

ORIGINAL RESEARCH

A Study On Port Site Infections After Laproscopic Cholecystectomy At A Tertiary Care Centre Of Bihar

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ABSTRACT

Introduction: Laparoscopic cholecystectomy is the gold standard treatment for symptomatic gallstones. Generally, most of the surgical procedures may end with complications. One of these complications is surgical site infection (SSI).

Materials and Methods: A descriptive study on 250 Patients was conducted by the Department of General Surgery of Narayan Medical College & Hospital, Jamuhar, Bihar. The study duration Was from March 2019 to February 2020. Ethical permission was obtained from the Institutional Ethics Committee and informed written consent forms were obtained from each patient before participation. All the patients were given broad spectrum antibiotics (Ceftriaxone vial 1 g twice daily by intravenous infusion) at the of induction of an aesthesia, in addition with Metronidazole 500 mg three times daily intravenously for 24 hours postoperatively, and for period of five days for those with acute cholecystitis. All data were collected in preformed format and statistical analysis was done.

Results: The age range of the study participants was 24 to 67 years with a mean age of 44.6 years. Majority (221/250, 88.4%) of the patients were female. Spillage of bile, stones or pus is an important predictor of infection, such incidence was reported with 19 (7.6%) cases. Port site infection (PSI) was reported in 9 patients, which constituted 3.6% of the study population. Out of these cases, 2 (22.2%) cases were deep seated and rests were superficial infection.

Conclusion: Special consideration should be taken in chronic deep surgical site infection. Most of the PSIs are superficial and more common in males.

Key Words: Port Site Infections, Laproscopic Cholecystectomy

INTRODUCTION

Laparoscopic surgery also termed as minimally invasive surgery, was first presented in the eighth decade of 20th century, shortly after that it became the surgical treatment of choice for many operations [1]. Now the laparoscopic cholecystectomy is the gold standard treatment for symptomatic gallstones [2]. Its advantages include decreased hospital stay postoperatively, earlier return to work, decreased post-operative pain [3], minimum surgical incisions and so better cosmetic results and lesser postoperative complications. So, it not only supplanted open cholecystectomy but also more or less ended attempts for the non-invasive management of gallstones, such extracorporeal shock wave, and bile salt therapy [4]. Generally, most of the surgical procedures may end with complications. One of these complications is surgical site infection (SSI). Infection could be intrinsic and/or extrinsic as

the human body enables the survival of a wide variety of microorganisms with potential for infection as a result of surgical intervention [5]. Patient's bacterial flora may become opportunistic and cause infection in special circumstances. This can occur in both open surgeries and to a lesser extent in laparoscopic one [6]. It is a fact that laparoscopic cholecystectomy associated with fewer SSI than open cholecystectomy [7].

However now-a-days, with increasing number of performed laparoscopic cholecystectomies, there is an increasing number of port site infection, although it occurs infrequently, but it has significant influence on overall outcomes of laparoscopic cholecystectomy and its final results like delay in return to work, increase cost and bad cosmetic results which become disappointing for both patient and surgeon. There are three types of surgical site infection which can occur in port site [8-10]: First is superficial surgical site infection occurring within 30 days post-surgery and involves only skin and subcutaneous tissues and the patient at least has one of the following: a) purulent discharge from the superficial incision. b) Organism isolated from aseptically obtained culture of fluid or tissue from superficial incision. The second type is deep surgical site infection which may be presented after 30 days of operation and involves deep soft tissues including fascia and muscles deep to the incision. The patient has at least two of the followings: a) purulent drainage from deep incision, b) dehiscence of the deep incision, and c) an abscess. The third type is organ/space SSI where infection involves any organ and spaces other than the incision which was opened or manipulated during surgery [11].

MATERIALS AND METHODS

A descriptive study was conducted by the Department of General Surgery of Narayan Medical College & Hospital, Jamuhar, Bihar. The study duration was from March 2019 to February 2020. Ethical permission was obtained from the Institutional Ethics Committee and informed written consent forms were obtained from each patient before participation. Patients who underwent laparoscopic cholecystectomies during this period were included in our study. All the patients were given broad spectrum antibiotics (Ceftriaxone vial 1 g twice daily by intravenous infusion) at the of induction of an aesthesia, in addition with Cetronidazole 500 mg three times daily intravenously for 24 hours postoperatively, and for period of five days for those with acute cholecystitis.

