

A Clinical Study and Management of Small Bowel Perforation

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Abstract

Background: Perforation of the small bowel is a common abdominal surgical emergency faced by the general surgeon. Perforation of the small bowel from a wide variety of causes comprises one of the major entity among emergency surgical admissions. The perforated small bowel viscus challenges the surgeon's knowledge of pre-operative, intraoperative and post operative care of severely ill surgical patient. Surgery plays an important role in the management of perforations. Hence this study is undertaken to find out the age, sex incidence, etiological factors, Clinical features and various surgical procedures for small bowel perforations and its complications in our set up. **Materials and Methods:** A prospective study of 100 patients presenting to Kamineni Institute of Medical Sciences, with a clinical diagnosis of small bowel perforation between October 2019 to March 2020. The clinical data, investigations done and the surgical procedure undertaken are recorded. **Observations:** Small intestinal perforation is the commonest surgical emergency among all cases of acute abdomen. Male to Female ratio observed was 90:10. Most commonly affected age group is among 31 to 40 years. Majority of patients presented to causality after 24 hours. Among small bowel perforation 70% were duodenal, 23% ileal and 7% jejuna. Overall mortality in small bowel perforation is 15%. Mortality rate in ileal perforation (39%) being greater than duodenal perforation (8.5%). **Conclusion:** Incidence of small bowel perforation is more in economically productive age group, 2nd to 5th decade. Most of the cases of perforation presented with sudden onset of pain. The physical signs like tenderness, rigidity and diminished bowel sounds are the common signs. Commonest complications in duodenal perforation were wound infection, toxemia and uraemia, in ileal perforation wound infection, toxemia, uraemia, fecal fistula and hypotension. Mortality and Morbidity rate is attributed to late presentation, toxemia, hypotension and renal failure. Closure of perforation with omental patch and peritoneal wash was the main stay of treatment. Resection with end to end ileal anastomosis was done in selected cases. Early presentation to hospital, fluid resuscitation and immediate operative intervention had better outcome.

Keywords: Anastomosis, Perforation, Mortality, Duodenal perforation, Omental Patch

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Introduction

Perforation of the small bowel is a common abdominal surgical emergency faced by the general surgeon. Perforation of the small bowel from a wide variety of causes comprises one of the major entity among emergency surgical admissions [1-3]. Perforation of the small bowel is relatively common in endemic areas of typhoid, tuberculosis and parasitic infestations. Perforated small bowel viscus challenges the surgeon's skill and his knowledge of pre-operative, intra-operative and post-operative care of severely ill surgical patient. In patients with sudden onset of abdominal pain without high index of suspicion and timely surgical intervention results in significant mortality and morbidity [4-7]. Surgery plays an important role in the management of small bowel perforation. Evaluation and management of small intestinal perforation provide some of the most challenging experiences for a surgeon with advent of new technology [8]. Hence this study is undertaken to find out the age, sex, incidence, etiological factors, clinical features and various surgical procedures for small bowel perforations and its complications in our setup.

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Aims & Objectives

1. To study the various causes, incidences and clinical features of small bowel perforations.
2. To study the various surgical procedures and its outcomes.
3. To study the morbidity and mortality of small bowel perforation.

Materials and Methods

Source of Data

Patients admitted in Kamineni Institute of Medical Sciences with small bowel perforation from October 2018 to March 2020.

Methods of Collection of Data

- Data collected with meticulous history taking, clinical examination and appropriate radiological, serological, histopathological and operative findings.
- The collected data analysed with respect to the presentation by the patient, age and sex incidence, etiologies, pathological features, morbidity and mortality associated with the causation and management.
- By analysing the data the common etiologies of small bowel perforation, the most appropriate modality of investigation, treatment, and complications associated with different management modalities and possible ways to prevent them will be studied.

Inclusion Criteria

- Patients aged > 12 years
- Patients presenting with Small bowel perforation

Exclusion Criteria

- Patients aged > 12 years

Sampling method: The data collected will be analyzed using descriptive statistical principles (like mean, proportions and percentages).

Investigations required:

1. Routine blood investigations like Random blood sugar, haemoglobin, Bleeding time, Clotting time.

2. Blood grouping and Rh typing ,complete blood count and LFT
3. Renal function tests, Serum electrolytes and Widal Test
4. X-ray erect abdomen.
5. Ultrasound abdomen
6. Computed tomography of abdomen
7. Histopathological Examination
8. Chest radiograph, ECG.

