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Original Article

Frequency of Port Site Infection after Laparoscopic Cholecystectomy

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ABSTRACT

Cholangitis is an inflammation of the biliary tree due to Gallstones. The port region is susceptible to postoperative infections when a patient has excessive wounding and a microorganisms isolated from spontaneously procured tissue or fluid inside the upper cut. **Objectives:** To analyze the frequency of port site infection (PSI) and to assess variables influencing PSI following laparoscopic cholecystectomies. **Methods:** This research was carried during 2022 in two hospitals in Peshawar(Pakistan). Only 55 of the 907 patients who had PSI after going through LC surgeries were included and were kept under observations for six months. Data were collected by questionnaire, imported into the SPSS for statistical analysis. Descriptive statistics and Chi-square test were used for association between variables. **Results:** 34 patients out of 55 had CC, whereas 21 patients underwent surgery following an AC and became infected. Following LC, PSI frequency were lower than after open cholecystectomy. Majority of patients were women. Only five patients, based on the PSI, got an infection at the lateral ports, whereas 11 patients and 39 patients respectively, developed infections at the umbilical and epigastric ports. PSI came from majority of the female patients showing a significant association in frequency of PSI in relation to gender. **Conclusion:** Females tend to have high PSI rates and frequent epigastric port PSIs.

INTRODUCTION

The gallbladder is located on the visceral inferior side of liver [1]. The commonest typical biliary pathology is thought to be gallstones. Gallstones are thought to afflict 10-15% of people in developed civilizations [2]. Among the most frequently performed surgeries in the US, cholecystectomies are done over nearly 700,000 patients annually [3]. Cholelithiasis is now prevalent at rates of 3-4% in Asian populations and 10-15% in western nations [4]. Gallstones are discovered in 8% and 20% of patients in Pakistan who are older than 40 and 60 years old, accordingly [5]. Gallstones are hard, stone-like fragments of bile waste. When scanning is done for other signs, more than 80% of gallstone patients are not aware that the gallbladder disease was also shown to be present [6]. Regarding gastrointestinal and liver illnesses, one of most frequent clinical indication in the United States is gallstone disease (GSD) [7]. Cholelithiasis is prevalent in 3–11% of the Chinese population, 7.1% in India, and 5% in Taiwan [8-10]. Although there is currently a lack of information in Pakistan, a prior study indicated that the surgical frequency in Pakistan's southern Sindh region was 9.03 percent [11]. In 1986, Eric Mühe conducted the first

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laparoscopic cholecystectomy (LC), which quickly rose to the status of the "Gold Standard" for the selective management of chronic gallstone disease [12, 13]. Multiple surgical treatments frequently lead to problems. Infections at the surgery area is among these issues (SSI). As a diversity of parasites may survive inside the body and get contaminated as a consequence of surgical intervention, the infection may be internal or exterior. In certain situations, a patient's bacterial pathogens may be invasive and result in infection. On a single laparoscopic procedure, this can happen during both open and partial surgery [14]. LC coupled with SSIs is extra open than cholecystectomy [15]. Even though port core infection is common after cholecystectomy, they are becoming more common and have a significant influence on the overall results of the procedure, including delayed return to work, higher expenditures, and unfavorable aesthetic adverse effects. The port region is susceptible to three different forms of postoperative infections [16, 17]. The patient has discharge from excessive cutting and microbes isolated from spontaneously procured tissue or fluid inside the upper cut. The first surgical infection happens within one month of surgery, affects only the skin and subcutaneous tissue, affects the patient's skin and subcutaneous tissue. The second form, a severe surgery infection, affects deep tissue that attaches the fascia and deep muscles to the wound and may appear 30 days after surgery. The patient has at least two of the following conditions: abscess, reduction of deep incision, and purulent discharge from deep incision. The third form of surgical site infection (SSI) affects any organ or place other than the incision that was made or utilized during surgery [18, 19]. Therefore, the current research was designed to analyze the frequency of port site infection (PSI) and to evaluate factors that influence PSI after laparoscopic cholecystectomies.