All operations were done by experienced surgeons, using four ports procedures, with reusable instruments; gallbladder was extracted from the epigastric port in all operations, without using retrieval bag. Sub-hepatic tube drain was used in most of the patients and removed next day after the operation. Stitches were removed 7th day postoperatively without the presence of infection. Swabs were taken for culture and sensitivity in all patients who developed PSI. Exploration under general anaesthesia was done for patients with chronic deep site infections, presented with persistent discharging sinus, wound debridement was done and the wound was left open to heal by secondary intention. Excisional biopsies for chronic discharging sinuses had been done and sent for histopathological studies & tissue samples examined for polymerase chain reaction (PCR).

All patients responded well within six months of follow-up. Patient's whose operations were converted to open procedures and those with a history of chronic co-morbid conditions were excluded from the sample to minimize bias in the study. For the same reason, and to avoid iatrogenic complications of beginner surgeons, we collect the data of experienced surgeons who have good documentation and postoperative follow-up. Their experience was estimated by their period of laparoscopic work (at least 10 years), their number of operating procedures and duration of procedures (20-90 minutes). Factors as gender, site of infected port, type of microorganism, acute versus chronic cholecystitis, type of infection (superficial or deep infection) and intraoperative spillage of stones, bile or pus were analyzed in our sample. The

method of sterilization used in our sample was washed the instruments by ENZYM (50 cc/20 L), then rinse with tap water, finally emersion in Formalin or OPA for 30 minutes.

All data were collected in preformed format and statistical analysis was done. The data was introduced in Microsoft excel. Descriptive analysis was done. Chi-square test was used to decide the significance of the association between related variables. $P \leq 0.05$ was considered as statistically significant.

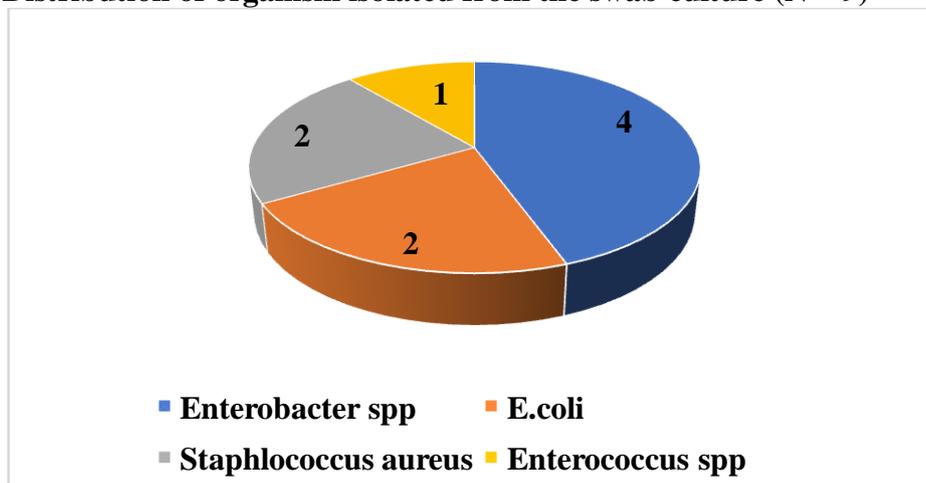
RESULTS

A total of 250 patients were included in the final analysis. The age range of the study participants was 24 to 67 years with a mean age of 44.6 years. Majority (221/250, 88.4%) of the patients were female. Acute cases were mostly kept under observation and conservative management. 14% cases (35/250) were operated in the acute phase. Spillage of bile, stones or pus is an important predictor of infection, such incidence was reported with 19 (7.6%) cases. Port site infection (PSI) was reported in 9 patients, which constituted 3.6% of the study population. Out of these cases, 2 (22.2%) cases were deep seated and rest were superficial infection. Swab cultures were sent and report has been shown in figure 1. All the factors known to predispose a person to infection have been checked for association and report has been shown in table 1. It was found that female gender, those operated in acute phase, spillage during surgery and site of port are important predictors of developing port site infection.

