

# EXPERIENCE WITH TYPHOID ILEAL PERFORATION

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## SUMMARY

This is a prospective study of 140 patients with spontaneous ileal perforation admitted to surgical 'A' unit during the period from 1st January 1994 to 31 December 1995 (2-years). All patients were operated in emergency in casualty department. Most of the patients (71%) presented with acute abdominal pain and pyrexia. Ninety six were below the age of 40 years. All patients had generalized abdominal tenderness and guarding which is a diagnostic feature of acute peritonitis. Complications were recorded in 40 patients (morbidity rate 28.5%), while 12 patients died (mortality rate 9.9%). The procedure of choice is primary closure in patients with single perforation presenting within 12 hours of acute abdominal pain.

## INTRODUCTION

Perforation of the ileum is a serious complication of typhoid fever and carries high morbidity and mortality rates.<sup>1</sup> Different surgical techniques have been tried to reduce the high mortality rate. These include primary closure, Ileostomy, right Hemicolectomy etc. It still remains controversial which is the best procedure for an individual patient.

This prospective study was under taken to find out presenting clinical features, various methods to investigate, compare various operative options and record complications in three months follow up.

## MATERIAL AND METHODS

This study includes 140 patients admitted into Surgical 'A' Unit from 1st January 1994 to 31st December 1995. A proforma was filled after the diagnosis of ileal perforation was confirmed at laparotomy. If perforation time was less than 12 hours, primary closure was performed in two layers, inner continuous, 2/0 chromic catgut and outer 2/0 interrupted silk. The anterior

inner catgut sutures were done by Connell's technique. Ileostomy, whenever done, was brought out in right iliac fossa by Brook's technique. A thorough peritoneal lavage with large amount of normal saline was done in all patients. Drains were put in all but 20 patients done by the second author. During the post operative period all the investigations including widal test, histology reports were recorded. Blood cultures done were recorded in these proformas. Special attention was given to post operative complications and were recorded in details, and managed accordingly. All these patients were followed up for 3 months after discharge from the unit.

## RESULTS

### Clinical presentation

Out of 140 patients one hundred and twelve were male. Ninety six male patients were below the age of 40 years. It is evident that the disease effects the younger earning population of the community. Twelve patients presented in casualty with acute abdomen after 3 days while 88 patients

TABLE - I  
SYMPTOMS OF PATIENTS WITH  
TYPHOID ILEAL PERFORATION  
TOTAL NO. OF PATIENTS (n = 140)

SYMPTOMS	NO. OF PATIENTS
FEVER	140 (100%)
ABDOMINAL PAIN	140 (100%)
VOMITING	100 (71.43%)
ABDOMINAL DISTENTION	100 (71.43%)
DIARRHOEA	40 (28.57%)
CONSTIPATION	84 (60.00%)
EPISTAXIS	08 (05.71%)

presented within 12 hours. Typhoid fever is more prevalent in summer months, in this series, 82 cases (60%) out of 140 were recorded in June, July and August. All patients presented with history of fever and abdominal pain. Interestingly 8 patients presented with epistaxis to ENT department. In addition they gave history of fever and mild abdominal pain. Investigations revealed typhoid fever. During their stay in the hospital, they developed abdominal pain and vomiting and surgeons's opinion was asked for. Abdominal distention and vomiting was present in 71% and constipation in 60% (Table -I). All patients had pyrexia of more than 100°F and generalized

TABLE -II  
SIGNS OF PATIENTS WITH TYPHOID  
ILEAL PERFORATION

SIGN	NO. OF PATIENTS
ABDOMINAL TENDERNESS	140 (100%)
PYREXIA	140 (100%)
ABDOMINAL DISTENTION	100 (71.72%)
TACHYCARDIA	124 (91.42%)
ABSENT BOWEL SOUNDS	112 (80%)
ANAEMIA ( PALLOR)	56 (40%)

abdominal tenderness and guarding. Ninety one percent had tachycardia (pulse rate more than 90/min) (Table-II).

