

## Original Research Article

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# A comparative study of umbilical port versus epigastric port for gall bladder extraction in laparoscopic cholecystectomy

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## ABSTRACT

**Background:** Laparoscopic cholecystectomy is the gold standard treatment for symptomatic cholelithiasis. Postoperative pain is important factor that decide requirement of injectable analgesics and post-operative hospital stay. Gall bladder (GB) can be extracted from umbilical or epigastric port. Excessive manipulation during GB extraction can cause postoperative pain.

**Methods:** Study was carried out in 60 patients between January 2022 to December 2022, including patients who have symptomatic gall bladder stone and required laparoscopic cholecystectomy. Patients with perforated GB and required emergency laparoscopic cholecystectomy and patient having GB carcinoma and required elective laparoscopic radical cholecystectomy and patients requiring laparoscopy converted to open cholecystectomy were not included in the study. In this study, patients were randomly allocated in two groups: group A (n=30) includes laparoscopic cholecystectomy with GB retrieval from epigastric port and group B (n=30) includes laparoscopic cholecystectomy with GB retrieval from umbilical port. Author have compared two groups in terms of intraoperative time, postoperative pain, wound infection and port site hernia development.

**Results:** This study shows that there is no significant difference in intraoperative time, wound infection and port site hernia development between two groups but there is significant less postoperative pain in group B patients with GB retrieval from umbilical port.

**Conclusions:** In laparoscopic cholecystectomy, there is no significant difference in GB retrieval from umbilical port and epigastric port in terms of intraoperative time, wound infection and port site hernia development. But GB retrieval from umbilical port reduce post-operative pain in comparison to epigastric port GB retrieval.

**Keywords:** Laparoscopic cholecystectomy, umbilical port, epigastric port, postoperative pain, port site hernia, wound infection

## INTRODUCTION

Laparoscopic cholecystectomy is the gold standard treatment for symptomatic cholelithiasis.<sup>1</sup> There are multiple factors that are responsible postoperative pain after laparoscopic cholecystectomy. Postoperative pain is important factor in long postoperative hospital stay and injectable analgesics use.<sup>2</sup> Factors that are responsible for postoperative pain are postoperative Gall bladder (GB) fossa collection, excessive manipulation during port

insertion, CO<sub>2</sub> use for pneumoperitoneum, port site manipulation during GB retrieval.<sup>2,3</sup>

Gall bladder can be retrieved from either epigastric port or umbilical port.<sup>4,6</sup> Some studies preferred epigastric port for GB extraction because telescope position was not need to be change and surgeon's comfortability.<sup>7</sup> However, some studies showed umbilical port was preferable due to less postoperative port site pain.<sup>8</sup>

Usually port site pain is more intense than any other cause especially during first 48 hours after laparoscopic cholecystectomy.<sup>9</sup>

Laparoscopic cholecystectomy is associated with intraperitoneal stone and bile spillage and port site contamination during GB extraction.<sup>10</sup> If GB is inflamed, edematous or pus filled, port site needs to be widened which ultimately increase risk of infection and port site hernia.<sup>11</sup> Umbilical port is common site for port site hernia. So, some studies favor GB extraction from epigastric port.<sup>12</sup>

The SAGES guidelines states that "The gall bladder may be extracted as the surgeon prefers".<sup>13</sup>

GB extraction is the terminal stage of laparoscopic cholecystectomy and it is one of the factor for postoperative pain. GB extraction can be done from epigastric or umbilical port. Both site have been proposed for GB extraction in laparoscopic cholecystectomy and it depends on surgeon's preference.<sup>14-16</sup>

Objective of this study is to evaluate various aspects like post-operative pain, SSI, port site hernia, intraoperative time in umbilical port or epigastric port gall bladder extraction.

## METHODS

This is an observational study. This study was conducted at tertiary care center, Surat Municipal Institute of Medical Education and Research, Surat. Sample was collected from January 2022 to December 2022 according to inclusion criteria.

### Study population

All the patient who undergone laparoscopic cholecystectomy and fulfilled inclusion criteria were taken as study population.

### Inclusion criteria

All the patients with age >18 years who have symptomatic gall bladder stone and require laparoscopic cholecystectomy were included in the study.

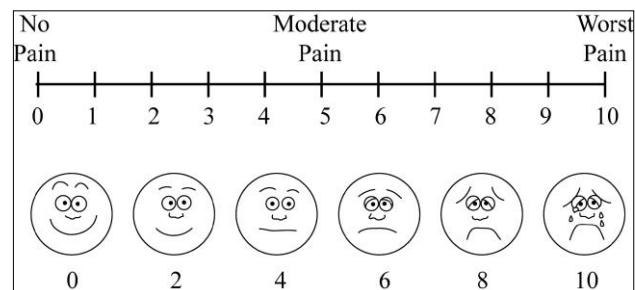
### Exclusion criteria

All the patients with age <18 years, emergency laparoscopic cholecystectomy for perforated GB, radical laparoscopic cholecystectomy for GB carcinoma, and laparoscopic converted to open cholecystectomy were excluded from the study.

