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Benefits and Complications of Extraction of Gall Bladder using a Drain Bag Vs Direct Extraction after Laproscopic Surgery

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KEYWORDS

Laparoscopic, intraoperative, cholecystectomy, complications

ABSTRACT:

Introduction: Laparoscopic cholecystectomy as the gold standard for gallbladder removal due to its benefits of decreased postoperative discomfort and scarring, but notes the risks associated with bile and stone spillage during surgery, such as abscesses and fistulas. While retrieval devices mitigate these risks, they can complicate extraction and increase the chance of organ damage.

Materials and methods: The study compares gallbladder extraction complications using an endobag versus direct extraction through a 10mm epigastric port, focusing on port site infection and intraoperative spillage. Group A (50 patients) used a retrieval bag made from a simple polythene drain cover for specimen removal, while Group B (50 patients) had specimens directly removed through the 10mm epigastric port.

Results: The mean intraoperative time for Group A with endobag extraction was 69±3.5 minutes, slightly longer than Group B (66±4.62 minutes). Port site infection occurred in 6% of Group A patients and 24% of Group B patients. Bile or stone spillage during retrieval was noted in 4% of Group A and 10% of Group B patients. Epigastric incision enlargement occurred in 4% of cases (n=4); three cases were in Group A and one in Group B. There were no instances of port site hernia in either group.

Conclusion: Laparoscopic cholecystectomy remains the preferred treatment for cholelithiasis due to its effectiveness and reduced complications. While using an endobag is recommended to minimize surgical site infections (SSI), it may prolong operative time and pose a risk of bowel injury. Nonetheless, the use of endobags significantly reduces the incidence of port site infections compared to direct extraction, underscoring its value in preventing complications during gallbladder removal.

INTRODUCTION

The laparoscopic approach to cholecystectomy is the “gold standard surgery globally for removing a diseased gallbladder”. It stands as treatment of choice for symptomatic gallstones due to reduced postoperative discomfort, quicker recuperation, shorter hospitalization, and minimal scarring compared to traditional open surgery.

Bile and stone spillage is a common hurdle that often occurs during lap cholecystectomy, either during dissection or while extracting the Gall bladder.[1,2] Adverse outcomes linked to spilled stones encompass abscesses in various locations such as the abdominal wall, port sites, and within the abdomen, with a predilection for sub-hepatic areas. Additionally, rare complications like fistula formation and the discovery of

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misplaced gallstones in hernia sacs, ovaries, and fallopian tubes have been documented in literature. [3]

Advocates of retrieval devices cite several reasons for their use, including the avoidance of SSI and port site metastasis. In laparoscopic cholecystectomy, their application is believed to offer the added advantage of decreasing the likelihood of stone spillage into the peritoneal cavity and port sites. It also provides protection from port site contamination in cases of incidental gall bladder cancer. However, employing retrieval bags may complicate specimen removal, potentially necessitating elongating the port site incision and increased risk of organ damage, thereby extending retrieval time.

In this study we aim to compare complication of extraction of gall bladder in an endobag vs direct extraction through 10mm epigastric port in terms of port site infection, and intraoperative spillage.

MATERIALS AND METHOD:

STUDY DESIGN-

This is a prospective randomized double arm interventional trial conducted at IGIMS, Patna conducted for a period of 1 year from January 2023 to January 2024.

The study includes 100 patients of who were operated by laparoscopic cholecystectomy for cholelithiasis. The study group was randomized into 2 groups- Group A consisting of 50 patients in whom a retrieval bag using a simple polythene drain cover was used for specimen retrieval through 10 mm epigastric port and Group B consisting of 50 patients in whom direct removal of specimen was done through the epigastric 10 mm port.

All subjects participating in the research were hospitalized overnight before their surgeries. Each patient underwent a comprehensive assessment, including a detailed medical and physical examination, and diagnostic tests. The procedural guidelines, administration of antibiotics, and pre- and post-operative care were consistent across both groups.

Surgery was performed under general anesthesia with four ports: a 10 mm epigastric port, a 10 mm umbilical port, and two 5 mm ports. Patients were discharged on the third post-operative day (POD) and were monitored at follow-up appointments scheduled for 10 days, 1 month, and 3 months post-surgery. The study received ethical clearance from the hospital's ethics committee before commencement, and informed consent was obtained from all participants. Statistical analysis was conducted using SPSS Data to compare the outcomes of the two groups.

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

The outcomes were assessed by comparing both groups across several variables:

(a) Procedure-related factors: including operative duration, occurrence of spillage at port sites and within the abdomen, and the extent of fascial defects.

(b) Postoperative factors: incidence of port-site hernias and infections

OPERATIVE PROCEDURE:

Under general anesthesia after proper dressing and draping, two 10mm and two 5mm ports are made at their usual sites.

Gallbladder is dissected using monopolar cautery and after achieving the critical view of safety the cystic duct and artery are clipped. Then it is removed using an endobag via the epigastric port in patients randomized to group A. In patients of group B gallbladder is extracted without bag. The 10 mm umbilical port was closed using port closure vicryl No.1. The skin was then closed using nylon 2-0 for skin closure.

POSTOPERATIVE PROCEDURE:

The patients are started on IV empirical antibiotics for 2 days. Pain medications are given in a stepup fashion of paracetamol followed by NSAID followed by tramadol if required. Pain is assessed according to the VAS score. Patient’s drain is removed when the drain output is less than 30ml, serous or sero sanguinous, and non bilious. Patient is discharged if there are no complains, and patient is hemodynamically stable with no complications.

