Comparative Study of Primary Repair Versus Ileostomy in Patients of Typhoid Perforation

T WAQAR S A KHAN
Department Of Surgery, Nishtar Hospital, Multan
Correspondence to Dr. Tariq Waqar E mail: drtariqwaqar@yahoo.com

Objective: To evaluate the better surgical option in cases of typhoid perforation comparing ileostomy and the primary repair. **Study design:** It was a cross sectional comparative study. **Place and duration of study:** Department of Surgery, Nishtar hospital Multan during December 2003 to November 2004. **Patients and methods:** A total of 50 cases of typhoid perforation which presented in less than 24 hours after perforation. The patients were divided into two groups of 25 patients each in double blind randomized pattern. In one group ileostomy was done and in the other group primary repair was done. **Results:** The mortality rate in the ileostomy was 8% and the morbidity rate was 56%. In the patients with primary repair the mortality rate was 12% and the morbidity rate was 24%. **Conclusion:** If patient present within 24 hours after perforation provided that the patient is in good general health and with no other concomitant illness primary repair of the typhoid perforation should be done in every patient.

Key Words: Typhoid perforation, primary intestinal repair, ileostomy,

Despite improvements in health care facilities, Typhoid fever remained an important cause of suffering in this part of the world.

This disease is endemic in region with poor hygienic conditions and water contamination such as Pakistan, India and countries in South America and Africa[1]. Typhoid fever is an infectious disease caused by salmonella typhi, which is a gram negative flagellated bacterium present in contaminated food and water[2]. The spread of infection is usually by orofecal route. The onset is insidious with **fever**, which rises in stepladder pattern for 4-5 days. There is generalized malaise with increasing headache, drowsiness, itching and relative bradycardia. In the second week typical rash may appear on upper abdomen and thorax and spleen may be enlarged.

If Typhoid fever is not treated properly by medical treatment, its complication begins to appear especially in third week of illness called 'week of complications'. The perforation of the typhoid ulcer usually occurs during this week[3] and is situated on antimesenteric border usually in the region of terminal ileum involving the peyer's patches[4]. Typhoid perforation is a serious complication having a mortality rate of 1-39.3% according to various reports[5]. Other complications include abscess formation, gangrenous typhoid Cholecystitis, arthritis and osteomyelitis[3,6]. Diagnosis in early stage of disease is difficult because symptoms often represents as generalized infection, leukocyte count may be helpful as there is characteristic leucopenia in Typhoid fever[1,3]. Diagnosis can be confirmed by culture of blood or stool[7].

Treatment depends upon the nature of complications, surgery remains the treatment of choice in typhoid perforation[1]. Various modalities of surgical options are available, one is ileostomy and other is primary repair.

Prognosis depends upon many factors including age, general condition of the patient, duration of the perforation and concomitant illness. In case of perforation, primary repair carries a significant risk of leakage and peritonitis, which may endanger life of the patient. On the other hand ileostomy has its own problems like ileostomy diarrhea, prolapse, and stoma care etc.

With the advancement in medical field and early availability of good antibiotics along with improved post operative care, now-a-days, the primary repair of typhoid perforation is considered better treatment option as it carries less morbidity and mortality.

Patients and methods:

It was double blind, randomized study of 50 cases, which were admitted in Nishtar hospital Multan and were diagnosed as a case of typhoid perforation. The patients were of both sexes, above the age of 13 years, having the history of peritonitis less than 24 hours, hemoglobin above 10 gm% and with no other concomitant illness like diabetes, ischemic heart disease and pulmonary diseases etc.

History, examination and investigations were recorded on a predesigned proforma. The decision of surgery was done by the consultants of the respective surgical wards. The surgery of the patients was done in the emergency operation theatre by the senior registrars. The postoperative care was done in the respective surgical wards, where they were daily seen and advised by the consultants. The patients were randomly divided into two groups i.e. Group A (control group): ileostomy was done in this group.

- Exteriorization of the perforation as a loop ileostomy.
- Resection and exteriorization as a double barrel ileostomy.

Group B (experimental group): Primary closure was done in this group in following ways:

- Simple repair of the perforation.
- Wedge resection of the perforation and repair.

- Resection and anastomosis.

The data was collected on a pre-designed proforma. The study was analyzed and groups were compared using chi-square test.

