

AN OVERVIEW OF MANAGEMENT OF SMALL INTESTINAL PERFORATIONS. S. Karbhari¹, Veeresh Hosamani², R. B. Dhaded³**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: BACKGROUND: Management of non-traumatic perforation of the small intestine has always been a consideration for surgeons because of associated enormous morbidity and mortality. There is a paucity of data on the management of non-traumatic perforation of the small intestine. **AIM:** To study incidence, etiopathogenesis, clinical profile and treatment modalities. **MATERIALS AND METHODS:** A prospective study was conducted between October 2012 to October 2014, which involved analysis of 55 patients treated for non-traumatic perforation of small intestine. Clinical profile and management of the patients were studied. **RESULTS:** The most common non-traumatic perforation of small intestine was DU perforation (54.5%) followed by ileal (typhoid) perforation (32.7%), tuberculosis (5.45%) and followed by perforation due to ascaris (3.6%) and secondary to obstruction (1.81%). After exploratory laparotomy primary repair with omental patch was the most frequent procedure followed by resection-anastomosis. The overall mortality rate was 20%. **CONCLUSION:** Early diagnosis, prompt pre-operative resuscitation, appropriate antibiotics, timely surgical intervention and good postoperative care can bring down the morbidity and mortality. **KEYWORDS:** Perforation peritonitis; Exploratory laparotomy; complications.

INTRODUCTION: Non-traumatic perforation of the small intestine is one of the common surgical emergencies encountered by surgeons in developing countries. Causes of non-traumatic perforation of the small intestine in developing countries are clearly different from those observed in developed countries.¹ Patients often present late with purulent peritonitis and poor general condition.² As a result, serious complications such as post-operative peritonitis caused by a leak from repaired intestine, superficial wound infection, and complete wound dehiscence are not uncommon. The management of complications is particularly difficult in developing countries due to limited resources, particularly facilities for parenteral nutrition. The present prospective study was undertaken to evaluate the existing management practices and outcomes in patients operated for non-traumatic perforation of the small intestine.

Different pathologies may lead to perforation of the small intestine. Perforation complicates duodenal ulcer about half as often as bleeding and most perforated ulcers are on the anterior surface of the duodenum. The patient population tends to be elderly (mean age 60–70%), chronically ill patients often (40–50%) taking ulcerogenic medication. Helicobacter pylori is implicated in 70–92% of all perforated duodenal ulcers even if those secondary to Non-Steroidal Anti-inflammatory Drugs (NSAID), cigarette smoking are included. Second most common cause of perforated duodenal ulcer is the ingestion of NSAID. The least common cause is pathologic hypersecretory states, such as Zollinger-Ellison syndrome, although these should be considered in all cases of recurrent ulcer after adequate treatment. In the modern treatment of perforated duodenal ulcer it must be born in mind that appropriate treatment of H. pylori infection results in eradication of the bacteria and healing of uncomplicated ulcers in more than 90% of cases.

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Infection is the commonest cause of such perforations in developing countries. This includes typhoid fever and tuberculosis.^{3,5,7,8,9} Nevertheless, in industrial countries, non-infectious etiology such as *Ascaris* infestation, Crohn's disease and malignancy is predominant. Rare cases of non-traumatic perforation of small intestine due to opportunistic infections were also reported.^{3,7} and also due obstruction.

