

Efficacy of Powder-Free Surgical Glove Bag versus No Glove Bag for Retrieval of the Gallbladder during Laparoscopic CholecystectomyS. Sivamanthiraraj MS¹, R Suganesh M.S²¹Senior Assistant Professor, Department of General Surgery, Govt Dharmapuri Medical College Hospital, Dharmapuri²Assistant Surgeon, Government Upgraded Primary Health Centre, Kokkarayanpet, Namakkal District

Received: 25-09-2023 / Revised: 28-10-2023 / Accepted: 30-11-2023

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Conflict of interest: Nil

Abstract:**Introduction:** The one of the most commonly done laparoscopic surgeries was laparoscopic cholecystectomy. The specimen after surgery can be retrieved outside either directly or through retrieval bags. The present study was done mainly to identify the benefits of use of retrieval bags.**Materials and Method:** Patients those who underwent laparoscopic cholecystectomy are taken into the study. The study was conducted at Government Dharmapuri Medical College and Hospital, during the time period April 2021 – September 2022. They were separated into two groups based on glove bag usage for gall bladder retrieval. Results obtained were analyzed, tabulated and interpreted.**Results:** In the present study out of 40 patients, Overall 22 % developed port site infection. Out of the 9 patients who developed port site infection, glove bag was used in 1 patient and glove bag was not used in 8 patients. Out of 40 patients, 23 patients developed port site discharge, which accounts for about 57%, 17 patients doesn't show any discharge, which accounts for about 43%, in which glove bag was used in 20 patients out of which only 6 patients developed port site discharge. The port site discharge in which no glove bag was present in 17 patients.**Conclusion:** Laparoscopic cholecystectomy done with retrieval of gallbladder using glove bag versus no glove bag was done. It is mainly to identify whether there benefit in decreasing the port site infection, discharge or metastasis.**Keywords:** Glove Bag, Gall Bladder, Laparoscopic Cholecystectomy.

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Introduction

Gallstones are an important health problem worldwide. The prevalence in the United States in the adult population is around 10% and increased to 30% in the age group above 70 years of age. In Pakistan, the prevalence of GS disease is 15%, representing 22% of applications in the surgical ward. Cholecystectomy is the preferred treatment for cholelithiasis. Carl Langerbach performed the first open cholecystectomy in 1882, and Philippe Mouret performed the first laparoscopic cholecystectomy in 1987 in Lyon, France. It is currently the most common surgery performed all over the world.

Laparoscopic cholecystectomy has become the standard treatment for cholelithiasis and has replaced open cholecystectomy. In the United States alone, 75% of 600,000 operations performed annually for gallstones disease are performed laparoscopically. Laparoscopic cholecystectomy offers the patient the benefits of minimally invasive surgery (MIS), including cosmetic scars, better

postoperative healing, and early return to work. [1] However, this is associated with some complications that are rarely reported with open cholecystectomy.

Laparoscopic cholecystectomy complications include early and late complications. Early complications include target, intestinal damage, bleeding and gallstones, including diffuse gallstones, gallbladder and bile duct damage. [2] Cholelithiasis is a common occurrence during laparoscopic cholecystectomy. It is estimated to occur between 3 and 33%. The complication rate of unexplored stones is about 0.3%. Bile leakage occurs in 0.3-2.7% of patients after laparoscopic cholecystectomy. Although diffuse intraperitoneal gallbladders are considered insignificant by most surgeons, postoperative peritonitis, adhesions, intra- and extra abdominal abscesses, bile, intestinal formation, and cutaneous intestinal fistulae have been documented [3]. In the developed world 90 % of cholecystectomies are

completed laparoscopically. Since the introduction of laparoscopic surgery for gallbladder disease different types of retrieval devices have been used to extract the gallbladder from the peritoneal cavity. These ranged from simple non-powdered gloves to several types of commercially produced bags [4,5]. The use of retrieval devices have been advocated for several reasons, including prevention of wound infection and avoidance of port site metastasis. [6,7,8] In LC, their use is thought to provide the further benefit of reducing the risk of stone spillage into the peritoneal cavity.

However, the use of retrieval bags can make removal of the specimen more difficult, requiring enlargement of the port site incision and potential risk of abdominal organ damage during bag insertion and retrieval [9,10]. Intraperitoneal spillage of bile and gallstones and later implantation of gallstones, during dissection of the gallbladder off its liver bed and its retrieval without endobag, are documented complications [11,12]. In order to prevent above complications, gallbladder specimen and the spilled gallstones are retrieved in an endobag, usually through umbilical port. Distended gallbladders that are packed with stones always create a problem during their retrieval from the abdomen.

