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## RESEARCH ARTICLE

# A STUDY OF SURGICAL MANAGEMENT OF SMALL BOWEL PERFORATION

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### ABSTRACT

**Background:** Small bowel perforations are widely considered as an emergency intervention for a general surgeon, of which, terminal ileum perforations are common are most tricky to be dealt with. Developing countries like India shows increased cases of enteric fever, which correspond to acute abdomen as ileum perforations. This study shows various causative factors, diagnostic modalities and management of small bowel perforation.

#### Objectives:

- })To study various causative factors of small bowel perforation.
- })To study various surgical procedures for perforation.
- })To study post surgical complications and management.

**Materials and Methods:** A total of 50 cases with small bowel perforation was assessed. A detailed clinical history, physical examination and investigations were done for all patients. All patients included in study were operated after stabilisation and adequate resuscitation and post operative complications, morbidity and mortality assessed. The data is subsequently analysed to assess the usefulness of clinical features and investigations for the diagnosis and prognosis.

**Results:** Study shows etiological distribution with 63.5% cases of enteric fever and trauma. Trauma and enteric fever contribute to major causes for multiple number of perforations. 54% of perforation cases were managed with simple closure in two layers. Most common post operative complication was wound infection (63%). **Conclusion:** This study denotes the etiological distribution of small bowel perforations, with highest number of cases of enteric fever and trauma. Various surgical procedures for management of perforation, with simple closure in two layers most commonly used in the current study, and post operative complications commonest seen in the study was wound infection.

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## INTRODUCTION

Small bowel perforations, especially terminal ileum, due to various causes leading to acute abdomen is one of the commonest abdominal emergency encountered by general surgeon. Incidence of small bowel perforation is lesser in western societies as compared to developing countries, except in regions where typhoid, tuberculosis, parasitic infestations are endemic (Taylor, 1992). Infections such as enteric fever, tuberculosis, ascariasis and various viral infections have higher chances of affecting the terminal ileum due to reasons such as rich plexus of lymphatic drainage, marked stasis of food. Perforated hollow viscus challenges the surgeon for pre operative,

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intra operative and post operative management of the patient with relevant investigations and care of the patient according to severity of the illness (William Schumer and Sheldon Burman, 1972). Patients with perforation present with different symptoms according to the cause and severity of the illness, most common symptom being acute onset of abdominal pain. Early diagnosis and relevant investigation is essential in such patients, as significant morbidity and mortality results from diagnostic delay. With emerging new technology, early evaluation and management of patients with perforation is challenging, as emergency investigations in some patients may still fail to provide diagnosis. In such cases, early laparotomy remains standard approach to treat lethal advanced peritonitis. The present study was conducted to find out the etiological factors, clinical features, various surgical procedures for gastro intestinal perforation and complications in our setup.

## MATERIALS AND METHODS

In this study, a total of 50 patients, with small bowel perforation admitted and undergone surgery, in the period of August 2011 to December 2013, in the Department of General Surgery, DrD.Y.Patil Medical College and Hospital, Nerul were assessed.

### Inclusion Criteria

- Patients aged > 15 years
- Patients presenting with Small bowel perforation.

### Exclusion Criteria

- Patients aged <15 years
- Patients managed conservatively (non surgically).

The study was approved by Institutional Ethical Committee. Informed consent was taken from all the patients. A detailed clinical history was taken for all the patients. Thorough physical examination was done for all the patients, which included inspection, palpation, percussion and auscultation. For every eligible case for operative, investigations were done, including Xray abdomen erect (to look for gas under diaphragm). All patients were operated after stabilisation and adequate resuscitation. Patients were subjected for laparotomy. The perforations were managed according to the protocol followed in our hospital. Patients were followed up in the post operative period to know the post operative complications, morbidity and mortality rates. The data is analysed to find the usefulness of clinical features and investigation for the diagnosis.

## RESULTS

Out of total 50 cases, 44 were ileal perforations and 6 were other small bowel perforations. Since the number of ileal perforations were more, they were studied in detail.

**Table 1. Distribution of cases according to cause in ileal perforation cases (44)**

Cause	No. of cases	Percentage (%)
Typhoid	17	36.3
Tuberculosis	6	13.6
Trauma	12	27.2
Miscellaneous	9	22
a) Ascariasis	0	0
b) Meckel's diverticulum	1	2.2
c) Lymphoma	0	0
d) SMA thrombosis	4	2.2
e) Undiagnoses	4	13.6

This table denotes that enteric perforation and trauma were the main causes of perforations in our study (63.5 % of cases).

