

## Outcome of primary repair versus ileostomy in patients with typhoid ileal perforation

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**Objective:** To compare the primary repair and ileostomy in patients with typhoid ileal perforation in terms of clinical outcome and post-operative complications.

**Methodology:** This randomized study was conducted at Department of Surgery, Hayatabad Medical Complex, Peshawar, from April 2017 to April 2019 and included 110 patients using consecutive non probability sampling technique. Typhoid ileal perforation was diagnosed on the basis of history, physical examination and investigations like leukocytosis, positive typhidot and pneumoperitoneum on X ray erect abdomen. The patients were divided into two groups using lottery method. Group A underwent primary repair and Group B underwent ileostomy. The procedures were performed by highly experienced surgeons. Patients were followed at 2 weeks, 1 month and 3 months after surgery. Data were analyzed using SPSS version 22. Hospital stay in both groups was compared using independent t-test and post-operative complications were compared using Chi-square test.

**Results:** Out of 110 patients, 55 were in each group; 90(81.82%) were male and 30(27.27%)

female. The mean age was  $42 \pm 10.47$  years. We found that 12(21.81%) patients in the primary repair group and 24(43.63%) in the ileostomy group developed wound infection ( $p < 0.05$ ). Two(3.63%) patients in the primary repair group compared to 5(9.09%) in the ileostomy group developed wound dehiscence ( $p > 0.05$ ). Two(3.63%) patients in the primary repair group while none in the ileostomy group developed fecal fistula ( $p > 0.05$ ). Four(7.27%) patients in the ileostomy group while none in the primary repair group developed stoma retraction ( $p < 0.05$ ). We found that 17(30.90%) patients in the primary repair group and 35(63.63%) in the ileostomy group developed complications ( $p < 0.05$ ). The mean hospital stay after the primary repair was  $6.78 \pm 2.1$  days compared to  $9.29 \pm 2.88$  days after the ileostomy ( $p = 0.000$ ).

**Conclusion:** Early surgery and adequate resuscitation is the key to success in the proper management of typhoid ileal perforation. We found that primary repair was superior to ileostomy. (Rawal Med J 202;45:406-409).

**Keywords:** Enteric fever, typhoid ileal perforation, stoma retraction, wound dehiscence.

## INTRODUCTION

Typhoid fever or enteric fever is an infective disease that is a major burden on public health sector in several countries with low economy.<sup>1</sup> Transmission is by the fecal-oral route from contamination of food and other waste from infected patients or carriers. It is estimated that greater than 33 million cases of enteric fever occur which are responsible for greater than 500,000 deaths.<sup>2</sup> Approximately 27 million cases of typhoid fever were recorded in 2010.<sup>3</sup>

Typhoid Ileal Perforation (TIP) is the most lethal type of typhoid fever.<sup>4,5</sup> Rate of TIP is in the range of 0.8 to 36 %, and annually approximately 6000 cases are reported in the U.S.<sup>7</sup> The emergence of multidrug resistant strains of *S. typhi* is an

important cause for many deaths and disabilities in intestinal perforation due to enteric fever.<sup>8</sup>

Following intestinal perforation, prompt adequate resuscitation and surgical repair is required. Per-operatively, primary repair of perforation, bringing out perforation as ileostomy, resection and anastomosis are done. Typhoid fever, in its complicated form, can therefore be regarded as a disease of poverty that requires expensive treatment, especially when mechanical ventilation and hemodynamic support are needed.<sup>9-11</sup>

Mortality from TIP is between 9% and 22%.<sup>6</sup> Surgical site infection (54%), wound dehiscence (19%) and intraperitoneal abscess (17%) are common complications causing significant

morbidity.<sup>12,13</sup> In spite of many deaths and disabilities due to enteric perforation in developing countries like Pakistan, comparatively little research work has been done. The purpose of this study was to compare the primary repair and ileostomy in patients with TIP in terms of clinical outcome and post-operative complications.

## METHODOLOGY

This randomized study was conducted at Department of Surgery, Hayatabad Medical Complex, Peshawar, from April 2017 to April 2019 and included 110 patients of TIP. Consecutive non probability type of sampling technique was used. Patients included in the study were having age of 18 to 60 years, of both gender with TIP. Patient with Post-traumatic ileal perforation, perforation associated with TB and IBD, obese patients and diagnosed diabetics were excluded. Informed consent was taken from all patients and approval was taken from hospital ethical committee.

A detailed history (sudden onset of pain abdomen, vomiting, high grade fever) was taken from all the patients followed by physical examination (guarding, rigidity and generalized tenderness) and baseline investigations (leukocytosis, positive typhidot and pneumoperitoneum on X ray erect abdomen) to help diagnose TIP. The patients were divided into two groups using lottery method. Group A underwent primary repair and Group B ileostomy. The procedures were performed by highly experienced surgeons. Patients were followed at 2 weeks, 1 month and 3 months after surgery for post-operative complications.

**Statistical Analysis:** Data were analyzed using SPSS version 22. Hospital stay in both groups was compared using independent t-test and post-operative complications were compared using Chi-square test. A  $p=0.05$  was considered significant.