#### Laboratory investigations

Gut perforation in typhoid fever usually occurs in later part of second week and early part of 3rd week of pyrexia (Table- III). In emergency cases, where typhoid perforation is suspected, the only available investigation is indirect agglutination test of Widal. In this study it was positive in 68(54.54%) out of 140 patients. Gas under right diaphragm is diagnostic of visceral perforations. In this

TABLE - III  
DURATION OF FEVER IN TYPHOID  
BEFORE OPERATION  
TOTAL NO. OF PATIENTS (n = 140)

DURATION OF FEVER	NO. OF PATIENTS
< 7 DAYS	16 (12.12%)
8-14 DAYS	84 (63.63%)
15-21 DAYS	28 (21.21%)
> 22 DAYS	12 (09.09%)

study it was seen in 84 (60%) patients. Blood cultures were done in triplicate in all patients during their hospital stay. They were positive for S. Typhi in 4 patients. Tissue removed from ulcer margin for histology was reported as non specific inflammation (Table-IV).

#### Surgical technique

Before surgery, all patients were resuscitated with intravenous fluids, blood transfusion and intravenous antimicrobial drugs. Exploratory laparotomy was performed via a midline incision. At laparotomy, 112 patients had one perforation, 16 had two while twelve had more than two. All the peritoneal fluid including pus and gut contents was sucked out. Perforation/s was identified and a decision made as to

TABLE-IV  
DIAGNOSTIC STUDIES (n = 140)

INVESTIGATION	PATIENTS	DONE IN POSITIVE
CHEST X-RAY / GAS UNDER DIAPHRAGM.	140	84 (60%)
X-RAY ABDOMEN / AIR AND FLUID LEVEL	140	56 (40%)
BLOOD CULTURE	140	04 (03.03%)
WIDAL TEST	140	68 (54.54%)
BIOPSY OF TISSUE REMOVED	140	140 (100%)

BLOOD CULTURE - DONE DURING HOSPITAL STAY (usually 7 days)

TISSUE BX - REPORTED NON SPECIFIC

the most appropriate surgical procedure. One of the important consideration was the time lapsed between the time of perforation and the time patient presented to casualty. Out of 140 patients eighty eight (64.3%) presented within 12 hours of the abdominal catastrophe, all these were primarily closed. Twelve patients presented after 3 days of abdominal pain (Table-II). In 30 (21.5%) patients perforations was exteriorized as ileostomy. Out of these 30, sixteen had double perforations. In these patients the distal perforation was closed and proximal one brought out as ileostomy. Right hemicolectomy was done in four patients, who had more than two perforation in the terminal ileum with extension on to the caecal wall. In 12 patients who had more than two perforations with in a 6 inch gut segment, had resection and end to end anastomosis. Peritoneal lavage was done in all patients with large amount of normal saline and cephradine. Four patients were very ill, frail and unfit for anaesthesia and surgery; therefore only drainage of the peritoneal cavity with or without lavage was done.

### Postoperative morbidity and mortality

Anastomosis leaked in 12 patients with resultant fistula formation (Table-V), 4 were treated successfully with conservative treatment (total parenteral nutrition) while 8 were exteriorized as Ileostomies, and were closed 2 months later as elective procedures. Paralytic ileus occurred in twenty eight patients, mostly due to intra-abdominal sepsis and electrolyte imbalance. They all settled with conservative treatment except one who was reopened and the pus was washed out. Wound infection occurred in 24 patients and cultures reported as mixed gram positive and gram negative bacteria they were treated with 3rd generation broad spectrum cephalosporins. Wound dehiscence occurred in patients who had wound infection. Clinical septicaemia affected 22 patients, 7 died. Chest infection was recorded in 9 patients, this was treated with broad spectrum penicillins successfully. Two out of three cases of Pulmonary embolism secondary to deep vein thrombosis died. Eight patients developed post operative