RESULT:

This study included 100 patients who were admitted in Indira Gandhi Institute of Medical Sciences, Patna with chronic calculous cholecystitis for laparoscopic cholecystectomy. This study did not record any mortality, iatrogenic bile duct injury, or conversion to open in both

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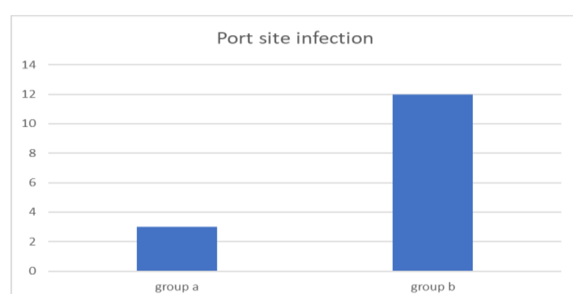
arms. The mean age and BMI in group A was 40.38±11.74 and 29.31 ±6.19 respectively and of group B was 44.6±11.53 years and 33.1±5.3 respectively.

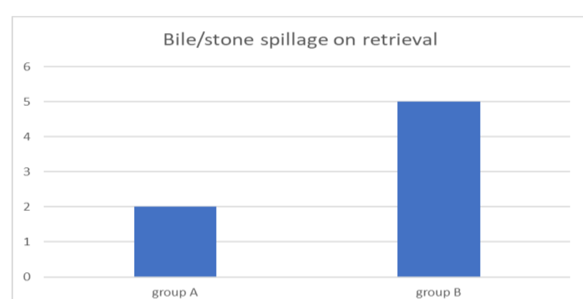
	Total patients	**retrieval bag used**	**no retrieval bag used**
No. of patients	100	50	50
Age (mean)		41.3±14.5	37.2±12.5
BMI		29.31 ±6.19	33.1±5.3
No. of males	n=61	44.2% (n=27)	55.7% (n=34)
No. of females	n=49	67.3% (n=33)	32.6% (n=16)

The mean intraoperative time of group with endobag extraction was 69±3.5 mins, slightly less that that of group B (66±4.62 mins).

Port site infection was seen in 6% patients of group A and 24% patients of group B. 3 of group B were deep infections while the rest were superficial infection.



Bile or stone spillage on retrieval was noted in 4% patients of group A and 10% patients of group B.



Epigastric incision was increased in 4% cases (n=4) out of which 3 were in group A and 1 in group B. There were no incidence of port site hernia in either group.

DISCUSSION:

Lap cholecystectomy is the treatment of choice for cholelithiasis. A lot of advances and innovations have been made in this surgery to make it more efficient with less complications, reduce hospital stay and decrease the incidence of SSI. [4,5,6]

Using an endobag or not- is the operating surgeon's decision. However, even with limited data using an endo-bag is a safe and recommended surgical practice to minimize the chance of developing SSI. [7] There are still certain disadvantages that haven't been fully discussed, like the possibility of unforeseen difficulties from utilizing endo-bags at different stages [8,9]. These include increased operative time, increased chances of bowel or other injuries while manipulation of the bag intraperitoneally, extension of the port site incision and subsequent herniation. In our study there were no intraperitioneal injuries and herniation, however there was a need to increase epigastric port site incision in 4 patients of group A and 1 of group B. there was also an increased operative time seen in patients with endobag retrieval.

When measured against the advantages of using an endobag, we can see in this study that the incidence of port site infection was 24% in patients without endobag retrieval. This is significant and PSI contribute to the morbidity, longer hospital stays and patient dissatisfaction.

For acute gall bladder infections, numerous experts advise removing the gallbladder within a bag to prevent infected bile, stones, or pus from spreading and causing infection at the port site. [10,11] A study by A.I. Memon et al. [12] found that despite using an endobag, 5% of their patients experienced retrieval port site infections. Similarly, Ali Sa et al. [13] and Helme et al. [14] demonstrated that employing an endobag is the most effective method for avoiding complications arising from spillage and contamination at the port site. Turk E et al. [15] observed a 1.1% infection rate despite utilizing Cefazolin Prophylaxis. Preventative measures against wound infections include antibiotic administration, adherence to aseptic techniques, and the utilization of endobags for specimen extraction [16]. Endobags aid in the collection of operative specimens and spilled stones, thereby reducing the risk of contamination in the abdominal cavity and at the retrieval port site.

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The current research draws the conclusion that in laparoscopic cholecystectomy procedures, employing an endobag for gallbladder retrieval offers significant advantages compared to not using the bag. It effectively prevents spillage and leads to a comparatively lower incidence of port site infections.

LIMITATION OF STUDY:

Few limitation of the study include- low number of patients, and that we excluded complicated cases such as gallbladder empyema, gangrene, and cholecystectomy in the immunocompromised populations, which compromise an unneglectable portion of our population.

CONCLUSION:

Using an endobag for gallbladder retrieval has demonstrated advantages over direct extraction (DE). These include lower rates of port-site spillage and infection. However, studies show that endobag usage yields similar outcomes to direct extraction in terms of the necessity for fascial extension, port-site hernia. Use of endobag takes more operative time than direct extraction. Despite the higher cost associated with endobag use, it can be cost-effective and is strongly recommended for cases involving complex gallbladder stones such as empyema and mucocele. For uncomplicated gallbladder stones, direct extraction can be utilized, especially in hospitals with limited resources, without significant adverse effects.

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CONFLICT OF INTEREST:

None

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