

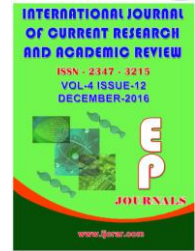


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Laparoscopic Cholecystectomy in Empyema of Gallbladder

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KEYWORDS

Empyema gall bladder,
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A B S T R A C T

Empyema of the gallbladder is a potentially fatal complication of gallstones. It is characterized by suppuration superimposed on acute cholecystitis. It has been considered one of the most common causes of difficult Laparoscopic Cholecystectomy. The current study aimed to determine the safety and feasibility of Laparoscopic Cholecystectomy in the empyema of the gallbladder. Therefore a prospectively selected 800 patients suffering from gallstone diseases underwent laparoscopic cholecystectomy during the period from December 2011 to December 2014 in Al Sader Medical City, teaching hospital in the holy Najaf governorate, Iraq. The procedure was performed by standard three-ports technique with few changes made to facilitate dissection according to situation. A total of 800 patients underwent Laparoscopic cholecystectomy, among these patients females were the dominant with a male to female ratio, 1:5.25. Empyema of gallbladder was identified in 50 patients (6.25%), and they represented the studied group. Laparoscopic cholecystectomy successfully completed in 49 (98%) patients while only one (2%) patient converted to open cholecystectomy due to uncontrolled bleeding. In Conclusion in well trained and skillful hands of an expert Surgeon, Laparoscopic Cholecystectomy is a safe and acceptable option in empyema of gallbladder.

Introduction

Gallstone disease is a major health problem worldwide particularly in the adult population (Friedman, 1993). The traditional open cholecystectomy performed for the first time in 1882 by Carl August Langerbach he appropriately stated, “The gall bladder needs to be removed not because it contains stones, but because it

forms them”, has been replaced by laparoscopic cholecystectomy (LC), first performed by Muhe in 1985, which has revolutionized the treatment of gall bladder disease and is now the gold standard for the treatment of gallstones and the commonest operation performed laparoscopically worldwide (Adamsen *et al.*, 1997; Barkun *et*

al., 1992). Laparoscopic surgery has certain technical limitations like loss of three dimensional perceptions, a relatively limited and fixed view of operative field, indirect contact with intra-abdominal structures, and limited tactile feedback during dissection and manipulation of tissues. This makes operation difficult sometimes and leads to conversion to open cholecystectomy. The definition of “difficult laparoscopic cholecystectomy (LC)” is inconsistent. The term difficult cholecystectomy refers to multiple technical intra-operative difficulties that increases the risk complications and significantly prolongs operation time (Capizzi *et al.*, 2003; Sahu, Agrawal, and Sachan, 2013). Approximately 75% of all cholecystectomies are performed laparoscopically, and conversion to the open procedure ranges from 5% to 10% nationwide (Livingston and Rege, 2004). However, The National Institutes of Health (NIH) postulated that the outcome of LCs would be greatly influenced by surgeon-specific factors, such as training, experience, skill and judgment (Gollan *et al.*, 1993). Conversion to open cholecystectomy has been associated with increased overall morbidity, surgical site and pulmonary infections, and longer hospital stay (Alponat *et al.*, 1997; Livingston and Rege, 2004) Empyema of the gallbladder is a potentially fatal complication of gallstones. It is characterized by suppuration superimposed on acute cholecystitis. The clinical presentation of this disease is often difficult to distinguish from acute cholecystitis (Chua, Cheah and Chew, 1988). There is an increased incidence in those with diabetes and/or advanced atherosclerotic disease (O’Connor and Maher, 2011).

Pathology

The Gallbladder neck is usually obstructed by a calculus (or rarely from a malignant

mass such as underlying cholangiocarcinoma) which prevents pus from draining through the cystic duct (Kumar *et al.*, 2011). Although multiple sonographic indicators of acute cholecystitis have been described including sonographic Murphy's sign, pericholecystic fluid, gall bladder wall thickening and gall bladder distension (Bennett and Balthazar, 2003; Menu and Vuillerme, 2002). The ability to predict acute cholecystitis and the ease or difficulty of cholecystectomy appears to be limited (Bingener *et al.*, 2004). Features suggesting diagnosis and seriousness of this disease are few (Chow *et al.*, 1993).

