

Use of Retrieval Bag Using Drain Bag *vs* Direct Extraction of Gall Bladder Specimen After Laparoscopic Cholecystectomy: Our Experience With 600 Patients

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Abstract

Since the introduction of laparoscopic surgery for gallbladder stones, 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. We compared the advantages and disadvantages of using a retrieval bag (using simple drain cover) with direct extraction of gall bladder specimen through the epigastric port in 600 patients. We concluded that using a retrieval bag (simple drain cover) for specimen retrieval in laproscopic cholecystectomy is a simple and cheap method with advantages of low rates of spillage and wound infection in comparison to direct retrieval of the specimen.

Keywords: Lap cholecystectomy; Retrieval bag; Wound infection.

Introduction

Laparoscopic cholecystectomy is the gold standard treatment for symptomatic cholelithiasis since the last 15–20 years¹ (Zehetner et al. 2007). Since the introduction of laparoscopic surgery for gallbladder

stones, 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.^{2,3} Laparoscopic cholecystectomy is associated with greater chances of intra-abdominal stone spillage and implantation (Figs. 1, 2 and 4) as well as port-site contamination (Fig. 3) during retrieval of gall-bladder specimen.⁴ The use of retrieval devices have been advocated for several reasons, including the prevention of wound infection and avoidance of port site metastasis.^{5,6} In laparoscopic cholecystectomy, their use is thought to provide the further benefit of reducing the risk of stone spillage into the peritoneal cavity and the port site. 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^{7,8} and increase in the retrieval time.

In our study, we compared the advantages and disadvantages of using a retrieval bag (simple polythene drain cover) in Group A patients with direct extraction of gall bladder specimen through epigastric port in Group B patients.

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Materials and Methods

This comparative prospective study was conducted in the department of general and minimal access surgery GMC Baramulla for a



Fig. 1: Intra abdominal Spillage of Bile and Stones.

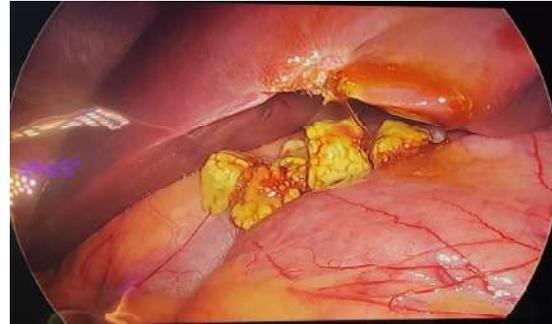


Fig. 2: Intra abdominal spillage of stones.



Fig. 3: Port site spillage of bile during gall bladder extraction through epigastric port.



Fig. 4: Intra abdominal gall bladder puncture and spillage of stones during extraction through epigastric port.

period of two years from June 2017 to April 2019. This study included 600 patients of either sex who underwent laparoscopic cholecystectomy for cholelithiasis. The study group was randomly divided into Group A consisting of 288 patients in whom a retrieval bag using a simple polythene drain cover was used for specimen retrieval through 10 mm epigastric port (Figs. 5, 6 and 7) and Group B consisting of 312 patients in whom direct removal of specimen was done through the epigastric 10 mm port. All patients included in the study were admitted one night prior to surgery. A thorough history, physical examination and investigations were done in all patients. The operative protocol, antibiotics use, pre- and post-

operative management of patients was the same in both groups. All patients were operated under general Anesthesia using four ports consisting of 10 mm epigastric port, 10 mm umbilical port and two 5 mm ports. The patients were discharged on 1st or 2nd POD and were followed at 1 week, 1 month, 3 months and 6 months after surgery. The ethical clearance was taken from the ethical committee of the hospital prior to the study and informed consent was obtained from all the patients. The results of the two groups were compared using SPSS Data.

Data was analyzed by Chi-square test statistic and the *p*-value was obtained.



Fig. 5: Simple polythene drain bag.

