

Frequency of Port Site Infection in Laparoscopic Cholecystectomies: An Hospital Based Study

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ABSTRACT

Background: Port site infection (PSI), although infrequent, is one of the bothersome complications which undermine the benefits of minimal invasive surgery. The aim of this study to evaluated the frequency of Port Site infections (PSI) in laparoscopic cholecystectomies.

Materials & Methods: This is a hospital based observational study done on 20 cases with port site infection after laparoscopic cholecystectomy in the department of General Surgery, Government Medical College, Pali. Wounds were assessed clinically a week after surgery and in case infection had occurred; once weekly until 4 weeks in the out-patients clinic. The frequency of port site infection studied in relation extent of infection, duration of surgery, intra-operative findings, site of port that was infected.

Results: The mean age of patients was 43.26 years. According to the site of port infection, 19 patients (95%) developed an infection at the epigastric port and one patient (5%) developed an infection at the umbilical port, which was P value was >0.05. The mean duration of surgery was 63.5 minutes. The port site infection was present in 18 (90%) patients at 7 days and only 1 (5%) case had port site infection at 30 days in our study.

Conclusion: Laparoscopic cholecystectomy is associated with a low risk of port-site infection which in most the cases is only superficial responding to local measures. Complication can occur even in the best of hands and it is vital that these are recognized properly and immediately addressed.

Keywords: Port Site Infection (PSI), Laparoscopy, Cholecystectomy, Surgery.

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INTRODUCTION

Laparoscopic surgery (LS), also termed minimal access surgery, has brought a paradigm shift in the approach to modern surgical care. Early postoperative recovery, less pain, improved aesthesis and early return to work has led to its popularity both amongst surgeons and patients. Its application has progressed from cholecystectomies and appendectomies to various other fields including gastrointestinal surgery, urology, gynecology and oncosurgery. However, LS has its own package of complications. Port site infection (PSI), although infrequent, is one of the bothersome complications which undermine the benefits of minimal invasive surgery. Not only does it add to the morbidity of the patient but also spoils the reputation of the surgeon. Despite the advances in the field of antimicrobial agents, sterilization techniques, surgical techniques, operating room ventilation, PSIs still prevail.¹

The total complication rate of Laparoscopic surgeries was 3.6/1000 procedures and the rate of major complications was 1.4/1000 procedures.² Recent study concluded that the currently prevalent practice of immersing laparoscopic instruments for 20

minutes in 2% alkaline glutaraldehyde should be reexamined.³ They also recommend that disinfectant solution used for sterilization was responsible for port site infections.

Now the laparoscopic cholecystectomy is the gold standard treatment for symptomatic gallstones.⁴ Its advantages include decreased hospital stay postoperatively, earlier return to work, decreased post-operative pain⁵, 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.⁶ 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.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.

Although the existing literature lacks consensus regarding PSI management, the complication can be best avoided by strictly abiding by the commandments of sterilization techniques of the laparoscopic instruments with appropriate sterilizing agent. The frequency of port site infection studied in relation extent of infection, duration of surgery, intra-operative findings, site of port that was infected.

MATERIALS & METHODS

This is a hospital based observational study done on 20 cases with port site infection after laparoscopic cholecystectomy in the department of General Surgery, Government Medical College, Pali.

Inclusion Criteria

- Patients aged above 18 years suffering from cholelithiasis, ultrasonographically proved.
- Patients who have given written and informed consent.
- Patients who have undergone pre anaesthetic checkup and medically fit.

Exclusion Criteria

- Inability to tolerate general anaesthesia as per ASA (American Society Of Anaesthesiologists) Guidelines.
- Uncontrolled coagulopathy Pregnant females.

All patients were admitted a day before surgery and were given one shot of ceftriaxone 1 gm (Inj. Rocephin, Roche, UK); at the time of induction, and two subsequently 12 hours apart. Most of the patients were discharged on the second post-op day. The patients were monitored for port site infection using standard National Nosocomial Infections Surveillance (NNIS) System definitions for SSI given by The Centers for Disease Control and Prevention (CDC) that defines SSIs as those occurring within 30 days of an operation. Wounds were assessed clinically a week after surgery and in case infection had occurred; once weekly until 4 weeks in the out-patients clinic. All wound infections were treated with regular local washes and oral antibiotics empirically. The frequency of port site infection was studied in relation to frequency, extent of infection, duration of surgery, operative findings and the site of the port that was infected. However it could not be studied in context to the gender, age, American Society of Anaesthesiologists (ASA) grade and body mass index (BMI) which have been considered as risk factors for SSI in available literature because the patients selected to undergo LC with us did not show much variation in these variables.

