



E-ISSN: 2616-3470

P-ISSN: 2616-3462

© Surgery Science

[www.surgeryscience.com](http://www.surgeryscience.com)

2020; 4(2): 15-20

Received: 12-02-2020

Accepted: 16-03-2020

**Dr. Shailesh K Rathod**

Associate Professor, Department of  
Surgery, Zydus Medical College,  
Dahod, Gujarat, India

**Dr. Shailesh S Parmar**

Assistant Professor, Department of  
Surgery, Zydus Medical College,  
Dahod, Gujarat, India

**Dr. Hitesh K Rathod**

Associate Professor, Department of  
Forensic Medicine, Gotri Medical  
College, Vadodara, Gujarat, India

**Dr. Asit R Sahu**

Department of Pharmaceutics,  
Pioneer Pharmacy Degree College,  
Vadodara, Gujarat, India

## A study of 40 cases typhoid ileal perforation

**Dr. Shailesh K Rathod, Dr. Shailesh S Parmar, Dr. Hitesh K Rathod and  
Dr. Asit R Sahu**

DOI: <https://doi.org/10.33545/surgery.2020.v4.i2a.390>

### Abstract

Review the patient of ileal typhoid perforation treated in surgical department in S.S.G. hospital Baroda. In present study, age and sex distribution, 31 male (77.5%) and 9 females (22.5%), clinical presentation role of investigation. To assess the morbid pathology and evaluate the complication arising from ileal perforation due to late presentation, multiple perforation and the incidence of faecal fistula and the mortality rate adversely affected by drainage of copious quantities of pus and faecal material from the peritoneal cavity. The complication arising from ileal typhoid perforation and those following surgery for the same and role of various operative procedure in the management of patient with ileal typhoid perforation. to study the incidence of mortality and morbidity in patient with typhoid perforation.

**Keywords:** Factors affecting prognosis, typhoid fever, typhoid ileal perforation, peritonitis, faecal fistula

### Introduction

*Salmonella typhi* which is a gram negative bacteria causes Typhoid an infectious disease a non-spore forming bacilli. Typhoid name was given by Louis (1829) Budd (1856) pointed out that the disease was transmitted through the excreta of patients. Because of inadequate sewage disposal and lack of safe water supplies causes the disease endemic<sup>[1]</sup>.

*Salmonella typhi* induced infection, a strict human pathogen that is invariably acquired from excreta of a patient with typhoid or chronic carrier that cause enterocolitis after ingestion, invade the mucosal cells and multiply within them. Inflammatory changes occur with accumulation of leucocytes. Enterotoxin liberated by the bacteria may form abscess which may burst causing ovoid ulcers. This may cause haemorrhage and if the ulcer reaches the serosa, perforation occurs<sup>[2-4]</sup>.

Till 1960 typhoid perforation was considered almost fatal. Most surgeons favoured conservative management. Surgeons have favoured surgical intervention in typhoid perforation from 1970 onwards. Various operative procedures have been advocated by different authors. Simple repair of perforation in two layers repair with proximal (ileotransverse) colostomy. Primary ileostomy, single layer repair with omental patch and resection and anastomosis. Even with such a variety of procedures, typhoid perforations still have a high rate of morbidity and mortality<sup>[5]</sup>.

**Materials & Methods:** A Comprehensive review and analysis of patients' records extending from September 1999 to September 2003. For a period of typhoid cases was carried out. All consecutive patients treated for ileal typhoid perforation after admission at Sir Sayajirao General Hospital. Medical college Baroda were studied. 40 patients with typhoid perforation was treated during this period<sup>[6-8]</sup>.

The patients were diagnosed on the basis of clinical symptoms, physical examination and haematological, serological as well as radiological investigations available at our hospital. There were 31(77.5%) male and 9(22.5%) female patients. The mean age of the patient was 35 year with the oldest patient being 70 years old and the youngest 5 years old. The average time from the onset of symptom to presentation was 48 hours. Abdominal pain, fever, distension of abdomen and vomiting were the presenting features. All the patients were investigated by abdominal x-rays in erect position in addition to routine haematological investigations. Blood culture in taurocholate broth was done in most patients. Widal testing was done on the day following admission<sup>[9-12]</sup>.