Results:

A total number of 50 patients were finalized for the analysis. 12(24%) patients were females and 38(76%) males. Female to male ratio was 1: 3. The age ranged from 15 years to 39 years. Most of the patients belonged to low socioeconomic status. The total duration of illness from onset of fever to development of peritonitis ranged from 2 to 4 weeks, with an average of three weeks. The white blood cell count was in the range of 7000 -12000/mm^3 with an average of 6500/mm^3. X-ray plain abdomen in erect posture was the most useful investigation revealing free gas under diaphragm in 45(90%) cases. Solitary rounded perforation was present in 45(90%) cases. 5(10%) patient had more than one perforation. All perforations were with in 1.5 feet of terminal ileum. The size of perforation ranged from pinhead to about 7mm. Fecal matter was present in peritoneal cavity in all cases. In all the patients of group A ileostomy was done irrespective of the number of perforations. While in group B primary repair of perforation was done. In group B 23(92%) patients out of 25 having single perforation, after freshening the margin, primary repair of perforation was done. While in the remaining 2(8%) patient who were having more than one perforation the affected portion of gut was resected followed by primary anastomosis. In group A patients who underwent ileostomy irrespective of number of perforations, death occurred in 2(8%) cases. One patient expired due to severe septicemia and the other patient died due to cardiac arrest. In Group A ileostomy prolapse occurred in 1(4%) patient, retraction of ileostomy in 1(4%) patient, which needed refashioning. Ileostomy diarrhea occurred in 3(12%) patients in which severe electrolyte disturbance occurred. There was excoriation of skin in 4(16%) patients. Wound was infected in 3(12%) patients and 2(8%) patients were psychologically disturbed (Table No. 1). While on the other hand in group B patients in which primary repair was done, death occurred in 3(12%) patients. Out of these 3 patients one patient expired due to fecal fistula, one due to severe septicemia and one could not sustained the stress of surgery and anesthesia and died just after operation. Wound was infected in 4(16%) patients and 2(8%) patients developed fecal fistula in which one died and other improved by conservative management (Figure No. 1). So mortality was 8% in patients who underwent ileostomy but morbidity was 56%. On the other hand in group B patients mortality was 12% but morbidity was 24% (Figure No.2).All patients of group A with ileostomy were subjected to ileostomy closure after 8 to 12 weeks.

Table 1: Complications of ileostomy

Complications	=n	%age
Skin excoriation	4	16
Wound infection	3	12
Ileostomy diarrhea	3	12
Psychological disturbance	2	8
Ileostomy prolapse	1	4
Ileostomy retraction	1	4

Fig. 1

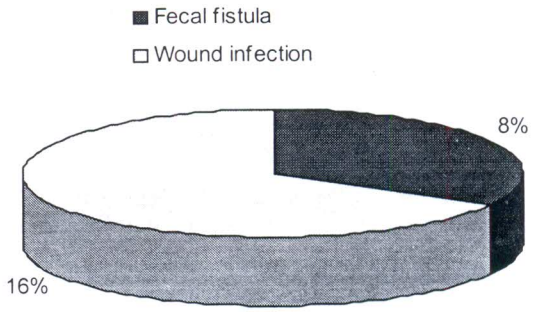
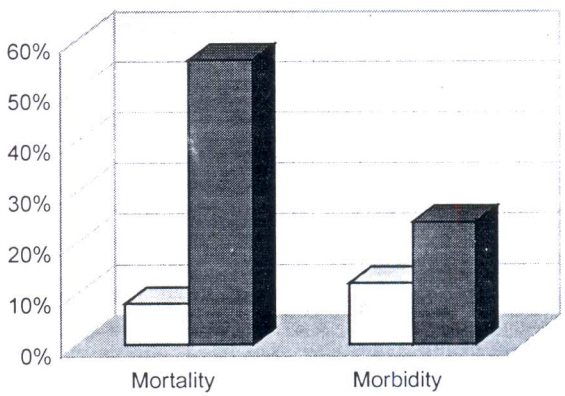


Fig. 2: Comparison of mortality and morbidity between ileostomy and primary repair



Discussion:

Typhoid fever is endemic in regions with poor hygienic conditions and where water is contaminated, such as Pakistan, India and countries of South America and Africa[1,8,9]. The results of present study are very much comparable to other studies cited in literature (Table.2). The disease is mainly affecting the young. Average age mentioned in literature is about 28 years[10,11] and in our study 27 years. Throughout literature males are more commonly affected than females with the ratio of about 4:1[10-13], in our study the male to female ratio was 3:1 which is close to the ratio mentioned in literature. Most of the times perforations occurs after an illness of 2-3 weeks[3,14] in this study period was 2.5 weeks. The single most important factor influencing the outcome of surgical

procedures is the time of surgery since perforation. Mortality and morbidity remains high particularly in those patients in whom surgical intervention is carried out after 24 hours of perforation[12,15]. Present study had all cases presenting with perforation within 24 hours. White blood cell count has been reported to low in patients with typhoid fever with average figure of 7000/mm^3.[1,3,15] However the presence of sepsis and the severe peritonitis tends to modify this number. In our study the no. of white blood cell count was an average of 6500/mm^3 which corresponds to studies of international literature. X-rays examination reveals gas under diaphragm in about 70% of the cases reported in literature[16]. In our study free gas under diaphragm was demonstrated in 90% cases. In most of the cases the perforation is single and located in the terminal ileum[10]. This study supports this finding and in 45(90%) cases the perforation was single and located within 1.5 feet of the terminal ileum. The reported mortality after primary closure ranges from 8-39%[17,18]. In present study the mortality after primary closure of perforation was 12% and in ileostomy was 8% which is very close to international literature. Morbidity was 24% after primary closure of perforation and 56% after ileostomy and in literature morbidity is 20% after primary closure and 31-40% after ileostomy19. Ileostomy is not very much favored in literature because of its high morbidity, second procedure required for its closure, social and psychological trauma to the patient. On the other hand primary closure of perforation is favored throughout international literature[19,20].

