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Laparoscopic Port Site Hernia: Incidence and Management of 150 Cases

M. Sayed[1*], S. Abu[2]

[1]Associate Professor, Department of Surgery, Tairunnessa Memorial Medical College & Hospital, Gazipur, Bangladesh
[2]Assistant Professor (Surgery), Department of Surgical Oncology, National Institute of Cancer Research & Hospital (NICRH), Dhaka, Bangladesh

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***Corresponding author:** M. Sayed
Associate Professor, Department of Surgery, Tairunnessa Memorial Medical College & Hospital, Gazipur, Bangladesh

Abstract **Original Research Article**

Introduction: Port side hernia, though rare, is a potentially serious complication following a laparoscopic procedure. It is a rare type of Incisional hernia that can occur following a laparoscopic surgery. The incidence of port site hernia is low and is likely to be underestimated. But despite many medical advances, the incidence rate has not been declining over time. Consideration of predisposing factors and modification of techniques may help reduce the risk. ***Aim of the study:*** The aim of the study was. ***Methods:*** This retrospective study included 150 patients who underwent laparoscopic cholecystectomy and laparoscopic appendectomy between the 2-year period of January 2018 to December 2019. Among the 150 patients, 6 were diagnosed with port site hernia. ***Result:*** Port site hernia ratio was 4% in the present study. Male prevalence was higher among the initial laparoscopic procedure patients, with male: female ratio at 1.5:1, while among the PSH cases, the female prevalence was higher, and the male: female ratio was 1:2. Most of the participant belonged to the older age groups. Infection and bleeding were the most prevalent clinical presentations among the participants. Mean ±SD port site incision was 10 ±2.4, operation time was 52 ±3.2 minutes. ***Conclusion:*** Port site hernia is a rare type of incisional hernia occurring at port sites after a laparoscopic surgery. Prevention of trocar site hernia appears to be more effective when trocar insertion is done through the abdominal wall tangential repair. The closure of both the fascia and the peritoneum is performed if the original incision is greater than 5mm. The suture of extra umbilical port site is performed under laparoscopic vision.

Keywords: Laparoscopic, Cholecystectomy, Appendectomy, Hernia.

INTRODUCTION

Laparoscopic surgery is a well-practiced surgery technique used for many benign diseases, and has been focused mainly on the biliary and colonic surgery [1]. It is preferred by many doctors due to the benefits provided over the conventional surgery methods [2]. But due to its great number of uses, various complications related to the laparoscopic approach occur. One of such complications are port-site hernia (PSH). Although its prevalence varies, it is potentially harmful and can result in significant morbidity necessitating surgical intervention [3, 4]. Several studies report an incidence of port-site hernia ranging from 1% to 22% [2, 5, 6], although the true incidence may be greater since some patients stay asymptomatic or do not return to the primary surgeon [3]. The first case of port-side hernia was reported at the early 1900's by Dr. Maio, after a laparoscopic surgery [7]. Laparoscopic equipment and methods have advanced significantly in recent years. There are several trocar designs in use, and opinions on fascial closure vary greatly. Following pneumoperitoneum removal, laparoscopic port closure (LPC) is often accomplished using a variety of procedures (PP). To attain the greatest results, new procedures have been gradually developed and current approaches have been refined. However, major difficulties have been documented as a result of the closure procedures. Because of its simplicity and low cost, the traditional approach of port-site closure is frequently utilized. Special equipment and needle types are utilized to execute the LPC in some of the closure procedures. However, this closure can be difficult at times due to the predicted worry of the needle damaging or involving the underlying bowel loops, omentum, or other abdominal organs. This may result in a less-than-optimal closure and later problems, such as a port-site incisional hernia (PIH). The development of port-site hernia can be attributed to various factors like site of incision, size of incision, the trocar design and some patient specific risk factors [8]. Due to the wide

range of risk factors, many research suggests various methods for the prevention of port site hernia [9-11]. The common practice of port site closure is by suture, but despite its cost effectiveness, it can be difficult to hard to use in some hernia cases. This is mainly because of the association of fear regarding injuring the patient, stitching the underlying bowel loops along with the skin, or damaging other abdominal organs [12, 13]. Even after a successful laparoscopy closure, various factor can contribute to port site hernia. The present study was conducted with the aim of observing any commonalities among patients with port site hernia in hopes of preventing future complications.

