72% had visceral injury during surgery. No mortality was observed.

CONCLUSION: Early laparoscopic Cholecystectomy in acute gall bladder is safe and feasible option and should be considered in patients instead of interval Cholecystectomy.

KEYWORDS: Cholecystectomy, Laparoscopy, Acute Cholecystitis, Empyema, Gangrene, Gallbladder

INTRODUCTION

Gallstones are one of the most common surgical diseases. Prevalence of gallstones is about 20% above the age of 40 years and this frequency increases up to 30% with advancing age. Male to female ratio is about 1:4 during reproductive age and this discrepancy narrows to near equality in the older population 1,2. Definitive treatment of gall stone disease still remains cholecystectomy. About 35% of patients with gall stones if untreated more likely to developed complications or recurrent symptoms at some stage during their life 2. Untreated gall stones may leads to potentially fatal complications like Empyema, gangrene, perforation, obstructive jaundice or fistula formation 2,3.

Acute inflammation of gall bladder requires emergency management which leads to hospitalization. Traditionally the acutely inflamed gall bladder was treated conservatively which includes bowel rest, intravenous hydration, correction of electrolyte abnormalities, analgesia, and intravenous antibiotics. Surgical intervention in emergency was only reserved for those cases where conservative treatment fails 4. Interval cholecystectomy was done in acute gall bladders treated successfully with conservative treatment. This leads to multiple admissions in hospitals causing significant burden on health system 5. To avoid repeated admissions, some surgeons or centers prefer to do early cholecystectomy if patients report within 72 hrs of acute attack. With the advent of Laparoscopic surgery, treatment of symptomatic gallstones has changed dramatically. The general principles of gallstone management have not notably altered since last two decades. The treatment of choice still remains Cholecystectomy 5,6.

Empyema gall bladder is more common males and in elderly patients 7. As an initial management the percutaneous drainage of gallbladder has often been recommended. This option is more effective and safe procedure with better outcome because majority of these patients are in sepsis and more sick 8,9. Initially, due to the lack of experience and interventional studies in literature, empyema and gangrenous gallbladder used to be considered as a contraindication for laparoscopic cholecystectomy. With the advancement in laparoscopic cholecystectomy, and better training and education facilities the surgeons of today are more experienced in laparoscopic dissection 9,10. But acute gall bladders still considered the commonest reasons for the interval or open cholecystectomy. 8,10 Despite various encouraging reports, some surgeons are still reluctant to treat acute gall bladder laparoscopically.

The aim of our study was to see the outcome of early laparoscopic cholecystectomy in patients with acutely inflamed gall bladder. The special emphasis of our study was to determine the feasibility and results of laparoscopic cholecystectomy in acute gall bladder, gangrenous cholecystitis and empyema gall bladder.

METHODOLOGY

This prospective interventional study was conducted at the Surgery Unit-I of Fauji Foundation Hospital, Rawalpindi from 1st January 2005 to 30th June 2009. All the patients above the age

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of 20 years, admitted within 72 hrs of attack of acute cholecystitis with cholelithiasis (acutely inflamed Gall bladder) were included in this study. Patients booked for elective laparoscopic cholecystectomy, in septicemia, having percutaneous drainage for empyema gall bladder, growth in the gall bladder, choledocholithiasis and failure to complete follow up were excluded from the study. After detailed clinical examination, blood tests and ultrasound examination the patients with diagnosis of acutely inflamed gall bladder were booked for emergency laparoscopic cholecystectomy. Criteria for the diagnosis of acutely inflamed GB / empyema was clinical examination, blood test and ultrasound scan and for gangrenous gall bladder was operative gross appearance of gall bladder and histopathology in addition to above mentioned criteria.

After informed consent all the patients underwent early laparoscopic cholecystectomy. All these patients were managed in a uniform manner by same team according to a management based algorithm. These patients were followed after 1 week, 3rd week and then after three months. All patients' demographic profile, clinical findings, operative details, postoperative complications and follow up findings of all patients was recorded meticulously. The data was analyzed using SPSS version 10. Continuous variables were expressed as mean ± SD, whereas the categorical variable included as percentage and frequency. For comparison of the categorical variables the Chi square test was used. A P value of = 0.05 was considered significant.

### TABLE - I: SEX AND AGE DISTRIBUTION OF PATIENTS (n=116)

<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>MALE</th>
<th>FEMALE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>21-30</td>
<td>-</td>
<td>6</td>
<td>6 (6.89%)</td>
</tr>
<tr>
<td>31-40</td>
<td>1</td>
<td>12</td>
<td>13 (11.20%)</td>
</tr>
<tr>
<td>41-50</td>
<td>2</td>
<td>43</td>
<td>45 (38.79%)</td>
</tr>
<tr>
<td>51-60</td>
<td>7</td>
<td>32</td>
<td>39 (33.63%)</td>
</tr>
<tr>
<td>61-70</td>
<td>4</td>
<td>8</td>
<td>12 (10.35%)</td>
</tr>
<tr>
<td>&gt;70</td>
<td>-</td>
<td>1</td>
<td>1 (0.86%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>14 (12.07%)</td>
<td>102 (87.93%)</td>
<td>116</td>
</tr>
</tbody>
</table>