All the patient except one patient underwent exploratory laparotomy due to the poor general condition, multiple ileal perforation (more than two) were present in 7 patients.

**Corresponding Author:**

**Dr. Hitesh K Rathod**

Associate Professor, Department of  
Forensic Medicine, Gotri Medical  
College, Vadodara, Gujarat, India

Single perforation was there in 29 patients. 24 patients had early perforation. While 16 no of patients had gross faecal contamination, 19 patients underwent primary suturing of

perforation, 10 patients underwent resection and anastomosis, 7 patients underwent ileostomy and 3 underwent suturing of perforation + exteriorization of ileal loop [13-16].

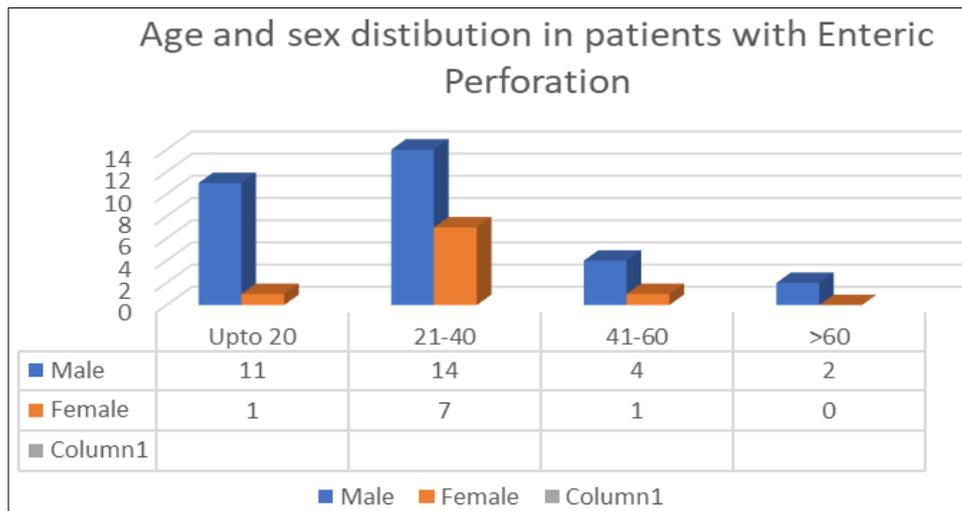


Fig 1: Age and Sex distribution of patients

Table 1: Age and sex incidence

Age Group	Sex		Total	Percentage
	Male	Female		
Up to 20	11	1	12	30%
21-40	14	7	21	52.5
41-60	4	1	5	12.5
>60	2	-	2	5.0
Total	31(77.5)	9(22.5)	40	100

This table shows age and sex incidence of enteric perforation. Out of 40 cases there were 31 male (77.5%) and 9 females

(22.5%). Amongst 52.5% cases from the 21-40 years of age group and 30% cases were below 20 years of age.

Table 2: Clinical Presentation

	Symptoms	Total cases	%
1	Pain in abdomen	40	100
2	Fever	38	95
3	Distension of abdomen	19	47.5
4	Vomiting	24	60
5	Constipation	17	42.5
6	Diarrhoea	2	5

This table shows the clinical presentation of enteric perforation. All the patient (100%) presented with pain in abdomen which started mainly in lower abdomen and become generalized. Duration of symptoms varied from 1 to 15 days. 38 patients (95%) presented with history of continuous fever rising in step ladder pattern during the first week with duration of 1 to 30

days.

Distension of abdomen was presented in 19 patients (47.5%) with duration of 1 to 5 days. 24 patients (60%) presented with non-projectile type of vomiting with duration of 1 to 10 days. Constipation was present in 17 patients (42.5%) while diarrhoea was present in 2 patients (20%).

