

To study risk factors responsible for port site infections in laparoscopic surgeries.

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Abstract

Background & Methods: The aim of the study is to study risk factors responsible for port site infections in laparoscopic surgeries. All patients were received prophylactic antibiotics during induction of general anesthesia and all surgeries were done under general anesthesia.

Results: Most common isolated organism was Mycobacterium Chelonae (64%) followed by Pseudomonas Aeruginosa and Staph Aureus (12% each). Klebsiella pneumonia and E. Coli was isolated in one case each (06%).

Conclusion: After the surgery, all the instruments should be dismantled completely. Cleaning and washing the instruments should be done under running water. Glutaraldehyde or ethylene oxide solution should be regularly changed and the minimum immersion time should be above 20 minutes. Hence, it is recommended to follow proper technique of sterilisation of laparoscopic instruments to prevent PSI.

Keywords: risk, port site, infections, laparoscopic & surgeries.

Study Design: Observational Study.

1. INTRODUCTION

Minimally invasive surgeries such as laparoscopic surgeries have become the order of the day for many surgical diseases. Laparoscopic surgery became the standard care for many gynecological and surgical conditions with documented benefits and excellent outcome[1]. The main reason for preference of laparoscopic surgeries to abdominal surgeries are the low cost, less pain and scarring, faster convalescence and lesser hospital stay. Major complications are access related such as major vascular injury or inadvertent bowel injuries, which are life threatening. These complications are by far very rare.

No surgical wound is completely immune to infections. Despite the advances in the fields of antimicrobial agents, sterilization techniques, surgical techniques, and operating room ventilation, PSIs still prevail. Incidence of SSI after elective laparoscopic cholecystectomy is less than that after open elective cholecystectomy due to shorter length of incision [2]. The technique of primary port entry to the peritoneum does not show any difference in umbilical PSIs in patients undergoing laparoscopic cholecystectomy [3]. The umbilical PSI rate in LS has been reported to be 8% with 89% of the infections occurring after laparoscopic cholecystectomy, whereas 11% after laparoscopic appendectomy [4]. The factors predicting 30-d readmission after laparoscopic colorectal cancer surgery. Out of 268 patients in their

study who underwent laparoscopic colorectal surgery, 48 (18%) were readmitted with surgical site infection (SSI). Incidence of SSI after elective gynaecological laparoscopy surgeries is less than that after open elective gynaecological surgeries. Several other authors have found that SSI rate is much higher in conventional surgical procedures than in MAS [5]. A number of contributing factors are somewhat responsible for the emergence of postoperative PSIs. Antibiotics always may not be the answer to this problem. Thus, using them irrationally, as is often done will only result in the emergence of multidrug resistant microbes[6]. The majority of the reports of postoperative wound infection are of SSIs. PSIs following LS have been less reported. The risk factors for SSIs, however, may be applicable to PSIs.

2. MATERIAL AND METHODS

In all the patients, preoperative preparation was done by complete bath prior to surgery using antiseptic soap and the parts were prepared by shaving method.

All laparoscopic instruments were sterilized by either 2% glutaraldehyde with a contact time of 120 minutes or Ethyleneoxide before surgery. Surgeries were performed by expert surgeons under strict aseptic condition. Pneumoperitoneum was created using veress needle or blind method in supra or infra-umbilical incision. Through the same incision, a 10 mm safety trocar (primary trocar) was introduced into the abdominal cavity. The time duration from the abdominal incision to primary trocar entry was calculated. All 10 mm port closure was done by hand-sewn intermittent suture.

Inclusion Criteria

1. Patient undergoing Emergency/Elective laparoscopic surgeries.
2. Age > 18 years.

Exclusion Criteria:

1. Patients below 18 years of age.
2. Patients converted to open surgery.
3. Patients –known case of malignancy, on chemotherapy.
4. Immune compromised states- HIV, HBsAg.
5. Pregnant and nursing mothers.

3. RESULT

Table 1: Incidence of Port site infections among study cases

Site of Infection	No.	%
Total Cases	200	100
Port Site Infections	17	8.5

A total of 17 out of 200 cases had port site infections. Incidence of port site infection in present study was 8.5%.

