INCIDENCE OF PORT SITE INFECTION AFTER LAPAROSCOPIC CHOLECYSTECTOMY: OUR EXPERIENCE AT HAYATABAD MEDICAL COMPLEX

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ABSTRACT

OBJECTIVES

This study aimed to assess the factors that affect post-laparoscopic cholecystectomies PSI and determine which characteristics can be changed to prevent PSI in a trial to maximize the benefits of laparoscopic surgery.

METHODOLOGY

The study included all patients who experienced port site infection following laparoscopic cholecystectomy. All patients received Inj Ceftriaxone 1gm pre-operatively & then twice a day postoperatively for 03 days. In all operations, the gallbladder is removed from the epigastric port without using a retrieval bag by skilled surgeons employing four-port methods and reusable equipment. Most patients had the sub-hepatic tube drain placed and were discharged the day after surgery.

RESULTS

Acute cholecystitis was the most common operative finding with port-site infection, i.e. 6(42.8%), second being empyema that was seen in 3(21.4%) patients, 2(14.3%) patients had bad adhesions, mucocele in 2(14.3%) patients and thick walled gall bladder with stones was found in 1(7.1%) patients respectively, indicating that the relationship between infection and acute cholecystitis is significant. Regarding the spills of bile, stones, or pus, 3(21.4%) patients had infections despite there being no spillage, while 11(78.6%) patients developed an infection while the spillage happened during their procedures. The p-value was 0.0001, meaning that the spillage might be considered a risk factor for the development of port site infection

CONCLUSION

The spilling of bile, stones, or pus, the port of gallbladder removal, and acute cholecystitis are all strongly associated with port site infection. Given that Mycobacterium tuberculosis may be the source of chronic deep surgical site infections, more care should be exercised. The majority of PSIs are superficial and more prevalent in men.

KEYWORDS: *Dorsal Spine Tuberculosis, Corpectomy with Fusion, Laminectomy, Outcome Measures*

INTRODUCTION

Laparoscopic surgery, often minimally invasive surgery, was developed in the 18th century and quickly became the favored surgical technique for several operations.[1] Laparoscopic cholecystectomy is currently the gold standard for treating gallstone symptoms.[2] Its advantages include a shorter hospital stay, an earlier return to work, less postoperative pain, fewer surgical evaluations, and better results for postoperative cosmetic and minor problems.[3] Although laparoscopic cholecystectomy is preferable to open cholecystectomy, it is not without problems and can result in minor to major complications. Laparoscopic cholecystectomy port-site complications include postoperative or intraoperative bleeding, an uncomfortable scar, wound infection and hernia.[4,5] In the event that a large vessel is damaged, port-site bleed could manifest as a significant gradual discharge or open bleed. It could be seen on an overlapping dressing or show up postoperatively as internal bleeding.[6] According to reports in the literature, it is most likely the port-related problem that affects 5–6.3% of patients.[7] A port site hernia is an incisional hernia that develops at the site of the trocar or port during laparoscopic surgery. Typically, 10 mm in the infra-umbilical, epigastric, and umbilical regions are noticed at the port site.[8,9] On a 5 mm cannula site, it is rarely

seen. Between 1% and 6% of ports sites get hernias.[10] The current study aimed to assess several port-related issues along with their management that will arise during laparoscopic cholecystectomy.

METHODOLOGY

From March 2021 to August 2022, this retrospective study was conducted in the Surgical "C" Unit, Hayatabad Medical Complex Peshawar. The study included all patients who experienced port site infection following laparoscopic cholecystectomy. All patients received an injection of ceftriaxone 1 gm twice a day, and 03 days for those with severe cholecystitis. In all operations, the gallbladder was removed from the epigastric port without using a retrieval bag by skilled surgeons employing four-port methods and reusable equipment. Most patients had the sub-hepatic tube drain placed and were discharged the day after surgery. On the 7th postoperative day, the stitches were removed without any signs of infection. All patients with port site infections had their swabs cultured and tested for sensitivity. Dissection was performed for patients with chronic, incurable illnesses who had their persistent sinuses removed, and the wound was left open to heal. Chronic sinus excisional biopsies were taken and sent for histopathological analysis; tissue samples were analyzed for polymerase chain reaction (PCR). Patients who had been diagnosed with TB received oral anti-TB medication. Patients having a history of chronic co-morbid conditions and those who were converted to open procedures were excluded. In the real world, factors like gender, the location of the infected port, the type of microorganism, acute and chronic cholecystitis, type of infection and the presence of stones, bile, or redness were examined. The sterilization procedure used in our sample involved rinsing the instruments with tap water, washing them with ENZYM (50 cc/20 l), and removing them from formalin or OPA (Cedex ®) for 30 minutes. A pre-built format was used to collect all the data, and statistical analysis was carried out. The statistical analysis was performed using SPSS 23.0. A p-value of 0.05 was regarded to indicate significance.

