

ORIGINAL ARTICLE

Frequency of Port Site Wound Infection with and Without End Gloves Techniques of Retrieval of Gallbladder in Pouch after Laparoscopic Cholecystectomy for Chronic Calculus Cholecystitis

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ABSTRACT

Background: The gallbladder is a hollow organ that sits just beneath the right lobe of the liver. Chief functioning of gallbladder is to store gall, also known as bile that is required for digestion of food. Removing gallbladder through small incision in the abdomen is called laparoscopic cholecystectomy. Among benefits of cholecystectomy are decreased need for postoperative analgesia, decreased postoperative pain and shortened hospital stay from 1 week to less than 24 hours.

Objective: To compare the frequency of port site wound infection with and without endogloves techniques of retrieval of gallbladder in pouch after laparoscopic cholecystectomy for chronic calculus cholecystitis.

Design: It was a randomized controlled trial.

Study Settings: This study was conducted at Department of General Surgery, Midland Doctors Medical Institute Tandali Muzaffarabad from July 2019 to July 2021

Material and Methods: A total of 260 cases who fulfilled inclusion criteria were enrolled in the study through wards of Department of General Surgery. Written informed consent was obtained from all the patients. Two groups were made by random division of patients. Conventional laparoscopic cholecystectomy was performed in patients of group I. Through umbilical port gall-bladder was retrieved in these patients, exactly spot on by a sterile surgical hand glove endobag. Vicryl "O" with J-shaped needle was used to close 10mm umbilical port (fascial defect) and 5mm ports were conventionally closed. In patients of group II, conventional laparoscopic cholecystectomy was performed and gall-bladder was retrieved as in patients of group I but without using surgical sterile hand glove endobag.

Results: The mean age of the patients in study group was 48.09±15.402 years and in control group it was 47.51±16.48 years. Male to female ratio was 1.06:1. The post-op wound infection was found in 11 (4.23%) patients. Statistically significant difference was found in groups (P<0.05).

Conclusion: The use of endoglove technique of retrieval of gallbladder in pouch after laparoscopic cholecystectomy for chronic calculus cholecystitis is safe, cheap, simple and potentially reduces significant port site wound infection compared to without endogloves.

Keywords: Laparoscopic Cholecystectomy, Endoglove, Gallbladder (GB).

INTRODUCTION

With substantial variation in its geographical occurrence, gallstone disease is worldwide problem with lowest rate in Africans. Gallbladder stones are formed by deposition of digestive fluid bile. Gallstones are resulted by imbalanced chemicals constituting bile. These stones are composed of bile, cholesterol, and bilirubin. Gallstones are not always symptomatic and with movement they may block cystic duct resulting into hindered flow of bile and may cause classic biliary colicky pain. Obstruction of cystic duct for few hours leads inflammation and this situation is called cholecystitis. In developed countries, a significant health problem is gallstones that affect 10-15% adult population. For symptomatic gallstones, treatment of choice is cholecystectomy as it removes the organ contributing to the formation of galls stones and its associated complications.¹ Now, for treating symptomatic gallstones, laparoscopic cholecystectomy is considered as gold standard and worldwide it is more commonly performed operation. During dissection of gallbladder for its removal, spillage and perform action of gallbladder are highly common complications and their occurrence is about 25%.^{2,3}

Gall-bladder specimens are retrieved in an endobage in order to avoid above complications. During retrieval process, complications occur in cases of distended and acutely inflamed gallbladder highly packed with stones.⁴ In laparoscopic cholecystectomy, an important terminal event is retrieval of gallbladder and among other causes it is highly associated with postoperative port site pain. Usually, GB is extracted through umbilical or epigastric port exactly on spot. In laparoscopic cholecystectomy, for retrieval of gallbladder both the ports have

been recommended by various studies.^{5,6} But, spillage of bile and un-retrieved stones has increased the incidence of infectious complications.⁷ So, the advantages of minimal access surgery are masked by these complications besides increasing economic burden on patients. Moreover, such instances arises question mark on reputation of the surgeon and hospital and additional workload on staff.^{8,9}

Memon et al.⁵ reported post-operative port site wound infection in patients undergoing laparoscopic cholecystectomy with GB retrieval from umbilical port with surgical glove verses without surgical glove as (5.11% vs. 1.55%, p<0.05). Taj et al.⁶ examined that postoperative post side wound infection was found in 5.28% patients in which endovlogves were not used for removing gall bladder; whereas 0.20% patients showed post-operative wound infections with endogloves (P<0.05).