METHODS

This research was carried out from January, 2022 to October, 2022 in Hayatabad Medical Complex Hospital and Khyber Teaching Hospital, Medical Teaching Institute Peshawar, Pakistan. In this research, patients who had port site infections (PSI) following LC were included. Patients with coexisting pancreatitis, cholangitis, or incomplete data were excluded from this research. Only 55 of the 907 patients who had LC surgeries were included in our research because they had PSI. An interventional radiologist performed ultrasound (US)-guided trans-hepatic PC under local anesthesia with a pigtail catheter. In all groups, oral food intake was regulated on the basis of patient's medical condition, and the decision to discharge was evaluated based on food tolerance. In all operations, the gallbladder is retrieved from epigastric port without the use of a retrieval bag by skilled surgeons employing four-port methods and reusable equipment. Most patients had the sub-hepatic tube drain placed, and they were released the day following surgery. On the seventh day following surgery, the sutures were removed without any signs of infection. All PSI-affected patients had sensitive swabs that were fermented. Patients who have chronic, incurable illnesses have tests with general anaesthesia, have their persisting sinuses removed, have their sinuses dissected, and then have the incision left open to recover for another reason. Chronic sinus excisional biopsies were made, sent to the histological evaluations, and samples were examined using PCR (PCR). Participants with tuberculosis (TB) received oral anti-TB treatment for 9 months. After six months of follow-up, all patients showed good responses. To reduce bias in the study, patients whose functions were changed to open procedures and those who had a record of persistent co-morbid diseases were excluded from the study. We gather information from seasoned surgeons who have adequate documentation and postoperative follow-up in the same purpose and to prevent iatrogenic issues for beginning surgeons. The level of experience is determined by how long they have been performing laparoscopic operations (at least ten years), how many surgeries they have had, and how long each surgery lasted (20-90 minutes). In our research, variables such gender, the site of the infected port, the kind of microorganisms, the degree of infection, and the presence of bile stones, or redness in the procedure were examined. The sample's sterilizing procedure involved washing the equipment with ENZYM (50cc), rinsing with water, and then removing CIDEX® OPA solution for 30 minutes. A pre-designed questionnaire was used to collect all the information, and statistical analysis was carried out. SPSS (v.25) was used to examine the data. Descriptive statistics were used for demographic and clinical features. The results were presented as percentages for continuous variables and the number/percentage for categorical variables. The Chi-square test was used to assess the importance of the association such as gender-wise comparison, PSI occurrence in several port locations and relationship between the prevalence of PSI and the preoperative clinical diagnosis of gallbladder.$P \leq 0.05$ was regarded as the significant value. The Helsinki Declaration's guiding principles guided the conduct of this study. Each and every patient who participated gave their written informed permission.

RESULTS

907 individuals who undergone LC are included in this study. They were between the ages of 20 and 65. Out of 907 patients, PSI was discovered in 55 (6.06%). In respect to gender, the PSI percentage was 4.74% for 43 female

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patients and 1.32% for 12 male patients (figure 1).

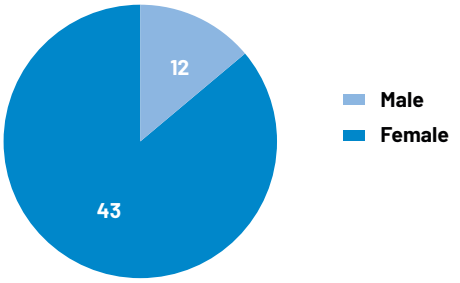

Figure 1: Frequency of male and female patients

Regarding the condition of the gallbladder before to surgery, 34 patients (3.5%) had chronic cholecystitis (CC), whereas 21 patients (2.31%) underwent surgery following an acute cholecystitis (AC) Table 1.

Condition	Infected (%)
ACCC	21 (2.31%)
Total	34 (3.74%)55

Table 1: Relationship between the prevalence of PSI and the preoperative clinical diagnosis of gallbladder

Only five patients (0.55%), based on the PSI, got an infection at the lateral ports, whereas 11 patients (1.21%) and 39 patients (4.29%) respectively, developed infections at the umbilical and epigastric ports (Table 2).