Clinical presentation in non-traumatic perforation of small intestine is non-specific.^{3,7} The diagnosis is mainly clinical, supported by radiological finding of free gas under diaphragm^{4,7,10} erect X-ray abdomen, ultrasound and CT scan were done. Laboratory investigations were not helpful in all cases.^{4,10,11} Leukocytosis was present only in some patients. In a series of 79 patients, Wani et al have found that only 29% of patients with non-traumatic perforation of terminal ileum have leucocytosis. Furthermore, no single investigation had a high diagnostic accuracy.⁷ Intestinal perforation is associated with high mortality if early and proper management is not initiated.^{7,10,12} Preoperative resuscitation, placement of nasogastric tube and intravenous antibiotic are important.^{10,13} Furthermore, the general condition of the patient, the number of perforations, the condition of the intestine, and surgeon's experience define the operative procedure, prognosis and outcome.^{8,13,14} A decision of laparotomy was made on clinical grounds supplemented by investigations. At laparotomy, operative findings were noted. Intestinal perforation was managed by one or more of the following procedures: Primary closure with omental patch; Ileal closure in two layers; Resection of the unhealthy segment of the intestine was done followed by end-to-end anastomosis. Peritoneal cavity was thoroughly lavaged with normal saline. Tube drains were placed to drain the pelvis and the paracolic gutters. Postoperative antibiotics were used. Attention was paid to major complications such as pulmonary complications, wound infection, wound dehiscence, residual intra-abdominal abscesses, and enterocutaneous fistula/leak. Appropriate measures, including a second operation, if required, were undertaken to manage the complications.

Histopathological examination of small bowel ulcer were non-conclusive. In a series of 82 cases of proven typhoid ileal perforation, Atamanalp et al have found that histopathological findings were non-specific in mild cases⁸. In another study of terminal ileal non-traumatic perforations, Wani et al have found that in almost one quarter of the patients the cause of perforation could not be known.⁷ The intra-operative findings have mimicked typhoid without laboratory confirmation of the disease.⁷ Perforation due to hookworm infestation in 2 cases (3.6%). It is difficult to know whether this is a coincidence or a cause. Wani et al have found ascariasis in the peritoneal cavity of 14 out of 79 patients of non-traumatic bowel perforation and they thought that this was a sequence and not the cause.⁷

Presence of granulomas in the histopathological examination was suggestive of a granulomatous inflammation with a differential diagnosis of tuberculosis or Crohn's disease¹⁵. Tuberculosis is more common. Furthermore, it is the second commonest cause of small bowel perforation after typhoid which is usually has a single perforation⁵. If the diagnosis is not definite, we assume that it is tuberculosis and treat it accordingly.

AIMS AND OBJECTIVES: To study incidence, etio-pathogenesis, clinical profile and treatment modalities.

MATERIALS AND METHODS: The study is a prospective study of 55 patients admitted in Basaveshwar Teaching and General Hospital, Gulbarga; from October 2012 to October 2014.

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The history of present illness, estimated time since onset of peritonitis was also noted. The drug history with special reference to anti-tuberculous therapy and analgesics was also noted. History evidence of typhoid and therapy for the enteric fever was also noted. Any evidence of some surgery in the past was also recorded. Record of fluid intake and output was looked for and rehydration volumes were also noted. Resuscitation time was found to be proportional to the chronicity of the disease.

The diagnosis of perforation/peritonitis was based on clinical and radiological findings and was confirmed on operation. Specimen for histopathology such as intestinal tissue or mesenteric lymph nodes in selective cases were taken at the time of operation. Triple antibiotic regimen such as cephalosporins, aminoglycosides and metronidazole were tried in more chronic perforations, however in most of the cases third generation cephalosporins and metronidazole were found to be adequate. In cases of enteric fever quinolones were used as drug of choice. Specific chemotherapy for underlying disease was offered later. Proton pump inhibitors were also used to keep the patients safe from the stressful effects of their disease. All patients were explored through midline incisions, complications or recovery were noted.

Informed consent was taken from the patients and the study had been approved by the ethical committee.

RESULTS:

Etiology	No. of cases	Percentage
Duodenal perforation	30	54.5%
Jejunal perforation	01	1.81%
Typhoid perforation	18	32.7%
Tubercular perforation	03	5.45%
Perforation due to helminths	02	3.6%
Secondary to obstruction	01	1.81%

Table 1: Distribution according to etiological factor

Age in years	No. of cases	Percentage
0 - 10 yrs	3	5.4%
11 - 20 yrs	7	12.7%
21 - 30 yrs	5	9.0%
31 - 40 yrs	11	20%
41 - 50 yrs	15	27.2%
51 - 60 yrs	14	25.4%

Table 2: Age wise distribution

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Symptoms	No. of cases	Percentage
Pain abdomen	55	100%
Fever	44	80%
Vomiting	28	50%
Abdominal distension	11	20%
Diarrhoea	14	25%
Constipation	24	45%