### TABLE - II: DIFFERENT TYPES OF ACUTE GALL BLADDER PRESENTATION OBSERVED DURING SURGERY (n=116)

<table>
<thead>
<tr>
<th>GB Type</th>
<th>MALE</th>
<th>FEMALE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ac Cholecystitis</td>
<td>9</td>
<td>73</td>
<td>82 (70.68%)</td>
</tr>
<tr>
<td>Empyema GB</td>
<td>4</td>
<td>22</td>
<td>26 (22.43%)</td>
</tr>
<tr>
<td>Gangrene GB</td>
<td>1</td>
<td>7</td>
<td>8 (6.89%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>14 (12.07%)</td>
<td>102 (87.93%)</td>
<td>116</td>
</tr>
</tbody>
</table>

### RESULTS

A total of 134 patients were included in study during study period. Among them 18 patients were excluded from study due to lost follow up (n=17) and histopathological diagnosis of Ca Gall bladder (n=1). The study includes 116 patients who had emergency laparoscopic cholecystectomy. Among them 12.07% (n=14) male and 87.93% (n=102) were female with male to female ration of 1:7.2. Majority of patients were in 5th (38.79%, n=45) and 6th decade (33.63%, n=39) of life (Table - I). The mean age of patients was 52.23 ± 7.27 years. Mean operative time was 63.89 ± 19.48 min, and mean hospital stay was 3.35 ± 1.95 days. All patients were divided into three groups based on types of inflammation and operative findings. Majority of patients have acutely inflamed gall bladder (70.68%, n=82), followed by Empyema gall bladder (22.43%, n=26) and Gangrenous gall bladder (6.89%, n=8) as shown in Table - II.

Regarding outcome or complications, overall conversion rate was 11.20% (n=13), followed by pus/infected fluid collection in 6.89% (n=8) patients. Bile leak from Gall bladder fossa was noticed in 2.58% (n=3), visceral injury in 1.72% (n=2) and port site infection was noticed in 3.44% (n=4) of patients (Table - III). A comparison of the complications of three types of acute Gall bladder shows that the conversion rate is higher in gangrenous gall bladder (28.57%, n=2) followed by empyema gall bladder (11.53%, n=3). Similarly complication rate is also higher in gangrenous gall bladder as compared to acutely inflamed or empyema gall bladder (Table - III).
### TABLE - III: OUTCOME AND COMPLICATIONS OF LAPAROSCOPIC CHOLECYSTECTOMY (n=116)

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Ac Cholecystitis (n=82)</th>
<th>Empyema GB (n=26)</th>
<th>Gangrenous GB (n=7)</th>
<th>Total (n=116)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion to open</td>
<td>8 (9.75%)</td>
<td>3 (11.53%)</td>
<td>2 (28.57%)</td>
<td>13 (11.20%)</td>
</tr>
<tr>
<td>Pus/infected fluid collection</td>
<td>5 (6.09%)</td>
<td>2 (7.69%)</td>
<td>1 (14.28%)</td>
<td>8 (6.89%)</td>
</tr>
<tr>
<td>Bile leak</td>
<td>2 (2.43%)</td>
<td>1 (3.84%)</td>
<td>-</td>
<td>3 (2.58%)</td>
</tr>
<tr>
<td>Visceral injury</td>
<td>2 (2.43%)</td>
<td>-</td>
<td>-</td>
<td>2 (1.72%)</td>
</tr>
<tr>
<td>Paralytic ileus</td>
<td>1 (1.21%)</td>
<td>1 (3.84%)</td>
<td>1 (14.28%)</td>
<td>3 (2.58%)</td>
</tr>
<tr>
<td>Port site infection</td>
<td>2 (2.43%)</td>
<td>1 (3.84%)</td>
<td>1 (14.28%)</td>
<td>4 (3.44%)</td>
</tr>
<tr>
<td>Mortality</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### DISCUSSION

In recent years open cholecystectomy has been replaced by laparoscopic cholecystectomy (LC) as a treatment of choice for the non-complicated symptomatic gall stones. Early experience with laparoscopic cholecystectomy of the acute cholecystitis raised some questions and cautions in literature due to higher complication and conversion rates. With the advancement in techniques and gadgets during last two decades the indications of laparoscopic cholecystectomy have changed to dramatically to its use in elective as well as in emergency cholecystectomy. Now a days many centers all over the world advocate early Laparoscopic intervention for acutely inflamed gallbladder during initial 3-4 days of illness. Recently early LC has established an acceptable and preferred option even in difficult situations which are associated with complicated gallbladders. This fact was also suggested by Hunter “Get it while it’s Hot” during early days of LC.