**Table 2. Incidence of number of perforations**

Cause	Single perforation	2 perforations	More than 2 perforations
Enteric fever	14	1	1
Trauma	10	1	1
Tuberculosis	6	0	0
Miscellaneous	9	0	0

Enteric fever and trauma were the two major causes in our study for multiple perforations.

**Table 3. Type of surgical procedure**

Surgical Procedure	Number (n=50)	Percentage (%)
Resection and end-end anastomosis in 2 layers	15	30.0
Resection and end-end anastomosis in 1 layer	0	0.0
Simple closure in 2 layers	27	54.0
Simple closure in 1 layer with omental patch	8	16.0

Simple closure in 2 layers was the preferred surgical procedure in this study (54.0%). However, resection with end to end anastomosis in 2 layers was done in cases of multiple perforations where terminal ileum wall was thinned out (30.0%).

**Table 4. Post Operative Complications**

Complication	Number of cases
Shock and toxemia	3
Pulmonary complications	8
Thrombophlebitis	2
Intraperitoneal abscess	8
Burst abdomen	2
Wound infection	28
Fecal fistula leak	8
Wound gaping	20
Post operative pyrexia	18

Wound infection was commonest complication seen in 63% of cases, followed by wound gaping in 45% cases.

## DISCUSSION

In the present study, it was observed that majority of cause of small bowel perforation was enteric fever and trauma. The number of perforations which is important to relate to the severity of the illness showed that multiple perforations were the most common in enteric fever and trauma. The surgical procedure used in this study was simple closure in 2 layers, except for cases where ileal wall thinning was noted. The most common post operative complication noted was wound infection. Perforation of hollow viscus has been one of the commonest abdominal emergencies for a surgeon, which requires immediate and proper measures. Terminal ileum has been the most common site of perforation due to its peculiar anatomical features. Ileum has a very rich plexus of lymphatic drainage, the terminal ileum is one of the main absorptive surfaces in GI tract hence infections such as Enteric fever, Tuberculosis, Ascariasis, Viral infections tend to affect ileum the most. It's not only the lymphatic supply but marked stasis of food also occurs there. The contents remain in contact with the mucosa for a long time and presence of Peyer's patches, which are nothing, but aggregations of lymphoid tissue, trap the organisms frequently. Whenever the host defense fails, they are the sites where infection start. The prominent complication of typhoid fever is perforation seen in 3rd week. The ileum is the most common site of perforation (3). Surgery plays an important role in the management of perforation. In today's era of laproscopic and Robotic surgery, abdomen still remains a Pandora's box because of confusing clinical picture where in emergency investigations also some times fail to give diagnosis. Early laparotomy remains the standard approach in treating lethal-advanced peritonitis. Typhoid is the commonest cause of ileal perforation in tropics. Analysis of 12 regional reports from different parts of India between 1972 and 1989

reveals that the causes of small bowel perforation in 450 cases out of 513 (87.7%) were Typhoid (4). S.K. Nair from New Delhi in a series of 50 cases of non-traumatic perforation has reported that Typhoid, Tuberculosis, Amoebiasis and Round worms were most common causes (5). The incidence of small bowel injury secondary to blunt trauma ranges from 5% to 15% and approaches 50% for all penetrating abdominal injuries. Conservative management for suspected ileal perforation remains questionable as in traumatic perforation injury to other organs remains a possibility. Treatment with broadspectrum antibiotics and rest to ileum obviates the chance of further perforation. Surgical closure eliminates further contamination of the peritoneal cavity, as there is no tendency for the localization of infection in typhoid fever. To treat the enteric perforation by conservative way or operative way is the matter of controversy. Some authors are in favor of conservative treatment since they say that the lower ileum is papyry thin at many places and is liable to perforate at such places, so that the repair of ileum is almost impossible, and attempt to suture may lead to tearing of the gut wall. For this, Prasad in 1974 advised closure of perforation and proximal side-to-side ileo-transverse anastomosis (6). But many author suggest that careful handling of gut, adequate closure of perforation, postoperative nasogastric suction and adequate treatment of shock as the treatment of choice. Laparoscopic management of small bowel perforation still remains a debatable modality.

## CONCLUSION

This prospective study of 50 patients conducted in our setup, who underwent surgery for small bowel perforation after adequate physical examination and investigations showed that the most common etiological factors responsible for perforation were enteric fever and trauma.

Typhoid and trauma were most common causes for multiple perforations, leading to increased morbidity and mortality. Simple closure in 2 layers was the preferred surgical procedure used for the management of small bowel perforation. The most common post operative complication noted was wound infection, followed by wound gaping.

**Conflict of interest:** None to declare

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