TABLE -V

POST OPERATIVE COMPLICATIONS IN TYPHOID ILEAL PERFORATION  
TOTAL NO. OF PATIENTS (n = 140)

COMPLICATION	NO. OF PATIENTS
PARALYTIC ILEUS	28 (20.00%)
WOUND INFECTION	24 (17.14%)
SEPTICAEMIA/TOXCAEMIA	22 (15.90%)
WOUND DEHISCENCE	16 (11.42%)
FISTULA	12 (08.57%)
PULMONARY COMPLICATIONS (CHEST INFECTION, PULMONARY EMBOLISM)	12 (08.57%)
INTRA PERITONEAL ABSCESS	08 (05.72%)
RENAL FAILURE	04 (02.85%)

intra peritoneal sepsis/abscess. Six patients were treated conservatively while 2 were reopened and washed with saline. Four patients went into acute renal shut down. Three were dialysed and recovered, while 1 died. Out of 140 patients, twelve died postoperatively (mortality rate 9.9%) (Table-VI). Maximum mortality (75%) was in patients who underwent drainage only. These were unfit, ill, and frail patients.

## DISCUSSION

Typhoid is still a common illness in the developing countries. The annual incidence of Typhoid fever as such is 12.5 million cases per year. Three quarter of these occur in Africa and South East Asia. The cause for this high incidence is lack of personal hygiene and contaminated drinking water.<sup>2</sup>

Since 1965 surgery has been established as the treatment of choice in cases of typhoid Ileal perforation. With the use of good surgical technique and more effective broad spectrum antibiotics, mortality has dropped to 10% in adults and 3% in children.<sup>3,4</sup>

Patients with gut perforation present with signs and symptoms of acute peritonitis. Besides clinical examination chest roentgenogramme is done as routine for gas under right dome of diaphragm. Diagnosis of typhoid ileal perforation is mostly clinical. In this study Widal and Blood cultures were of little diagnostic value while radiological evidence of gas under diaphragm was found in 84 patients (60%). Perforation was confirmed at laparotomy in all 140 patients. Almost similar picture is reported in a study of 45 patients from India.<sup>5</sup>

The diagnosis of typhoid perforation is not always an easy one. A patient with symptoms and signs of peritonitis who gives history of fever for more than one week duration, is most likely suffering from typhoid perforation. In spite of this cases still

come across whom at laparotomy will be found to have perforated peptic ulcer or perforated appendicitis.<sup>6</sup> Conservative treatment carries high mortality and so is no more recommended once a patient with history of typhoid fever develops symptoms and signs of acute abdomen.<sup>7,8</sup> The reported incidence of bowel perforation in typhoid fever varies markedly from place to place. The highest quoted is from Ghana i.e. 17.9%.<sup>6</sup> A rising titre of agglutinin (widal test) is diagnostic of typhoid fever. Therefore patients with abdominal pain, should be promptly examined by surgeon and if doubt exists, it is better to explore rather to continue observation.<sup>6</sup> The significance of widal test has been evaluated by many authors especially in endemic areas and was found to be 61% sensitive and 88% specific with a positive predictive value of 83% and negative predictive value of 72%.<sup>9</sup> In the present study widal was positive in 68 patients (54.54%).

The best surgical operation is excision of ulcer margins and two layers closure with catgut and silk. In addition intensive peritoneal cavity lavage with normal saline give the most acceptable results.<sup>10,22</sup> Important prognostic factors are serum urea and the time lapse after perforation.<sup>11</sup> In the present study we fix the duration as 12 hours to decide either primary closure or ileostomy. It has been shown that morbidity is closely associated with the duration of perforation. If less than 24 hours have passed the mortality is 25% but if perforation is more than 96 hours old, the mortality rises to 83%.<sup>12</sup> Nevertheless aggressive preoperative intravenous fluids and electrolytes infusion and antibiotic cover are as important as surgery itself.<sup>13</sup> In some patients even resection of the diseased small bowel is undertaken while still other who are very serious and cannot withstand anaesthesia / surgery are benefitted from simple drainage of the peritoneal cavity under local anaesthesia.<sup>14</sup> In our study "drainage only" was performed in 4 patients. In Nigeria there

