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Study of management of non-traumatic small intestinal perforation

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Abstract---Background: Perforation of the small bowel from a wide variety of causes is a significant entity in surgical emergencies. Surgery is the cornerstone in the management of perforation peritonitis. The most common etiology is of infective origin. This study was undertaken to find out the demographic characteristics, etiological factors, clinical presentations and various surgical procedures for small intestinal perforation, it's complications in our setup. Materials and methods: This was a prospective observational study conducted in the department of general surgery at SCB Medical College, Cuttack from January 2017 to January 2020. A total of 50 cases of non-traumatic small bowel perforation were included in this study. Results: Most common age group was 21-30 years (40%). Ileum was the most common site accounting for 80%. Sixty per cent of cases were enteric infections due to typhoid followed by tuberculosis (20%). Conclusion: Diagnosis of non-traumatic small bowel perforation is a challenge even with the advent of newer technology.

Younger populations are commonly affected compared to the western population. Infective aetiology is most common in our part of the world. Early surgical intervention along with treatment of the etiological factors may lead to a better outcome.

Keywords---management, non-traumatic, intestinal perforation.

Introduction

Perforation of the small bowel from a wide variety of causes is a significant entity in surgical emergencies [1]. It is relatively uncommon in western societies but its incidence is more in the regions where typhoid, tuberculosis and parasitic infestation are endemic [2]. The prominent complication of typhoid is perforation seen in the 3rd week where the ileum is the main site [3]. Sudden onset of abdominal pain with rebound tenderness and guarding is seen in the majority of patients. It requires a high index of suspicion as diagnostic delay results in significant morbidity and mortality. Surgery is the cornerstone in the management of perforations peritonitis. Even with the advent of the newer technology the management of gastrointestinal perforation is a challenge to a surgeon. This study is undertaken to find out the demographic characteristics, etiological factors, clinical presentations and various surgical procedures for small intestinal perforations, and its complications in our setup.

Materials and Methods

This was a prospective study conducted in the department of general surgery at SCB medical college, Cuttack from Jan 2017 to Jan 2020. A total of 50 patients of non-traumatic small intestinal perforation who underwent surgery were included in the study.

Inclusion Criteria

Age > 12 years

Non traumatic small bowel perforation diagnosed clinically or radiologically.

Exclusion Criteria

Age <12years

Duodenal perforation

Traumatic small bowel injury

Patients who have undergone conservative management.

After the diagnosis of perforation peritonitis, the patients were resuscitated and prepared for exploratory laparotomy. During the operative procedure, the pathological findings were noted and managed accordingly. The data was recorded using a detailed working proforma mentioning relevant demographic details, clinical findings, and radiological and pathological data. Patients were followed up in the post-operative period to know the postoperative complications, morbidity and mortality rates. The data is analyzed to find the usefulness of

clinical features and investigation for the diagnosis.

Statistical software

The Statistical software namely SPSS 22 was used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc

Observation and Results

The present study included 50 cases of non-traumatic small bowel perforation who underwent surgical procedures at our hospital. The maximum numbers of cases were in the age group of 21-30yrs accounting for 40 per cent. A major part of the study group was males (80%) whereas females accounted for 20% of cases (table 1). Pain abdomen was the presenting symptom in all cases under the study followed by vomiting (76%), fever (46 %) and distension of the abdomen (44%). Constipation accounted for 50% of cases (table 2). In the present study majority of cases had guarding and rigidity at presentation (84%), rebound tenderness (84%), absent bowel sounds were in 72% of cases, distension of the abdomen (66%), obliteration of liver dullness (42%) and per rectal tenderness (12%) (table 3). Hemodynamically 30% of cases were presented with shock.

On laparotomy, the most common site of perforation was found to be Ileum (80%) followed by the jejunum (20%). Enteric perforation due to typhoid was 60% and Tubercular perforation accounted for 20% of cases. Two cases were diagnosed as appendicular perforation where the abdomen was opened by McBurney's incision and per operatively diagnosed as ileal perforation. Other causes were malignant perforation (4%), ischemic bowel disease (4%) and rest were nonspecific (12%) (table 4). Resection & End to End anastomosis or end to side ileo-transverse anastomosis in two layers was done in 30% of cases, Simple closure was in 36% of cases and the stoma was made in 34% of cases. The most common complication in this series was wound infection which accounted for 17 cases (34%).

Wound dehiscence was seen in 3 cases. Anastomotic leak was seen in two cases. We came across 5 deaths in the present study (10%) (table 5). One death was seen in a patient with perforation in the case of Ischemic Bowel Disease. One death was with ileal perforation where the patient developed ARDS. One death was seen in jejunal perforation as the patient developed ARF. Two patients died of septicemic shock in the postoperative period. The patients were followed up for a period of 2 months and the complications were noted. 4 patients were lost to follow-up. At the end of 2 months wound infection was seen in one case (2.4%). In this case, the patient underwent re-laparotomy for iatrogenic ileal perforation as explained earlier. The wound was infected and healed with regular dressings in two and half months.