The rationale of the study was to compare the frequency of port site wound infection with and without endogloves techniques of retrieval of gallbladder in pouch after laparoscopic cholecystectomy for chronic calculus cholecystitis. Literature showed that without endogloves, the chances of port site infection increases. But in routine, endogloves are not used, especially in poor resource settings. Moreover, locally published data was scarce. So, this study aimed to evaluate the technique that is associated with a decreased post laparoscopic cholecystectomy port site wound infection. Results of this study will help in decision making, whether to use endogloves or not. This will help to reduce the frequency of port site infection and reduce burden of hospital and surgeons.

MATERIAL AND METHODS

This Randomized control trial was conducted at the Department of General Surgery, Midland Doctors Medical Institute Tandali Muzaffarabad from July 2019 to July 2021. Sample size of 260 cases was calculated (130 in each group) with 80% power of test, 5% significance level, and taking expected percentages of port site wound infection i.e. 5.28%⁶ without endogloves and 0.20%⁶ with endogloves after laparoscopic cholecystectomy. Non probability consecutive sampling was used. Patients of age range 18-75 years of either gender undergoing elective laparoscopic cholecystectomy for gallbladder diseases were included in study. Patients with obstructive jaundice, empyema, mucocele, malignancy of gallbladder, chronic users of analgesic medicines and steroids and those undergoing laparoscopic cholecystectomy were excluded from the subjects. Written informed consent was obtained from all the patients. Demographic i.e. name, age, gender, BMI and duration of cholecystitis was recoded. Two groups were made by random division of patients. Conventional laparoscopic cholecystectomy with four port technique was performed in patients of group I. Through umbilical port gall-bladder was retrieved in these patients, exactly spot on by a sterile surgical hand glove (size 6 ½ or 7 inches) endobag. Vicryl “O” with J-shaped needle was used to close 10mm umbilical port (fascial defect) and 5mm ports were conventionally closed. In patients of group II, conventional laparoscopic cholecystectomy with four port technique was performed and gall-bladder was retrieved as in patients of group I but without using surgical sterile hand glove endobag.

In these patients, GB was retrieved through umbilical port exactly spot on by without sterile surgical hand glove endobag. All surgeries were performed by a single surgeon under general anesthesia with assistance of researcher. 10 mm ports were inserted at infraumbilical. After complete dissection, gallbladder was extracted in a bag either through umbilical port with and without glove. In both the groups, if GB was found containing larger stones or distended, it was opened at the time of retrieval and bile was sucked under vision. Then, patients were followed-up in OPD for 7 days. Postoperative port site wound infection was assessed after 7days of procedure. Data was analyzed using SPSS Version 20.0. Mean ± S.D was given for quantitative variables like age, BMI and duration of cholecystitis. Frequency and percentage was given for qualitative variables like gender and port site infection. Chi square test was applied to compare postoperative port site wound infection in both groups. p-value ≤0.05 was considered significance. Data was stratified for age, gender, BMI and duration of cholecystitis. Post-stratification, Chi square test was applied with p-value ≤0.05 considered as significant.

RESULTS

In this present study total 260 patients were enrolled. The mean age of the patients with gloves group was 48.09±15.402 years and in patients without gloves it was 47.51±16.48 years. Total 134(51.54%) patients were male and 126(48.46%) patients were female as given in Table 1. Male to female ratio was 1.06:1. The study results showed that the mean duration of the patients in with gloves group was 3.16±1.46 months and in without gloves group was 3.05±1.37 months. Post-op wound infection was observed in 11 (4.23%) patients. Post-op wound infection was found in 11 cases in which 2 were from with gloves group and 9 were from without gloves group.