Gallbladder removal in these cases required a needle decompression, stone fragmentation and stone removal from the gallbladder near the port site or enlargement of the one of the fascial incision to facilitate gallbladder retrieval, which causes more postoperative port site pain. After laparoscopic cholecystectomy, extraction of the gallbladder is a time consuming and difficult job. So proper positioning of instruments (railroading) and orientation are required for retrieval of gallbladder specimen.

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.

Based on this the aim of the study is to compare the efficacy of powder free glove bag vs direct retrieval of gall bladder in laparoscopic cholecystectomy on the factors like port site infection, duration of surgery, Port site discharge, Bile/ gall stones spillage, Port site pain and port site metastasis.

Materials and Methods

This prospective descriptive study of 40 patients was conducted at the surgical ward of Government Dharmapuri Medical college hospital for one and half year duration from Patients with obstructive jaundice, gallbladder cancer, comorbidities and higher medical history of abdominal surgery was excluded because these were disturbing factors and distorted test results. Patients with gallstones were admitted and undergone elective laparoscopic cholecystectomy was included in the study. After obtaining written and informed consent, he was enrolled for examination. All relevant investigations have been carried out. Fitness for anesthesia was assessed using the ASA scoring system. Patients with deranged coagulopathy, ejection fraction <20% or less and patients with peritonitis were excluded.

Ethical Considerations: Study was approved by institutional human ethics committee. Informed written consent was obtained from all the study participants and only those participants willing to sign the informed consent were included in the study. The risks and benefits involved in the study and voluntary nature of participation were explained to the participants before obtaining consent. Confidentiality of the study participants was maintained. Computer generated random numbers by SPSS software were used to assign the type of intervention chosen for the patients that is, group A (use of powder free glove bag for extraction of gall bladder specimen) and group B (without the use of glove bag for extraction of gall bladder specimen) The intra-op time taken for withdrawal of the specimen in both groups was measured and compared.

Results

This study was done in 40 patients divided into two groups, group A = 20 (use of powder free glove bag for extraction of gall bladder specimen) and group B = 20 (without the use of glove bag for extraction of gall bladder specimen).

Among 40 patients included in this study, mostly i.e. 28 patients were above 40 years of age group with 41-50 years being most common. There was not much difference in distribution between groups too. The mean age in glove bag group was 49.5 with SD of 14.27 while in another group it was 44.95 with SD of 14.79.

In our study female were predominant with 29 females and 11 males among our patients. There was no statistical significance in sex distribution between groups.

Table 1: Correlation with main outcomes

Outcomes	Power Free Surgical Glove Bag		P Value
	Used	Not Used	
Port Site Infection	Used	Not Used	0.008
Present	1	8	
Absent	19	12	
Port Site Discharge	Used	Not Used	0.001
Present	6	17	
Absent	14	3	
Port Site Pain	Used	Not Used	0.376
Present	16	18	
Absent	4	2	
Spillage	Used	Not Used	0.001
Present	0	9	
Absent	20	11	
Port Site Metastasis	Used	Not Used	Na
Present	0	0	
Absent	20	20	
Duration Of Surgery	Used	Not Used	0.001
Less Than 70 Min	0	2	
70-90 Min	0	18	
More Than 90 Min	20	0	0.001
Duration Of Surgery	Used	Not Used	
Mean	102.1	74.15	
Sd	4.09	4.54	

Coming to main outcomes to start with port site infection was seen in 9 (22%) of patients among which only 1 patient was in glove bag used group. This was statistically significant too. Next coming to port site discharge, it was present in 23 patient's only 6 in glove bag used group and rest 17 in not used group, this was statistically significant.

In our study port site pain was present in 34 patients; there was not much difference between groups with 16 in glove bag used group and 18 patients in non-glove bag group. Moving on to spillage, nine patients in our study had spillage and all were from group was glove bag was not used and this was statistically significant too. In our study no port site metastasis was seen.

The average duration of the laparoscopic cholecystectomy in direct specimen retrieval was 74.15mins, whereas in non-powdered glove bag used was 102.1 min. Although it consumes time but it's useful in reducing the port site infection and discharge. All patients were glove bag used required more than 90 min of surgery, while in another group all required less than 90 minutes of surgery.

