Section: Surgery

Original Research Article

PORTSIDE BACTERIOLOGICAL INFECTION AFTER LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Background: Laparoscopic cholecystectomy (LC) is now the gold standard treatment of symptomatic gallstones. Our study aims to assess the prevalence of port-site infection in laparoscopic cholecystectomies, associated factors, and the most common organism causing port-side infections.

Materials and Methods: This is a retrospective institute-based study including all laparoscopic cholecystectomies in our institute during two years period from 1 May 2022 to 30 April 2024. This study includes a total of 847 laparoscopic cholecystectomies. Patients who developed PSI swabs were taken for culture and sensitivity in all. Excisional biopsies for chronic discharging sinuses were done and sent for histopathological studies.

Results: PSI was found in 27/847 patients (3.19%). According to the site of port infection, 22 patients (81.48%) developed an infection at the epigastric port, 4 patients (14.81%) developed an infection at the umbilical port and only 1 patient (3.70%) developed an infection at the lateral port. About the results of swab culture and histopathology of tissue samples, 16 patients (59.26%) were infected by Gram–ve bacteria, 3 patients (11.11%) were infected by Gram +ve bacteria, 8 patients (29.63%) with no growth. In the patients with deep infection, tissue was sent for histopathology out of six patients 3 showed granulomatous lesion (11.11%) and 3 with inflammatory lesion.

Conclusion: Port site infection is very problematic It is important that instruments should be cleaned thoroughly after each surgery and should be sent for ethylene trioxide sterilization It is important to prevent any spillage during retrieval of gallbladder.

Keywords: Gallbladder, Laparoscopic cholecystectomy, Port site infection.

INTRODUCTION

Laparoscopic cholecystectomy (LC) is now the gold standard treatment of symptomatic gallstones and is the most common operation performed laparoscopically worldwide.[1] The advantages offered by laparoscopic surgery are vast, like decreased postoperative pain, quicker return to normal activity, and fewer post-operative complications.[2] Laparoscopy has helped us to limit the chances of intraoperative and postoperative complications like excessive bleeding, infection, reducing the morbidity, pain, duration of hospital stay, etc.[3] Despite of all benefits, laparoscopic cholecystectomy is still not altogether free of complications like traumatic injuries, diathermy injuries, hepatobiliary injuries, unsuitable application of clips and energy sources and port related complications like infection, metastasis, bleeding, hypertrophic scar and incisional hernia.[4,5] Our study aims to assess the prevalence of port-site infection in laparoscopic cholecystectomies, associated factors, and the most common organism causing port-side infections. Port site infection is a common entity in laparoscopic cholecystectomy. It has been reported in 1.4 – 6.7% of the cases.

MATERIALS AND METHODS

This is a retrospective institute-based study including all laparoscopic cholecystectomies in our institute during two years period from 1 May 2022 to 30 April 2024. Patients of all age groups and both sexes were included in the study. Exclusion Criteria: Those patients who were converted to open procedures were excluded from the study.

This study includes a total of 847 laparoscopic cholecystectomies out of a total of 914 cases of laparoscopic cholecystectomies of which 67 were converted to open cholecystectomies during two years period from 1 May 2022 to 30 April 2024. Patients who underwent laparoscopic cholecystectomies all had been given broad-spectrum antibiotics (cefuroxime vial 1.5 gm by intravenous infusion at the of induction of anesthesia and the same is given 1 gm 12 hourly, in addition to metronidazole 500 mg three times intravenously and aminoglycosides 500mg 12 hourly postoperatively for 24 hours. After 24 hours the patient is orally allowed and shifted to oral antibiotics, cefuroxime 500mg BD, Extended-release metronidazole 600mg OD and analgesics SOS for the period of five days. All operations were done by experienced surgeons, using four ports procedures, with reusable instruments; the gallbladder was extracted from the epigastric port in all operations, without using a retrieval bag. Stitches were removed 8th day postoperatively without the presence of infection. Swabs were taken for culture and sensitivity in all patients who developed PSI. Exploration under general anesthesia was done for patients with chronic deep-site infections, who 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 were done and sent for histopathological studies & tissue samples were examined for polymerase chain reaction (PCR). In patients proved to have TB, anti-TB-therapy was given orally (Ethambutol 800-1200 mg daily, rifampicin 600 mg daily, isoniazid 300 mg daily, and pyrazinamide 1000-1500 mg daily) for nine months.

All patients responded well within six months of follow-up. Factors such 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.

RESULTS

Out of the total of 847 patients, those are included in our study, 72.50% of patients in this study belong to the age group of 21-50 years of age as shown in Table 1.

PSI was found in 27/847 patients (3.19%). Regarding gender distribution of PSI was reported in 19/769 female patients, percentage of the PSI was 2.24 % and in 8/78 male patients, the percentage was 10.26% as shown in Figure 1.

Regarding the condition of the gallbladder before the operation, 9/27 patients (33.33%) were operated during an acute attack and 18/27 patients (66.67 %) were suffering from chronic cholecystitis. Concerning spillage of bile, stones, or pus, 16/27 patients (59.26%) developed infection in those patients where spillage occurred during their operations and 11/27 patients (40.74%) of PSI had no history of spillage during operation as shown in Table 2.

According to the site of port infection, 22 patients (81.48%) developed an infection at the epigastric port, 4 patients (14.81%) developed an infection at the umbilical port and only 1 patient (3.70%) developed an infection at the lateral port as shown in Table 3.