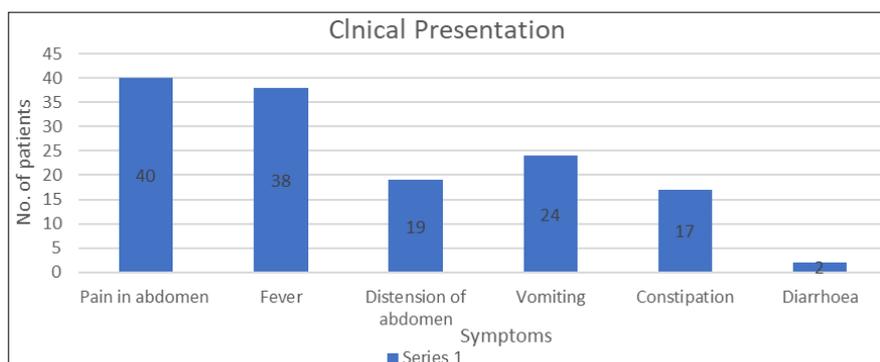


Fig 2: Clinical presentation of patients

### Physical Examination

- 1. Pulse rate:** 39 patients had pulse rate between 80-120/min and one patient has pulse rate more than 120/min.
- 2. Temperature on admission was as follows**

**Table 3:** Temperature on admission

Temperature (in ° F)	No. of patient	Percentage
97-99	34	85%
99-101	6	15%

- 3. Blood pressure:** Blood pressure recorded on the day of admission was as below.

**Mean systolic B.P.:** 104 mmHg

**Range systolic B.P.:** 100-134 mmHg

**Mean Diastolic B.P.:** 86 mmHg

**Range Diastolic B.P.:** 70-110 mmHg

**Signs:** Abdominal tenderness, guarding and rigidity were present in all the patients (55%) presented with dehydration. 24 patients (58%) had obliteration of liver dullness. All patients on day of admission had absent bowel sounds.

### Investigations

#### a. Widal test

Widal test was done by tube agglutination methods in all the patients on the day after admission.

**Table 4:** Widal test

Widal test	Cases	Percentage
Positive	30	75%
Negative	10	25%
Total	40	100%

Out of 40 cases 30 patients (75%) had Widal test positive and 10 patients (25%) had negative.

#### b. X-Ray abdomen in standing position

X-Ray abdomen in standing position was done all patients. In 31 patients X-ray abdomen was suggestive of free gas under diaphragm and in 5 patients X-ray abdomen suggestive of multiple air fluid level and in 4 patients X-ray abdomen suggestive both gas under diaphragm and multiple air-fluid level.

#### c. USG abdomen

Ultrasonography was done in 27 patients out of 40 cases. Ultrasonography was suggestive of free fluid in abdomen with dilated bowel loop in all these patients.

#### d. Histopathological Examination

Biopsy specimen, from ulcer edge was taken in 3 patient and resected segments was sent for biopsy in 4 cases, Histopathological report was suggestive of typhoid perforation in 4 cases (57.4%) and 3 cases were showing mixed inflammatory infiltrate.

#### e. Blood culture

Blood culture was done in all patients on the day of admission 5-10ml of blood was collected by venepuncture and inoculated in taurocholate broth. After incubation overnight at 37 c. the bile broth was subculture on DCA agar.

Blood culture was positive in 26 patients (65%) and negative in 14 patients (35%).

### Intra-operative findings

#### a. Peritoneal contamination

The amount of peritoneal contamination ranged from 100 ml to 3000 ml.

**Table 5:** Peritoneal Contamination.

	Nature of contamination	No. of cases
1.	Bilious	2
2.	Feculent	16
3.	Purulent	22
	Total	40

In one patient who was not operated the initial amount of drain fluid was calculated.

#### b. Number of perforations

39 out of 40 patients were subjected to exploratory laparotomy and following finding were noted.

**Table 6:** No. of perforation per patient

No. of perforation per patient	No. of patient	Percentage
Single	29	74.35
Two	3	7.69
Multiple (>2)	7	17.94
Total	39	100%

Majority of the patient (74.35%) had single perforation.

Out of 40, one patient was treated conservatively by putting peritoneal drain,

Under local anaesthesia. Patients expired within 8 hours due to cardio-respiratory arrest.

#### c. Site of perforation

**Table 7:** Site of perforation

Site Proximal to ileo-cecal junction	Upto 1 feet from ICJ			Upto 2 feet from ICJ
	0-10 cm	10-20 cm	20-30 cm	
No. of perforation	22	10	5	2

Out of 39 patient 22 patients had perforation in close proximity to ileocecal region (0-10cm).