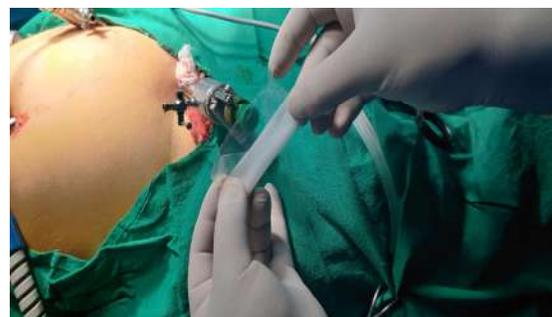


Fig. 6: Drain bag being folded before insertion.



Fig. 7: Drain bag being inserted through epigastric port.

Results

Six-hundred elective laparoscopic cholecystectomies were performed during the study period which included 82% ($n=492$) females and 18% ($n=108$) males. The mean age of the patients was 46.2 years (min. age 15 years and max. 72 years). The

mean age in Group A was 47 years (min. age 21 years and max. 72 years) and in Group B was 44.4 years (min 15 years max 69 years).

Retrieval bag using polythene drain cover (Figs. 8, 9 10 and 11) was used in 288 patients (48%) and direct retrieval of the specimen through epigastric port was done in 312 patients (52%).

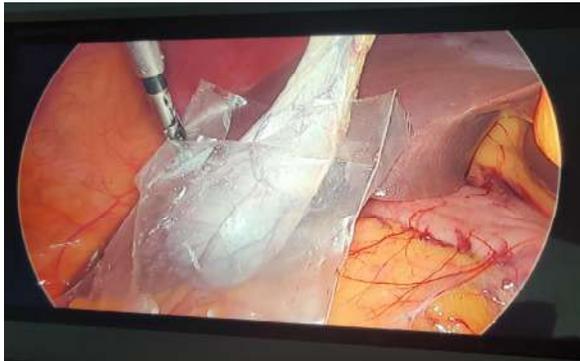


Fig. 8: Intra abdominal transfer of Gall bladder into Endobag (polythene drain bag).



Fig. 9: Gall bladder extraction through epigastric port in polythene drain bag (Internal view)



Fig. 10: Gall bladder extraction through epigastric port in polythene drain bag (External view)



Fig. 11: Removal of specimen from the polythene drain bag.

In Group A 178 patients (61.8%) had multiple stones and 110 patients (38.1%) had solitary calculus. In Group B 215 patients (68.9%) had multiple stones and 97 patients (31.0%) had solitary calculus. In Group A 32 patients (11.1%) had mucocele/pyocele and in Group B 39 patients (12.5%) had Mucocele/pyocele.

In Group A intra-abdominal spillage of stones was seen in 12 patients (4.1%) and bile in 31 patients (10.7%) either during gall bladder separation from liver or during transfer of specimen into drain bag. 6 patients had port site spillage (2.08%) because of endo bag puncture during removal. In Group B Intra-abdominal Spillage of Stones Was Seen in 38 Patients (12.1%) and Bile in 64 Patients (20.5%). 44 (14.1%) patients had port site spillage. Port site wound infection was seen in 48 patients (8%), with 36 patients (75%) being from Group B where no retrieval bag was used for specimen retrieval. The Statistical Analysis showed the difference in port site spillage ($p < 0.00001$) and wound infection ($p = 0.000883$) between the two groups was statistically significant.

All superficial wound infections were treated with oral antibiotics/dressings and required no further intervention. There were 5 recorded deep wound infections, 2 in Group A and 3 in Group B. All of them required drainage of wound collection.

An extension of port site incision in the fascia was required in 36 patients (6%) with 28 patients (77.7%) being from Group A in whom a retrieval bag was used. The Statistical Analysis showed that difference was significant (p -value 0.000226) between the two groups.

The mean operative time taken in Group A was 49 minutes and in Group B was 43 minutes with minimum time of 15 minutes to maximum time of 95 minutes. The Statistical Analysis showed that difference was insignificant between the two groups.

In Group A in 202 patients (70.13%) no drain was placed and in 82 patients (28.4%) intraabdominal tube drains were placed and removed on 1st or 2nd post-operative day. 4 patients (1.38%) were discharged along with drain for bilious drainage which settled in 7 to 10 days after which the drain was removed. In Group B in 221 patients (70.8%) no drain was placed and in 85 patients (27.2%) intra-abdominal tube drains were placed and removed on 1st or 2nd post-operative day. 5 patients (1.6%) had bilious drain and were discharged with drain which was removed on 7 to 10 day and in 1 patient (0.32%) re-exploration laproscopy was done for

persistent bile leak (more than 200 ml/ 24 hours) and on exploration an accessory duct of lushka was found in gall bladder fossa which was clipped. The Statistical Analysis showed that difference between the two groups was insignificant.

