

## ORIGINAL ARTICLE

**COMPARISON OF PORT SITE WOUND INFECTION WITH AND WITHOUT ENDOGLOVES TECHNIQUES FOR RETRIEVAL OF GALLBLADDER AFTER LAPAROSCOPIC CHOLECYSTECTOMY****Naheed Akhtar, Ziyad Afzal Kayani, Naeem Ahmad\*, Farzana Sabir, Nabeel Imran\*\*, Irum Gilani\*\*\***

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**Background:** Laparoscopic cholecystectomy decreases postoperative pain, the need for postoperative analgesia, and hospital stay from 1 week to less than 24 hours. Endogloves are frequently used in laparoscopic cholecystectomy. The study was conducted to compare the frequency of port site wound infection with and without endogloves techniques of retrieval of gallbladder (GB) in pouch after laparoscopic cholecystectomy for chronic calculus cholecystitis. **Methods:** This comparative analytical study was done at Department of General Surgery, CMH, Muzaffarabad, Azad Kashmir from March 2018 to March 2020, and included 260 patients in the study. Patients with symptomatic cholelithiasis but without acute onset were selected for the study. The patients were divided into two groups; one group underwent conventional laparoscopic cholecystectomy with endogloves technique and the other group without endogloves. All operations were done by the same surgical team and all patients got same preoperative and postoperative antibiotics. Port site wound infection was looked for. Data was recorded and analysed using SPSS-20. **Results:** The mean age of the patients in group undergoing laparoscopic cholecystectomy with endogloves was 48.09±15.40 years and in group undergoing laparoscopic cholecystectomy without endogloves 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 (2 from with-endoglove group, 9 from without-endoglove group). Statistically significant differences were found between the groups ( $p<0.05$ ). **Conclusion:** The use of endoglove technique of retrieval of gallbladder in pouch after laparoscopic cholecystectomy for chronic calculus cholecystitis potentially reduces port site wound infection compared to retrieval without endogloves.

**Keywords:** Laparoscopic cholecystectomy, endoglove, gallbladder

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**INTRODUCTION**

Gallstones constitute a significant health problem in both developing and developed societies affecting 10–15% of the adult population and 3–6% of adult Pakistani population.<sup>1</sup> Cholecystectomy is the treatment of choice for symptomatic gallstones because it removes the organ that contributes to formation of gallstones and the complications ensuing from them. Laparoscopic cholecystectomy is now the gold standard procedure for symptomatic gallstones and is the commonest operation performed laparoscopically worldwide. Gallbladder (GB) perforation and spillage are the commonest (25%) complications encountered during dissection and removal of gallbladder.<sup>2</sup> In order to prevent above complications, gallbladder specimen is retrieved in an endobag. An inflamed or distended gallbladder packed with stones always creates a problem during its retrieval.<sup>3</sup>

Retrieval of gallbladder is an important terminal event of laparoscopic cholecystectomy and is reported as one of the factors affecting postoperative port site pain.<sup>4</sup> Gallbladder is extracted commonly either from the epigastric or umbilical port exactly spot on. Both the ports have been recommended for retrieval of gallbladder in laparoscopic cholecystectomy.<sup>3</sup>

There have been increasing reports of infectious complications due to un-retrieved stones and spillage of bile. Such complications mask not only the advantages of minimal access surgery but also increase the economic burden on the patient.<sup>5</sup> Work load on the staff is also increased and the reputation of hospital and attending surgeon bears the brunt.<sup>6</sup>

In routine, endogloves are not used, especially in poor resource setting. Without endogloves, the chances of port site infection increase. The purpose of this study was to evaluate the technique that is associated with a decreased post-laparoscopic cholecystectomy port site wound infection in our setup.

**PATIENTS AND METHODS**

A total of 260 cases were enrolled in the study through Department of General Surgery, who were admitted for elective cholecystectomy. Informed consent was obtained from all participating patients. Demographic details were recorded. Patients were randomly divided in two groups using lottery method.

In group I, patients underwent conventional laparoscopic cholecystectomy with four port technique. In these patients, the gallbladder was retrieved through

umbilical port exactly spot on using a sterile surgical hand glove (size 6½ or 7) endobag. The 10 mm umbilical port (fascial defect) was closed using vicryl '1' with a J-shaped needle, while three 5 mm ports were closed using prolene 2/0.

In group II: patients underwent conventional laparoscopic cholecystectomy with four port technique. In these patients, the gallbladder was retrieved through umbilical port exactly spot on without sterile surgical hand glove endobag. All surgeries were done by consultant general surgeon or chief resident (Resident Year IV) under general anaesthesia with four ports technique. In both groups, if GB was found distended or contained large stones, it was opened at the time of retrieval and bile was suctioned (and/or stone was retrieved) under vision. Then patients were followed-up for 7 days. Postoperative port site wound infection was assessed after 7 days of the procedure and findings recorded. Data was analysed using SPSS-20. Chi-square test was applied to compare postoperative port site wound infection in both groups, and  $p \leq 0.05$  was considered statistically significant.

