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Typhoid Ileal Perforation: Comparative Study of Ileostomy Versus Primary Repair and associated Morbidity and Mortality

Shahzore Gul, Sughra Parveen, Mazhar Iqbal, Tanveer Ahmed, Imran Khan, Ali Nawaz

Jinnah Postgraduate Medical Centre Karachi Pakistan

ABSTRACT

Objectives: To study the result of primary repair with ileostomy in cases of typhoid ileal perforation.
Study Design: Quasi-experimental study.
Place and Duration of Study: Department of Surgery, Jinnah Postgraduate Medical Center, Karachi Pakistan, from May 2019 to Jun 2020
***Methodology*:** Participants who were operated on for typhoid ileal perforation were included, while patients who presented with a hollow viscus perforation other than ileal perforation were excluded from the study. Peritoneal lavage and exploration were performed. All per-operative findings were documented. In addition, the socio-demographic and clinical parameters, including the postoperative complications and morbidity/mortality, were documented.
Results: Out of the 73 individuals with ileal perforation included in this research, 52 underwent primary repair, whereas 21 underwent ileostomy. Patients who had undergone ileostomy had a higher morbidity (61.90%) and mortality (19.00%) rate than patients in the Primary Repair Group. In addition, patients in the ileostomy Group had significantly higher rates of wound dehiscence and infection, electrolyte imbalance, and weight loss than patients in the Primary Repair Group.
Conclusion: The current study indicates that primary repair is an ideal procedure for typhoid ileal perforation compared to an ileostomy.

Keywords: Ileostomy, Primary repair, Typhoid ileal perforation.

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INTRODUCTION

The most common surgical emergency in Pakistan and the subcontinent is perforation peritonitis.[1] According to the literature, lower gastrointestinal tract perforations in the west are more common, whereas, in Asian countries, upper gastrointestinal tract perforation is more frequent.[2,3]

A comprehensive study conducted in India emphasizes that enteric fever is the cause of nearly 87% of all nontraumatic small bowel perforations, with a fatality between 11 to 34%. The most prevalent and dreadful complications of enteric fever are small intestinal perforation and gastrointestinal bleeding. Pakistan, India, and other tropical countries suffer from Typhoid fever, an endemic disease.[4,5]

Even though surgery is considered a definite treatment, the choice of the exact surgical procedure remains controversial. Different authors have recommended numerous operative procedures in their studies, the most suggested being: i) simple primary repair of perforation; ii) repair of perforation with an intertransverse colostomy; iii) primary ileostomy; iv) single layer repair with an omental patch; v) resection and anastomosis.[6-8]

Most series have stated simple closure of the perforation or resection and anastomosis in case of multiple perforations, though results have only been satisfactory.[9,10] This procedure, even though it seems to be appealing in an emergency, has complications. Even though there is a wide range of procedures available, Ileal perforation has high morbidity and mortality rates.

The present research compared the result of primary repair with ileostomy in typhoid ileal perforation based on postoperative morbidity, mortality, and complications to determine an ideal procedure. In addition, this study was conducted to establish a standard treatment and management plan to provide optimum results in patients with typhoid ileal perforation.

METHODOLOGY

The quasi-experimental study was conducted at the Surgery Department, Jinnah Postgraduate Medical Centre, Karachi Pakistan, from May 2019 to June 2020 after obtaining approval from the Ethical Committee (F-2-81/2020-GENL/45262/JPMC). Using OpenEpi, keeping the morbidity rate for primary repair at 29.2%

Correspondence: Dr Shahzore Gul, Jinnah Postgraduate Medical Centre, Karachi Pakistan
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and for ileostomy at 63.6%, the sample size was calculated.[11]

Inclusion Criteria: All patients of either gender, operated on for typhoid ileal perforation at the centre were included in the study.

Exclusion Criteria: Patients aged above 70 years, patients with multiple comorbidities, patients who presented with a hollow viscus perforation other than ileal perforation and those who refused to consent to exploratory laparotomy were excluded from the study.

With the affirmation of the initial diagnosis of intestinal perforation, laparotomy was planned in all cases. General anaesthesia (GA) was used during the procedure, and laparotomy was done using a midline incision. Peritoneal lavage and exploration were performed by an experienced surgeon with over five years of experience as a general surgeon. All intraoperative findings were documented, and the perforation site was identified, i.e., round or oval-shaped ulcer at the terminal ileum. Third-generation antibiotics and supportive treatment was prescribed in all cases initially. In addition, an ultrasound abdomen and an X-ray chest and abdomen were performed to aid in the diagnosis. In the present study, patients were divided randomly into those: a) dealt with ileostomy and b) those who dealt with primary repair during exploratory laparotomy.

The socio-demographic and clinical parameters, including the postoperative complications and morbidity/mortality, were documented in a predefined proforma.

Statistical Package for Social Sciences (SPSS) version 23.0 was used for the data analysis. Quantitative variables were expressed as mean±SD and qualitative variables were expressed as frequency and percentages. Chi-Square tests were applied to compare the two treatment groups' complication rate, morbidity, and mortality. The *p*-value of ≤0.05 was considered statistically significant.

RESULTS

A total of 73 patients with Ileal Perforation' were included in the study. Out of these, 52(71.3%) underwent primary repair, and in 21(28.7%), the patient's ileostomy was performed to manage typhoid ileal perforation. The mean age of patients was 28.9±12.6 years. The majority were aged 21 to 30 years (Table-I).In our results, abdominal pain was the most common symptom (73,100%), followed by Pyrexia (68 ,93.15%), Group-A had wound infection as the most common complication (10,19.23%). In Group-B post ileostomy, the most common complication was wound infection (12 ,57.14%), followed by wound dehiscence (7 ,33.33%) (Table-II).