Table 2: Comparison of various parameters between international literature and this study

Parameter	Internation al literature	This study
Mean Age	28 Years	27years
Sex Ratio	4:1	3:1
Time elapsed before perforation	2-3 Weeks	2.5 Weeks
TLC	7000/Mm^3	6500/Mm^3
X-ray abdomen erect posture	70%	90%
Widal Test	Significant	+Ve In 70%
Site Of Perforation	Terminal Ileum	Within 1.5feet of IC Junction
No. Of Perforations	Single	Single 90%
Mortality of primary closure	8-39%	12%
Morbidity of ileostomy	31-40%	56%
Morbidity of primary closure	20%	24%

Conclusion:

The results of primary closure of typhoid perforation are comparable with that of ileostomy. If patient presents with history of perforation less than 24 hours, having no other concomitant illness and good general condition then in every patient primary repair of the perforation should be done because it has less morbidity and an approximately equal mortality as compare to ileostomy.

References:

1. Joseph SS, Dietmar WW et al. Intraabdominal infections. In: Seymour I. Schwartz principles of surgery. 7th ed. New York: McGraw Hill, 1999: 1515-50.
2. Samuelson J. Infectious diseases. In: Cotron RS, Kumar V, CollinsT. Robbins pathological basis of diseases. 6th ed. Philadelphia: WB Saunders, 1999: 329-402.
3. Finch RG, Moss P, Jefferies DJ,Anderson J. Infectious disease, tropical medicine and sexually transmitted diseases. In: Kumar P, Michael C. Clinical medicine. 5th ed. Edinbergh: WB Saunders, 2002:21-152.
4. Neil JMM. The small and large intestine. In: Russel RCG, William NS, Bulstroda CGK. Bailey & Love's Short practice of surgery.23rd ed. London: Arnold, 2000:1026.
5. Nooram MA, Sial I, Mal V. Typhoid perforation of small bowel: a study of 72 cases. JRColl Surg Edinb 1997;42(4):274-6.
6. Robert JCS, Moosa AR. Disorders of small intestine and vermiform appendix. In: Cuschieri A, Essential surgical practice.4th ed. vol.II. London: Arnold, 2002: 527-68.
7. Habib AJ, Atiq R. Specificity of Widal test in typhoid fever. JAMC 1999: Vol II.(2): 15-6.
8. Sinha A, Sazawal S, Kumar R, et al. Typhoid fever in children aged less than 5 years. Lancet 1999;354: 734-737.
9. Thong K-L, Bhutta ZA, Pang T. Multidrug-resistant strains of Salmonella enterica serotype typhi are genetically homogenous and coexist with antibiotic-sensitive strains as distinct, independent clones. Int J Infect Dis 2000;4:194.
10. Mirza SM, Ali AA, Gondal KM, Asghar M et al. Typhoid perforation: an experience at Mayo hospital Lahore. Ann King Edward Med Coll 1999; 5(1): 34-7.
11. Arain GM, Jaffri S. Proximal tube enterostomy adjunct to primary repair of typhoid perforation: a study of 33 cases at Sir Ganga Ram hospital Lahore. Biomedia 1998; 14: 101-4.
12. Gupta V. et al. Perforated typhoid enteritis in children. Postgraduate Med J 1994; 70(819): 19-22.
13. Adesunkanmi AR, Ajai OG. The prognostic factors in typhoid ileal perforation: a prospective study of 50 patients. J R Coll Edinb 1997; 42(6): 395-9.
14. Mitsubara Y. Clinical research on patients with typhoid and paratyphoid fever. Kansenshogaku Zasshi 1991; 65(6): 710-17.
15. Shehzad K, Aktar I, Ijaz I, Khan MM. Outcome of ileostomy in cases of typhoid perforation presenting after 48 hours. J Rawal Med Coll 2000; 4(1-2): 17-9.
16. Kayabali I, Jokcora IH, Kyabali M. Contemporary evaluation of enteric perforation in typhoid fever, analysis of 257 cases. Int Surg 1990; 57(2): 96-100.\
17. Pal DK. Evaluation of best surgical procedures in typhoid perforation- an experience of 60 cases. Trop Doct 1998;28(1): 16-8.
18. Athie CG, Guizar CB, Alcantara AB, Alcaraz GH, Montalvo EJ. Twenty five years of experience in the surgical treatment of perforations of ileum caused by salmonella typhi at the general hospital of Mexico city, Mexico. Surgery 1998; 123(6): 632-6.
19. Conolly DP, Ugwu BT, Eke BA. Single layer closure for typhoid perforation of the small intestine: case report. East Afr Med J 1998; 75(7): 439-40.
20. Saleh AB, Memon. A surgical audit of the management of typhoid perforation. J Surg Pak 2001; 6(2): 4-5.