

The Frequency of Port-Site Infection in Laparoscopic Cholecystectomies

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ABSTRACT

Background: Introduction of laparoscopic surgery was a revolution in the field of surgery. Despite many benefits, the technique is associated with certain complications including port site infection. Port site infection, although less common is annoying both for the surgeon and the patient, and cripple the benefits of minimally invasive surgery. Port site infection not only increases the economic burden, pain and hospital stay of patient but also harm the reputation of the attending surgeon and hospital. Unfortunately, there is a reflection that antibiotics can solve the situation leading to misuse of antibiotics and evolution of multi drug resistant strains of microorganisms.

Methods: This observational study carried by the Department of General Surgery at Nawaz Sharif Social Security teaching hospital Lahore over a period of 4 years (Jan 2012 to Jan 2016). The study was carried out in 200 patients who underwent laparoscopic cholecystectomy. Age, gender, operation duration and operative findings were evaluated regarding port site infections.

Aim: To study the frequency of port-site infection (PSI) and their magnitude, planning adequate management and to recommend the measures to prevent them in future.

Results: In the current study, 200 patients including 166 females (83%) and 34 males (17%) were operated. A total of 12 Patients (6%) had port site infection. Infection was seen in 4 male patients (33.33%) and 8 female patients (66.66%). Age range was 16-71 years. Most common port involved was epigastric, which developed infection in 11 patients (91.66%), followed by umbilical port which got infected in 1 patient (8.33%). Gall bladder was extracted through epigastric port site in 186 patients (93%) and through umbilical port site in 14 patients (7%). All cases were superficial wound infections

Conclusion: Laparoscopic cholecystectomy is associated with a low risk of Port Site Infection, which in most cases is only superficial and responds to local measures. Infection is most commonly seen at port site through which gall bladder was extracted

Keywords: Laparoscopic cholecystectomy, Port-site infection

INTRODUCTION

Laparoscopic surgery also known as minimal invasive surgery (MIS) is a technique, in which operations can be performed using small incisions away from the site of pathology. It revolutionized the surgical world when first introduced in the beginning of nineteenth century.

Cholecystectomy is the most common operation of the biliary tract and the second most common operative procedure performed nowadays¹.

Laparoscopic cholecystectomy is now considered the gold standard procedure for management of cholelithiasis². Despite many benefits such as decrease post operative pain, early mobility, early return to work and small scars³, the technique carries certain complications including port site infection.

Port site infection not only increases the pain and hospital stay of the patient but also increases

work load on hospital staff, thus decreasing the cost effectiveness of a minimally invasive procedure.

The Centers for Disease Control and Prevention classification (CDC) categorized surgical site infection into incision-site infection and organ-space infection. The incision-site infection is further subdivided into "superficial" in which only skin and subcutaneous tissue is infected and "deep" where fascia and muscles are infected^{4,5}.

In our study of port site infection in laparoscopic cholecystectomy, only the incisional category is applicable and has been used.

In this study we analyzed our experience of port site infection in laparoscopic cholecystectomy.

MATERIAL AND METHODS

This prospective study was conducted in the department of General Surgery unit 1 Nawaz Sharif Social Security Teaching Hospital Lahore over a period of 4 years (Jan 2012- Jan2016). Approval from the hospital ethical committee was obtained. All the patients with symptomatic gallstones were admitted

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through outdoor department, their age range was between 20-71 years.

Patients with age < 20 years, acute pancreatitis, choledocholithiasis, skin infections, pregnancy, past history of peritonitis and bleeding disorders were excluded from the study. Procedure was discussed in detail with the patient and written informed consent was obtained.

All the patients were admitted to surgical ward a day before surgery and were given 3 doses of third generation antibiotics (ceftriaxone 1gm). First dose at the time of induction of anesthesia and rest after the surgery. The patients were monitored for port site infection using standard National Nosocomial Infections Surveillance (NNIS) System definitions given by the Centers for Disease Control and Prevention (CDC).

Operative technique: All the patients were operated under General anesthesia. After painting with Povidone-iodine solution (from the nipple line to the inguinal ligaments and laterally to the anterior superior iliac spine) and draping, a 1.5-cm longitudinal incision was made at the inferior aspect of the umbilicus, then deepened through the subcutaneous fat to the anterior rectus sheath. A Kocher clamp was used to grasp the reflection of the linea alba onto the umbilicus and elevate it. A 1cm longitudinal incision was made in the linea alba with a No. 15 blade. The peritoneum was elevated between two straight clamps and incised so as to afford safe entry into the abdominal cavity. A 10-mm blunt trocar was placed into the abdominal cavity, and pneumoperitoneum created.