Table 2: Distribution of study cases as per type of Infections

Site of Infection	No.	%
Superficial	15	89
Deep	02	11
Total	17	100

Out of total 17 cases, 15 (89%) were superficial infections while 2 cases (11%) had deep infections.

Table 3: Distribution of study cases as per Isolated Organisms

Isolated Organisms	No.	%
Mycobacterium Chelonae	11	64
Staph Aureus	02	12
P. Aeruginosa	02	12
K. Pneumonia	01	06
E. Coli	01	06
Total	17	100

Most common isolated organism was Mycobacterium Chelonae (64%) followed by Pseudomonas Aeruginosa and Staph Aureus (12% each). Klebsiella pneumonia and E. Coli was isolated in one case each (06%).

Table 4: Association of Port site infections with co-morbidities

Co-morbidity	PSI %		P value
	No	Yes	
Hypertension	93	07	.046971
Diabetes	91	08	
Obesity	91	08	

No association was observed between presence of any co-morbidity i.e. hypertension, diabetes or obesity with incidence of PSI. The chi-square statistic is 2.109. The *p*-value is .046971. The result is significant at $p < .05$.

4. DISCUSSION

A significant association was observed between size of port (≥ 10 mm) and presence of PSI (18.3% vs 2.2%; $p < 0.01$). A significant association was observed between emergency laparoscopic procedure and presence of PSI (18.2% vs 3.5%; $p < 0.05$). No association was observed between presence of any co-morbidity i.e. hypertension, diabetes or obesity with incidence of PSI ($p > 0.05$).

Factors like emergency laparoscopic surgery and surgery in acutely inflamed organs have been associated with increased frequency of PSIs across many studies. Karthik S et al. [7] in their study observed that size of port is a risk factor for the development of infections at port site in laparoscopic surgeries. Kumar S et al. [8] in their study observed that port site infections are more common in 10 mm or more port size and in surgeries using 3 ports.

Thus to summarize, PSI, though a minor complication in laparoscopic procedures, needs to be addressed to maintain the postoperative quality of life. These wound infections can be prevented by appropriate administration of antibiotic prophylaxis, sterile techniques, and the use of specimen bags during specimen extraction. Once present, infections are treated with drainage, packing, and antibiotics as appropriate. Further large scale studies are recommended related to specific type of laparoscopic procedures and effect of various prevention measures suggested above on the incidence of PSI.

Laparoscopic procedures are reported to have a reduced incidence of port site infections, in present study only 2.6% patients had surgical site infection, in agreement to present study

Den Hoed et al found the incidence to be 5.3%, Shindholimath et al 6.3% and Colizza et al <2%.[9] Surgical site infection can be prevented by using appropriate antibiotic prophylaxis and sterile techniques. Dugg et al[10] studied 90 patients undergoing laparoscopic cholecystectomy and reported that only three developed port site infections. No case of port site bleeding, discharge and hernia were reported in follow-up period. Ahmed et al and Memon et al[11] are also in agreement with the present study and reported lower infection rate of 0.31% and 1.8% respectively with laparoscopic surgeries. However, Voitek et al and Hamzaoglu et al[12] showed slightly higher rate of infections (9% and 8% respectively). Kumar et al studied 104 patients and reported incidence of port site infection as 5.7%.

5. CONCLUSION

Most common isolated organism was *Mycobacterium Chelonae* (64%) followed by *Pseudomonas Aeruginosa* and *Staph Aureus* (12% each). *Klebsiella pneumoniae* and *E. Coli* was isolated in one case each (06%). No association was observed between presence of any co-morbidity i.e. hypertension, diabetes or obesity with incidence of PSI.

After the surgery, all the instruments should be dismantled completely. Cleaning and washing the instruments should be done under running water. Glutaraldehyde or ethylene oxide solution should be regularly changed and the minimum immersion time should be above 20 minutes. Hence, it is recommended to follow proper technique of sterilisation of laparoscopic instruments to prevent PSI.

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