## RESULTS

Out of 110 patients, 55 were in each group; 90(81.82%) were male and 30(27.27%) female. The mean age was  $42\pm 10.47$  years. We found that 12(21.81%) patients with primary repair and 24(43.63%) with ileostomy developed wound infection ( $p<0.05$ ). Two(3.63%) patients in the

primary repair group compared to 5(9.09%) in the ileostomy group developed wound dehiscence ( $p>0.05$ ) (Table 1).

**Table 1. Comparison of complications between primary repair and ileostomy.**

Complication	Primary repair	Ileostomy	p value
Wound infection	12(21.81%)	24(43.63%)	0.015
Wound dehiscence	2(3.63%)	5(9.09%)	0.241
Fecal fistula	2(3.63%)	0(0%)	0.154
Stoma retraction	0(0%)	4(7.27%)	0.042
Total	17(30.90%)	35(63.63%)	< 0.05

**Table 2. Mean hospital stay in two groups (days).**

Procedure	Mean hospital stay	p value
Primary Repair	$6.78\pm 2.1$ days	0.000
Ileostomy	$9.29\pm 2.88$ days	

When overall post-operative complications of both procedures were analyzed, we concluded that 17(30.90%) patients in the primary repair group and 35(63.63%) patients in the ileostomy group developed complications. The mean hospital stay after the primary repair was  $6.78\pm 2.1$  days compared to  $9.29\pm 2.88$  days after the ileostomy and this difference came out to be statistically significant ( $p=0.000$ ) (Table 2).

## DISCUSSION

Typhoid and paratyphoid fevers are amongst the main public health issues in countries with low economy. In those areas of the world where, there is inadequate approach to clean water and sanitation it is an important cause of preventable death.<sup>14</sup> According to one survey, in 2010 there were approximately 13.5 million episodes of typhoid fever globally.<sup>15</sup> One of the most lethal complications of typhoid fever is TIP, which occurs in 0.8-39% of cases, with significant variation between high and low income countries.<sup>6</sup> Multiple factors are responsible for high mortality in typhoid fever.<sup>16</sup> The mean age of patients in our study was  $42\pm 10.47$  years. Among 110 patients, 90(81.82%) were males and 30(27.27%) females with male:female ratio of 4:1. This is similar to previous studies.<sup>17,18</sup>

When both groups were analyzed for post-operative

complications, we found that 21.81% patients in the primary repair group and 43.63% patients in the ileostomy group developed wound infection and this difference was statistically significant ( $p < 0.05$ ). The study by Mishra et al showed that in comparison to primary repair wound infection was more common in ileostomy group i.e, 19.51% vs 57.89%.<sup>18</sup> Similarly, Qureshi et al<sup>19</sup> reported that 24.4% patient developed wound infection after primary repair of TIP.

In our study, 3.63% patients in the primary repair group compared to 9.09% patients in the ileostomy group developed wound dehiscence and it was statistically non-significant ( $p > 0.05$ ). Mishra et al<sup>18</sup> and Nema et al<sup>20</sup> also observed almost similar results. We observed that 3.63% patients in the primary repair group while none in the ileostomy group developed fecal fistula and it was also not significant statistically ( $p > 0.05$ ). Studies by Mishra et al<sup>18</sup>, Nema et al<sup>20</sup> and Nsar et al<sup>21</sup> reported that fecal fistula occurred in 4.87%, 4.3% and 6.66% of patients respectively in the primary repair group.

We found that 7.27% patients in the ileostomy group while none in the primary repair group in our study developed stoma retraction and this difference was statistically significant ( $p < 0.05$ ). Studies by Mishra et al<sup>18</sup> and Nsar et al<sup>21</sup> found that stoma retraction occurred in 5.26% and 13.33% of patients respectively in the ileostomy group.

When overall post-operative complications of both procedures were analyzed, we found that 17(30.90%) patients in the primary repair group and 35(63.63%) in the ileostomy group developed complications and this high morbidity in the latter group was due to ileostomy related complications ( $p < 0.05$ .) A study by Mishra et al<sup>18</sup> showed the morbidity of 50% in the primary repair vs 65.5% in the ileostomy group. Similarly Qureshi et al<sup>19</sup> reported an overall complication rate of 42.14% after primary repair of ileal perforation. In comparison to these studies, we had lower rate of overall complications.

The mean hospital stay after the primary repair was  $6.78 \pm 2.1$  days compared to  $9.29 \pm 2.88$  days after the ileostomy in our study and this was statistically significant ( $p = 0.000$ ) Like our results, Nsar et al<sup>21</sup> reported lower mean hospital stay after primary

repair ( $6.5 \pm 1.1$  days) compared to ileostomy ( $9.1 \pm 2.4$  days). Nema et al<sup>20</sup> also reported shorter hospital stay for the primary repair group.

## CONCLUSION

We compared the primary repair and ileostomy for typhoid ileal perforation in terms of hospital stay and post-operative complications and found that primary repair was superior to ileostomy. Early surgery and adequate resuscitation is the key to success in the proper management. We recommend that primary repair is the preferred operative procedure while treating these patients.

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