The laparoscope was white-balanced and advanced into the abdominal cavity. A 1.2-cm incision is made three fingerbreadths below the xiphoid process and deepened into the subcutaneous fat. A 10-mm trocar was advanced into the abdominal cavity under direct vision in the direction of the gallbladder through the abdominal wall, with care to enter just to the right of the falciform ligament. The table was then adjusted to place the patient in a reverse Trendelenburg position with the right side up to allow the small bowel and colon to fall away from the operative field. The optimal position for lateral 5-mm ports were chosen by the surgeon and the lateral skin incisions were made, and two 5-mm trocars were advanced into the peritoneal cavity under direct vision. Calot's triangle was identified and all the areolar tissue was removed identifying cystic duct and artery clearly. Both the structures were clipped and cut separately. Cholecystectomy was completed using L-hook and hemostasis rechecked and secured. Gall bladder was extracted from epigastric or umbilical port site depending upon surgeon's

choice. Pouch for gallbladder was not used in any case.

The ports were removed under direct vision. The fascia was closed at the umbilical port by using prolene sutures. All the skin incisions were closed using prolene 2/0.

The drain was removed and patients were discharged on 1st postoperative day. Port sites were evaluated clinically for infection on day 5 after surgery and wound infections were dealt with local washes with Normal Saline and surgical dressings plus empirical antibiotics. Stitches were removed after 7 days of surgery. All patients were followed for a period of one month.

RESULTS

In our study laparoscopic cholecystectomy was performed in 200 patients, which included 166 females (83%) and 34 males (17%). Their age range was between 20- 71years (Table 1). Out of these 200 patients 12 (6%)of patients developed port site infection. The patients who developed wound infections includes 8 females and 4 males (Table 2).Most common port site involved was epigastric port, which developed infection in 11 patients (91.66%), followed by umbilical port which got infected in 1patient (8.33%). Gall bladder was extracted through epigastric port site in 186 patients (93%) and through umbilical port site in 14 patients (7%).All cases were superficial wound infections. Out of the 12 patients who developed port site infection, gallbladder was perforated while extraction in 2 cases (16.66%). Out of these 12 patients who developed wound infection, 3 (25%) patients had operative findings of acute cholecystitis and 1 patient (8.33%) had thick walled gallbladder. All others 8 (67.77%) was having chronic cholecystitis.

Table 1: Age range of the patients

Age Zone	n	%age
20 -30 years	15	7.5
30- 40 years	52	26
40 – 50 years	73	36.5
50– 60 years	42	21
60 – 70 years	15	7.55
>70 years	3	1.55

Table 2: Frequency of wound infection

Total No. of patients developed wound infection	12/200 (6%)
Percentage of females with wound infection	8/12 (66.67%)
Percentage of males with wound infection	4/12 (34.33%)

DISCUSSION

Wound infection is the most common complication of almost every open surgery. Same applies to laparoscopic surgery. Although laparoscopic surgeries have less incidence of port site infections⁶, still they can produce undesirable effects and increase morbidity. Laparoscopic cholecystectomy is now performed commonly throughout the world and it has been accepted as safe out-patients procedure⁷.

The frequency of port site infections observed in our study was 6%. Our results are comparable to Shindholimath et al⁸ who has reported an incidence of 6.3%, while, Den Hoed et al⁹ and Jan et al¹⁰ reported an incidence of 5.3% and 5.07% respectively. In contrary to our results, Zitser et al¹¹ and Colizza et al.¹² reported a significantly decreased incidences i.e., 2.3% and <2%, respectively.

The higher incidence of port site infections in our study may be due to the use of reuseable ports after sterilization, as the cost of disposable ports for every case is not affordable by the patient nor by the hospital.

In our study, most common port site affected by infection was epigastric port site (91.66%), followed by umbilical port which got infected in 1 patient (8.33%). Similar predominance of epigastric port site infection was noted by Jan et al¹⁰ and Hamzagaolu et al¹³. But studies conducted by Colizza et al¹² and Tocchi et al¹⁴ have shown that PSI is more common at the umbilical port site. Increased incidence of infection affecting epigastric over umbilical port site was due to repeated extraction of gall bladder through epigastric port site.

On reviewing the cases with port site infection, acute cholecystitis was the most common operative finding i.e., 25% (3 patients) followed by thick walled gall bladder (8.33%). Tocchi et al¹⁴ have also reported higher incidence of port site infection in cases of acute cholecystitis.

CONCLUSION

With innovation of minimal invasive surgery (MIS) the risk of wound infection has decreased considerably, but still on and off patients do develop port site infection, which not only disturbs the patient, but also agitates the operating surgeons, because it not just increase the duration of recovery but also increase

the cost. We feel it can be reduced by adopting strict antiseptic measure, with no compromise on sterilization or by using disposable instruments.

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