OBJECTIVE

General Objective

- To observe risk factors of port site hernia among patients of laparoscopic cholecystectomy and appendectomy

METHODS

This retrospective study was conducted at the Department of Surgery, Tairunnessa Memorial Medical College & Hospital, Gazipur, Bangladesh. The study duration was 2 years, from January 2018 to December 2019. The study sample was selected from 150 patients who had undergone laparoscopic cholecystectomy and appendectomy at the study hospital during the 2-year study period. Among them, 6 patients were diagnosed with port site hernia. All necessary data and hospital findings were collected from the hospital database, and verbal informed consent was obtained from all the participants. Permission was obtained from the departments necessary for the collection of medical data, and ethical approval was obtained from the ethical review committee of the study hospital.

Inclusion Criteria

- Patients who underwent laparoscopic cholecystectomy and laparoscopic appendectomy
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Patients who refused to participate in the study
- Patients who underwent conversion open cholecystectomy
- Patients who underwent conversion open appendectomy
- Exclude those affected with other chronic diseases etc.

RESULTS

Port site hernia ratio was 4% in the present study. Male prevalence was higher among the initial laparoscopic procedure patients, with male: female ratio at 1.5:1, while among the PSH cases, the female prevalence was higher, and the male: female ratio was 1:2. Most of the participant belonged to the older age groups. Infection and bleeding were the most prevalent clinical presentations among the participants. Mean ±SD port site incision was 10 ±2.4, operation time was 52 ±3.2 minutes.

Table 1: Age distribution of initial patients (n=150)

Age	Frequency	Percentage
20-29	9	6.0%
30-39	18	12.0%
40-49	51	34.0%
50-59	36	24.0%
60-69	27	18.0%
70-79	9	6.0%

Among the initial 150 patients who had undergone laparoscopic cholecystectomy and appendectomy, majority (34%) were from the age group of 40-49 years, 24% were from the age group of 50-59 years, 18% were from 60-69 years of age. Most of the patients belonged to the older population, with only 6% being from the youngest age group of 20-29 years.

Table 2: Gender Distribution of initial patients (n=150)

Gender	Frequency	Percentage
Male	90	60%
Female	60	40%

Among the initial 150 patients, 60% were male, while 40% were female. Male: female ratio was 1.5:1.

Table 3: Indication of laparoscopic surgery among initial study participants (n=150)

Indication	Frequency	Percentage
Cholelithiasis	85	56.7%
Cholecystitis	35	23.3%
Biliary sludge	5	3.3%
Appendicitis	25	16.7%

Among the initial 150 patients, indication for laparoscopic cholecystectomy and appendectomy were recorded. Majority of the participants (56.7%) had cholelithiasis as the primary reason. Both acute and chronic cholecystitis was observed in 23.3% of patients, biliary sludge in 3.3%, and 16.7% of patients had appendicitis.

Table 4: Incidence rate of Port-Site Hernia (PSH) among initial study participants (n=150)

Port Site Hernia	Frequency	Percentage
Negative	144	96%
Positive	6	4%

Among the total 150 participants, 4% had port site hernia, while 96% did not.

Table 5: Age distribution of PSH cases (n=6)

Age	Frequency	Percentage
20-39	1	16.7%
40-59	3	50.0%
60-79	2	33.3%

Among the 6 post site hernia cases, 50% belonged to the age group of 40-59 years, 33.3% belonged to the group of 60-79 years, and 1 patient was from the age group of 20-39 years.

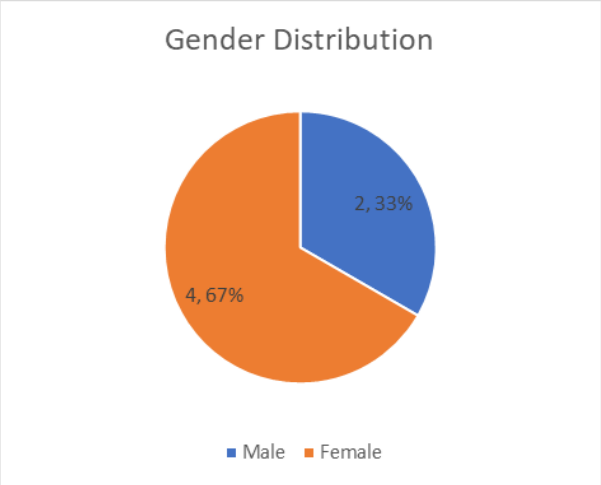

Figure 1: Gender distribution of port-site hernia cases (n=6)

Among the port-site hernia patients, 33% were male and 67% were female. The male: female ratio was 1:2.