RESULTS

Our study showed that the maximum number of port site infection (56%) was seen in above 31-50 years of age. The mean age of patients was 43.26 years (table 1).

According to the site of port infection, 19 patients (95%) developed an infection at the epigastric port and one patient (5%) developed an infection at the umbilical port, which was P value was >0.05 (table 2).

Our study showed that the two (10%) patients with port-site infection had operation lasting <1 hour while in 18 (90%) cases the surgery lasted for >1hr. Thus the duration of surgical

procedure appeared to be a factor involved in predicting the risk of port-site infection. The mean duration of surgery was 63.5 minutes (table 3).

The operative findings of the cases that developed port-site infection included acute cholecystitis in 14 (70%) patients, mucocele gall bladder in 3 (15%) patients, thick walled gall bladder in 2 (10%) patients and empyema gall bladder in 1 (5%) case (table 4). The port site infection was present in 18 (90%) patients at 7 days and only 1 (5%) case had port site infection at 30 days in our study (table 5).

Table 1: Age wise distribution of port site infection

Age (yrs)	n	%
20-30 yrs	2	12%
31-40 yrs	7	28%
41-50 yrs	7	28%
>50 yrs	4	32%
Total	20	100%
Mean ± SD	43.26 ± 11.87	

Table 2: port site affected in the cases with infection

Port site	n	%	P-value
Epigastric port	19	95%	0.1247
Umbilical port	1	5%	

Table 3: Duration of surgery

Duration of surgery	n	%
>1 hrs	18	90%
<1 hrs	2	10%
Mean ± SD	61.4 ± 7.113 min.	

Table 4: Operative findings in case of laparoscopic

Operative findings	n	%
Acute cholecystitis	14	70%
Mucocele gall bladder	3	15%
Thick walled gall bladder	2	10%
Empyema	1	5%

Table 5: Follow-up

Port site infection	At 7 days	At 30 days
Present	18	1
Absent	2	19

DISCUSSION

Laparoscopic surgery is the gold standard for many surgical diseases. Even many patients demand laparoscopic surgery because of the advantages like small incision, less pain and shortened recovery time as well as resulting less post-operative scarring.⁸ All laparoscopic surgeries should be done by the experienced surgeons to avoid major complications.

According to the site of port infection, 19 patients (95%) developed an infection at the epigastric port and one patient (5%)

developed an infection at the umbilical port, which was P value was >0.05. 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. Study was done in governmental medical college in India which also shows high association between epigastric port and infection (88.2%)⁹ 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 surgery¹⁰ which indicates that site of gall bladder extraction was the most common site of PSI.

Our study showed that the two (10%) patients with port-site infection had operation lasting <1 hour while in 18 (90%) cases the surgery lasted for >1hr. Thus the duration of surgical procedure appeared to be a factor involved in predicting the risk of port-site infection. The mean duration of surgery was 63.5 minutes. The literature shows that with the duration of above 2 hours, the risk of SSI increases.¹¹ We however kept our time range to be less than or 1 hr and more than 1 hour. Duration of operation longer than one hour of operation and in acute condition have also been found to be statistically significant risk factors for wound infection.¹²

The operative findings of the cases that developed port-site infection included acute cholecystitis in 14 (70%) patients, mucocele gall bladder in 3 (15%) patients, thick walled gall bladder in 2 (10%) patients and empyema gall bladder in 1 (5%) case. Waqar Alam Jan et al (2008)¹³ found that the acute cholecystitis was the most common operative finding that we came across on reviewing the cases with port-site infection i.e. 7 (41.1%) out of 17, second being empyema that was seen in 4 (23.5%) patients. 3 (17.6%) patients had bad adhesions, while mucocele and thick walled gall bladder with stones was found in 2 (11.6%) and 1 (5.8%) patients respectively. Acute cholecystitis as a risk factor for SSI has been recognized by other workers as well.¹⁴ Tocchi et al have also reported higher incidence of port-site infection in cases of acute cholecystitis.¹⁵ Similarly, wound infection was found to be three times more common in acute cholecystitis/ empyema gall bladder in both open and laparoscopic cholecystectomy in a national study where no wound infection was seen in cases of chronic cholecystitis. The operative findings are related to the wound sepsis not only directly by contamination but also by modifying duration of intervention.

CONCLUSION

The present study is an attempt to make surgeons aware about the complications which occur due to improper sterilisation of laparoscopic instruments ending into increased morbidity of patients. PSI is one of the complication of laparoscopic surgery.

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