It used to be a contraindication for LC because of fear of life-threatening complications (Koperna, Kisser and Schulz, 1998; Larson *et al.*, 1992). It is also considered one of the commonest reasons for the conversion (Miller and Kimmelstiel, 1993). Increasing experience and technology in the field of laparoscopic surgery has brought a significant change and a number of studies have reported LC to be safe and effective option in acute cholecystitis and associated conditions like empyema of the gall bladder (Miller and Kimmelstiel, 1993; Pisanu *et al.*, 2001). There can be various reasons and factors which can however, lead to conversion (Eldar *et al.*, 1998). Obscured local anatomy, uncontrolled bleeding and damage to nearby vital structures are the common factors responsible for conversion (Eldar *et al.*, 1998). Despite various encouraging reports, the role of laparoscopic surgery in such acute conditions is still under evaluation. This study aimed to find out safety and outcome of LC in empyema gallbladder.

Patient and Methods

A prospective study involving 800 patients undergoing laparoscopic cholecystectomy

(LC), experience of one surgeon team (Dr. Consultant Raad AlSaffar, Dr. Ahmed Rasheed, Dr. Haider A.Z. Al Khaqany), for different indications (usually pain in the right upper abdominal quadrant) from December 2011 to December 2014 in Al Sader medical city, teaching hospital in the holy Najaf governorate, Iraq. The patients seen at the outpatient clinic of gastrointestinal center and the private clinics. Patients of both genders aged 13 years or more who underwent laparoscopic cholecystectomy were included. Patients who had jaundice, mass or dilated common bile duct (CBD) (>10 mm in diameter) and hepatitis B or C positive patients were excluded.

Full history and clinical examination performed for all patients, preoperative routine investigations were performed. Ultrasound of the abdomen was done for each patient to confirm gallstones and to assess the CBD diameter. Additionally, Chest X-ray and ECG were performed for patients aged forty years or more. A laparoscope (Storz) has been used.

The LC was done by standard 3-port technique with few modifications depending upon the situation such as an additional port, percutaneous decompression of gallbladder by verrus needle. In case of thick pus the gallbladder was incised and the suction cannula directly introduced into gall bladder to aspirate pus. At times the suction cannula was also used to dissect the dense adhesions in the area of Calot's triangle, in many cases the cystic duct ligated by extracorporeal or sometimes intracorporeal ligature, use of endobags and sometimes sterile gloves to extract the GB, use of irrigation suction technique and drain was put in almost all patients. Data of each patient was recorded on a data form including demographic details, operative findings, intraoperative

complications, post operative complications and duration of hospitalization. Patients were followed up for 2 – 24 months in regular outpatient visits. The collected data were analyzed using the statistical package for social sciences (SPSS), IBM, version 23 and the appropriate statistical tests were used accordingly.

Results and Discussion

Eight hundred LC were performed for gallstone disease, of which 250 (31.25%) patients were found to have complicated gallstone disease. Empyema of gallbladder forms a major component in the complicated gallstone disease and account for 20% of the complicated gallstone disease in this study. Of the total laparoscopic cholecystectomies, 50 (6.25%) patients, eight males and 42 females, had empyema of gallbladder. Their age ranged 20 years to 65 with a mean of 42.5 years.

The main presentations and ultrasound findings of the patients are shown in [Table 1]. Preoperative diagnosis was predicted in 38 (76%) patients while remaining 12 (24%) patients were identified during surgery. All of these patients were operated laparoscopically within 24h of the admission.

Laparoscopic cholecystectomy was completed successfully in 49 (98%) patients while in one (2%) patient the procedure was converted to OC due to bleeding that couldn't be controlled laparoscopically.

The operation time ranged from 40-80 minutes with a mean of 60 minutes. In majority, (80%), of patients the operation time ranged 40-50 minutes. Operative complications of varying degrees and severity occurred in 8 (16%) out of the 49 successfully LC operated cases [Table 2].

