



A COMPARATIVE STUDY OF GALL BLADDER EXTRACTION DURING LAPAROSCOPIC CHOLECYSTECTOMY WITH AN ENDOBAG VERSUS WITHOUT AN ENDOBAG

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ABSTRACT **Introduction:** Cholelithiasis is a very common hepatobiliary system disorder affecting millions of people worldwide. Gallstones are asymptomatic in majority of cases (>80%). Laparoscopic cholecystectomy is now the gold standard for the treatment of cholelithiasis. Laparoscopic cholecystectomy can have various complications like gall bladder perforation, stone spillage and biliary injury that mainly occur while its dissection from hepatic bed resulting in spillage into the peritoneal cavity. The incidence reported ranges from 10% to 40% for perforation and from 6% to 30% for the spilling of the contents. Spillage of gallstones and infected bile and port site infection are common complications that can occur during laparoscopic cholecystectomy. To reduce such complications and to improve outcome, newer and innovative techniques are coming up day by day like various dissection techniques, energy sources, gallbladder extraction devices like endobag etc. **Aim:** To make a comparison of gallbladder extraction using an endobag VERSUS direct extraction of gallbladder without an endobag in terms of operative time, duration of hospital stay, incidence of port site infection. **Materials And Methods:** This study was carried out to compare the benefits and complications of extraction of gallbladder during laparoscopic cholecystectomy using an endobag versus without an endobag. A total of 100 patients with USG proven cholelithiasis were included in the study after relevant examinations and investigations. They were randomly divided into 2 groups, each group comprising of 50 patients each. Group A included patients in whom gallbladder extraction was done using an endobag. Group B included 50 patients in whom direct gallbladder extraction was done without an endobag. **Results:** With the use of an endobag, the mean operative time, mean hospital stay and port site infection was found to be lesser than in the group without endobag usage. There was no spillage of gallstones or infected bile in the group with endobag usage. **Conclusion:** An endobag for extraction of gallbladder was found to be better than the direct extraction of gallbladder. A sterile plastic bag is a simple and cost-effective method for gallbladder extraction.

KEYWORDS :

INTRODUCTION:

Laparoscopic cholecystectomy, introduced in 1987, is now the preferred and gold standard method of cholecystectomy. Laparoscopic cholecystectomy has revolutionized the surgical management of gallbladder disease by reducing post operative pain, risk of surgical infection and incisional hernia. Laparoscopic cholecystectomy is also reported to have an edge over open cholecystectomy due to shorter hospital stay, early return to work and overall low cost.

Cholecystectomy if done laparoscopically has gall bladder perforation, stone spillage, and biliary injury as common complications that mainly occurs while its dissection from hepatic bed resulting in spillage into the peritoneal cavity. The incidence reported ranges from 10% to 40% for perforation and from 6% to 30% for the spilling of the contents [1]. Spillage of gallstones and infected bile and port site infection are common complications that can occur during laparoscopic cholecystectomy. To reduce such complications and to improve outcome, newer and innovative techniques are coming up day by day. These include newer techniques for dissection of gallbladder from its bed, energy sources like harmonic scissors, ligasure etc., techniques for ligation of cystic duct and cystic artery including intracorporeal or extracorporeal ligation, gallbladder extraction devices like endobag etc.

Gallbladder perforation is a common problem, which results in lost gallbladder stones and spillage of its contents. Port site infections, sometimes seen in Laparoscopic cholecystectomy, are usually superficial and respond to local measures. This is mostly seen at the trocar site of gallbladder extraction due to surgical site infection [2].

After Laparoscopic cholecystectomy, extraction of gallbladder is a time consuming and difficult job. Although several techniques and methods are suggested to facilitate the retrieval of gallbladder safely, problems occurring during retraction have not been completely remedied and generally widening of the port site is required. This

increases the risk of bleeding, hematoma and infection as well as leaving a risky area for incisional hernia [3].

The infected specimen should be removed in an endobag in order to prevent wound infection and accidental spillage of contents or occult malignant cells and minimising contamination of abdominal cavity and wound tract [4]. Scattering of stones and specimen into the abdominal cavity can be avoided and may prevent serious infection [5]. Spilled gallbladder stones have been reported to be recovered after two years of surgery, from supra umbilical port, presenting as a chronic discharging sinus, suggesting an endobag technique to be simple, safe and economical with fewer complications [6].

