

A Study of Port Site Infection After Laparoscopic Cholecystectomies at Tertiary Care Hospital in Western Rajasthan

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Abstract

Background: Port site infection though rare, shall be evaluated and studied so as to improve the quality of healthcare.

Materials and Methods: This prospective study was conducted in the Department of General Surgery, Sardar Patel Medical College & P.B.M. Hospital, Bikaner, Rajasthan. 300 patients of all age group and both sexes with symptomatic cholelithiasis undergoing laparoscopic cholecystectomy.

Result: Out of 300 patients studied only 12 patients presented with port site infection. Most common organism was enterobacter specius (25.00%), Staphylococcus aureus spp (16.67%), Enterobacter spp. (16.67%) and E. coli (8.33%).

Conclusion: It is concluded that port site infection are rare in elective laparoscopic cholecystectomy and can be further reduced by proper selection of patients, and strictly following basic principles of laparoscopic cholecystectomy.

Keywords: Laparoscopic cholecystectomy (LC); Port site infection; Micro-organism.

Introduction

Laparoscopic cholecystectomy (LC) is now the gold standard treatment of symptomatic

gallstones and is the commonest operation performed laparoscopically worldwide. Gall bladder perforation and spillage are the common complications encountered during dissection and removal of gall bladder (25%).^{1,2} However there has been increasing report of infectious complications due to un-retrieved stones and spillage of bile. Such complications mask not only the advantages of minimal access surgery but also increase the economic burden on the patient. Work load on the staff is also increased and the reputation of hospital and attending surgeon bears the brunt.

The total complication rate of laparoscopic surgeries was 3.6/1000 procedures and the rate of major complication was 1.4/1000 procedures.³ Current practice of immersing laparoscopic instruments for 20 min in 2% alkaline glutaraldehyde should be re-examined, according to a recent study.⁴ They also recommend that disinfectant solution used for sterilisation was responsible for port site infections.⁵

Aim of our study is to assess the port site infections in laparoscopic surgeries and its management. To prevent the infection, proper sterilisation and storage of instruments is recommended. The centers for Disease control & prevention classification (CDC) categorised Surgical Site Infection (SSI) in to incision site infection and organ space infection. The incision site infection is divided in to superficial and deep infection. Superficial means only skin and subcutaneous tissue infection whereas deep means fascia and muscle involvement.

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Materials & Methods

Study design: Retrospective & prospective hospital based study.

Study duration: Total duration 3 Year (1 July 2016 to 30 June 2018 Retrospectively & 1 July 2018 to 30 June 2019 prospectively)

Study place: Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner

Study population: Patients of all age group and both sex who underwent laparoscopic surgeries during the above period was include in the the study.

Sample size: All patients reporting to the Surgery dept. within study duration and eligible as per inclusion criteria will be included in the study.

Sampling Method: Convenience sampling

Inclusion Criteria: Patients of all age group 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 was excluded from the study.

Procedure of Data Collection

After taking consent Details of cases was recorded including history, clinical examination and investigations done. In all the patients preoperative preparation will be done by complete bath prior to surgery using antiseptic soap and the parts will be prepare by shaving method. All patients received prophylactic antibiotics during induction of general Anesthesia. All surgeries was done under general Anesthesia. Pneumoperitoneum created using veress needle in supra or infra umbilical incision. Through the same incision, a 10 mm safety trocar (primary trocar) introduced in to the abdominal cavity. The time duration from abdominal incision to primary trocar entry will be calculate. All the specimens like gallbladder and appendix will be extracte without endobag. All 10 mm port closure will be done by hand sewn intermittent suture. All laparoscopic instruments will be sterilise by 2% glutaraldehyde solution with a contact time of 20 minutes. Before surgery, all the instruments was washwarm saline.

Data Analyzis

To collect required information from eligible patients a pre-structured pre-tested Proforma was used. For data Analyzis Microsoft excel and statistical software SPSS will be used and data was analyzed with the help of frequencies, figures, proportions, measures of central tendency and appropriate statistical test wherever required p -value < 0.05 was considered as significant.