Results

Table 1:Age distribution with Sex

Age in years	Male		Female		Total	
	No	%	No	%	No	%
12-20	4	5.7	3	30	7	7
21-30	30	42.8	4	40	34	34
31-40	40	57.1	2	20	42	42
41-50	9	12.8	1	10	10	10
>50	7	10	0	0	7	7
Total	90	100	10	100	100	100

Socio-Economic Status: Most of the patients admitted to this hospital came from rural areas. Most of the patients were from low socio economic status, illiterate, anaemic and malnourished and were solely responsible for their family earning. Because of this, the disease not only caused physical and mental problem but they also

had serious repercussions on psychological as well as economical status of whole family.

Time interval between occurrence of perforation and institutional therapy: The following table shows time interval between occurrence of perforation and admission to the hospital.

Table 2:

Time	Duodenal	%	Jejunal&Ileal	%
Within 24 hours	25	35.7	5	16.7
48 hours	26	37.6	9	30
3 days	10	14.3	10	33.4
4 days	4	5.7	3	10
More than 4 days	5	7.1	3	10

Table 3: Clinical Symptoms

Symptoms	Duodenal Perforation	Percentage	Jejunal & Ileal perforation	Percentage
Pain	70	100%	30	100%
Distention	51	72.8	23	76.6
Vomiting	40	57.1	20	66.6
Fever	21	30	20	66.6
Constipation	10	14	12	40
Headache	3	4.2	2	6.6
Loose motion	7	10	4	13.3
Chest Pain	0	0	0	0

The common mode of presentation of these patients were abdominal pain, distention, vomiting, fever and constipation.

Table 4: Clinical Signs

Symptoms	Duodenal Perforation	Percentage	Jejunal&Ileal perforation	ercentage
Tenderness	70	100	30	100
Distension	51	72.8	23	76.6
Guarding	65	92	28	93.3
Rigidity	58	82.8	27	90
Obliteration of liver dullness	50	71.4	18	60
Bowel sounds Absent	60	85.7	26	86.6
Present	10	14.3	4	13.3
Shock	18	25.7	10	33.3

Among the signs tenderness, distension, guarding and rigidity are commonest signs in both groups.

Radiological Investigation: Plain x-ray abdomen (erect posture) was done in all patients, out of 100 patients 86 showed gas under diaphragm (86%)

Table 5:Radiological Investigation

No. Of Patients	Gas UnderDiaphragm	Percentage	Operative Diagnosis	
			Duodenal	Jejunal&Ileal
100	86	86	62	24

Widal Test:Widal test is done where enteric perforation is strongly suspected. Following table shows the number of patients and percentage.

Table 6: Widal Test

Total No. of Cases of suspected enteric	Done	Positive	Percentage
20	20	11	55

Histopathology:Biopsy specimen taken from the edge of the perforation and lymphnodes in suspected tubercular, enteric and non-specific ileal perforations.

Table 7:Histopathology

Suspected Cases of Tuberculosis	Done	Positive	Percentage
6	6	3	50

Table 8:Post Operative Diagnosis of Ileal and Jejunal Perforation

Post-Operative Diagnosis	Number (n=30)	%
Ileum Perforation 23		
Tuberculosis	03	47.8
Typhoid	11	13
iatrogenic	1	4.3
Traumatic	3	13
Non Specific	5	21.7
Jejunum Perforation 7		
Non specific	4	57.2
Trauma	3	42.8

Table 9: Different Surgical Procedures

Procedure	Frequency			
	Duodenal	Percentage	Jejunal&Ileal	Percentage
Simple closure with omentum(Simple closure alone in case of ileal and jejunal perforation)	66	94.3	21	70
Resection and anastomosis	0	0	5	16.6
Simple drainage	4	5.7	2	6.6
Simple closure with stricturoplasty	0	0	2	6.6

Post Operative Complications

Table 10: showing most common post operative complications

Post operative complications	Duodenal Perforation	Percentage	Ileal&Jejunal Perforation	Percentage
Wound infection	15	21.4	10	33.3
Burst abdomen	4	5.7	3	10
Toxaemia	12	17.1	10	33.3
Respiratory	5	7.1	5	16.6
Paralytic ileus	3	4.2	2	6.6
Faecal fistula	1	1.4	6	20
Uraemia	8	11.4	9	30
Cardiac arrest(MI)	3	4.2	1	3.3
Obstruction	0	0	0	0
Hypotension	8	11.4	7	23.3
Encephalopathy	0	0	0	0

Discussion

The above table shows the most common clinical symptoms and signs recorded in ileal perforation (enteric). Most common symptoms are pain abdomen, distension and fever. Most common signs are tenderness, guarding, rigidity and increased temperature. It is to be noted that about 33.3% of all patients are in a State of Shock at the time of presentation. The most common symptom was pain

abdomen, fever, vomiting in most cases of duodenal ulcer perforation. And these symptoms varies with stage of peritonitis. Most common signs are tenderness, board like rigidity, tachycardia and distension. In our series duodenal ulcer patient presented with pain abdomen (100%), distension (72.8%), vomiting (57.1%) and fever (30%). Most common signs are tenderness (100%), distension (72.8%), guarding (92%) and rigidity (82.8%). Jejunal and ileal

perforations presented with pain abdomen (100%), distension (76.6%), vomiting (66.6%) and fever (66.6%). Most of the patients present with extreme signs of peritonitis at the time of admission because of late arrival to hospital. In our series most of the x-ray erect abdomen are taken on emergency basis 86% of cases showed gas under diaphragm.