No patients presented with the port site malignancy in both the groups and none of the patients in either group had histological evidence of malignancy.

In Group A 4 patients (1.38%) presented with port site hernia and In Group B 2 patients (0.64%) presented with port site hernia on follow-up. The Statistical Analysis showed that difference between both the groups was insignificant.

Discussion

After lap cholecystectomy, there is a lot of controversy regarding removal of specimen through epigastric or umbilical port and using or not using endobag, for specimen retrieval. In laparoscopic cholecystectomy, the ratio of gall-bladder perforation and gallstone spillage reaches up to 36% (Mohiuddin 2006).⁹ Gall-bladder perforation (10–40%) and stone spillage (6–30%) are the two most common complications encountered during dissection (75%) and removal (25%) of gall-bladder in laparoscopic cholecystectomy (Brockmann 2002;¹⁰ Wood field 2004;¹¹ Sathesh-Kumar 2004.¹² Kimura T et al.¹⁸ 26.3% bile leak and 2.7% spilled stones, Rice DC et al.¹⁹ 28.9% bile leak and 9.7% spilled stones, Diez J et al.²⁰ 17% bile leak and 6.9% spilled stones., Schafer M et al.²¹ 5.7% spilled stones, Memon M A et al.²² 12.3% Sarli L et al.²³ 11.6% spilled stones. In our study group gall-bladder perforation and bile leak was found in 10.76% in Group A and 20.5% in Group B while spillage of stones in 4.1% in Group A and 12.1% in Group B patients. Intra-abdominal spillage can be controlled by the use of endobag so that intraoperative and post-operative morbidity due to spillage of stones and bile can be reduced. In the present study, overall 8% of our patients developed port site infection mostly epigastric. it was seen mainly in patients who had bile and stone spillage. Memonet al.¹³ (2013) also reported 5% umbilical port sepsis in patients with acutely inflamed gall-bladder specimen despite of using endobag for its retrieval. Ali & Siddiqui⁴ (2013) and Helme et al.¹⁴ (2009) stated that best way to avoid complication of spilled gall-stones and port site contamination is to use endobag. Another study reported port site wound infection 1.02% and port site hernia 1.38% (Sharma et al. 2013)¹⁵. Singh DP et al.²³ report port

site infection rate of 4%, Memon JM et al.²⁴ 5.11%, Den Hoed PT et al.²⁵ 5.3%, Shindoholimath W et al.²⁶ 6.3%, Colizza S et al.²⁷ less than 2%. In our study, epigastric port site hernia occurred through epigastric port in 1.38% in Group A patients and in 0.64% in epigastric port in Group B patients. Memon et al.¹³ (2011) reported 2.14% umbilical port site hernia despite using endobag for gall-bladder retrieval. Not performing the fascial closure at the port site and large sized stone may be cause for increased incidence of hernia. The mean operating time in Group A was 49 minutes and in Group B was 43 minutes. The results were comparable with other studies. Kirshstein B et al.¹⁶ reports mean time of 42.5 min in drain group and 37 min in patients without drain. Makama JG and Ameh EA¹⁷ report mean operating time of 37 min.

In a study done by Memon AI et al., port site spillage was 0.88%.¹³

In this study there was no case reported of port site malignancy.

Port site hernia occurred in some patients who came for follow-up after laparoscopic cholecystectomy. Memon AI et al.¹³ reported 3.66% port site hernia, Uslu HY et al.²⁸ 5.4%, Coda A et al.²⁹ 0.38%. Not performing the fascial closure at the port site and large sized stone may be cause for increased incidence of hernia.

Conclusion

We conclude that using a retrieval bag (simple drain cover) for specimen retrieval in laproscopic cholecystectomy is a simple and cheap method with advantages of low rates of spillage of bile and stones in comparison to direct retrieval of specimen. Gall bladder retrieval with endobag reduces the port site infection rate and using a simple polythene drain bag is cost effective.

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