In this study, we used sterile plastic bags as endobags. The motive of this study was to find out the better method for the extraction of gallbladder on a routine basis as it compares the benefits and risks of Endobag extraction of gallbladder versus direct extraction of gallbladder without an endobag through the 10mm epigastric port or umbilical port.

MATERIALS AND METHODS:

The study was conducted on a total of 100 patients of either sex, with proven cholelithiasis on USG. These patients underwent clinical, general, systemic examination and all necessary investigations and were included in the study.

The ethical clearance was taken from the ethical committee prior to the study and informed consent was obtained from all the patients. The sample size was determined by the average number of laparoscopic cholecystectomies performed in the surgery unit during the study time. After obtaining written informed consent regarding the study, the 100 patients were randomly assigned into 2 groups, each group comprising of 50 patients each

- **Group A:** Patients undergoing extraction of gall bladder with an

endobag via 10mm umbilical or epigastric port.

- **Group B:** Patients undergoing direct extraction of gallbladder without an endobag via 10mm umbilical or epigastric port.

TECHNIQUE:

After all necessary pre-operative preparation, all patients were given general anaesthesia and Laparoscopic cholecystectomy performed using the standard 4-port technique.

In **group A**, after identification of triangle of safety and Calot's triangle and securing the cystic artery and cystic duct, Calot's dissection of the gallbladder was done and it was separated from the liver bed. A sterile plastic **endobag** was then inserted inside the abdominal cavity. The gall bladder without any spilled stones was put into the endobag and extracted via the 10mm epigastric or umbilical port. Bigger specimen of gallbladder was first fragmented into small pieces in the endobag and then extracted via the 10mm epigastric or umbilical port.

In **group B**, after Calot's dissection and securing the cystic artery and duct, the gall bladder was separated from the liver bed and it was extracted **directly** through the 10mm epigastric or umbilical port without any endobag. The operative time from onset of procedure to closure of wound was noted down in each case.

Postoperative assessment regarding temperature, pulse, BP, post-op pain was noted. Follow-up was done after 1 week, 1 month and 3 months.

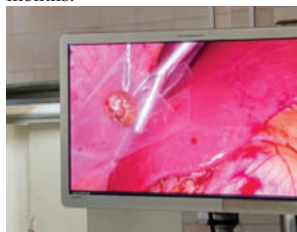


Figure 1- Gall Bladder Being Put Inside The Endobag During Surgery



Figure 2- Endobag Containing The Gallbladder Being Extracted Via The 10mm Umbilical Port

Statistical Analysis:

The data which was collected was statistically analysed using SPSS version 10.0. Chi square test was used for analysis and probability value of less than 0.05 was considered as significant.

RESULTS:

Table 1: Patient Characteristics

GENDER	NO. OF PATIENTS	PERCENT AGE (%)	AGE (YEARS)	MEAN
FEMALE	92	92	16-70	38
MALE	8	8	25-70	42
TOTAL	100	100	16-70	39

Table 1

This study included a total of 100 patients, 50 in each group. 92% of these patients were females, and the rest 8% were males. The mean age was 39 years.

Table 2: Pathological Types Of Cholecystitis

Pathological Type Of Cholecystitis	Group A	Group B	Total	Percentage (Group A)	Percentage (Group B)
Chronic calculus cholecystitis	42	44	86	84%	88%
Acute calculus cholecystitis	3	3	6	6%	6%
Empyema gall bladder	1	0	1	2%	0%
Mucocele gall bladder	4	3	7	8%	6%
TOTAL	50	50	100	100%	100%

Table 2

The statistical analysis showed that difference in these groups was insignificant [p-value=0.22]

Table 3: Comparative Factors

Comparative Factors	Group A	Group B	P Value	Inference
Duration of surgery	1 hour	1.30 hours	0.1371	Insignificant

Port site infection	1 (2%)	5 (10%)	0.018	Significant
Duration of hospital stay (days)	3.45	3.60	0.05700	Insignificant

Table 3

In **GROUP A:** The mean operative time was 1 hour. There was no intra-abdominal or port site spillage of gall stones or bile. Port site infection was seen in 1/50 patients (2%). The mean duration of hospital stay was 3.45 days.

