Journal of Cardiovascular Disease Research
ISSN: 0975-3583,0976-2833 VOL 15, ISSUE 9, 2024

ORIGINAL RESEARCH

Incidence And Management Of Port Site Infections After Laparoscopic Procedures: A Retrospective Cohort Study

[1]Dr. Rafia Busri, [2]Dr. Keerti Dogra, [3]Dr. Taniya Sharma

[1,2,3]Department of Obstetrics and Gynaecology, SMGS Hospital, GMC Jammu

Corresponding author:
Dr. Taniya Sharma
Department of Obstetrics and Gynaecology, SMGS Hospital, GMC Jammu
Email ID: taniya96sharma@gmail.com

Received: 21 July 2024 Accepted: 27 August 2024

Abstract
Background: Laparoscopic surgery also known as Minimal Invasive 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 have led to its popularity both amongst surgeons and patients. However, Laparoscopic surgery has its own set of complications. Port site infection is one of the complications which undermine the benefits of Minimally Invasive Surgery. The aim of this study is to assess the incidence of laparoscopic port site infections and their management.
Methods: A retrospective cohort study was done with 100 patients who underwent laparoscopic procedures at SMGS hospital over a period of 1 year from Jan 2022 to Dec 2022.The patients received prophylactic antibiotics during induction of general anaesthesia. All ports after completion of laparoscopic surgery were closed by intermittent sutures at the end and all laparoscopic instruments were sterilised. In our study,14 patients developed port site infections and all of them were superficial port site infection. Culture sensitivity was taken from all PSI patients.
Results: In our study, total 100 patients of laparoscopic procedures were taken of which 14 got infected. Incidence of PSIs was 14 %. Incidence of early PSIs was 4% and that of delayed PSIs was 10%.The most common infected port was umbilical port. The most common organism associated with early PSIs was Staphlococcus aureus and that with delayed PSIs was atypical mycobacteria that responded to different treatment.
Conclusion: Port site infection is a problem faced by laparoscopic surgeons in developing countries which is preventable through proper sterilization of instruments and early diagnosis and treatment.

Introduction

- Laparoscopic surgery is becoming popular nowadays. Its advantages are less post operative pain and scarring and early return to work are its advantages.
- In obstetrics and gynaecology,it has various applications like laparoscopic salpingectomy, cystectomy, hysterectomy, diagnostic hysterolaparoscopy etc
- PSIs still happen inspite of advances in surgical techniques, sterilization techniques, and antimicrobial agents. PSIs are of 2 types :

-Early: They present within a week of surgical procedure. Cause is usually gram positive or negative organisms contracted from native skin or infected surgical site.

-Late: They present after 3 to 4 weeks of surgery. Cause is usually rapidly growing atypical mycobacteria which show a poor response to usual antimicrobial agents. They respond poorly to first line anti-tubercular drug treatment. Second line anti- tubercular drugs including macrolides (clarithromycin),quinolones (ciprofloxacin), tetracyclines (doxycycline) and aminiglycosides (amikacin and tobramycin) in various combinations have been used with promising results.

- The aim of this study is to assess the incidence of laparoscopic port site infections and their management.