#### d. Size of perforation

**Table 8:** Size of Perforation

Size	0.5x0.5cm	1x1 cm	1.5x1 cm	2x1 cm	2x2 cm	More than 2cm
No. of perforation	12	10	9	3	4	1

In 39 patients explored, 12 patients were found to have 0.5x0.5 cm size perforation and one patient had more than 2 cm size perforation.

### 8. Perforation-operation time interval

**Table 9:** Perforation-operation time interval

Perforation operation interval (h)	Survived		Died		Total	
	N	%	N	%	N	%
0-24	12	42.8	2	16.6	14	35
24-48	11	39.28	7	58.3	18	45
>48	5	17.85	3	25	8	20
Total	28		12		40	100

As perforation-operation time interval increased beyond 24 hrs mortality is increased significantly.

**9. Other intra-operative findings**

Most of the patients had interloop fibrinous adhesions with congested bowel loops. (Patient with single small perforation about 0.5x0.5 cm size had healthy and normal bowel loops.)

**10. Treatment**

Pre-operatively all the patient was given broad spectrum antibiotic (ciprofloxacin 1 pint and metronidazole 1 pint IV or ceftriaxone 1 gm and metronidazole 1 pint IV or ceftriaxone 1 gm, metronidazole 1 pint and amikacin 500mg IV) and IV fluids, Ryle’s tube aspiration. Catherization and correction of fluid and electrolyte imbalance was done in all the patients.

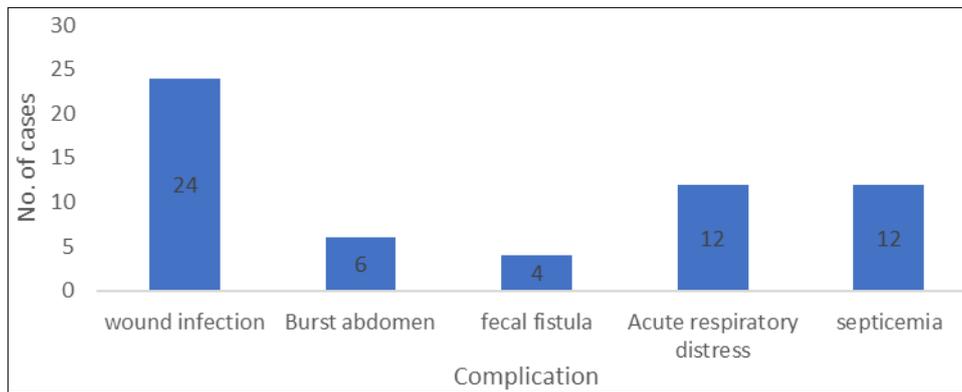
**Table 10:** Various operative procedure done in different size, site of entering perforation

	Operative procedure	No. of cases
1	Primary suturing of perforation	19
2	Ileostomy with mucous fistula with resection of ileal perforation	7
3	Resection and ileo-ascending anastomosis	10
4	Suturing of perforation + exteriorization ileal loop	3
5	Only peritoneal drainage	1
	Total	40

Primary suturing was done in 19 patients. One patient was treated by keeping peritoneal drain in Rt. Flank under local anaesthesia.

**11. Post-operative complication**

Post-operative wound infection was major complication that occurred where septicaemia was seen in 30% of cases.



**Fig 3:** Post-operative complication in no. of cases

**12. Distribution of complication, number of perforations and mortality**

**Table 11:** Distribution of complication, number of perforations and mortality

Complication	Single perforation	Two perforation	Multiple perforation	Mortality		
				Single perforation	Two Perforation	Multiple Perforation
Wound infection	17(58.6)	3 (100)	4 (57.1)	1	-	-
Burst abdomen	3(10.3)	0	3(42.6)	1	-	-
Pneumonitis	6(20.7)	0	6(85.71)	6(100%)	-	5(83.33%)
Septicaemia	6(20.7)	0	6(85.71)	6(100%)	-	5(83.33%)
Faecal fistula	3(10.3)	1(33.3)	0	1	-	-

29 patients with single perforation developed post-operative complication as follows: - wound infection in 17 patients (58.6%), burst abdomen in 3 patients (10.3%) pneumonitis in 6 patients (20.7%), septicaemia 6 in patients (20.7%), faecal fistula in 3 patient (10.3%) and mortality in 6 patients.