RESULT

A total of 168 patients who underwent laparoscopic cholecystectomy were enrolled. Age ranged between 18-70 years, with a mean age of 44. There were 97(57.7%) females, and 71(42.3%) males, with a ratio of 1.3:1. The incidence of overall port site infection, was noted in 14(8.3%). Port site infection rate in females was 8(4.7%) & 6(3.6%) in males. Table-1

Table 1: Gender Distribution

Gender	f	%age
Male	71	42.3%
Female	97	57.7%
Port Site Infection n=14		
Male	08	57.1%
Female	06	42.8 %

Acute cholecystitis was the most common operative finding with port-site infection, i.e. 6(42.8%), second being empyema that was seen in 3(21.4%) patients, 2(14.3%) patients had bad adhesions, mucocele 2(14.3%) and thick-walled gall bladder with stones was found in 1 (7.1%) patients respectively, indicating that the relationship between infection and acute cholecystitis is significant. Regarding the spills of bile, stones, or pus, 3(21.4%) patients had infections despite there being no spillage, while 11(78.6%) patients developed an infection while the spillage happened during their procedures. The p-value was 0.002, meaning the spillage might be considered a risk factor for developing port site infection. Table-2 Incidence of infection at the lateral port site was noted in 1(7.1%) cases, while 3(21.4%) patients developed an infection at the umbilical port, and 10(71.4%) patients developed an infection at the epigastric port (port side of the gallbladder removal). A total of 4(28.6%) patients developed deep tissue infections, and 10(71.4%) patients had a superficial skin infection. Tissue sample swab culture and PCR showed that 5(35.7%) patients had gram-negative bacterial infections, 2(14.3%) patients had gram-positive bacterial infections, 3(21.4%) patients had mixed infections, 2(14.2%) patients had chronic inflammation without growth, and 2(14.2%) patients had Mycobacterium species infections.

Table 2: Incidence of Port Site Infection to Different Study Outcomes

Outcome		f	%age	P-Value
Operative Finding with Port Site Infection	Acute cholecystitis	06	42.8%	0.003
	Empyema	03	21.4%	0.071
	Bad adhesions	02	14.3%	0.080
	Mucocele	02	14.3%	0.080
	Thick wall GB with stones	01	07.1%	0.099
Spillage	Infection without spillage	03	21.4%	0.091
	Infection due to spillage	11	78.6%	0.002
Port Involvement	Lateral port infection	01	07.1%	0.081
	Umbilical port	03	21.4%	0.099
	Epigastric port	10	71.4%	0.002
Infection Status	Deep tissue infection	04	28.6%	0.080
	Superficial / skin infection	10	71.4%	0.002
Culture and PCR Results	Gram-negative	05	35.7%	0.050
	Gram-positive	02	14.3%	0.061
	Mixed infection	03	21.4%	0.091
	Chronic inflammation	02	14.2%	0.060
	Mycobacterium species	02	14.2%	0.060

DISCUSSION

Any surgery that is performed carries some risks and problems. The most frequent complications of inpatient hospitalizations are abdominal surgical site infections, which substantially negatively affect outcomes and expenses.[11] Less invasive surgical techniques are becoming more popular due to technological advancements, which may benefit patients. Laparoscopic cholecystectomy has experienced a significant rise in popularity since its inception in 1987, to the point where it is now recognized as the gold standard for treating symptomatic gallstone disease. Because of its well-established safety, it is now recommended as a secure outpatient operation. Following laparoscopic surgery, studies show decreased port site infections and other wound-related complications.[12,13] Since laparoscopic procedures are less invasive and affect the immune system less than open surgery, the port site infection level following a laparoscopic cholecystectomy is lower than that following an open cholecystectomy.[14] The results of port site infection in a study by Maurya AK et al. (8.7%) were almost similar to our findings (8.3%).[15] In another study by Ryu YJ et al. port site infection rate was lower than our findings (6.7%).[16] These studies varied from one another, possibly due to variances in demographic location and sterilization techniques that may vary from hospital to hospital. In our study, we concluded that females (57.7%) made up the majority of patients who underwent laparoscopic cholecystectomy, consistent with the findings of Devana JV et al. (81.57%), who observed that females outnumbered males.[17] Although statistical analysis revealed that port site infection was more common in male cases, which was statistically significant. The use of antibiotic prophylaxis in laparoscopic cholecystectomy is still debatable in the literature, even though we gave all patients antibiotics at the time of induction and then twice a day for three days. While some studies have advocated its usage and have cited it as one of the most important predictors of wound infection, others have questioned its usefulness. Out of the 14 cases of port-site infection, 71.4% involved just the skin and subcutaneous tissues, while the deeper fascia and muscle layers were affected in 28.6%. According to a Centers for Disease Control and Prevention Atlanta, Georgia report, superficial skin infections are much more common than deeper ones. Numerous causes may be directly responsible for contaminating the port site and causing infection. Although the increased frequency of umbilical port infection and the role of umbilical flora in developing port sites have received considerable attention in the literature, we found that the epigastric port served as the site of gall bladder extraction, was the most frequently infected port.[18] Several researchers investigated the connection between bactibilia and bile cultures with port-site infection. Kulaya et al., in their study, disproved both the flora and bile as potential sources of port site infection.[19] Weiser MC did not find a connection between infected complications and bacterial presence of the bile or gallbladder wall.[20] Our study has shown that infections are more frequent near the trocar site of gallbladder removal. Additionally, with preventative antibiotics, it is possible to attempt gallbladder removal via the umbilical port, and if the wound becomes contaminated, it should remain open. To have more information to investigate the different patient aspects involved, we advise that laparoscopic cholecystectomy be made available to a larger range of patients of both genders and all age groups. It is preferable to leave wounds exposed rather than to close them when there has been a clear spill, contamination, or bile at the trocar site.

LIMITATIONS

Patients in this study were fewer, and follow-up was short. We recommend further studies with many cases and long follow up to determine the long-term complications of this procedure.

CONCLUSION

The secretion of bile, stones, or pus, as well as the gall bladder and acute cholecystitis, are all strongly associated with port site infection. Chronic deep surgical illnesses should receive further care since Mycobacterium tuberculosis may be the root cause.

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