## RESULTS

The mean age of the patients with endogloves group was  $48.09 \pm 15.402$  years and in patients without endogloves it was  $47.51 \pm 16.48$  years. Male patients were 134, out of which 65 were in with-endogloves group and 69 were in without-gloves group. The female patients were 126, out of whom 65 were from with-endogloves group and 61 were from without-endogloves group. Mean BMI in endogloves group was  $26.20 \pm 4.74$  Kg/m<sup>2</sup> and in without-endogloves group it was  $26.26 \pm 4.84$  Kg/m<sup>2</sup>. The mean duration of the patients' symptoms in with-endogloves group was  $3.16 \pm 1.46$  months and in without-endogloves group it was  $3.05 \pm 1.37$  months. (Table-1).

The post-op wound infection was found in 11 cases, out of which 2 were from with-endogloves group and 9 were from without-endogloves group. Statistically significant differences were found between the groups for post-op wound infection ( $p=0.031$ ). (Table-2).

**Table-1: Baseline characteristics of patients**

Characteristics	With endogloves	Without endogloves
Number of cases	130	130
Age (Years)	$48.09 \pm 15.40$	$47.51 \pm 16.48$
Male	65	69
Female	65	61
BMI (Kg/m <sup>2</sup> )	$26.20 \pm 4.74$	$26.26 \pm 4.48$
Duration of symptoms (Months)	$3.16 \pm 1.46$	$3.05 \pm 1.37$

**Table-2: Comparison of post-op wound infection in both groups [n (%)]**

Post-op wound infection	With endogloves	Without endogloves	Total
Yes	2 (0.77)	9 (3.46)	11 (4.23)
No	128 (49.2)	121 (46.54)	249 (95.76)
Total	130	130	260

## DISCUSSION

While treating a case of chronic calculus cholecystitis, surgery is always the final resort and laparoscopic cholecystectomy is considered better than open cholecystectomy due to short hospital stay, early recovery, less postoperative pain, good cosmetic results and early return to work. The rate of port site infection after laparoscopic cholecystectomy is lower than that of open cholecystectomy because laparoscopic procedures are minimally invasive and have less impact on the immune system than the open one.<sup>7-8</sup> Laparoscopic cholecystectomy is associated with spillage of gallstones in 5–40% cases.<sup>9,10</sup>

In a study by Narayanswamy and Prajwal<sup>9</sup> it was observed that using an endobag for retrieval of gallbladder resulted in less port site infection compared to retrieval without endobag. But it has its own disadvantages; to deliver a gallbladder in an endobag needs for extending the incision of facial layer and time of whole procedure also increases while using an endobag. We observed that it not necessary to increase the size of facial layer incision in every case, sometime we can retrieve gallbladder in endoglove by only finger dilatation of already present incision. In case the incision in facial layer is extended, it can be repaired with vicryl 1/0 meticulously to prevent incisional hernia.<sup>3</sup>

In our study the post-op wound infection was found in 11 (4.23%) patients in whom 2 were from with-endogloves group and 9 were from without-endogloves group. Statistically significant differences were found between both groups for post-op wound infection. A study conducted by Rehman UH *et al*<sup>11</sup> concluded that the frequency of port site wound infection in group where endoglove was used was 0.4% whereas in group where endoglove was not used was 5.5% showing that the frequency of port site wound infection was less with the use of endoglove removal of gallbladder during laparoscopic cholecystectomy. Moreover, port site wound infection was insignificantly associated with categories of age, gender and duration of cholelithiasis. Almost similar results were observed in our study which showed no significance of age or gender on wound infection but wound infection was less in group of patients in whom endogloves were used in comparison to patients in whom endogloves were not used for retrieval of gallbladder.

In a randomized control trial conducted by Kothapalli *et al*<sup>12</sup> it was concluded that the wound site infection in case of gallbladder retrieval using powdered sterile gloves is less in comparison to retrieval without it, but the time duration of retrieval increases using a glove. We too had similar observations that when a glove is used it definitely increases the time of the surgery. On the other hand when compared with morbidity of the patient due to wound infection and

financial burden on patients while treating a wound infection, it seems better to spend some more minutes to remove gallbladder in an endoglove. It also reduces the intraperitoneal septic complications. Intraperitoneal spillage of bile and gallstones, during dissection of gallbladder from liver bed and its retrieval without endobag are documented complications.<sup>13,14</sup>

Peponis *et al*<sup>13</sup> and Singh *et al*<sup>15</sup> stated that best way to avoid complications of spilled gallstones and port site contamination is to use endobag. Endobag facilitates collection of operative specimens and spilled gallstones, and minimizes the chances of contamination of the abdominal cavity and the retrieval port site, hence decreases the port site wound infection.<sup>7,16</sup> In our study almost similar results were observed that removing gallbladder in an endoglove decreases the chances of intraperitoneal spillage of bile and also decreases wound site infection. There was no significant impact of age or gender on wound infection in both groups of patients.

## CONCLUSION

Endoglove technique of retrieval of gallbladder in pouch after laparoscopic cholecystectomy for chronic calculus cholecystitis potentially reduces port site wound infection compared to that without endogloves.

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## Contribution of Authors:

**NA:** Conception, planning, methodology, data collection and interpretation, discussion

**ZAK:** Review and supervision of methodology

**NA:** Active participation in methodology

**FS:** Data analysis and interpretation, discussion

**NI:** Data analysis and interpretation, discussion

**IG:** Data analysis and tabulation, discussion

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