All the patients who fulfilled inclusion criteria were divided into two groups: in group A (n=30), in laparoscopic cholecystectomy gall bladder was removed

from epigastric port, and in group B (n=30), gall bladder was removed from umbilical port.

Each group was observed for intraoperative time, postoperative pain, wound infection and port site hernia. Post-operative pain was assessed by visual analogue scale for pain after 12 hour, 24 hour and 48 hour postoperatively.



**Figure 1: Visual analogue score for pain.**

Statistical data were analysed by statistical package for the social science (SPSS) version 20 software.

## RESULTS

Important parameters in our study is intraoperative time, postoperative pain, surgical site infection and port site hernia in group A and group B patients.

Gender distribution in group A and group B is described in Table 1.

**Table 1: Male and female in group A and group B.**

Parameters	Group A	Group B
<b>Male</b>	10	9
<b>Female</b>	20	21

Intraoperative time taken in group A and group B is described in Table 2.

**Table 2: Intraoperative time in group A and B.**

Time (min)	Group A	Group B
<45	4	3
45-60	20	21
>60	6	6

So, Table 2 shows there is no significant difference in intraoperative time between group A and group B patients.

Wound infection in group A and group B patients are described in Table 3.

Table 3 shows there is no incidence of wound infection in group A and group B.

Port site hernia in group A and group B patients are described in Table 4.

**Table 3: Wound infection in group A and group B.**

Parameter	Group A	Group B
<b>Wound infection incidence</b>	0	0

**Table 4: Post site hernia in group A and group B.**

Parameter	Group A	Group B
<b>Incidence of port site hernia</b>	1	1

So, Table 4 shows that there is no significant difference in port site hernia between both groups.

Postoperative pain was assessed by visual analogue scale for pain after 12 hour, 24 hour and 48 hour postoperatively. Postoperative pain after 12, 24 and 48 hour in group A and group B is described in Tables 5-7 respectively.

**Table 5: Postoperative pain after 12 hour in group A and group B.**

VAS	Group A	Group B
<b>0-3</b>	2	6
<b>4-7</b>	20	22
<b>8-10</b>	8	2

**Table 6: Postoperative pain after 24 hour in group A and group B.**

VAS	Group A	Group B
<b>0-3</b>	3	10
<b>4-7</b>	19	19
<b>8-10</b>	8	1

**Table 7: Postoperative pain after 48 hour in group A and group B.**

VAS	Group A	Group B
<b>0-3</b>	15	25
<b>4-7</b>	13	5
<b>8-10</b>	2	0

So, Table 5-7 shows that there is significant less pain in group B patients than in group A patients. So, results of our study shows that there is no significant difference in intraoperative time, wound infection and port site hernia in group A and group B patients. But postoperative pain is significantly reduced in group B patients.

## DISCUSSION

Laparoscopic cholecystectomy is the standard treatment for symptomatic gall bladder stone. Laparoscopic cholecystectomy has lesser postoperative pain and surgical site infection than open cholecystectomy.<sup>17-19</sup> Port site pain is common factor for prolonged hospital stay.<sup>20</sup> So, the port

from which GB is retrieved is important factor for postoperative pain.

Studies showed that GB retrieval port has higher pain scores than non GB retrieval port.<sup>21</sup> Some studies showed that GB retrieval from epigastric port have higher pain score than GB retrieval from umbilical port.<sup>17,21</sup> These studies also revealed that difficulty in GB retrieval is higher in umbilical port than in epigastric port. So that there is significantly prolonged time required for GB retrieval from umbilical port than from epigastric port.<sup>17,21</sup>

Shakya et al showed that there is higher chance of surgical site infection in epigastric port because there is higher chances of hematoma formation at epigastric port due to direct incision on the sheath.<sup>22</sup> However, there is 8% infection rate at umbilical port site in laparoscopic surgery of which 89% in laparoscopic cholecystectomy.<sup>23</sup> It may be due to large load of microbes harboring in umbilicus which was not taken care of during antiseptic cleaning. However, endobag use during GB retrieval showed less incidence of port site infection.<sup>24</sup> Gall stone and bile spillage is also common in laparoscopic cholecystectomy. The best practice to prevent contamination from stone and bile is to use endobag.<sup>25</sup>

Some studies showed that both umbilical and subxiphoid ports are similar for gall bladder retrieval in terms of post-operative pain.<sup>26,27</sup> Some studies showed that GB removal from umbilical port has longer operative time and high risk of developing port site hernia than epigastric port GB removal and no difference in post-operative pain and infection between umbilical and epigastric pain.<sup>28</sup>

In our study, it is observed that there is no significant difference in intraoperative time, surgical site infection and port site hernia between epigastric port GB extraction and umbilical port GB extraction. But there is reduce post-operative pain in umbilical port GB extraction than epigastric port GB extraction.

The limitation of this study is that we have used visual analogue scale for pain which is subjective score for pain. So, it may vary from person to person.

## CONCLUSION

In laparoscopic cholecystectomy, GB extraction from umbilical port is associated with reduced post-operative pain with no other extra risk of surgical site infection, post site hernia and intraoperative time.

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**Ethical approval:** The study was approved by the Institutional Ethics Committee

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