

## Comparison of Port-Site Hernia Development With And Without Use of Dilator For Gall Bladder Extraction Site in Elective Laparoscopic Cholecystectomy

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### ABSTRACT

**Objective:** To compare the incidence of port-site hernia with and without use of dilator for extraction of gall bladder in elective laparoscopic cholecystectomy.

**Study Design:** Quasi-experimental study.

**Place and Duration of Study:** Combined Military Hospital, Bahawalpur Pakistan, from Oct 2019 to Oct 2021.

**Methodology:** Sixty patients scheduled to undergo laparoscopic cholecystectomy were included in the study based on the inclusion and exclusion criteria. Patients were divided into two equal groups (n=30). Group-A included patients in whom dilator was used and Group-B had those patients in whom dilator was not used. All patients were followed up by clinical examination for development of hernia at the port-site for extraction of gall bladder for 18-24 months postoperatively. Frequency of clinical development of gall bladder extraction port-site hernia was noted for every group.

**Result:** Mean age of the patients was 42.90±14.12 years with an age range of 22 to 85 years. Of all the patients 9(18%) were male and 51(82%) patients were females. In Group-A, one patient developed port-site hernia clinically whereas in Group-B no patients developed this condition. The *p*-value was found to be 0.31. These results are statistically insignificant showing that use of dilator in elective laparoscopic cholecystectomy does not increase the incidence of port-site hernia significantly.

**Conclusion:** Use of dilator does not significantly affect the incidence of development of port-site hernia from where gall bladder is extracted.

**Keywords:** Dilator, Gall Bladder, Hernia, Laparoscopic Cholecystectomy.

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### INTRODUCTION

Laparoscopic cholecystectomy has become the first line surgical treatment for cholelithiasis. Patients expect to be discharged the same day and recover early. These expectations are met successfully in a great number of cases. But sometimes the success is marred by the glitches arising as a result of port-site infections in early post operative period and port-site hernias later. These problems mostly occur at gall bladder extraction port-site.<sup>1,2</sup> Port-site hernia is in fact an incisional hernia having a multifactorial etiology including female gender, midline incisions, 10 mm and larger trocars, enlargement of specimen extraction sites, use of dilators and port-site infections.<sup>3,4</sup>

Port-site hernias can present from an asymptomatic swelling diagnosed as port-site hernia after ultrasonographic surveillance to catastrophic presentation as intestinal obstruction.<sup>5,6</sup> Umbilical port-site is associated with most cases of port-site hernia

especially in patients with high body mass index (BMI).<sup>7,8</sup>

There are several methods to reduce the magnitude of port-site hernias, including the selection of patients and their preoperative preparation such as controlling blood sugar and pressures. Different suturing techniques have been devised to reduce the number of cases presenting with port-site hernias.<sup>9</sup> In routine practice, the gall bladder is extracted through the epigastric port in our set up. Sometimes dilators have to be used to extract the gall bladder after which the dilated port-site is sutured with absorbable sutures. Dilators are used sparingly for fear of developing port-site hernia. We conducted this study was to compare the incidence of port-site hernia with and without use of dilator for extraction of gall bladder in elective laparoscopic cholecystectomy.

### METHODOLOGY

The quasi-experimental study was conducted at Combined Military Hospital, Bahawalpur, Pakistan, from Oct 2019 to Oct 2021 after taking approval from Research Review Board of the Hospital (IRB certificate EC-11-2023).

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**Inclusion criteria:** Patients of all age group, of either gender, undergoing laparoscopic cholecystectomy as an elective procedure were included.

**Exclusion criteria:** Patients who underwent emergent laparoscopic cholecystectomy or had peroperative perforation of the gall bladder accidentally were excluded.

Non-probability convenience technique was used for sampling, after obtaining informed consent. The incidence of clinical port-site hernia was found to be 1.5-1.8%,<sup>7</sup> using this value as a reference, sample size was calculated using Open Epi software.

Patients were divided in 02 groups Of 30 each, according to the use of dilator for extraction of gall bladder. In Group-A Patients in whom dilator was used for the extraction of gall bladder and in Group-B patients in whom dilator was not used for the extraction of gall bladder were placed. Epigastric portsite was used for extraction of gall bladder in this study.

All patients undergoing laparoscopic cholecystomies were operated by the same surgeon and proper antiseptic and sterilization techniques were used. Group-A included patients in whom dilator was used and Group-B had those patients in whom dilator was not used (Figure). An Addler port dilator was used for gall bladders needed to be removed through epigastric port either due to thick walled gall bladder or large stone size, which was not amenable to be extracted through 10 mm port-site. Post extraction the dilated port-site fascial defect was sutured with vicryl 1 absorbable suture. Whereas those patients in whom dilator was not used, port-site fascial defect was not closed with the suture. Injection ceftriaxone intravenously in a dose of 1g was given preoperatively at induction of anesthesia to all patients. They were followed up for the clinical development of gall bladder extraction port-site hernia characterized by development of swelling having positive cough impulse and was confirmed by ultrasonography. The patients were followed up for 18-24 months. The results were recorded in their respective groups.

Data analysis was done using Statistical Package for Social Sciences (SPSS) version 20. Continuous variables were shown by Mean±SD. Categorical variables were shown as frequency and percentage. The frequency of development of clinical port-site hernia for both groups was measured independently and a comparison was made. Categorical variables like port-site hernia and use of dilator for every group

were compared using Chi square test to find the significance of clinical port-site hernia in both groups. The *p*-value of ≤0.05 was considered statistically significant.