Table 1: Demographic Characters is of the Participants

Characteristics	Participants (n=260)
Age (years)	
• With gloves	48.09±15.40
• Without gloves	47.51±16.48
Gender	
• Male	134 (51.54%)
• Female	126 (48.46%)

Across the study groups post-op wound infection of the patients was statistically significant i.e. p-value=0.031 as given in Table 2. Data stratification on the basis of effect modifiers has been given in Table 3.

Table 2: Frequency Distribution

Description	With Gloves (n=130)	Without Gloves (n=130)
Gender		
Male	65	69
Female	65	61
BMI (Kg/m2)	26.20±4.74	26.26±4.84
Duration of study	3.16±1.46	3.05±1.37
Post-op wound infection		p-value=0.031
Yes	2	9
No	128	121

Table 3: Comparison of post-op wound infection with study groups stratified by age, gender, BMI and duration

Description	Post-Op wound infection	With Gloves	Without Gloves	p-value
Age				
≤ 50	Yes	0	6	0.029
	No	68	68	
≤ 50	Yes	2	3	0.667
	No	60	53	
Gender				
Male	Yes	0	6	0.028
	No	65	63	0.673
Female	Yes	2	3	
	No	63	58	
BMI				
Abnormal	Yes	1	6	0.117
	No	77	72	
Normal	Yes	1	3	0.618
	No	51	49	
Duration				
≤ 3	Yes	1	4	0.367
	No	71	72	
> 3	Yes	1	5	0.104
	No	57	49	

DISCUSSION

Gallbladder is a small organ in vertebrates used for storing bile for concentration before its release into small intestine and is also known as cholecyst or biliary vesicle. Cholecystectomy is surgical removal of GB. Advent of laparoscopy has profoundly affected all operations especially cholecystectomy. For treating symptomatic gallbladder disease, laparoscopic cholecystectomy is taken as 'gold standard' owing early recovery, shorter stay at hospital, good cosmetic results, less postoperative pain and early return to work^{4,5} despite of the fact its direct costs are high. Moreover, in comparison with open cholecystectomy, the frequency of post-operative site infection is also less in laparoscopic cholecystectomy as these procedures are minimally invasive in nature and they also have less effect on immune system as compared to open one. However, in 5-40% cases of laparoscopic cholecystectomy, gallstone spillage has been reported.⁹⁻¹¹

We found post-op wound infection in 11 (4.23%) patients, among them 9 patients belonged to without glove group while two were from glove group. With regard to post-op wound infection, between study groups it was statistically significant with p-value=0.031. Results of our study matches with Calland et al.¹⁰, Joseph et al.¹¹ and Shindholimath et al.¹² who reported its incidence as 5.07%, 5.3% and 6.3% respectively. However, and Colizza et al.¹³ and Zitser et al.¹⁴ reported a significantly less incidence <2% and 2.3% respectively. For retrieval of gallbladder from umbilical port in patients though laparoscopic cholecystectomy, post-operative site wound infection was reported with surgical glove verses without surgical glove as (5.11% vs. 1.55%, p<0.05).⁴ Post-op wound infection was reported in 5.48% patients by Taj et al.⁶ They found umbilical port infection 0.2% in

endogloves group while in group without gloves it was 5.28%. In empyema of gallbladder and acute cholecystitis rate of wound infection was very high as 44.4% and 25.9% respectively. Therefore, they recommended use of surgical glove being simple, cheap and safe having potential of reducing morbidity significantly.

Use of sterile male condoms was studied by AL-Dhahiry et al.¹⁵ as endobag for retrieving spilled stones and gallbladder specimens and recommended it to be safe, inexpensive and simple technique for reducing port site and intraperitoneal septic complications. Use of endobag was recommended Helme et al.¹⁶ and Ali SA et al.¹⁷ for avoiding complications like contamination of port site and spillage of gallstones.

There is a strong limitation of this study as we could not observe any allergy to the patients owing to these gloves which is an important aspect of management and should be conspired in future studies.

CONCLUSION

According to our study results the use of endoglove technique of retrieval of gallbladder in pouch after laparoscopic cholecystectomy for chronic calculus cholecystitis is safe, cheap, simple and potentially reduces significant port site wound infection compared to without endogloves.

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