Results

In present study, Maximum patients (40.33%) were from 46–60 yrs age group followed by 24.67% patients 31–45 yrs age group and 21.00% patients were more than 60 Yrs. 62.67% patients were female and 37.33% patients were male.

Table 1: Prevalence of port site infection

Port site infection	No of patients	Percentage (%)
Present	12	4.00
Absent	189	96.33
Total	300	100.00

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

Table 2: Type of port site infection

Port site infection	No of patients	Percentage (%)
Superficial	9	75.00
Deep	3	25.00
Total	12	100.00

In our study 75.00% port site infections were superficial and 25.00% were deep (Table 2).

Table 3: Microorganism wise distribution

Microorganism	No of patients port site infection present	Percentage (%)
Enterobacter spp	3	25.00
Staphylococcus auras spp	2	16.67
Enterobacter spp.	2	16.67
E. coli	1	8.33
Mixed	2	16.67
No growth	2	16.67
Total	12	100.00

In our study most common organism was enterobacter specius (25.00%), Staphylococcus auras spp (16.67%), Enterobacter spp. (16.67%) and E. coli (8.33%) (Table 3).

Table 4: Management wise distribution

Treatment	No of patients	Percentage
Antibiotic prophylaxis	12	100.00
Incision and drainage	3	25.00

In our study 100.00% patients treat by antibiotic prophylaxis and 25.00% patients were treated by I & D with antibiotic (Table 4).

Discussion

In present study, Maximum patients (40.33%) were from 46–60 yrs age group followed by 24.67% patients 31–45 yrs age group and 21.00% patients were more than 60 yrs. 62.67% patients were female and 37.33% patients were male.

Ravindranath GG et al.⁶ was found that among the 328 patients, 229 (69.8%) were females and 99 (30.2%) were males.

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 present study, out of 300 patients only 6.00% Diagnostic Laparoscopy and 94.00% Lap cholecystomy. 3.67% cases were present with port site infection. 75.00% port site infections were superficial and 25.00% were deep.

Ravindranath GG et al.⁶ 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.⁸

PSI was 5.7% in a study by Sujith Kumar et al⁹ 6.3% by Shindhohimath et al.,¹⁰ 5.3% by Den Hoed et al.¹¹ and 5.5% by Atul K¹² 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.⁶ 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 form other studies.^{13–15}

No surgical wound is completely immune to infections¹⁶ Despite the advances in the fields of antimicrobial agents, sterilization techniques, surgical techniques, and operating room ventilation, PSIs still prevail.¹⁷ Wound infection is the most

common complication of almost every open surgery. Same applies to laparoscopic surgery. Although laparoscopic surgeries have less incidence of wound infections,¹⁸ still they can produce undesirable effects and increase morbidity. Mycobacterial infections due to atypical mycobacteria at the laparoscopic port site are a common menace encountered in patients undergoing laparoscopic surgery. Atypical mycobacterial colonies often exist in tap water, natural waters and soil and so can easily contaminate solutions and disinfectants used in hospital settings. These infections have been a source of significant morbidity for patients recovering from laparoscopic surgeries. Port Site Wound infections in laparoscopy can be of two types.¹⁹

- 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 includes 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.

Infections with atypical mycobacteria have been primarily reported after laparoscopic procedures.²⁰ This is because, unlike open surgery, the instruments used for laparoscopic surgery have a layer of insulation that restricts the use of the autoclave in the sterilization process as the high temperatures involved destroy the insulation on them. 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,²¹ 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 sterilise thus allowing bacterial endospores to survive. Also, when proper mechanical cleaning of the instruments is not done, blood and charred tissue deposits are left in the joints of the instruments during laparoscopic surgery. These Contaminated instruments deposit

the endospores on to the subcutaneous tissue during the surgery which then germinate following which clinical symptoms appear after an incubation period of 3 to 4 weeks.²²

Conclusion

It is concluded that port site infection are rare in elective laparoscopic cholecystectomy and can be further reduced by proper selection of patients, and strictly following basic principles of laparoscopic cholecystectomy

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