



An Observational Study for Port Site Infection Post Laparoscopic Cholecystectomy

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Abstract

Background

Port site infection (PSI) is less common surgical site infection in laparoscopic surgery but has a significant effect on post op outcome of laparoscopic cholecystectomy. These should be studied to improve post op outcome of laparoscopic surgery.

Methods and Materials

This prospective study was conducted in the Department of General Surgery, SMS Medical College & Hospital, Jaipur, Rajasthan and RUHS College of Medical science, Jaipur, Rajasthan. 100 patients of selected age group and both sexes with cholelithiasis undergoing laparoscopic cholecystectomy Swabs were taken for culture & sensitivity in all patients who developed PSI.

Results

Out of 100 patients studied only 10 patients

presented with port site infection. Most common organism was Enterobacter spp. (30%), Staphylococcus aureus spp. (20%) and E. coli (20%).

Conclusion

It is concluded that port site infection is more common when there is spillage of bile, stones and pus. PSI can be reduced by proper selection of patient and strictly following basic principles of instrument sterilization in laparoscopic cholecystectomy.

Keywords

Port site infection, surgical site infection, Laparoscopic cholecystectomy, Cholelithiasis

Introduction

Laparoscopic cholecystectomy (LC) is now the gold standard treatment of cholelithiasis and is the most common operation done laparoscopically worldwide. 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 [1]. Patient's bacterial flora may become opportunistic and cause infection in some circumstances. This can occur in both open surgeries and to a lesser extent in laparoscopic surgeries [2]. It is a fact that laparoscopic cholecystectomy associated with fewer SSI than open cholecystectomy [3]. But port site infective complications are also not uncommon now days because increase number of laparoscopic procedure at present time [4]. It was also studied that disinfectant solution used for sterilization was also responsible for port site infections [5]. Port site infections are of two broad varieties based on the timing of presentation. The more common type manifests **early** within a week or so following the surgical procedure with pain or tenderness, wound discharge and erythema around the port site. They are usually caused by Gram positive or Gram-negative bacteria and respond well to the common antimicrobial agents. Other variety - the **delayed** types was chronic in nature, commonly caused by mycobacteria and manifests nearly a month or so after the surgery in the form of nodules, abscess or persistent discharging sinus at the port sites. These wounds usually not respond to common antibiotics [6]. Now 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.

Materials & Methods

Study Design

A prospective hospital based study.

Study Duration

The study was conducted from March 2019 to December 2020.

Study Place

Dept. of Surgery, SMS Medical College and Hospital, Jaipur, Rajasthan Dept. of Microbiology, RUHS College of Medical Science, Jaipur, Rajasthan

Study Population

Patients of selected age group and both sex who underwent laparoscopic surgeries during the above period was included in the study.

Sample Size

100 Patients taken randomly who admitted in the Unit of Surgery dept. Within study duration and eligible as per inclusion criteria.

Sampling Method

Convenience sampling

Inclusion Criteria

Patients of age 18-60 year and both sex who underwent laparoscopic surgeries during the above period will be include in the the study.

Exclusion Criteria

Those patients who were converted to open procedures were excluded from the study.

Data Collection Procedure

After taking consent all cases were operated under general anaesthesia with standard four port technique (periumbilical and epigastric both as 10 mm while lateral both ports as 5 mm) of laparoscopic cholecystectomy. Preoperative antibiotic (inj. Ceftriaxone, 1 gm) was administered in all cases as a routine practice. Closed method (Veress needle) was used to create the pneumoperitoneum with carbon

dioxide gas. The time duration from abdominal incision to primary trocar entry is calculated. Specimen of gallbladder extracted without end bag. All 10 mm port closure will be done by hand sewn intermittent suture. Reusable trocars were used in all the cases which were sterilized by glutaraldehyde solution and autoclave randomly. Swabs were taken for culture & sensitivity in all patients who developed Port site infection in early and delayed phase.

Statistical Analysis

All data were collected in preformed format and statistical analysis was done. The data was introduced in Microsoft excel and statistical software

SPSS to analyze data. Descriptive statistic “tables” were used to displays variables. Chisquare test was used to decide the significance of the association between related variables. The level of significance was considered as $p < 0.05$.

Results

In this study, 60 Patients (60%) were from 40–60 yrs age group and 40 patients (40%) were from 18–39 yrs age group. 62 (62%) patients were female and 38(38%) patients were male.

In our study 4.00% cases were present with port site infection (Table 1).

