J Pediatr Adolesc Surg. 2020; 1:37-40
DOI: https://doi.org/10.46831/jpas.v1i1.13

Original Article

Frequency of port-site infection in children undergoing laparoscopic appendectomy for uncomplicated appendicitis

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Cite as: Khan MJ, Khan J, Shah AA, Uzair M. Frequency of port-site infection in children undergoing laparoscopic appendectomy for uncomplicated appendicitis. J Pediatr Adolesc Surg. 2020; 1:37-40

ABSTRACT

Background: Laparoscopic appendectomy is being practiced throughout the world for the treatment of acute appendicitis in children and adults. The objective of this study was to determine the frequency of port sites infection in children undergoing laparoscopic appendectomy at our institution.

Methods: The study was conducted at the Pediatric Surgery Unit of Lady Reading Hospital Peshawar from January 2014 to Jan 2015. All the patients with the diagnosis of acute appendicitis underwent a three-port laparoscopic appendectomy. Port-site infection was noted postoperatively.

Results: Total number of patients in this study was 207 including 138 males (66.70%) and 69 (33.3%) females (M:F 2:1). The age ranged from 6 to 14 years, with mean age of 11 years ±2.096. The overall complications occurred in 39 (18.84%) patients. The port-site infection occurred in 33 (16%) patients. Port-site infection involved only the umbilical port sites and was superficial. Port-site infection was managed conservatively without any sequelae.

Conclusion: Laparoscopic appendectomy is a safe technique in children with port-site infection rate of 16%. There is no morbidity as all the port-site infections occurred at umbilical port-site were superficial thus managed conservatively.

Keywords: Acute appendicitis, Laparoscopic appendicectomy, Port-site infection

INTRODUCTION

Acute appendicitis is the one of the common causes of acute abdominal pain in children presenting to the surgical emergency.[1] It is generally treated with appendectomy though conservative management is also advised.[2] Appendicectomy when needed can be performed as open or laparoscopic procedure.[3]

Laparoscopic approach is being practiced in various abdominal surgical conditions including appendicitis. Additional benefits of laparoscopic surgery is better and wider visual field, smaller incision, minimal tissue dissection, less tissue trauma, less postoperative pain, early recovery, short hospital stay, and good cosmetic results.[4-6] The frequency of surgical site infection in laparoscopic appendectomy is varied among different series,[7-17] therefore, this study was done to provide the local data on port-site infection in our patients undergoing laparoscopic appendectomy.

METHODS

This was a prospective case series done at the Department of Pediatric Surgery Lady Reading Hospital Peshawar during Jan 2014 to Jan 2015. A total of 207 patients with the diagnosis of acute appendicitis and who were planned for laparoscopic appendectomy, were enrolled in this study after taking informed written consent. Patients with appendicular mass, peritonitis, or

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Submitted on: 24-06-2020
Accepted on: 19-09-2020
Conflict of interest: Nil
Source of Support: Nil

perforated appendix, and with other co-morbidities were excluded. In this study 8 patients were converted from laparoscopic to open appendectomy. These patients were also excluded from the study. Approval from the hospital's ethical and research committee was taken. Most of the patients in this study were presented from district Peshawar, followed by Charsadda and Karak.

All patients were admitted to the surgical emergency ward for 24 hours and intravenous fluid, antibiotics, and analgesia were given. LA was performed by three ports technique under general anesthesia. After LA, the patients were given routine postoperative care and discharged. Port-site was examined at the time of discharge and on follow-up visit (10th day of discharge), for any port-site infection. If a port-site infection was encountered, a culture swab was taken for culture and sensitivity. Antibiotics were started accordingly along with wound care in case of any port-site infection.

The data were analyzed with SPSS version 16. Mean and standard deviation were computed for numerical variables like age. Frequency and percentage were calculated for categorical variables like gender and port-site infection.

RESULTS

Of the total 207 children included in this study, 138 (66.70%) were male and 69 (33.3%) were female (M:F 2:1). The age ranged between 6 to 14 years. The mean age was 11 years (±2.096). All patients underwent three port laparoscopic appendectomy both on emergent and elective basis. Overall complications occurred in 39 (18.84%) patients. The port-site infection (PSI) occurred in 33 (16%) patients out of 207 and mechanical ileus in the reminder cases. Among these 33 patients having PSI, the number of male patients who developed PSI was 19 while the female patients were 14 in count. The age group of patients who developed PSI was 8 to 11 years (18 patients) followed by 12 to 14 years (15 patients). Only 6 patients were diagnosed to have PSI at the time of discharge and the remaining 27 patients were diagnosed during the first follow-up visit on 10th postoperative.

The clinical features of PSI included pain in the wound, fever, erythema, and wound discharge. The temperature in these patients did not escalate more than 101°F. On clinical examination, only the umbilical port-sites were involved. All PSI were superficial. Other port sites were without any signs of infection.

The patients with PSI were reassured, wound stitches removed, and samples of the pus were taken for culture and sensitivity (C/S). The most common pathogen cultured was staph aureus. The wounds were managed with daily saline wash and povidone-iodine dressing, and antibiotics as per C/S. All the patients responded well to the wound care without any further complications. None of the patients developed intra-abdominal abscess. No mortality occurred in this series.

DISCUSSION

The laparoscopic procedures have advantages of minimal trauma to the tissues, smaller incisions, minimal tissue handling especially bowel, less pain thus allowing faster recovery. It is diagnostic as well as therapeutic.[1] In laparoscopic surgery, there are fewer incidences of adhesion formation and wound complications.[1]

In this study, the overall complications occurred in 39 (18.84%) patients including PSI in 16% of the patients undergoing laparoscopic appendectomy. In a study by Nicolaj et al. on laparoscopic appendectomy in children, the complications were encountered in 14.4% of the patients.[8] Deepak et al. carried out a study on 26 children who underwent laparoscopic appendectomy and noticed overall complication rate of 11.5% while the PSI was encountered in 3.8% of the patients.[9] A study from Egypt done by Abdelaty et al. depicted a 10% rate of PSI in children after laparoscopic appendectomy for uncomplicated acute appendicitis.[11] But this this comparative study had a limitation of very small sample size.

Postoperative wound infection is greater in open appendectomy as compared to laparoscopic appendectomy. A study carried out in India by Saha et al. in 2010, compared postoperative wound infection in laparoscopic and open appendectomy in children. He noticed significantly lower (3.3%) wound infection rate in laparoscopic appendectomy compared to (23.3%) the open appendectomy.[12] Similarly Mohamed et al. from Egypt found PSI rate of 8.3% in case of laparoscopic approach, while in open approach the wound infection rate was 24.4% for complicated appendicitis.[13] Costa-Navarro et al. documented that the risk of developing a complication after surgery for acute appendicitis is four times higher in open appendectomy as compared to laparoscopic appendectomy.[14] The financial impact and sequelae of wound infection are significant. Wound infection increases length of hospital stay, patient discomfort, delay of routine life activities and joining school, and prolonged use of drugs.

Gołębiewski et al. studies PSI rate in laparoscopic appendectomy through three, two and one port techniques. There were 48 patients operated with one port technique, 27 patients with two port technique, and 25 patients with three port technique. He observed 16% PSI rate in patients operated with a three-port technique, while 11.1% and 8.3% PSI rates in patients operated with two and one port techniques, respectively.[16] This study showed that PSI increases with number of ports. We also utilized a three-port technique for laparoscopic appendectomy in our cohort and found a similar PSI rate in our series.

Few studies from Pakistan have documented PSI in adult patients undergoing laparoscopic appendectomy. In study by Jan et al., PSI of LA in adults was 3.33%.[7] Similarly, in study by Zubair et al., the incidence of PSI in laparoscopic appendectomy was 5.88% in adult population.[18] The rate is low because of enhanced expertise, short duration of procedure, and greater number of laparoscopic procedures as compared to pediatric population. In the study of Khiari et al., the reported PSI was 6% in patients undergoing laparoscopic appendectomy.[17]

In our study the patients who developed PSI involved only umbilical port as it is the main exit-port for appendix after laparoscopic appendicectomy. We are routinely performing laparoscopic procedures such as laparoscopic Fowler Stephen orchidopexy, diagnostic laparoscopy, laparoscopic lymph node biopsy, and laparoscopic aspiration and de-roofing of simple ovarian cysts, etc., but the port sites infection is not routinely encountered in these procedures.

Port-site infection, although an infrequent complication, can be a nightmare for laparoscopic surgeons as well as the patients. Our study showed PSI was superficial and it did not lead to any drastic surgical complications, but it was a major concern of parental /care givers unscheduled visits to the outpatient department. It was managed by conservative strategy, wound care, and prescription of culture sensitive antibiotics. Primary port-site at umbilicus was the main site of PSI as it was used for the retrieval of the appendix that might lead to translocation of bacteria to port site. Late presentation of the patients to surgical care, unhygienic conditions of the pediatric population in our community, heavy burden of elective and emergency surgical cases in the same surgical suite might be another cause of this complication.

CONCLUSION

Laparoscopic appendectomy is a safe technique in children with port-site infection rate of 16%. There is no morbidity as all the port-site infections occurred at umbilical port-site were superficial thus managed conservatively.

Consent to Publication: No clinical figure is used in this manuscript.

Authors Contribution: Author(s) declared to fulfill authorship criteria as devised by ICMJE and approved the final version. Authorship declaration form, submitted by the author(s), is available with the editorial office.

Acknowledgements: Nil

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