In **GROUP B:** The mean operative time was 1.30 hours. Intra-abdominal spillage of gall stones or bile occurred in 4/50 patients (8%). Port site spillage was seen in 6/50 patients (12%). Port site infection was seen in 5/50 patients (10%).

DISCUSSION:

Cholecystectomy has evolved from an open to a laparoscopic approach over the past decade. Laparoscopic cholecystectomy is now considered the gold standard for treatment of cholelithiasis. The evident benefit of laparoscopy in terms of reducing post operative pain, shortening hospital stay, and quicker return to normal life activities, contributes to the current profile of more than 90% of cholecystectomies being done laparoscopically [7]. There are a lot of techniques and innovations that have widely been used by surgeons in response to the fast-evolving laparoscopic surgery to provide the best results and avoid postoperative infection risks [8]. These include a wide array of dissection techniques, various energy sources like Harmonic scissors, Ligasure, intracorporeal and extracorporeal ligation of the cystic duct, use of titanium clips versus clipless ligation, new methods of extraction of gallbladder like use of an endobag, sterile glove etc. All of these are aimed at reducing the morbidity and mortality associated with laparoscopic cholecystectomy and improving the outcomes.

Spilled or implanted gallstones and spillage of infected bile in the peritoneal cavity are common complications that are encountered during laparoscopic cholecystectomy when gall bladder is directly extracted as such via a 10mm umbilical or epigastric port, without the use of an endobag. This may lead to formation of discharging sinus or abscesses.

Depending on the choice of the surgeon, an endobag can be used to extract the gallbladder through a trocar incision [9]. Endobag should be used when gallbladder cancer is suspected, to minimize the risk of tumour cell dissemination [10]. An endobag can also be used in case of acute cholecystitis to avoid spillage of infected bile, gall stones or pus [11].

Our study was done over a total of 100 patients with symptomatic cholelithiasis. These were divided into 2 groups, each group comprising of 50 patients each. In our study, out of the total 100 patients, 92 were females and 8 were males. The mean age of the study was 39 years.

The mean operative time was calculated from the start of the procedure to the final closure of the wound. In group A, it was found to be 1 hour. In group B, it was found to be 1.30 hours. These results were comparable with other studies. In a study done by Makama JG and Ameh EA [12], the mean operative time was 37 minutes and in a study by Kirshtein B [13], the mean operative time was 42.5 minutes.

In our study, the mean duration of hospital stay post laparoscopic cholecystectomy was found to be 3.45 days in Group A. In Group B, it was found to be 3.60 days. In a study done by Stevens KA et al, the mean duration of hospital stay was 2.60 days [14]. The statistical data generated in our study was comparable with these other studies.

In our study, port site infection occurred in 1/50 patients in group A (2%) while in group B, it occurred in 5/50 patients (10%). Al Memon et al [15] reported retrieval port site infection to be 5% in their patients despite using endobag. Ali SA et al [16] and Helme et al [17] stated that the best way to avoid complications of spilled gallstones or bile and port site contamination is by using an endobag.

In a study done by Karthik S et al [18], port site infection was seen in 1.8% of the study group. In a study done by Taj MN et al [19], port site infection was found to be 5.28% without using an endoglove, whereas it was found to be 0.20% when using an endoglove. Wound infections

can be prevented by sterile techniques and the use of specimen endobags for specimen extraction [20]. An endobag facilitates the collection of operative specimens, spilled gall stones, and minimizes the chances of contamination of abdominal cavity and port site [21].

Port site malignancy: In our study, there was no case reported for port site malignancy. In a study done by Katz SC et al, the incidence of port site malignancy was found to be 0.2% [22].

In our study, we used a sterile plastic endobag for gall bladder extraction which is readily available and cost effective.

LIMITATION:

The sample size in our study was small, so more studies with a bigger sample size should be undertaken, to stamp the regular use of endobag in laparoscopic cholecystectomy for its benefits and cost effectiveness.

CONCLUSION:

Based on the findings of my study, it can be concluded that an endobag should be used for the extraction of gall bladder as it prevents spillage of gallstones or infected bile into the abdominal cavity. It also reduces the incidence of port site infection, without taking any additional time during the operative procedure. It also does not prolong the hospital stay. Previous authors have also advocated the use of an endobag for gallbladder extraction during laparoscopic cholecystectomy as it prevents spillage of stones or bile.

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