Table 1: Prevalence of port site infection

Port site infection	Number of patients	Percentage
Present	10	10%
Absent	90	90%
Total	100	100%

In our study 75.00% port site infections were superficial and 25.00% were deep. P value was 0.003 which is significant ($P < 0.05$) (Table 2)

Table 2: Type of port site infection

Port site infection	Number of patients	Percentage
Superficial	7	70%
deep	3	30%
Total	10	100%

In our study Port site infection occur in 80% of patients in which spillage of bile, stone, pus present and 20 % patients are those in which without spillage port site infection present. P value was 0.004 which is significant ($P < 0.05$) (Table

3)

Table 3: Type of port site infection

Port site infection	Number of patients	Percentage
Spillage	8	80%
Without Spillage	2	20%
Total	10	100%

In our study most common organism was Enterobacter spp. (30%), Staphylococcus aureus spp (20%) and E. coli (20%) (Table 4)

Table 4: Type of Micro organism

Micro organism	No. of patients port site infection present	Percentage
Enterobacter spp.	3	30%
Staphylococcus aureus spp.	2	20%
E. coli	2	20%
Mixed	1	10%
No growth	2	20%
Total	10	100%

In our study 70% patients treat by antibiotic prophylaxis and 30% patients were treated by I&D with antibiotic (Table 5)

Table 5: Management wise distribution

Treatment	Number of patients	Percentage
Antibiotic prophylaxis	7	70%
Incision and drainage	3	30%
Total	10	100%

Discussion

In this study, Maximum patients (60%) were from 40–60 yrs age group and 40% patients were from 18-39 years age group. 62% patients were female and 38% patients were male. Pabitra Kumar Goswami et al.[7]

was found that laparoscopic cholecystectomy was performed in 200 patients, which included 122 females (61%) and 78 males (39%). Their age range was between 20–72 years. In this study, In 100 patients Lap

cholecystectomy was done in which 10% cases were present with port site infection. 70% port site infections were superficial and 30% were deep. Ravindranath GG et al.[8] was found that 6.4% of the patients had port site infections. This was in accordance to a study by Mir et al. who observed a PSI of 6.7% in patients after elective cholecystectomy by laparoscopy. The cause of the incidence was accredited to the reusable trocars[9]. 6.3% by Shindholimath et al.,[10] 5.3% by Den Hoed et al.[11] and 5.5% by Atul K[12] et al. in their studies. Atul K et al. pointed out that proper sterilization of instruments is the most crucial step in prevention of PSI[12] Ravindranath GG et al.[8] was found that all the port site infections were superficial or subcutaneous, with no serious complications. Similar was the case in a study by Adisa et al., where 75% of the cases had superficial infections. Similar cases were reported from other studies[13–15] Despite the advances in the fields of antimicrobial agents, sterilization techniques, surgical techniques, and operating room ventilation, PSIs still prevail[16] laparoscopic surgeries have less incidence of wound infections, [17] still they can produce undesirable effects and increase morbidity. Port Site Wound infections in laparoscopy can be of two types [18]

- The first type occurs immediately within 1 week of laparoscopic surgery due to gram negative or positive bacteria derived from infection acquired during surgery from the infected gall bladder or from the skin or the surgical procedure itself and can be treated by common antibiotics and local wound dressing.
- The second type is caused by atypical mycobacteria which include the group of mycobacterial species that is not part of the M. tuberculosis complex

having an incubation period of 3 to 4 weeks which do not respond to common antibiotics.

The higher incidence of port site infections in our study may be due to the use of reusable metallic ports. as the cost of disposable ports for every case is not affordable either by the patient nor by the hospital. All instruments are re-used frequently after sterilization in CIDEX (CIDEX-OPA Solution, containing 0.55% ortho - phthalaldehyde, [19] is a fast and effective way to high level disinfect a wide range of endoscopes and other semi-critical devices) at least 3 to 4 cases per OT-day. The standard sterilization procedure has been a 20 minute exposure to CIDEX. At the current exposure time, these solutions act only as disinfectants and not sterilize thus allowing bacterial end spores to survive.

Conclusion

It is concluded that laparoscopic surgery requires meticulous strategy regarding sterilization of laparoscopic instruments and proper selection of patients to prevent undesirable complications like Port Site Infection. It is significant that Port Site Infection is more common with spillage of bile, stones and pus. Most of Port Site Infection are superficial which can be managed mostly by antibiotic prophylaxis.

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