Materials and methods

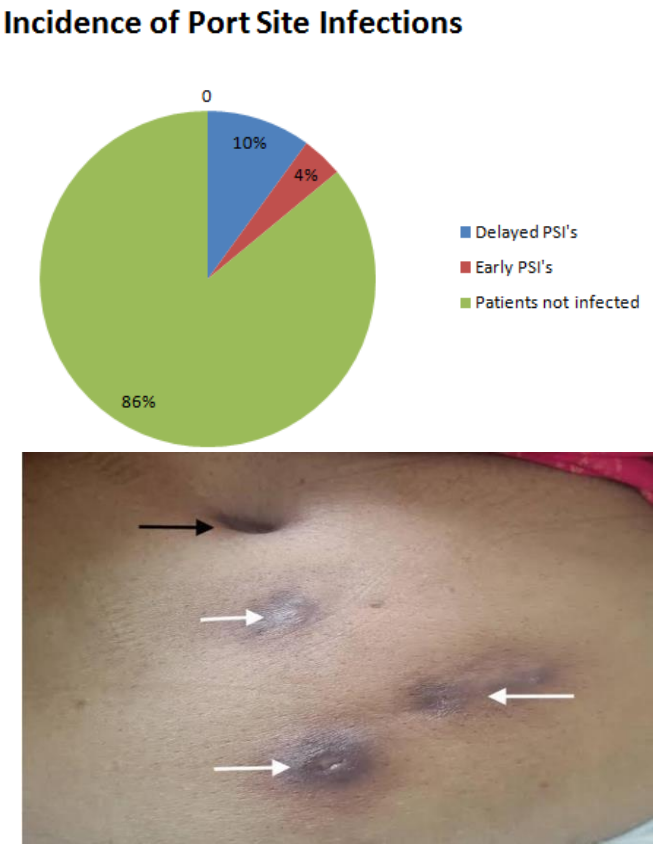
- The study included 100 patients who underwent laparoscopic procedures at SMGS hospital over a period of 1 year from Jan 2022 to Dec 2022.
- The patients received prophylactic antibiotics during induction of general anaesthesia.
- Pneumoperitoneum created using veress needle in supraumbilical incision.Through the same incision, 10 mm safety trocar is introduced in abdominal cavity.
- All 10 mm port closure was done by intermittent suture at the end.
- All laparoscopic instruments were sterilised by 2% glutaraldehyde solution with a contact period of 20 min.In our study, 14 patients developed port site infections and all of them were superficial port site infection. Culture sensitivity was taken from all PSI patients and sent to microbiology department for analysis.

Results

- In our study, total 100 patients of laparoscopic procedures were taken of which 14 got infected.
- Incidence of PSIs was 14 %.
- Incidence of early PSIs was 4% and that of delayed PSIs was 10%
- The most common infected port was umbilical port.
- The most common organism associated with early PSIs was Staphlococcus aureus and it was treated with commonly used antimicrobial agents.
- The most common organisms associated with delayed PSIs were atypical rapidly growing mycobacteria and in in few cases it was mycobacterium tuberculosis.
- The atypical mycobacterial infection was treated with ciprofloxacin 500 mg bd

+ clarithromycin 500 mg bd for 28 days to 3 months with or without local injection of amikacin 500 mg bd for 5 days and most of the patients responded.

- The patients that did not respond to above treatment or Mycobacterium tuberculosis infection was treated with standard first line antitubercular therapy– isoniazid ,rifampicin,pyrazinamide ,ethambutol for 2 months and isoniazid ,rifampicin and ethambutol for 6 to 9 months.



Port site infections

Discussion

- Laparoscopic surgery is the gold standard for any surgical diseases but delayed PSIs are common.Atypical mycobacteria colonies often exist in tap water and soil and can easily contaminate solutions and disinfectants .Also the instruments used have a layer of insulation that restricts the use of autoclave in sterilization process.The standard sterilization process has been a 20 min exposure to 2% glutaraldehyde .At this current exposure time,these solutions only act as disinfectants and not sterilants thus allowing endospores to survive. Also when proper mechanical cleaning is not done ,blood and charred tissue deposits are left in joints of instruments.These contaminated instruments then deposit the endospores on subcutaneous tissue during surgery which then germinate after 3 to 4 weeks.

Prevention of laparoscopic PSIs:

- Use of disposable trocars and instruments-gold standard
- Use of autoclavable laparoscopic hand instruments;
- All the laparoscopic instruments should be dismantled into parts and each part should be cleaned completely. Use of autoclaved water for cleaning the instruments after dismantling. Apart from this mechanical cleaning, best cleaning is done by ultrasonic technology.

- Use of ethylene oxide sterilisation as compared to glutaraldehyde. High level of sterilisation can be done using chemical sterilants in higher concentrations (3-4%) and exposure time to be increased to 8 to 12 hrs.
- Avoiding inter-departmental sharing of instruments,such as using instruments used for gynecological or urological procedures
- Use of non-porous specimen retrieval bags for retrieving the specimen; and thorough irrigation and cleaning of the port site before wound closure.