Discussion

During this modern era, in laparoscopic cholecystectomy there is quite a lot controversy regarding the retrieval of gallbladder either through umbilical or epigastric port, and using or not using bag for retrieval of gallbladder. Laparoscopic cholecystectomy has been established as the most preferred approach in the management of

symptomatic gallbladder diseases due to short hospital stay, early recovery, less postoperative pain, good cosmetic results and early return to work. Spilled or implanted gallstones and spillage of infected bile in the peritoneal cavity are common events during LC without using glove bag Spillage of infected bile and gallstones in the peritoneal cavity and retrieval port site with implantation of the gallstones in the subcutaneous tissues of the abdominal wall causing discharging sinus or abscess are reported complications. Sajid M et al. [13] performed laparoscopic cholecystectomy in 92% patients. Currently, more than 80% of cholecystectomies globally are laparoscopically performed.

The intraoperative and post-operative morbidity due to gall stones/ bile spillage and port site infection /discharge can be reduced by use of non-powdered glove bag. Regarding the complications during or after surgery, AL-Dhahiry [14] noted post-operative bile leak among 2% of their cases, while no port site infection, intra peritoneal infection was present in the patients. However, bleeding from the cystic artery was noted in 4.2% of patients, accidental spillage of gallbladder with/without spillage of stones was seen in 3.6% patients and perforation of condom endobag during the retrieval of specimens occurred in 3.8% cases. Sajid M et al. [13] noted post-operative bile leak in 2% patients which was due to minor injury of CBD, which required re-exploration & suturing of defect and 6% patients developed wound infection.

In the present study out of 40 patients, Overall 22 % developed port site infection. Out of the 9 patients who developed port site infection, glove bag was used in 1 patient and glove bag was not used in 8 patients. This was found to be statistically significant (p value -0.008). Concurring this are the findings from Majid et al [15] who found that among those post LC surgery patients with superficial wound infections, 57% patients were in the group in whom retrieval bag was not used compared with those in whom retrieval bag was used (43%). Wound infections can be prevented by; appropriate administration of antibiotic prophylaxis, sterile techniques and the use of specimen endobags for specimen extraction [16].

Out of 40 patients, 23 patients developed port site discharge, which accounts for about 57%, 17 patients don't show any discharge, which accounts for about 43%, in which glove bag was used in 20 patients out of which only 6 patients developed port site discharge. The port site discharge in which no glove bag was present in 17 patients. Machado et al [17] reported that nearly 50% of the cases with complications had bile leakage, while Amir D et al [18] reported in 1.4% of patients. However, in our study a higher proportion of bile leak was noted during the operation. This was more participants of the study group (18.2%) than the control group (10.5%) From total 40 patients, 34 develops port site pain which accounts for about 85%, 6 patients don't have port site pain which accounts for about 15%, out of 20 patients, 16 patients had port site pain. The port site pain was present in 16 patients (glove bag used) and in 18 patients (no glove bag) and the p value (0.376), which statistically non-significant. Concurring with these findings Majid et al [15]. Reported that the post-operative pain was not significantly different between the group undergoing LC using a retrieval bag and the group where no bag was used. There was no port site metastasis in our study.

The average duration of the laparoscopic cholecystectomy in direct specimen retrieval was 74.15mins, whereas in non-powdered glove bag used was 102.1 min. Although it consumes time but it's useful in reducing the port site infection and discharge. Kirshtein et al [19] reported similar increase in overall operative time in the drain (endobag) group (42.5 minutes) than the non-drain group (37 minutes). It could be possibly due to delay in using the glove bag, which in turn influenced by the surgeon's inexperience in maneuvering the glove bag, the need to crush the gall stones before retrieval, the need to drain bile before retrieval, the necessity to remove the specimens without increasing the incision size or combination of all these factors.

Conclusion

From this study we have concluded that use of non-powdered glove bag in laparoscopic cholecystectomy for specimen retrieval is effective and cheap method which may prevent complications like gall stones spillage, bile spillage, port site infection/ discharge in comparison to retrieval of specimen directly and has no role in reducing the port site pain when compared to direct retrieval of gall bladder in laparoscopic cholecystectomy. It is cost effective and hence gall bladder can be removed outside the peritoneal cavity without any spillage. Even a use simple polythene bag or urobag can be used in places where routine Endo bag for retrieval of gallbladder is not available. In our study we conclude that the use of glove bag may be time consuming but it's found to be effective in using any of the retrieval bag for taking specimen outside. In the upcoming days we should use the specimen retrieval bag in any kind of laparoscopic surgeries.

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