Table 1: Table showing association of various factors with development of PSI (N = 250)

Factor	Number of cases developing PSI	P value
Gender		
Male	2/29	< 0.05
Female	7/221	
Condition		
Acute	4/35	< 0.05
Chronic	5/215	
Spillage		
Yes	6/19	< 0.05
No	3/231	
Port site		
Umbilical port	2/37	< 0.05
Epigastric port	6/200	
Lateral port	1/13	

Figure 1: Distribution of organism isolated from the swab culture (N = 9)



DISCUSSION

The rate of PSI after laparoscopic cholecystectomy is lower than that of open cholecystectomy because laparoscopic procedures are minimally invasive technique and have less impact on the immune system than an open one [12]. The incidence of port site infection in our sample is about 3.6% which was lower than results of study done by Khurshid, et al. in 2012, their results was 6.7% [13] and higher than results of study done by Jasim Saud, et al, their result was lower than our (2.4%) [14]. The differences among the three studies may be due to differences in environment, population and sterilization technique which could be different from hospital to another and there may be rapid turnover on the expense of adequate sterilization.

In our study, we found the majority of patients underwent laparoscopic cholecystectomy were females, also most of our port site infection patients were females. This finding is in contrast to a previous study [14]. Also, perforation of gallbladder during operation more in males than in females [15]. The explanation of this is not so clear but we can say that male gender tolerates more pain than female (by questioner). Our study patients operated during acute phase are more at risk to develop infection. This is similar to another study [7]. Both studies show the significance of acute phase with PSI. This is due to increased probability of perforation of gallbladder and spillage of bile, stones, or pus as a result of difficult manipulation, tensely distended gallbladder with thickened oedematous wall [16]. As long as the inflammation is limited to gallbladder, laparoscopic cholecystectomy is usually feasible. However, the inflammation extends to the porta-hepatis, great care must be taken in proceeding with operations, as normally thin minimally adhesive tissue that invest cystic duct and artery is markedly thickened and oedematous and may not readily separated by usual blind dissection [17].

Laparoscopic cholecystectomy is associated with spillage of gallstones in 5% to 40% [11,17] of procedures and perforation of gallbladder during surgery occur frequently at a rate of 10% to 40% [18] and may occur secondary to traction applied by grasping forceps or because of electro-surgical thermal injury during removal of the gallbladder from its bed [16]. Escaped stones composed primarily of cholesterol that pose little threat of infection, however, pigment stones frequently harbour viable bacteria and may potentially lead to subsequent infections if allowed to remain in the peritoneal cavity [16]. Spillage of bile, pus or stones which can be retained inside the abdomen or in the wound is highly associated with port site infection and abscess formation [16] which was statistically significant in our study. Foreign body retained could be stones, clips, or parts of plastic sheath.

Another study conducted over three years 2009-2012 show relation between port site infection and intraoperative spillage during laparoscopic cholecystectomy in 5.3% of perforated cases [19]. In our study, the percentage was higher maybe due to lack of usage of retrieval bag which prevent direct contact of port wound with the content of infected gallbladder. This may be due to the fact that the epigastric port is the site of gallbladder extraction therefore this port will be in direct contact with inflamed gallbladder. Another study showed high association between epigastric port and infection [20] and in another study, shows surgical site infection in umbilical port more than epigastric port and this related to umbilical flora and gall bladder extraction through umbilicus in single port surgery [21] which indicates that site of gall bladder extraction was the most common site of PSI.

Most of the patients presented with PSI in our study were superficial infection Also, superficial infection is more common than deep infection as reported by study done by Mir, et al. [13].

CONCLUSION

There is a significant association of PSI with spillage of bile, stones, or pus, with the port of gallbladder extraction and with acute cholecystitis. Special consideration should be taken in chronic deep surgical site infection. Most of the PSIs are superficial and more common in males.

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