Discussion

Non-traumatic small bowel perforation is not so uncommon but is associated with severe morbidity and mortality [1]. It is necessary to know the exact etiology of the condition for better management and outcome. Our study revealed that enteric

perforation of typhoid origin was the most common etiology of nontraumatic small bowel perforation and younger patients were more commonly affected as compared to the western population. Demographically we recorded that the incidence of small bowel perforation peaked in the age group 21 to 30 years with a male to female ratio of 4:1 (Table 1). These findings are concurrent with most of the past studies. According to Talwars et al, most patients (42.7%) were in the 21 year to 30 year age group [4]. Eggleston et al. [5] who analyzed 78 patients of typhoid perforation observed that the male to female ratio was 3.5:1. The male to female ratio was found to be 2.2:1 in Chatterjee et al. [6] study and the maximum number of patients (40%) was in the second and third decades. Rajender Singh Jhobta et al. in their study of perforation peritonitis found a male-to-female ratio of 5:1 and maximum patients were in the 31 years to 40 year age group [6].

Abdominal pain was the most common presenting symptom and found in all the patients in our study. 76 % of the patients presented with vomiting. Abdominal distention, obstipation and fever were present in 44%, 50% and 46% of cases respectively (Table 2). Most of the patients presented within 3 days (82.22%) of onset of symptoms. Chatterjee et al. [6] in their study recorded that pain abdomen was the principal presenting feature (92.3%) followed by obstipation (63.6%) and fever (44.3%). The most common clinical signs in our study were generalized tenderness and guarding and rigidity (84% each) followed by diminished bowel sound in 72% and abdominal distension (66%). Hemodynamically 30% of patients were presented with shock and dehydration (Table 3). Chatterjee et al. [6] observed that abdominal guarding and rigidity (89%) were the main physical signs.

According to the French Society of Anesthesia and Resuscitation, surgery should not be delayed for more than a few hours, even if shock persists despite intensive resuscitation. Because, any delay in the surgical management further promotes the extension of the peritonitis, blood diffusion of the peritoneal contamination and increased risk of anastomotic dehiscence due to more bowel edema. In our study ileum was the most common site (80%), followed by jejunum (20%). Typhoid was found to be the most common cause of enteric perforation in 60% of cases followed by intestinal tuberculosis (20%), ischemic bowel disease (4%), malignancy (4%) and other non-specific causes in 12% of cases. The results of Huttunen et al. study showed the etiology of non-traumatic small bowel perforations as follows: strangulation (20%), diverticulum (15%), foreign bodies (15%), idiopathic (12%), Crohn's disease (8%) [1]. According to Mehendale, Samsi et al [7] the most common etiology seems to be non-specific ulceration of the small bowel. Orringer et al. study [8] revealed that non infective causes like malignancy, inflammatory small bowel disease, post chemo-radiation, mechanical and iatrogenic. Chatterjee et al. [6] mentioned that most of the perforations (52.8%) were due to non-specific causes followed by Trauma (19.3%) and mechanical factors (12.7%). Ahmet Türkoğlu et al. on his study revealed that non-specific etiology was the most common followed by intestinal tuberculosis, typhoid, lymphoma, adenocarcinoma, Crohn's disease, and gangrene [9]. Jain Bhupendra et al. conducted a study of non-traumatic small bowel perforation of the small intestine and found that the most common cause was typhoid (46.4%) followed by non-specific inflammation (39.2%), tuberculosis (12.8%) and malignant neoplasm (1.6%) [10].

We encountered that wound infection (34%) was the most common post-operative complication in our series. Wound dehiscence was seen in 3 cases (6%). Anastomotic leak was present in 2 patients.(4%). According to Jain Bhupendra et al, [10] the wound infection rate was around 46%. Incidence of wound infection has been variable in various studies, ranging from 19.5 to 95% [11,12] Most probably it was due to fecal contaminated wounds. The associated malnutrition and poor hygiene in developing countries increase risk wound infection.

Conclusion

Diagnosis of non traumatic small bowel perforation is a challenge even with the advent of newer technology. Most of the clinical findings are usually non specific and a definite diagnosis is usually reached after surgery. The infective etiology like typhoid and tuberculosis are considered to be the common causes of non-traumatic small intestinal perforation in developing countries like ours. The younger population are more commonly affected compared to the western population. Delayed presentation results in increased morbidity and mortality. Management of these patients should be tailored according to the demographic and etiologic factors.

Table 1
Age and Sex distribution

Age in years	Males		Females	
	No patients	Percentages	No patients	Percentages
12-20	4	8%	5	10%
21-30	16	32%	4	8%
31-40	14	28%	1	2%
41-50	4	8%	0	0
51-60	2	4%	0	0
Total	40	80%	10	20%
Mean ± SD	32.60±10.91		22.60±6.55	

Table 2
Clinical presentation (symptoms)

Presenting symptoms		
Pain	48	96%
Vomiting	38	76%

Distension	22	44%
Constipation	25	50%
Fever	23	46%

Table 3
Clinical Presentation (signs)

Presenting signs	Number of patients	Percentages
Guarding and Rigidity	42	84%
Rebound Tenderness	42	84%
Distension	33	66%
Obliteration of Liver Dullness	21	42%
Absent/Diminished bowel sounds	33	66%
Per rectal Tenderness	6	12%

Table 4
Site and post-operative diagnosis

Post -Operative Diagnosis	Number	Percentages
Ileal Perforation		
Tuberculosis	10	20%
Typhoid	30	60%
Malignancy	1	2%
Ischemic Bowel Disease	1	2%
Non-Specific	2	4%
Jejunal Perforation		
Malignancy	1	2%
Ischemic Bowel Disease	1	2%
Non-specific	4	8%

Table 5
Postoperative complications

Complications	Number patients	of	Percentage
Wound Infection	17		34%
Burst Abdomen	3		6%
Anastomotic leak	1		2%
Entero cutaneous fistula	1		2%
Mortality	5		10%
No complication	28		56%

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