Majority of the patients 40 (80%) with successful LC were discharged within 48-96 hours. In 7 patients (14%), the stay in hospital was extended to seven days until stitches removal. The remaining 2 (4%) patients were discharged in 10 days. The converted patient stayed for 2 weeks due to active drain, pulmonary complications and wound infection as shown in post-operative complications [Table 3].

Patients between 40-49 years old were the most common age group to have empyema of the gallbladder in the present study with overall mean age of 42.5 years, with male to female ratio of 1:5.25, this is nearly the same as mentioned by Eldar *et al.*, (1998).

The most valuable indicator in the prediction of the diagnosis preoperatively was the increased Gallbladder wall thickness that was revealed by abdominal ultrasound; for sure it remains an operator dependent. Before proceeding in the dissection we decompressed the distended gallbladder to facilitate the procedure. Tseng *et al.*, (2000) have also favored this procedure to make

surgery safe and easier (Tseng *et al.*, 1999). By using the panoramic and critical view technique in almost all cases except in those with frozen area of Calot's triangle with totally obscured anatomy, we avoided many preventable operative complications by handling such life threatening situations through performing subtotal cholecystectomy with ligature and clipping after removal of all the stones to ensure safety of patients life instead of continuing dissection in the frozen Calot's triangle. Duodenum should never be pushed down to avoid injury. This is against Malik *et al.*, (2007) (Malik *et al.*, 2007).

The conversion rate to open cholecystectomy in this study is 2% (i.e just in one patient) this is much less than seen in another studies like Malik *et al.*, (2007) which was (19.40%). This is mainly due to surgeon skills, experience and judgment, however, a number of intraoperative complications encountered but no significant injuries to the common bile duct or the bowel.

Table.1 Findings of abdominal ultrasound of the 50 patients with empyema of gall bladder

	No. of Patients
Presentation	
Pain at right hypochondrium	50 (100%)
Fever	28 (56%)
Vomiting	15 (30%)
Palpable gallbladder	12 (24%)
Ultrasound finding	
Distended gallbladder	38 (76%)
Thickened wall of gallbladder	39 (78%)
Intraluminal sludge with stones	48 (96%)
Pericholecystic fluid accumulation	7 (14%)

Table.2 Operative complications of the studied groups

Variable	Empyema group (n = 50)	Non empyema group (n = 750)	<i>P.value</i>
Perforation of gallbladder	9 (18%)	50 (6.66%)	0.003
Bleeding	8 (16%)	40(5.33 %)	0.002
Conversion to open cholecystectomy	1 (2%)	2 (0.26%)	0.052
Operating time longer than mean (~60 min)	10 (20%)	55(7.33%)	0.002

Table.3 Postoperative complications of the studied groups

Variable	Empyema group (n = 50)	Non empyema group (n = 750)	<i>P.value</i>
Port site/wound infection	4 (8%)	20 (2.66%)	0.032
Bile leak	3 (6%)	9 (1.2%)	0.006
Intra-abdominal collection	3 (6%)	11 (1.46%)	0.018
Chest infection	4 (8%)	22 (2.93%)	0.050

The rate of major complications is not significant in current study as to preclude the laparoscopic approach in this condition but there should always be a word of caution while operating on such difficult conditions. This is consistent with the findings of Hobbs *et al.* (Hobbs *et al.*, 2006) claiming that increased risk of complications with LC has stabilized. The post operative complications managed conservatively in a period didn't exceed 10 days in most of cases, the most common postoperative complications encountered are the pulmonary complications (atelectasis and chest infection) and ports sites infection and single complication reported in non-empyema group was (port site hernia) in one patient. However, in the converted patient the hospitalization period prolonged for 2

weeks. This is, however, contrary to the finding of Johansson *et al.* claiming that conversion did not prolong the postoperative hospital stay in the study population (Johansson *et al.*, 2005).

Conclusion

In well trained and skillful hands of an expert Surgeon, Laparoscopic Cholecystectomy is a safe and acceptable option in empyema of gallbladder. There are, however, significant technical difficulties due to edema, adhesions and distorted anatomy in the area of Calot's triangle. We recommend that patient's safety should be given priority and threshold for conversion should be kept lower and sub-total cholecystectomy may be considered

wherever dissection is found to be dangerous.

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