Conclusion

Port site infection is a problem faced by laparoscopic surgeons in developing countries which is preventable through proper sterilization of instruments and early diagnosis and treatment.

Funding: None
Conflict of interest: None

References

1. Cuschieri A, Dubois F, Mouiel J, et al.The European experience with laparoscopic cholecystectomy. Am J Surg. 19911;161:385–387.
2. Kalita JB, Rahman H, Baruah KC.Delayed post-operative wound infections due to non-tuberculous Mycobacterium. Indian J Med Res. 2005;122:535–539.
3. Sasmal PK, Mishra TS, Rath S, Meher S, Mohapatra D.Port site infection in laparoscopic surgery: A review of its management. World J Clin Cases. 2015;3:864–871.
4. Narayanswamy T, RK P. Is endobag effective preventing port site infections in laparoscopic cholecystectomy: Our experience. Int J Surg Sci. 2019;3:316–318.
5. Bhave Chittawar P, Franik S, Pouwer AW, Farquhar C. Minimally invasive surgical techniques versus open myomectomy for uterine fibroids. Cochrane Database Syst Rev. 2014;10:CD004638.
6. Molloy D, Kaloo PD, Cooper M, Nguyen TV. Laparoscopic entry: a literature review and analysis of techniques and complications of primary port entry. Aust N Z J Obstet Gynaecol. 2002;42:246–254.
7. Hamzaoglu I, Baca B, Böler DE, Polat E, Ozer Y. Is umbilical flora responsible for wound infection after laparoscopic surgery? Surg Laparosc Endosc Percutan Tech. 2004;14:263–267.
8. Lilani SP, Jangale N, Chowdhary A, Daver GB. Surgical site infection in clean and clean-contaminated cases. Indian J Med Microbiol. 2005;23:249–252.
9. Yanni F, Mekhail P, Morris-Stiff G. A selective antibiotic prophylaxis policy for laparoscopic cholecystectomy is effective in minimising infective complications. Ann R Coll Surg Engl. 2013;95:345–348.
10. Taj MN, Iqbal Y, Akbar Z. Frequency and prevention of laparoscopic port site infection. J Ayub Med Coll Abbottabad. 2012;24:197–199.
11. Yi F, Jin WS, Xiang DB, Sun GY, Huaguo D. Complications of laparoscopic cholecystectomy and its prevention: a review and experience of 400 cases. Hepatogastroenterology. 2012;59:47–50.
12. Rassweiler J, Frede T, Guillonneau B.Advanced laparoscopy. Eur Urol. 2002;42:1–12.
13. Chaudhuri S, Sarkar D, Mukerji R..Diagnosis and management of atypical mycobacterial infection after laparoscopic surgery. Indian J Surg. 2010;72:438–442.
14. Ghosh R, Das S, De A, Kela H, Saha ML, Maiti PK.Port-site infections by nontuberculous mycobacterium: A retrospective clinico-microbiological study. Int J Mycobacteriol. 2017;6:34–37.
15. Alam MR, Nuruzzaman M, Begum M, Alim MA, Rahman MM, Karim MR et al.The frequency of port-site infection in laparoscopic cholecystectomies. Med Today. 2021;25:22–26.
16. Sasmal PK, Mishra TS, Rath S, Meher S, Mohapatra D. Port site infection in laparoscopic surgery: A review of its management. World J Clin Cases. 2015;3:864–871.
17. Narayanswamy T, RK P. Is endobag effective preventing port site infections in laparoscopic cholecystectomy: Our experience. Int J Surg Sci. 2019;3:316–318.
18. Muthusami JC, Vyas FL, Mukundan U, Jesudason MR, Govil S, Jesudason SR.Mycobacterium fortuitum: an iatrogenic cause of soft tissue infection in surgery. ANZ J Surg. 2004;74:662–666.
19. Ramesh H, Prakash K, Lekha V, Jacob G, Venugopal A, Venugopal B.Port-site tuberculosis after laparoscopy: report of eight cases. Surg Endosc. 2003;17:930–932