has been tremendous improvement in mortality from 53% to 6.25% by adopting a policy of early diagnosis, rigorous intensive resuscitation, fresh blood transfusion, surgical rather than conservative management, early rather than delayed surgery, quick and simple rather than lengthy and radical surgery, thorough peritoneal toilet and adjuvant metronidazole in addition to Chloramphenicol.<sup>15</sup>

Some authors have reported eosinophilia in patients with typhoid ileal perforation.<sup>16</sup> Other factors which affect mortality and morbidity of these patients are; age of the patient, duration of perforation before surgery, presence of additional complications, the extent of surgery and the number of perforations present.<sup>17</sup> Bacteriology and Immunology in typhoid perforation varies accordingly. In one study salmonella typhae was isolated from blood in 4% of cases, from ileal contents in 23%, peritoneal pus in 13% and from mesenteric lymph nodes in 71% of case. salmonella typhae remain viable in lymph nodes even after 4 days of chloramphenicol therapy. Two groups of uncomplicated typhoid fever and perforated gut were compared and were found to show no significant difference in total serum IgG, IgM, and IgA, indicating that the apparent hyporeactivity was not due to a generalized humoral immuno-deficiency.<sup>18</sup> The mortality of typhoid ileal perforation had been very high in the past. With the availability of good broad spectrum antibiotics and good surgical techniques, the surgeons world wide, have been able to bring it down to acceptable levels. In this study the mortality recorded was 9.9%. This is well in comparison with other national and international studies Table-XI. One of the reason of high mortality rate in typhoid perforation is the vexing problem of re-leakage after closure. In view of this some research workers have tried deflation techniques either proximally in the form of Ileocolic by pass or distally in the form of Caecostomy

or colostomy etc. Unfortunately all these methods have failed to give any gratifying results, therefore, a total resection of the terminal ileum with closure of the ileo-cecal opening and anastomosis of the proximal healthy ileum to the transverse colon have been tried with no mortality at all.<sup>19</sup> Some surgeons have found single layer closure more effective in reducing post operative fecal fistula rate than the double layer technique.<sup>20</sup> Bypass procedures with closure of the perforation has shown better results regarding post operative fecal fistula rate. This usually is in the form of an end to side ileotransverse colostomy with either division of the ileum proximal to perforation or closure of the perforation or removal of the terminal ileum.<sup>21</sup> A thorough peritoneal lavage with cephradine in normal saline has proved to be of great value specially when peritonitis is diffused. With this technique mortality from the intra-abdominal sepsis has been brought down to acceptable levels.<sup>22</sup> Some authors have also been able to recognize certain factors adversely affecting the ultimate overall mortality in patients with typhoid perforation. These are extremes of age, generalized peritonitis, lower white cell count, multiple perforations, and post operative enterocutaneous fistula. Double layer closure lowers mortality rate compared with single layer. Broader spectrum antibiotics, in the form of Chlo-ramphenicol with gentamycine or metronidazole or both, reduced the mortality rate compared with chloramphenicol alone.<sup>23</sup>

Epidemiological studies have revealed that water borne outbreaks of typhoid are typically explosive in onset. Countries that show increased typhoid severity share several characteristics in common i.e. rapidly increasing population, improper disposal of human waste, decreasing water supply per capita, and intimate contact between human, food and contaminated water supply.<sup>24</sup> In one study a retrospective

analysis of 108 patients with typhoid perforation revealed a high mortality rate of 32%. This was attributed to overwhelming sepsis which progressed despite of aggressive operative management and antibiotic administration. Therefore, it seems that, the key to improved survival in this deadly disease lies not in a better operation or improved pre-operative care but in the prevention of typhoid fever by providing safe drink water and improved sanitation methods for all of the global community.<sup>1</sup>