Surgery

Duodenal Perforation

1. Most of the patients underwent Grahams simple closure operation.
2. 90% of cases had live omental patch used.
3. No definitive ulcer surgery done.

Ileal and Jejunal Perforation

In present series 30 cases of jejunal and ileal perforations encountered.

1. Most of the perforation are single situated within in 30 cm of ileocaecal junction.
2. Multiple perforations are found out in 3 cases number varies from 2-4.
3. Two cases of ileal perforation with stricture of small bowel identified.
4. Most of the cases faecal purulent peritonitis noted.

Surgery

1. In most of the patients (21) simple closure procedure adopted.
2. Resection anastomosis was done in 5 cases.
3. As the general condition is very poor and not fit for any kind of anaesthesia simple drainage was done in 2 cases.
4. Simple closure of perforation with stricturoplasty done in 2 cases.
5. Bilateral drainage of peritoneal cavity done in all cases with drains kept atleast for 5 days.

Most common post operative complication in present series is wound infection in 21.4% of all cases undergone surgery. Toxaemia occurred in 17.1% of the cases, Uraemia and Hypotension occurred in 11.4% of the cases. S.B. Mishra et al[9]., recorded 21% wound infection rate which is almost equal to our series, Toxaemia is 6.6% of cases compared to our series 17.2%. In present series wound infection and toxaemia are the two major post operative complications. Most of the patients admitted to hospital in state of septicemic shock and hypotension. Wound infection is lesser than what reported by Sachin Talwar[10] 79.1% and N.D. Swadia (55.3%) Toxaemia developed in 33.3% of cases which is nearer to the N.D. Swadia (26.7) studies. Fecal fistula rate is 20% much higher than the two authors (10% and 3.5%). This may be due to poor tolerating capacity of patient, anaemia and malnutrition. About 15-20 patients developed multiple complications such as wound infection, toxaemia, faecal fistula etc.,

Mortality

In our series, 15 cases of perforation died related to post operative complication. 6 patients died in duodenal perforation and 9 patients in ileal perforation. The high incidence of mortality in our series is because of late presentations of patients, most of the patients are malnourished, anaemic. About 20% of patients, presented in a state of shock, and septicemia. Majority of the patients have to travel long distance to reach this hospital. This makes a definitive impact on mortality of the patients. Results of our series are closely compared with any other series. According to SB Mishra 1982 mortality rate is 10%. According to RAD Booth it is 2.9% [9]. Mortality in duodenal perforation is less compared to ileal perforation because of early diagnosis and late onset septicemia. E.Q. Archampong [11] recorded a mortality to 29.8 in 1969 and 14.1% in 1976. This indicates improved modality of treatment. In present series there were 9 deaths among 23 ileal perforation. Which

constitutes 39%. This is because of about 30% of the patients admitted to hospital in a state of shock and septicemia. Many people tried indigenous treatments and quacks before reaching hospital. As earlier stated poor general condition, nutritional status influences the mortality. Most patients died because of combined effect of septicemia, hypotension, respiratory complications. This is due to late presentation and over whelming sepsis, dehydration, and malnourishment.

Conclusion

- Small intestinal perforation is the commonest surgical emergency among all cases of acute abdomen.
- Incidence is more in economically productive age group, 2nd to 5th decade.
- There was a Male: Female ratio 9:1
- Most of the cases of perforation presented with Sudden onset of pain.
- The physical signs like tenderness, rigidity and diminished bowel sounds are the common signs. Fever was found in some cases of ileal perforation.
- Commonest complications in duodenal perforation were wound infection toxaemia and uraemia.
- Common complications of ileal perforation were wound infection, toxaemia, Uraemia, faecal fistula and hypotension.
- Mortality and Morbidity rate is attributed to late presentation, toxaemia, hypotension, renal failure and faecal fistula
- Closure of perforation with omental patch and peritoneal lavage was the main stay of treatment. Resection with end to end ileal anastomosis was done in selected cases.
- Post operative complications were wound infection, respiratory infection burst abdomen and enterocutaneous fistula

Early presentation to hospital, fluid resuscitation and immediate operative intervention had better outcome.

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