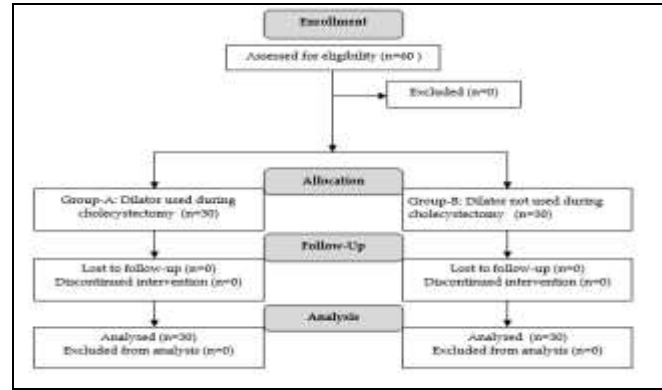


Figure: Patient Flow Diagram (n= 60)

**RESULTS**

Out of 60 patients 51(82%) were female and 9(18%) were male. Age range was between 22 to 85 years, with a mean value of 42.90±14.12 years.

In Group-A, clinical port-site hernia occurred in 01 patient and no patients in Group-B had clinical port-site hernia. The *p*-value was measured to be 0.31, hence not significant (Table)

The patient who developed port-site hernia were operated upon and primary closure of the fascial defect was carried out under general anaesthesia without placing a mesh with good result with no recurrence of hernia.

These results of our key variable were not statistically significant, indicating that routine dilator use for the extraction of gall bladder in elective laparoscopic cholecystectomy did not increase the magnitude of gall bladder extraction port-site hernia.

Table: Development Of Gall Bladder Extraction Port-Site Hernia With And Without Use Of Dilator(n=60)

Study Groups	Port-Site Hernia		<i>p</i> -value
	Present	Absent	
Group-A(dilator used)	1(3.3%)	29(96.7%)	0.31
Group-B(dilator not used)	0(0%)	30(100%)	

**DISCUSSION**

There are studies showing that port-site hernias are not very common but are a potential complication of laparoscopic surgery. This involves not only the general surgical procedures but also gynaecologic procedures as well.<sup>5-10</sup> Port-site hernias most commonly occur at the trocars that are 10mm or more

in size.<sup>7</sup> Wells *et al.* in their study found that port-site hernia only occurs in 1.5 to 1.8% of all laparoscopic surgeries, including general, gynecologic, urologic and bariatric surgeries. They found out that out of fascial closure, type of surgery and port size, port size is the single most important factor for development of port-site hernia.<sup>7</sup> Ahlqvist *et al.* in their study found that most of the port-site hernias after sleeve gastrectomy were asymptomatic, mostly through the umbilical port and associated with larger trocar size and obesity. They did not put any patient to further surgery for port-site hernias as these were asymptomatic. They also found that CT scan in prone position was the best way of diagnosing the port-site hernia.<sup>8</sup>

Khan *et al.* in their study used retractable trocars for first direct blind entry into the peritoneum and noted the magnitude of visceral injury per operatively and port-site hernias that developed post operatively. They found their method to be perfectly safe as they did not encounter any case of port-site hernia or visceral injury at trocar entry site.<sup>11</sup>

Valcarengi *et al.* found in their study done on single incision laparoscopic surgery for cholecystectomy, that there was a high incidence of port-site hernia mostly within first 2 years of surgery. They concluded that single incision laparoscopic surgery for cholecystectomy is a safe procedure except having a high incidence of port-site hernia.<sup>12</sup>

De Alwis *et al.* found port-site hernias to be under reported due to delayed onset, loss to followup patients and asymptomatic nature. Port-site hernias can be complicated by incarceration, obstruction and strangulation leading to emergent or urgent surgical interventions leading to increase in morbidity of this condition which can be and should be an avoidable problem with correct technique.<sup>13</sup> Kareem *et al.* found that older age, open technique of port insertion and non closure of fascial layer is associated with port-site hernias.<sup>14</sup> Arifuzaman *et al.* in their study found out that most of the port-site hernias occur at and around the umbilicus in the midline and few occur in laterally placed trocars. And port-site hernia can be avoided if midline fascial defect is closed in any of the multitude of methods described by different surgeons.<sup>4</sup> Malik *et al.* in their study found that port-site hernia is a serious complication that can be avoided by good surgical technique and avoiding port-site infection.<sup>15</sup>

Gutierrez *et al.* in their study found out that bladed trocars and midline port-sites result in more incidence of port-site hernias, while leaving the port-

site without fascial closure has less effect on development of port-site hernia.<sup>16</sup> Sood *et al.* also found out that epigastric extraction of gall bladder is better than umbilical port extraction of gall bladder in terms of port-site infection, port-site hernia incidence and lesser operative time.<sup>17</sup> Majid *et al.* found that extension of port-site fascial defect for extraction of gall bladder is associated with the increased incidence of port-site hernias, increased operation time and more early post operative time.<sup>18</sup>

## CONCLUSION

This study has demonstrated that there is no statistically significant added risk of using dilator for extraction of gall bladder in elective laparoscopic cholecystectomy as far as port-site hernia of the gall bladder extraction port-site is concerned.

**Conflict of Interest:** None.

## Authors' Contribution

Following authors have made substantial contributions to the manuscript as under:

IA & QZ: Conception, study design, drafting the manuscript, approval of the final version to be published.

SAA & AH: Data analysis, drafting the manuscript, critical review, approval of the final version to be published.

SR & AAM: Data acquisition, critical review, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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