PSI	n (%)
Umbilical	11 (1.21%)
Epigastric	39 (4.29%)
Lateral	5 (0.55%)
Total	55

Table 2: PSI occurrence in several port locations

DISCUSSION

Literature shows that the ultimate treatment for cholecystitis is an LC [20, 21]. In other patients who are not suitable candidates for surgical treatment, it is common practice to perform a cholecystostomy if there is no improvement within one to three days after starting antibiotic treatment unless sepsis is present. However, for reasons, such as concomitant diseases and sepsis, surgery may not always be appropriate or safe for every patient. PC, which is a potentially life-saving and less invasive treatment option, may be preferred for patients in this category [22, 23]. Since laparoscopic operations become less intrusive and have a reduced influence on the immune system than open surgery, the incidence of PSI following LC is lower than that following an open cholecystectomy. The majority of individuals who performed LC were observed to be women, which are similar to the findings by Khursheed et al. and, Kumari and Narain [24, 25]. Furthermore, PSI in both the studies came from majority of the female patients which are similar to the findings of current research and significant association was found in the frequency of PSI in relation to gender. All the patients were diagnosed negatively with COVID-19. Almost similar findings were observed in a recent research [22,23]. Patients were more likely to get the infections during the critical period compared to the chronic phase [26]. The current results were almost similar with the statement of Dai et al and findings of Opal et al as only five patients, based on the PSI, got an infection at the lateral ports, whereas 11 patients and 39 patients respectively, developed infections at the umbilical and epigastric ports [26, 27]. P-value was 0.002, which is quite significant, and the location of the gallbladder removal may have contributed to PSI. These findings are in line with the Tevis et al [28]. This is because having a firm, flexible gallbladder with a thick wall of edoema increases the likelihood of the gallbladder perforating and dislocating, developing stones, or becoming red.

CONCLUSIONS

Mostly in initial management of AC, PC was suggested and chosen to surgery, particularly in high-risk, chronically sick patients. Females tend to have high PSI rates and frequent epigastric port PSIs. The length of the procedure and AC may be factors in the development of a port-site infection. It is essential to pay close attention to the infection caused by persistent deep surgeries. It is essential to pay close attention to the infection caused by persistent deep surgeries.

Conflicts of Interest

The authors declare no conflict of interest

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REFERENCES

[1] Barbara L, Sama C, Labate AM, Taroni F, Rusticali AG, Festi D, et al. A population study on the prevalence of gallstone disease: the Sirmione Study. Hepatology. 1987 Sep; 7(5): 913-7. doi: 10.1002/hep.1840070520

[2] Diehl AK. Epidemiology and natural history of gallstone disease. Gastroenterology Clinics of North America. 1991 Mar; 20(1): 1-9. doi: 10.1016/S0889-8553(21)00531-8

[3] Shaffer EA. Epidemiology and risk factors for gallstone disease: has the paradigm changed in the 21st century?. Current gastroenterology reports. 2005 Apr; 7(2): 132-40. doi: 10.1007/s11894-005-0051-8

[4] Shaffer EA. Epidemiology of gallbladder stone disease. Best practice & research Clinical gastroenterology. 2006 Jan; 20(6): 981-96. doi:

DOI: https://doi.org/10.54393/pjhs.v3i06.375

10.1016/j.bpg.2006.05.004

[5] Hayat N, Duja B, Ahmed T, Rehan AG. To determine the importance of age and sex in the clinical presentation and subsequent outcome in cholelithiasis. Journal of University Medical & Dental College. 2013; 4: 36-41.

[6] Everhart JE, Yeh F, Lee ET, Hill MC, Fabsitz R, Howard BV, et al. Prevalence of gallbladder disease in American Indian populations: findings from the Strong Heart Study. Hepatology. 2002; 35: 1507-12. doi: 10.1053/jhep.2002.33336

[7] Russo MW, Wei JT, Thiny MT, Gangarosa LM, Brown A, Ringel Y, Shaheen NJ, et al. Digestive and liver diseases statistics, 2004. Gastroenterology. 2004 May; 126(5): 1448-53. doi: 10.1053/j.gastro.2004.01.025

[8] Zhang W, Jiang Z, Han T, Lei R. Epidemiology and risk factors of cholelithiasis. Journal of Surgery Concepts & Practice. 2011; 16: 408-12.

[9] Unisa S, Jagannath P, Dhir V, Khandelwal C, Sarangi L, Roy TK. Population-based study to estimate prevalence and determine risk factors of gallbladder diseases in the rural Gangetic basin of North India. Hpb. 2011 Feb; 13(2): 117-25. doi: 10.1111/j.1477-2574.2010.00255.x

[10] Chen CH, Huang MH, Yang JC, Nien CK, Etheredge GD, Yang CC, Yeh YH, Wu HS, Der-Aur et al. Prevalence and risk factors of gallstone disease in an adult population of Taiwan: an epidemiological survey. Journal of gastroenterology and hepatology. 2006 Nov; 21(11): 1737-43. doi: 10.1111/j.1440-1746.2006.04381.x

[11] Channa NA, Khand FD, Bhanger MI, Leghari MH. Surgical incidence of Cholelithiasis in Hyderabad and adjoining areas (Pakistan). Pakistan Journal of Medical Sciences. 2004; 20: 13-7.

[12] Muhe E. Laparoscopic cholecystectomy. Zeitschrift für Gastroenterologie. 1991; 26: 204-6.
1.13Arvidsson D, Haglund U, Schersten T, Svanvik J. Laparoscopic cholecystectomy is a revolutionary surgical alternative in gallstones. Lakartidningen. 1992 Feb; 89(6): 395-6.