Public awareness is urgently required to prevent typhoid fever as such and therefore morbidity and mortality associated with perforation. Mass health education programmes on print and electronic media must be given top priority in this regard. The control of typhoid fever depends primarily upon the universal availability of adequate clean water and sewer system. Until these measures are enacted, perhaps the only worthwhile option is to utilize vaccines to prevent the disease. Vaccine are much more useful on a short term basis. Long term control of typhoid fever depends on improvement in water supply and sanitation. Do most countries have the capital for such an undertakings? is the crucial question.<sup>24</sup>

## REFERENCES

1. Meier DE, et al. Perforated typhoid Enteritis: Operative experience with 108 cases. *Am J Surg.* 1989; 157: 423.
2. La Brooy T. Typhoid in 1993 in "Tropical Health" *Med J Austra.* 1993; 159: 597.
3. Li FWP. Surgical treatment of typhoid perforation of the intestine. *Br J Surg* 1963; 50: 976.
4. Vargas M, Pena A. Perforated viscera in typhoid fever: a better prognosis for children. *J Pediatr Surg* 1975; 10: 531.
5. Kapoor VK, et al. Typhoid enteric perforations. *Jap J Surg* 1985; 15: 205.
6. Gibney EJ. Typhoid perforation *Br J Surg.* 1989; 76:887.
7. Richens J. Management of bowel perforation in typhoid fever. *Tropical Doctor* 1991; 21: 149.
8. Rathore AH. Typhoid perforation. *Specialist* 1991; 7: 31.
9. Aquino RL, et al. Evaluation of a single widal test in the diagnosis of enteric fever. *South east Asian J Trop Med Public Health.* 1991; 22: 375.
10. Keenan JP, et al. The surgical management of typhoid perforation in children. *Br J Surg.* 1984; 71: 928.
11. Akoh JA. Prognostic factors in typhoid perforation. *East Afr Med J* 1993; 70: 18.
12. Khanna AK, et al. Typhoid perforation of the gut *PG Med J* 1984; 60: 523.
13. Chouhan MK, et al. Typhoid enteric perforation. *Br J Surg* 1982;69:173.
14. Entache Jean-Maric. Typhoid perforation of the intestine *Arch Surg.* 1983;118:1269.
15. Efem EES. Recent advances in the management of typhoid enteric perforation in children. *J R Coll Surg Edin.* 1986;31: 214.
16. Van Der Werf TS, et al. Typhoid perforation of the Ileum. *Trop Geograph Medicine* 1990; 42: 330.
17. Ajao OG, et al. Typhoid Perforation: Factors affecting mortality and morbidity. *Int Surg* 1982; 67: 317.
18. Peiris JSM. Ileal Perforation in Typhoid: Bacteriological and Immunological Findings. *Southeast Asian J. Trop Med Public Health* 1993; 24: 119.
19. Singh AB, et al. Surgical management of typhoid perforation (A new approach). *J Indian M A* 1987; 85: 140.
20. Maurya SD, et al. Typhoid Bowel perforation: A review of 264 cases. *Int. Surg* 1984; 69: 155.

21. Thomas SS, et al. Typhoid Perforation: Further experience with end to side ileotransverse colostomy. *Trop Doct* 1990; 20: 126.
22. Mumtaz K. Retrospective analysis of patients with acute diffuse peritonitis. *JPMI, Pakistan*, 1994; 8(2): 62.
23. Mock CN, et al. Improvement in survival from typhoid ileal perforation. *Am J Surg* 1992; 215: 244.
24. Siddiqui S. Epidemiologic Patterns and control strategies in typhoid fever. *JPMA* 1991; 143: