E-ISSN: 2616-3470
P-ISSN: 2616-3462

www.surgeryscience.com
2021; 5(1): 194-196
Received: 08-11-2020
Accepted: 15-12-2020

Dr. Raj Gautam
Associate Professor,
Department of General Surgery
Dr. DY Patil Hospital, Navi Mumbai, Maharashtra, India

Dr. Anuradha Panchal
Professor,
Department of General Surgery
Dr. DY Patil Hospital, Navi Mumbai, Maharashtra, India

Dr. Shweta Verma
3rd year resident,
Department of General Surgery
Dr. DY Patil Hospital, Navi Mumbai, Maharashtra, India

Dr. Adeel Ansari
2nd Year resident,
Department of General Surgery
Dr. DY Patil Hospital, Navi Mumbai, Maharashtra, India

Dr. Chandan Singh
Lecturer,
Department of General Surgery
Dr. DY Patil Hospital, Navi Mumbai, Maharashtra, India

Dr. Aashay Shah
Assistant professor
Department of General Surgery
Dr. DY Patil Hospital, Navi Mumbai, Maharashtra, India

Corresponding Author:
Dr. Aashay Shah
Assistant professor
Department of General Surgery
Dr. DY Patil Hospital, Navi Mumbai, Maharashtra, India

Assessment of surgical site infection in cases of intestinal perforation

Dr. Raj Gautam, Dr. Anuradha Panchal, Dr. Shweta Verma, Dr. Adeel Ansari, Dr. Chandan Singh and Dr. Aashay Shah

DOI: https://doi.org/10.33545/surgery.2021.v5.i1d.611

Abstract
Aims: The present study was undertaken for assessing surgical site infection cases of intestinal perforation.
Materials and methods: A total of 17 patients were enrolled. Complete demographic details of all the patients were obtained. Only those patients were included which were within the age group of 20 to 65 years and had acute intestinal perforation. Surgical site infection was classified according to national research council as Class I (Clean), Class II (Clean-contaminated), Class III (Contaminated) and Class IV (Dirty infected). Incidence of surgical site infection was recorded. All the results were recorded and analysed by SPSS software.
Results: Overall incidence of surgical site infection was 29.42 percent. Class III surgical site infection was the most common found to be present in 17.65 percent of the patients. Mean hospital stay was significantly higher among the patients with surgical site infection.
Conclusion: Surgical site infection is rapidly identified as a degree of the quality of patient care by surgeons, infection control practitioners, health planners and public.

Keywords: Surgical site infection, intestinal perforation

Introduction
Intestinal perforation, defined as a loss of continuity of the bowel wall, is a potentially devastating complication that may result from a variety of disease processes. Common causes of perforation include trauma, instrumentation, inflammation, infection, malignancy, ischemia, and obstruction. Early recognition and prompt treatment are critical to prevent the morbidity and potential mortality of peritonitis and its systemic sequelae that result from the spillage of intestinal contents [1-3]. Surgical site infection occurs in significant proportion in patients undergoing extra-abdominal surgical procedures. This infection rate nearly doubles in patients undergoing intra-abdominal surgeries resulting in increased mortality, morbidity, hospital stay and costs. There are different risk factors for incisional and organ/space SSI after abdominal colorectal surgery [4-6]. The incidence of incisional SSI in patients who undergo emergency abdominal surgery is influenced greatly by the degree of site contamination, and the incidence rate of incisional SSI of dirty abdominal sites is more than 40%. Moreover, colorectal operations are associated with a higher incidence of incisional SSI than are upper gastrointestinal procedures because the target bacteria are gramnegative enteric bacilli, principally Escherichia coli, and anaerobic bacteria, including Bacteroides spp [6, 7]. Hence; under the light of above mentioned data, the present study was undertaken for assessing surgical site infection cases of intestinal perforation.

Materials and Methods
The present study was conducted in the department of general surgery with the aim of assessing the surgical site infection cases of intestinal perforation. A total of 17 patients were enrolled. Complete demographic details of all the patients were obtained. Only those patients were included which were within the age group of 20 to 65 years and had acute intestinal perforation. Surgical site infection was classified according to national research council as Class I (Clean), Class II (Clean-contaminated), Class III (Contaminated) and Class IV (Dirty infected). Pregnant subjects were excluded from the present study. Incidence of surgical site infection was recorded. All the results were recorded and analysed by SPSS software.

Results

A total of 17 patients of acute intestinal perforation were enrolled. 35.29 percent of the patients each belonged to the age group of 36 to 50 years and 51 to 65 years respectively. Mean age of the patients was 43.8 years. 52.94 percent of the patients were males while the remaining were females. Overall incidence of surgical site infection was 29.42 percent. Class III surgical site infection was the most common found to be present in 17.65 percent of the patients. Mean hospital stay was significantly higher among the patients with surgical site infection. Among appendectomy patients, surgical site infection was present in 4 patients. Among patients with stoma formation, resection anastomosis and primary perforation closure, surgical site of infection was present in 3 patients, 2 patients and 1 patient respectively.

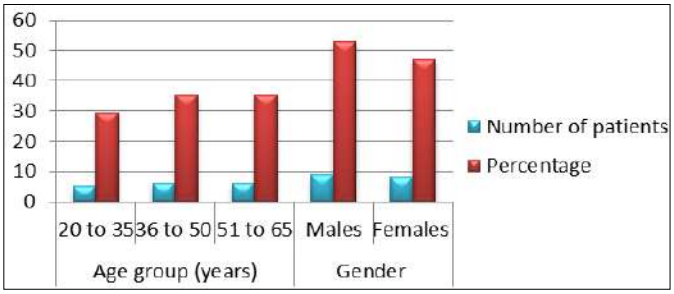

Fig 1: Demographic data

Table 1: Type of procedures performed

Procedures performed	Number of patients	Percentage
Appendectomy	7	41.18
Stoma formation	4	23.53
Resection anatomises	3	17.65
Primary perforation closure	3	17.65
Total	17	100

Table 2: Overall Incidence of surgical site infection

Variable	Number of patients	Percentage
Class I	0	0
Class II	1	5.88
Class III	3	17.65
Class IV	1	5.88
Overall incidence	5	29.42

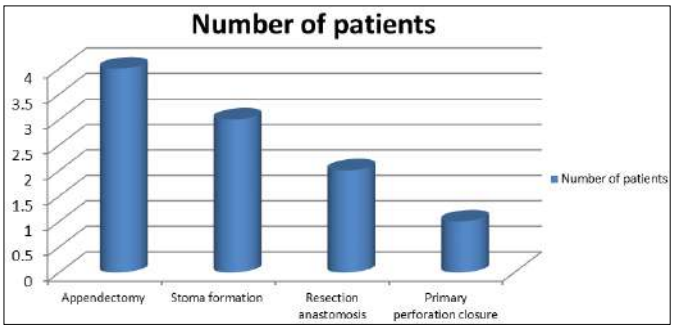

Fig 2: Correlation of type of procedures performed and incidence of surgical site infection

Table 3: Comparison of hospital stay among patients with and without surgical site infection

Hospital stay	Surgical site infection	
	Present	Absent
Mean	8.6	4.8
SD	3.1	1.7
p- value	0.00 (Significant)	

Discussion

Bowel perforation results from insult or injury to the mucosa of the bowel wall resulting from a violation of the closed system. This exposes the structures within the peritoneal cavity to gastrointestinal contents. Bowel perforation can be secondary to many factors, most commonly inflammation, infection, obstruction, trauma, or invasive procedure. Patients presenting with abdominal pain and distension, especially in the appropriate historical setting, must be evaluated for this entity as delayed diagnosis can be life-threatening due to the risk of developing infections such as peritonitis. Management includes stabilizing the patient while making surgical consultation. Even appropriately managed, bowel perforation can lead to increased morbidity and mortality from post-repair complications such as adhesions and fistula formation. Despite the various advances made in sterility, antimicrobial drugs and operative techniques, surgical site infections are continue to be a major problem in all surgical departments of a Hospital. Surgical Site Infections leads to increase in cost of treatment, prolonged hospital stay, morbidity and mortality related to surgical operations [7-9]. Hence; under the light of above mentioned data, the present study was undertaken for assessing surgical site infection cases of intestinal perforation.

In the present study, a total of 17 patients of acute intestinal perforation were enrolled. 35.29 percent of the patients each belonged to the age group of 36 to 50 years and 51 to 65 years respectively. Mean age of the patients was 43.8 years. 52.94 percent of the patients were males while the remaining were females. Overall incidence of surgical site infection was 29.42 percent. In 2011, Galal and El-Hindawy reported the results of an RCT on the impact of using triclosan antimicrobial sutures on the incidence of SSI. The use of antimicrobial suture led to a statistically significant decrease in the incidence of SSI in 450 patients undergoing various types of operations, including 65 cases of gastrointestinal surgery. Allaire *et al*. reported that the use of closed suction drainage in the subcutaneous space might reduce the incidence of postoperative site complications (including incisional SSI) in obese women who have at least 2 cm of subcutaneous fat and undergo cesarean delivery [10-12].

In the present study, class III surgical site infection was the most common found to be present in 17.65 percent of the patients. Mean hospital stay was significantly higher among the patients with surgical site infection. Mahmoud *et al*. retrospectively analyzed 25,825 patients and reported that SSI was significantly and independently associated with longer hospital stay and increased costs. Determining the strategies for its prevention could therefore improve patient care while lowering the duration and cost of hospital stay in patients at risk [13]. Shinkawa *et al*. previously reported that the in-hospital mortality from colonic perforation was 8 times higher in patients with septic shock than in those without septic shock. Several scoring systems that consider a patient's initial status to predict prognosis, such as the Acute Physiology and Chronic Health Evaluation II score and the Simplified Acute Physiology Score, are available. These scoring systems can be used to predict the prognosis of patients with intestinal perforations; however, they do not consider disease-specific conditions [14-16]. Tang R *et al*. identified the risk factors for surgical site infection (SSI) in patients undergoing elective resection of the colon and rectum. The overall SSI, incisional SSI, and organ/space SSI with and without clinical anastomotic leakage rates were 4.7%, 3%, 2%, and 0.8%, respectively. Risk factors for overall SSI were American Society of Anesthesiology (ASA) score 2 or 3, male gender, surgeons, types of operation, creation of ostomy, contaminated wound, use

of drainage, and intra- or postoperative blood transfusion. In addition to ASA score and surgical wound class, blood transfusion, creation of ostomy, types of operation, use of drainage, sex, and surgeons were important in predicting SSIs after elective colorectal resection [17].

Conclusion

From the above results, the authors concluded that surgical site infection is rapidly identified as a degree of the quality of patient care by surgeons, infection control practitioners, health planners and public. A reduction in the infection rate to a minimal level could have significant benefits; both in terms of mortality and morbidity.

References

1. Tanner TN, Hall BR, Oran J. Pneumoperitoneum. Surg Clin North Am 2018;98(5):915-932.
2. Grotelüschen R, Bergmann W, Welte MN, Reeh M, Izbicki JR, Bachmann K. What predicts the outcome in patients with intestinal ischemia? A single center experience. J Visc Surg 2019;156(5):405-411.
3. Long B, Robertson J, Koyfman A. Emergency Medicine Evaluation and Management of Small Bowel Obstruction: Evidence-Based Recommendations. J Emerg Med 2019;56(2):166-176.
4. Ingram D, Franco S. NCHS urban-rural classification scheme for counties. Vital Health Stat 2012;2:1-65.
5. Elixhauser A, Steiner C, Harris DR, Coffey RM. Comorbidity measures for use with administrative data. Med Care 1998;36:8–27.
6. Fan YC, Peery AF. Therapeutic management of acute uncomplicated diverticulitis. Minerva Gastroenterol Dietol 2017;63(2):143-151.
7. Bill JG, Smith Z, Brancheck J, Elsner J, Hobbs P, Lang GD *et al*. The importance of early recognition in management of ERCP-related perforations. Surg Endosc 2018;32(12):4841-4849
8. Guzman-Pruneda FA, Husain SG, Jones CD, Beal EW, Porter E, Grove M *et al*. Compliance with preoperative care measures reduces surgical site infection after colorectal operation. J Surg Oncol 2019;119(4):497-502.
9. Li S, Cheng L, Li Y, Ning L, Yu Z, Wang P *et al*. [Analysis of high risk factors for acute complex appendicitis in adults]. Zhonghua Wei Chang Wai Ke Za Zhi 2018;21(12):1374-1379.
10. Galal I, El-Hindawy K. Impact of using triclosan-antibacterial sutures on incidence of surgical site infection. Am J Surg 2011;202:133–138.
11. Allaire AD, Fisch J, McMahon MJ. Subcutaneous drain vs. suture in obese women undergoing cesarean delivery: A prospective, randomized trial. J Reprod Med 2000;45:327–331.
12. Chowdri NA, Qadri SA, Parray FQ *et al*. Role of subcutaneous drains in obese patients undergoing elective cholecystectomy: A cohort study. Int. J Surg 2007;5:404–407.
13. Mahmoud NN, Turpin RS, Yang G, Saunders WB. Impact of surgical site infections on length of stay and costs in selected colorectal procedures. Surg Infect (Larchmt) 2009;10(6):539-44.
14. Shinkawa H, Yasuhara H, Naka S, Yanagie H, Nojiri T, Furuya Y *et al*. Factors affecting the early mortality of patients with nontraumatic colorectal perforation. Surg Today 2003;33:13–17.
15. Biondo S, Ramos E, Deiros M, Ragué JM, De Oca J, Moreno P *et al*. Prognostic factors for mortality in left colonic peritonitis: a new scoring system. J Am Coll Surg 2000;191:635–642.
16. Horiuchi A, Watanabe Y, Doi T, Sato K, Yukumi S, Yoshida M *et al*. Evaluation of prognostic factors and scoring system in colonic perforation. World J Gastroenterol 2007;13:3228–3231.
17. Tang R, Chen HH, Wang YL *et al*. Risk factors for surgical site infection after elective resection of the colon and rectum: a single-center prospective study of 2,809 consecutive patients. Ann Surg 2001;234(2):181-189.