In Pakistan laparoscopic cholecystectomy is being done since last two decades at different centers or at the individual’s levels but early cholecystectomy is not being practiced for acute or complicated gall bladders gall bladders routinely. Our study shows that the outcome of LC for acute gallbladder in our patients is comparable to the results reported in the literature. In acutely inflamed gall bladders the only acute cholecystitis was found in majority of patients (70.68%). Rest of patients had empyema gall bladder (22.42%) or gangrenous gall bladders (6.89%). The literature suggests that gangrenous cholecystitis is difficult to diagnose preoperatively and usually leads to potential misdiagnoses in most of the patients. It is usually suspected among male, elderly patients with high WBC count, with comorbidities and in sepsis. The empyema gall bladder can be suspected or diagnosed clinically among patients with palpable gall bladder, having sepsis and on the basis of ultrasound san findings.

One cannot predict preoperatively that which patient may undergo conversion or develop complications during or after the laparoscopic early cholecystectomy. In our study the conversion rate (11.20%) in acute gall bladder was observed which is quite low as compared to our expectations and various studies reported in literature. The low conversion rate in our series is due to the experienced surgeons who operated or supervised all cases. Senior surgeons are of opinion that a careful dissection, better anatomical identification will lead to better surgical outcome. Literature review shows that the different forms of hot gall bladder carry variable complication and conversion rates. In case series by Eldar and his colleagues, they have observed that Biliary disease history, age (>65year), non-palpable gallbladder, WCC count (>13,000/cc) and gangrenous gall bladder are independently associated with a higher conversion rate. Literature review shows that patient with gangrenous gallbladder, empyema gall bladder or having multiple attacks of inflammation and undue delay in surgery are more likely to develop complication or undergo conversion. Conversion rate in gangrenous GB varies from 8.7% to 49% as reported in literature. Operative time was not prolonged significantly and the outcome in terms of hospital stay and morbidity was significantly better in patients in whom the LC was successful. In empyema GB up to 28.5% conversion rate is reported in literature. In our study conversion rate is 28.57% in gangrenous gall bladder and 11.53% in empyema gall bladder which is comparatively better than many studies reported in literature especially in empyema gall bladder.

The decompression of distended GB in empyema before starting dissection at Calot’s triangle facilitates the dissection. We strictly followed this principle in our patients. Moreover, we adhere to the principal of basic training of minimally invasive surgery that the conversion rate can be minimized significantly by observing patience, clear identification and display of Calot’s triangle anatomy before clipping and cutting the structures. All complications among our patients were managed successfully due to multidisciplinary team approach. There was no mortality observed in our series. We have observed that the difficulties encountered during dissection in Calot’s triangle, gall bladder fossa, anatomical variations and adhesions are more or less the same as mentioned in literature. The dissection should be done gently with extreme caution along with identification of the surrounding viscera. Decision to convert to open is an important factor in minimizing the major complication in laparoscopic cholecystectomy especially in hot gall bladders. Literature review reveals that the different factors responsible for high complication in laparoscopic cholecystectomy are gender (>male), large size gall stones, serum bilirubin (> 0.8 mg/dl) and WCC (>13,000/cc) with or without conversion. Infected fluid or pus collection was the major complication observed in our patients and especially in patients with gangrenous gall bladder. Minimal and under vision use of diathermy should also helps to
minimize the complications during surgery. In addition, in difficult gall bladders some surgeons promote subtotal cholecystectomy to ensure safety of procedure instead of attempting dissection in frozen Calot's triangle with totally obscured anatomy. Only two cases (1.72%) of visceral injury (CBD injury, duodenal injury) due to difficult dissection observed in our study which was managed amicably. There is always a risk of common bile duct or vascular injury, if the anatomy is not clearly displayed and the operating surgeon is impatient. Moreover, excessive use of diathermy is another factor causing visceral or vascular injury and should be minimized in area of Calot’s triangle and hepatic bed.

Early Laparoscopic cholecystectomy which was initially criticized in acute gall bladder is now recognized as an effective and safe option. In international literature, several reports of large case series, and nonrandomized studies have been reported the successful use of Laparoscopy for acute GB in emergency surgery. Now a day, more laparoscopic surgeons are convinced to perform Laparoscopic surgery in acute GB. These studies also prove that the laparoscopic cholecystectomy as proven to be a feasible and safe treatment for acutely inflamed gall bladder with low complication rate and fewer burdens to health services due to multiple admissions. Similarly, our study also favour the early laparoscopic Cholecystectomy with less than 1% mortality, less then 2% visceral injury and low incidence of minor complications. Moreover, hospital stay and sick leave required by the patients after LC were also significantly shorter. One can easily emphasize that the overall benefits conferred by early LC could lead to a reduced treatment cost, due to short hospital stay, rehabilitation and sick leave required by the patients.

CONCLUSION

Early laparoscopic Cholecystectomy in acute gall bladder is safe and feasible option and should be considered in patients instead of interval Cholecystectomy.

REFERENCES


20. Soleimani M, Mehrabi A, Mood ZA, Fonouni H, Kashfi A, Büchner MW, Schmidt J. Partial cholecystectomy as a safe treatment for acutely inflamed gall bladder with low mortality, less then 1% mortality, less then 2% visceral injury and low incidence of minor complications. Moreover, hospital stay and sick leave required by the patients after LC were also significantly shorter. One can easily emphasize that the overall benefits conferred by early LC could lead to a reduced treatment cost, due to short hospital stay, rehabilitation and sick leave required by the patients.