Table 3: Symptom-wise distribution

Etiology	Surgical intervention	No. of Cases	Percentage
Duodenal perforation	Closure with Omental patch	29	96.6%
	Closure of perforation with vagotomy with GJ	1	3.3%
Jejunal perforation	Closure with Omental patch	1	100%
Ileal (Typhoid) perforation	Closure in two layers	15	83.3%
	Resection and Anastomoses	2	11.1%
	Closure with Omental patch	1	5.5%
Tubercular perforation	Simple closure	2	66.6%
	Resection and Anastomoses	1	33.3%
Perforation due to Ascariasis	Resection and Anastomoses	1	50%
	Simple closure with omental patch	1	50%
Perforation due to Obstruction	Resection and Anastomoses	1	100%

Table 4: Analysis management in relation to etiology

Procedure	Duodenal perforation		Typhoid		Tuberculosis		Due to Helminths		Due to Obstruction	
	No. of cases	Death	No. of cases	Death	No. of cases	Death	No. of cases	Death	No. of cases	Death
Simple closure	-	-	15	5	1	1	-	-	-	-
Simple closure with Omentoplasty	29	4	2	0	-	-	-	-	-	-
Resection and end to end Anastomoses	0	0	1	1	2	-	1	-	1	-

Table 5: Distribution according to mortality

DISCUSSION: Of the 55 cases included in the study, maximum number of cases present from childhood upto 60years. Maximum incidence is in 2nd and 3rd decade with a comparative preponderance in males, ratio is M:F=1.89:1.

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About 54.5% perforations are duodenal perforation due to duodenal ulcer which is most common cause in the study as Nair et al 1981, NN Mahendra et al 1988, DMC Rao et al 1999, commonest cause of duodenal perforation is smoking followed by NSAIDs and alcohol (cecilie svanes MD) World Journal of surgery 2000.

In remaining 32.7% are typhoid; 6 tuberculosis perforation accounts for 5.45% and perforations due to ascariasis 3.6% and obstructed hernia accounts for 1.8%. All cases on non-traumatic perforation of small bowel are toxic and dehydrated due to peritonitis.

Symptoms were mainly pain abdomen (100%), fever (80%), vomiting (50%), abdominal distension (20%), diarrhea (25%), constipation (45%). GC Sepaha et al (1970) shows pain and distension of abdomen are the common presenting symptoms.

Various authors have recommended a variety of operative procedures for treatment of small intestinal perforations: simple closure^{16,17}; resection and anastomosis^{18,19}; closure with omental patch; closure in two layers etc. Simple closure (purohit 1978, swadia 1979), closure of perforation with omental reinforcement (Nair 1981, Vaidnathan 1986, Shah 1988). In another study resection and anastomoses was the commonest surgical procedure in the group as it is the procedure of choice for intestinal stricture perforation cases.²⁰

The overall mortality was 20% (11 out of 55 patients). The mortality had a positive correlation with the presence of shock at admission and peritoneal contaminant fluid volume. Almost similar with other studies like Prasad et al 1975 (20%), Mahendra et al (11.5%). Delayed presentation and delayed surgery increases the mortality. In this study septicemia and electrolyte imbalance were important factors which increases risk of mortality. Superficial wound infection was the most frequent postoperative complication detected of patients.

CONCLUSION: Commonest affected age was 2nd and 3rd decade of life and older age group patients had significant morbidity and mortality. Duodenal perforation due to duodenal ulcer is most common cause of non-traumatic small bowel perforation, followed by typhoid, tuberculosis, perforation due to helminthes and perforation due to obstruction. Primary repair was the most frequent operative procedure, followed by closure with omental patch and resection-anastomoses, while superficial wound infection was the most common postoperative complication. Operative procedures undertaken for small intestinal perforations should be individualized according to preoperative factors and the operative findings. Early diagnosis, prompt pre-operative resuscitation, appropriate antibiotics, timely surgical intervention and good postoperative care can bring down the morbidity and mortality.

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