3 patients with two perforation developed post-operative complications as follows: - wound infection in 3 patients (100%) and faecal fistula in 1 patient (33.3%).

7 patients with multiple perforation developed post-operative complication as follows: - wound infection in 4 patients (57.1%) burst abdomen in 3 patients (42.6%). Acute respiratory distress in 6 patients (85.71%), septicaemia in 5 patients.

**13. Various operative procedure with mortality and faecal fistula.**

**Table 12:** Various operative procedure with mortality and faecal fistula.

Operation	No. of cases	Faecal fistula	Mortality
Suturing of perforation	19	3 (15.7%)	2 (10.5%)
Ileostomy with mucus fistula with resection of ileal perforation	7	0	3(42.85%)
Resection and anastomosis	10	1 (10%)	5 (50%)
Suturing of perforation + exteriorization of ileal loop	3	0	1 (33.3%)
Only peritoneal drainage	1	0	1 (100%)

Total	40	4	12
-------	----	---	----

Various operative procedure mention above were done in 40 patients of typhoid perforation.

Primary suturing was done in 19 patients. Amongst them 2 patients (10.5%) died and 3 patients developed faecal fistula.

Ileostomy with mucus fistula with resection of ileal perforation was done in 7 patients, 3 patients (42.85%) died post operatively.

Resection and anastomosis were done in 10 patients. Amongst them 5 patients (50%) died and one patient developed faecal fistula.

Suturing of perforation of exteriorization of ileal loop was done in 3 patients. One patient expired postoperatively.

Only peritoneal drainage was done in one patient who expired due to septicaemia and pneumonitis.

#### 14. Outcome

**Table 13:** Final outcome of 40 patients of enteric perforation

	Outcome	No. of patients	Percentage %
1	Complete recovery	17	42.5
2	Recovery with complication	11	27.5
3	Death	12	30
4	Total	40	100%

42.5% patients recovered fully without any complication. 27.5% of patients recovered with complication. There was a mortality in 30% cases.

#### Hospital stay

**Table 14:** Hospital stay in 28 patients those who survived ranged from 9-60 days

Hospital stay	No. of patients
Up to 10 days	3
11-20 days	10
21-30 days	8
More than 30 days	7
	28

Mean hospital stay in 40 patients was 18 days

#### 15. Follow up

- Out of 28 patients who survived, 24 patients came for follow-up after, 15 days, 1 month, 2 months and 3 months.
- 7 patients who underwent ileostomy with mucus fistula, all 7 patients follow up and underwent ileostomy closure successfully.
- 3 patients who underwent suturing of perforation + exteriorization of ileal loop, 2 patients came for follow-up and underwent interiorization of ileal loop.
- One patient expired in the ward.

#### Discussion

Typhoid ileal perforation is a common and severe surgical emergency in many 'third world' countries, affecting mainly young people. While the duration of the typhoid fever did not seem greatly to affect the mortality, probably due to the small number of patients, duration of the perforation longer than 4 d had some relevance to the outcome. Therefore, surgery should be undertaken as soon as the patient's general condition permits. Adequate rehydration was the factor which most significantly improved the outcome of ileal perforation in this study.

Our study demonstrated symptoms of pain in abdomen was common in all patients. The other symptoms vomiting (60%) distension of abdomen (47.5%) fever (95%), constipation (42.5%), diarrhoea (5%)

And Widal test positive in 75%. -signs of peritonitis in the form of abdominal tenderness (100%), guarding / rigidity (100%) were present in all cases and dehydration (55%), obliteration of liver dullness (58%) and absent bowel sound (100%) were also present.