Table 6: Complications among PSH patients (n=6)

Port site complications	Frequency	Percentage
Swelling	2	33.3%
Infection	1	16.7%
Pain and swelling	3	50.0%

Among the PSH cases, 50% had pain and swelling, 33.3% had swelling, and 1 patient had infection.

Table 7: Clinical variables among PSH patients (n=6)

Clinical Variables	Mean	±SD	Range
Port Size	10	2.4	5-12 mm
Operative Time	52	3.2	40-120 minutes
Blood Loss	30	2.6	10-150 mL

Mean ±SD port size was 10±2.4 mm, ranging from 10 mm to 12 mm among the PSH patients. The mean operative time was 52±3.2 minutes, and the range was from 40-120 minutes. The mean amount of blood loss was 30±2.6 mL, ranging from 10-150 mL.

Table 8: Cause of PSH among patients (n=6)

Cause of PSH	Frequency	Percentage
Port Site Infection	1	16.7%
Large Trocar size	4	66.7%
Incomplete Closure	1	16.7%

Possible cause of port site hernia was large trocar size for most of the cases (66.7%). Incomplete closure was observed in 1 case, and port site infection was observed in another 16.7% of patients.

DISCUSSION

Laparoscopy has become a very common practice for many medical problems, even more so for complications related to the abdominal region. It provides many benefits over the conventional methods, making it a preferred choice for many doctors [2]. It is also used for cholecystectomy and appendectomy, and can provide results satisfying for both the patients and the doctors. But like any other medical procedure, laparoscopy has its own share of risks and complications. One of the complications of laparoscopic cholecystectomy and appendectomy is

port-site hernia (PSH). Port site hernia, or trocar site hernia, is a hernia occurring at the canula or trocar insertion site, and can occur long after a successful closure [9]. Although the incidence of port site hernia has been relatively low for a long time, ranging from 0.38% to 7% in different studies, it is, nonetheless, a serious complication [14-16]. The present study was conducted with a initial sample size of 150 patients, who had undergone both laparoscopic cholecystectomy and appendectomy at the study hospital. Most of the patients were from the older population, with very few patients (18%) being younger than 40 years. This was similar to many other hernia related studies, as laparoscopic cholecystectomy is performed among the older population more commonly [17, 18]. At the initial selection, majority of the participants (n=90) were male, while 40% were female. This was slightly different to the common findings, where female population has higher incidence [19]. This might be due to the overall lack of female patients at the study location. Among the 6 port site hernia patients, 50% were from the age group of 40-59 years, and overall prevalence was higher among the elderly. This was similar to the initial findings of the study. Female prevalence was higher among the PSH patients, contradictory to the findings of initial 150 cases. This was similar to the findings of a univariate analysis [15]. Among the PSH participants, Infection was found in 1 of the 6 patients, swelling at port site was observed in 33.3% of cases, and 3 patients had both pain and swelling. Among the clinical variables, mean ±SD port site was 10 ±2.4 mm, which was higher than average, mean ±SD operative time was 52 ±3.2 minutes, ranging from 40 to 120 minutes. Mean ±SD blood loss was 30 ± 2.6 mL, ranging from 10-150 mL. Port site and operation time was higher compared to other studies, and amount of blood loss was within normal observable limits [14]. PSH was associated with a large trocar size for 66.7% of the cases, port site infection in 16.7% of cases, and incomplete closure in 1 case. Large trocar size, or trocar diameter, has been widely observed as a primary cause for port site hernia in most of the patients of our study. This was similar to the findings of many other studies and observations [2, 16, 20-23]. Some studies have also recorded herniation cases with <5 mm port usage, but such cases usually included children [24].

Limitations of the Study

The study was conducted in a single hospital with small sample size. So, the results may not represent the whole community.

CONCLUSION

The Port site hernia is a rare type of incisional hernia occurring at port sites after a laparoscopic surgery. Prevention of trocar site hernia appears to be more effective when trocar insertion is done through the abdominal wall tangential repair. The closure of both the fascia and the peritoneum is performed if the original incision is greater than 5mm. The suture of extra umbilical port site is performed under laparoscopic vision.

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Conflict of interest: None declared

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