[13] Richards MJ, Edwards JR, Culver DH, Gaynes RP, National Nosocomial Infections Surveillance System. Nosocomial infections in combined medical-surgical intensive care units in the United States. Infection Control & Hospital Epidemiology. 2000 Aug; 21(8): 510-5. doi: 10.1086/501795

[14] Jan WA, Ali IS, Shah NA, Ghani A, Khan M, Khan AS. The frequency of port-site infection in laparoscopic cholecystectomies. Journal of Postgraduate Medical Institute. 2008; 22(1): 66-70

[15] Sriram BM. SRB's Manual of Surgery. Jaypee Brothers Medical Publishers; Fifth edition. 2016.

[16] Horan TC, Gaynes RP, Martone WJ, Jarvis WR, Emori TG. CDC definitions of nosocomial surgical site infections, 1992: a modification of CDC definitions of surgical wound infections. Infection Control & Hospital Epidemiology. 1992 Oct; 13(10): 606-8. doi: 10.2307/30148464

[17] Williams NS, O'Connell PR, McCaskie A, editors. Bailey & Love's short practice of surgery. CRC press; 2018 Apr.

[18] Sathesh-Kumar T, Saklani AP, Vinayagam R, Blackett RL. Spilled gall stones during laparoscopic cholecystectomy: a review of the literature. Postgraduate medical journal. 2004 Feb; 80(940): 77-9. doi: 10.1136/pmj.2003.006023

[19] Agresta F, Campanile FC, Vettoretto N, Silecchia G, Bergamini C, Maida P, Lombari P, Narilli P, Marchi D, Carrara A, Esposito MG. Laparoscopic cholecystectomy: consensus conference-based guidelines. Langenbeck's archives of surgery. 2015 May; 400(4): 429-53. doi: 10.1007/s00423-015-1300-4

[20] Ansaloni L, Pisano M, Coccolini F, Peitzmann AB, Fingerhut A, Catena F, et al. 2016 WSES guidelines on acute calculous cholecystitis. World journal of emergency surgery. 2016 Dec; 11(1): 1-23. doi: 10.1186/s13017-016-0082-5

[21] Wang CH, Wu CY, Yang JC, Lien WC, Wang HP, Liu KL, et al. Long-term outcomes of patients with acute cholecystitis after successful percutaneous cholecystostomy treatment and the risk factors for recurrence: a decade experience at a single center. PloS one. 2016 Jan; 11(1): e0148017. doi: 10.1371/journal.pone.0148017

[22] Somuncu E, Kara Y, Kızılkaya MC, Bozdağ E, Yıldız ZB, Özkan C, et al. Percutaneous cholecystostomy instead of laparoscopy to treat acute cholecystitis during the COVID-19 pandemic period: single center experience. Turkish Journal of Trauma and Emergency Surgery. 2021 Jan; 27(1): 89-94. doi: 10.14744/tjtes.2020.69804

[23] Mir M, Khursheed S, Malik U, Bali B. Frequency and risk factor assessment of port-site infection after elective laparoscopic cholecystectomy in low-risk patients at a tertiary care hospital of Kashmir. The Internet Journal of Surgery. 2012; 28(2).

[24] Kumari C and Narain NP. Port site infections after laparoscopic cholecystectomy. International Surgery Journal. 2022 Apr; 9(5): 1002-5. doi: 10.18203/2349-2902.isj20221146

[25] Dai M, Liu D, Liu M, Zhou F, Li G, Chen Z, Zhang Z, You H, Wu M, Zheng Q, Xiong Y. Patients with Cancer Appear More Vulnerable to SARS-CoV-2: A Multicenter Study

DOI: https://doi.org/10.54393/pjhs.v3i06.375

during the COVID-19 OutbreakPatients with Cancer in SARS-COV-2 Infection. Cancer discovery. 2020 Jun; 10(6): 783-91. doi: 10.1158/2159-8290.CD-20-0422

[26] Opal SM, Fisher CJ, Dhainaut JF, Vincent JL, Brase R, Lowry SF, et al. Confirmatory interleukin-1 receptor antagonist trial in severe sepsis: a phase III, randomized, doubleblind, placebo-controlled, multicenter trial. Critical care medicine. 1997 Jul; 25(7): 1115-24.

[27] Tevis SE, Kennedy GD. Patient satisfaction: does surgical volume matter?. journal of surgical research. 2015 Jun; 196(1): 124-9. doi: 10.1016/j.jss.2015.02.054.