Intra-operatively most of the patients had interloop februations with congested bowel loops. Patients with single perforation (74.35%) of 0.5\*0.5cm size had healthy and normal bowel loops. Primary suturing of typhoid perforation was the most frequent used modality of treatment (19 cases) with mortality rate (2 cases) 10.5% and ileostomy +mucus fistula was done in 7 cases with 42.85% mortality, resection and anastomosis was done in 10 cases with 50% mortality and suturing of ileal perforation with exteriorization of ileal loops was done in 3 cases with 33.3% mortality, only peritoneal drainage was done in one patients which expired due to cardio-respiratory arrest and septicaemia post operatively. The most common complications were wound infection (60%), septicaemia (30%), and pneumonitis (30%). The other complications is burst abdomen faecal- fistula. Morbidity was maximum in patients having perforation and operation time interval more than 48 hours.

In our study mortality rate highest in patient with multiple ileal perforation (30%) the final outcome with complete recovery without any complications in 42% patients, with complication in 27.5% and death in 35% patients. Out of 28 patients, all patients came for follow up and 7 patients for ileostomy closure and 2 patients for interiorization of ileal loop.

#### Conclusion

The typhoid perforation in a age old disease and though newer operative procedure have evolved over a period of time. The morbidity and mortality of patients presenting in the hospital is still high. Poor nutrition and limited parental nutrition may have a role to play foe high mortality and morbidity. A lot need to be done for such patients in future.

**Financial support and sponsorship:** Nil.

**Conflicts of interest:** there are no conflicts of interest.

#### References

1. Dickson JAS, Cole GJ. Perforation of the terminal ileum. Br. J Surgery. 1964; 51:893-897.
2. Acheampong EQ. Typhoid ileal Perforation: Why such mortality? Br. J Surgery. 1976; 63:317-32.
3. Emmanuel A. Ameh. Typhoid ileal perforation in children: a scourge in developing countries. Annals of tropical paediatrics. 1999; 19:267-272.
4. Adesunkanmi ARK, Ajao OG. The prognostic factors in typhoid ileal perforation: a prospective study of 50 patients R. Call Surg. Eding. 42, December, 1997, 395-399.
5. Sachin Talwar, Rakesh K. Sharma, Dinesh K, Mittal, Prasad P. Typhoid Enteric perforation N.Z.J. Surg. 1997; 67:351-353.
6. Akash A, Shah, Khursheed A, Wani, Baldev S, Wazir. The ideal treatment of the enteric perforation -resection anastomosis. Int Surg. 1999; 84:35-38.
7. Udal Singh Beniwal, Dinesh Jindal, Jagdish Sharma, Sumita

- Jain Ghanshyam. Comparative study of operative procedure in typhoid perforation. *Indian J Surg.* 2003; 65:172-7.
8. Kullberg G, Frisk B. Factor reducing mortality in typhoid ileal perforation. *Tropical medicine.* 1991; 85:793-795.
  9. Huckstep RL, MA, MD (Cantab.), F.R.C.S. (Eng.), F.R.C.S. (Ed.) *Recent Advances in the surgery of typhoid fever Hunterian Lecture delivered at the Royal College of surgeons of England on 17<sup>th</sup> November, 1959.*
  10. Joginder Singh, Bhola Singh. Enteric Perforation in Typhoid Fever: A study of 15 cases *N.Z.H. surg.* August, 1975, 45(3).
  11. Singh S, Singh K, Grover AS, Kumar P, Singh G, Gupta DK. Two-layer closure of typhoid ileal perforation: a prospective study of 46 cases *British journal of surgery.* 1995; 82:1253.
  12. Rahman GA, Abubakar AM, Johnson BR, Adeniran JO. Typhoid ileal perforation in Nigerian children: an analysis of 106 operative cases *Paediatr Surg Int.* 2001; 17:628-630.
  13. Wardhan H, Gangopadhyay AN, Singhal GD. Intestinal perforation in children *Aust. Paediatr. J.* 1989; 25:99-100.
  14. Connolly DP, Ugwu BT, Eke BA. Single-layer closure for typhoid perforations of the small intestine: case report *East African Medical Journal,* 1998, 75.
  15. Forrest C. Eggleston and Bannu Santoshi. Typhoid perforation: choice of operation *Br. J Surg.* 1981; 68:341-342.
  16. Vyas ID, Purohit MG, Patel HL. Simultaneous Typhoid ileal Perforation in identical Twin Brothers