Regarding the type of port site infection, 21/27 patients (77.78%) developed a superficial infection and 6/27 patients (22.22%) developed deep site infection. Port site infection according to the duration of surgery was also accessed as 19/27 (70.37%) patients with PSI had their surgery duration of more than one hour and 8/27 (29.62 %) has been done in less than one hour. About the results of swab culture and histopathology of tissue samples, 16 patients (59.26%) were infected by Gram –ve bacteria, 3 patients (11.11%) were infected by Gram +ve bacteria, 8 patients (29.63%) with no growth as shown in Table 4.

In the patients with deep infection, I and D was done and tissue was sent to histopathology out of six patients histopathology 3 showed granulomatous lesion (11.11%) and 3 with inflammatory lesion. The most common presentation of the wound infection postoperatively was discharge from port site 23 (85.19 %) and associated with fever in 4 patients (14.81%). (Causes of fever like chest infection, urinary tract infection and drug-induced were excluded.) as shown in Table 5.

In our study, all patients were treated with antibiotics and 6 (22.22%) patients were treated by I & D with antibiotics.

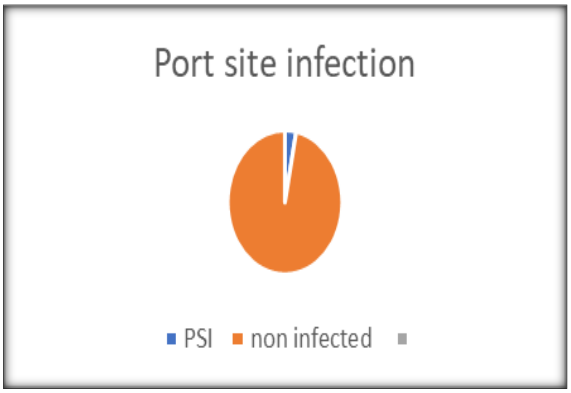

Figure 1: port site infection in patients according to pre-operative clinical diagnosis of gallbladder

Table 1: Age group distribution

S.no	Age group (years)	No of patients (n=700)	Percentage (%)
1	11-20	11	1.30
2	21-30	194	22.90
3	31-40	243	28.69
4	41-50	179	21.13
5	51-60	118	13.94
6	61-70	93	10.98
7	>70	09	1.06

Table 2: port site infection in relation to spillage of content in peritoneal cavity

Condition	Complications	
	N	%
Acute cholecystitis	9	33.33
Chronic cholecystitis	18	66.67
Total	27	

Table 3: port site infection in different port site

Retrieval of specimen (spillage of content)	Patients	
	N	%
Yes	16	59.26
No	11	40.74
Total	27	100.00
Port involved	Number of patients	Percentage (%)
Epigastric	22	81.48
Umbilical	4	14.81
Lateral	1	3.70
Total	27	100

Table 4: Port site infection according to duration of surgery

Duration of operation (minutes)	Patients	
	N	%
<60	8	29.62
>60	19	70.37
Total	27	100.00

Table 5: type of microorganism associated with post laparoscopic cholecystectomy

Microorganism	Microorganism n(%)
Gram -ve 16 (59.25 %)	Enterobacter spp. 2(7.41)
	E. Coli 12 (44.44)
	Klebsiella species 1(3.70)
	Salmonella typhi 1(3.70)
Gram +ve 3 (11.11%)	Staphylococcus auras spp. 2(7.41)
	Enterococcus spp. 1(3.70)
No growth	8 (29.63)

DISCUSSION

In the new era of medical sciences, laparoscopic surgeries are better alternatives as compared to conventional surgeries. Surgical site infection is the most commonly known complication in any surgical procedure, laparoscopic surgeries are also associated with complications like port site infection.

The present study is done to evaluate the incidence of port site infection in laparoscopic cholecystectomy patients. In our study majority of patients (72.50%) belong to age group of 21-50 years of age. Mukesh et al,[8] reported 70.13%. Maximum cases were of 41-50 age group 31.40%, similar studies have been given by Usman et al,[9] and AI-Salamah et al,[10] while Adisa et al,[11] reported third-decade prominence. Port site infection in our study was 3.19% which was lower than Arvind Kumar et al,[12] 5.17% and higher than results of study done by Jasim Saud, et al (2.4%) in concordance with other studies like Mukesh et al, Shindholimath et al Ravindranath GG et al.[8,4,12]

Regarding the condition of gall bladder before operation it was found in our study that port site infection is more common in chronic cholecystitis patients 66.67% as compared to acute cholecystitis patients 33.33% which was in concordance with other studies of Jishan et al and Arvind et al,[13,12]

In our study major port infection was epigastric port 81.48% followed by umbilical port similar findings were also of Mukesh et al,[14] but differ as few study reported umbilical port as most commonly infected site.[15,6]

Duration of surgery was also associated with PSI as 70.37% of patient in whom the duration of surgery was more than 1 hour develop infection similar findings are reported by Jishan et al,[13] and Yadav D et al,[16]

The port site was contaminated at the time of retrieval of the specimen is also an important cause

for port site infection. 59.25% of patient develop infection with spillage history.

CONCLUSION

Port site infection is very problematic to patients as well as to operating doctors. It is important that instruments should be dismantled into parts and then cleaned thoroughly after each surgery. After mechanical cleaning instrument should be sent for ethylene trioxide sterilization which has better results as compared to glutaraldehyde solution. It is important to maintain strict asepsis, take utmost care during retrieval of gallbladder to prevent any spillage or if possible, use specimen bag for extraction and adequate wound care.

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