Table-I: Socio-Demographic and Clinical Symptoms of the Participants (n=73)

Characteristics	n(%)
Gender	
Male	62(84.93%)
Female	11(15.07%)
Age Groups	
<20 years	18(24.66%)
21-30 years	26(35.62%)
31-40 years	13(17.81%)
>40 years	16(21.92%)
Symptoms	
Abdominal Pain	73(100.00%)
Pyrexia	68(93.15%)
Abdominal distention	64(87.67%)
Constipation	46(63.01%)
Diarrhea	18(24.66%)
Vomiting	43(58.90%)

Table-II: Comparison of Local and Systemic Complications in Patients who Underwent Primary Repair versus Ileostomy (n=73)

Complications	Group A (Primary Repair) [n=52]	Group B (Ileostomy) [n=21]	*p*-value
Local			
Wound Dehiscence	1(1.92%)	7(33.33%)	<0.001
Wound infection	10(19.23%)	12(57.14%)	0.001
Incisional hernia	2(3.85%)	2(9.52%)	0.335
obstruction	1(1.92%)	2(9.52%)	0.139
Burst abdomen	3(5.77%)	3(14.29%)	0.230
Primary repair leak	3(5.77%)	-	-
Ileostomy prolapse	-	2(9.52%)	-
Skin excoriation	-	11(52.38%)	-
Systemic	-	-	-
Electrolyte imbalance	3(5.77%)	6(28.57%)	0.007
Pulmonary infection	4(7.69%)	4(19.05%)	0.160
Septicaemia	3(5.77%)	2(9.52%)	0.565
Weight loss	3(5.77%)	10(47.62%)	<0.001
Shock	1(1.92%)	1(4.76%)	0.501
Incisional hernia	2(3.85%)	2(9.52%)	0.335

While looking at the mortality and morbidity rates of Group-A (Primary Repair) and Group-B (ileostomy), Group-B had the highest morbidity rates (61.90%) and the highest mortality rate (19%). However, morbidity was lower in Group-A (28.80%), and mortality was low (5.80%). Morbidity was significantly associated with ileostomy (p<0.01) (Table-III).

Table-III: Morbidity and Mortality Comparison Between Primary Repair Versus Ileostomy Groups (n=73)

Characteristics	Study Groups		*p*-value
	Group-A Primary Repair (n=52)	Group-B Ileostomy (n=21)	
Morbidity			
Yes	15 (28.8%)	13 (61.9%)	<0.01
No	37 (71.7%)	8 (38.1%)	
Mortality			
Yes	3 (5.8%)	4 (19%)	0.08
No	49 (94.2%)	17 (81%)	

DISCUSSION

Our study compared ileostomy and primary repair in patients with typhoid ileal perforation. Our study revealed that patients who underwent ileostomy more frequently suffered from wound dehiscence (p-value <0.001), wound infection (p-value= 0.001) and electrolyte imbalance (p-value 0.007) as compared to those who underwent primary repair. We further reported that morbidity was significantly associated with the ileostomy group (p< 0.01), while the rate of mortality did not differ significantly between the two groups (p=0.08). The study indicated that primary repair was associated with lower rates of postoperative complications and morbidity compared to an ileostomy. Mittal *et al*. found patients after ileostomy to have high morbidity compared to those who underwent primary repair.[10] Mortality, however, did not wary between the two treatment groups. Wound infection was the most common complication (36.67%). Hospital stay was more in patients who underwent ileostomy (21.53 days) than in patients who underwent primary repair (14.23 days). The authors also advocated the importance of urgent exploratory laparotomy when there is suspicion of leakage in the intestine after ileostomy is done. Loop ileostomy, for instance, was seen as limiting the damage after intestinal leakage postoperatively in patients who underwent primary repair. Mishra *et al*. found morbidity in patients who underwent primary repair to be 50%, while for those who underwent ileostomy, morbidity was 65.5%.[11]

Mortality in primary repair was 8.33%, whereas, in ileostomy, the mortality was 11.53% which is lower than some studies reporting 28%.[12,13] Another study by Babu *et al*. proved that primary repair was still preferred as the treatment choice over ileostomy in patients with no comorbidities and who are clinically stable.[14] In patients with multiple perforations, elderly patients and those suffering from comorbidities should be treated with ileostomy rather than primary repair.[15,16] A higher mortality rate was associated with an inefficient use of antibiotics, delayed presentation to the emergency, postoperative complications, and significant contamination of the peritoneum. [17,18]

LIMITATIONS OF STUDY

Our study had limitations. A larger study would have permitted a thorough evaluation of factors associated with the risk of mortality and morbidity in patients with typhoid ileal perforation. Gender disparity was also seen in our study, as only 15% of the individuals were females, the majority were males.

CONCLUSION

The current study indicates that in patients who have presented with typhoid ileal perforation, the primary repair is a safer and more suitable procedure for complications and overall morbidity. The mortality rate did not differ significantly between the two treatment groups. However, the surgeon should clinically assess the patient and make the most appropriate decision.

Conflict of Interest: None.

Author's Contribution

Following authors have made substantial contributions to the manuscript as under:

SG & SP: Critical review, drafting the manuscript, approval of the final version to be published.

MI & TA: Data acquisition, data analysis, data interpretation, critical review, approval of the final version to be published.

IK & AN: Conception, study design, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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