

Outcomes of Primary Repair in Patients with Typhoid Ileal Perforation

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ABSTRACT

Background: Typhoid fever is still a high burden disease in developing nations. Caused by infection with *Salmonella typhi*. Fecal flora is a risk source of this bacteria and the infection is routinely caused by ingestion of soiled food and water which is a major problem in developing countries. WHO reported >200,000 deaths due to typhoid fever in 2015. While in Pakistan the mortality rate has been reported to be 9.3/100,000 in overall population. The mortality rate of typhoid fever globally has been decreased about 1.5% from 1990 to 2013, but still mortality is there due to typhoid fever and it has not been eradicated completely.

Objective: To determine the outcomes of primary repair in patients of typhoid ileal perforation.

Material and Methods: In present case series we included 170 adult patients of age 15-75 years of age, who presented with typhoid ileal perforation in Department of General Surgery Saidu Teaching Hospital within the period of 01-Jan-2018 to 31-Dec-2019. In all patients two-layer primary repair was done. Outcomes were noted in-terms of post-surgery wound infections, intra-abdominal collection, anastomotic leakage, wound dehiscence and in-hospital mortality.

Results: Mean age of patients was 43.5±14.7 years. Out of 170 patients, 145 (85.2%) were men and 25 (14.8%) women. Mean duration of illness was 6.56±3.62 days. Wound infections were diagnosed in 49 (28.8%) patients, pneumonia in 22 (12.9%), intra-abdominal collection in 11 (6.5%), anastomotic leakage in 08 (4.7%) patients, wound dehiscence (burst abdomen) in 07 (4.1%) and 6 (3.5%) patients required ICU admission. In-hospital mortality occurred in 08 (4.7%) patients.

Conclusion: Primary repair is an easy and safe technique of typhoid ileal perforation and has acceptable rate of post-operative complications.

Keywords: Typhoid ileal perforation, primary repair.

This article may be cited as: Ahmad N, Akbar F, Ali I, Abbas S, Khan N, Syed A. Outcomes of Primary Repair in Patients with Typhoid Ileal Perforation. J Saidu Med Coll Swat 2022;12(2):90-93. DOI: <https://doi.org/10.52206/jsmc.2022.12.2.733>

INTRODUCTION

Typhoid fever is still a high burden disease in developing nations and has high mortality. This systemic illness is caused by infection with *Salmonella typhi*. Fecal flora is a risk source of this bacteria and the infection is routinely caused by ingestion of soiled food and water which is a major problem in developing countries.¹ WHO reported >200,000 deaths due to typhoid fever in 2015.² While in Pakistan the mortality rate has been reported to be 9.3/100,000 in overall population.³ The mortality rate of typhoid fever globally has been decreased about 1.5% from 1990 to 2013,^{4,5} but still mortality is there due to typhoid fever and it has not been eradicated completely.

Ileal perforation is the potentially fatal complication of typhoid fever it occurs in 0.85-18.0% total cases.^{6, 7} It mostly occurs in undiagnosed patients typically in third week after onset of symptoms. The *S. typhi* causes infections of peyer's patches, which intern results in development of ulcers in antimesenteric wall of GI tract mostly within 45 cm area of ileocecal valve.⁸ If perforation occurs, this will cause infection in the

abdominal cavity because of spillage of gut contents in peritoneum resulting in peritonitis.⁹ The reason of mortality due to perforation is multifactorial. The availability of broad spectrum antibiotics and improvements in patient care has reduced mortality but still is a big challenge to treat patients of perforation.¹⁰

Primary repair is the preferred method of surgical management of typhoid ileal perforation as it has lower complications rate as compared to other procedures. Relaparotomy is second procedure is the only drawback of primary repair. In present study, we determined the outcomes of primary repair in patients of typhoid ileal perforation.

MATERIAL AND METHODS

In present case series we included 170 adult patients of 15-75 years of age, who presented with typhoid ileal perforation in department of general surgery Saidu Teaching Hospital within the period of 01-Jan-2018 to 31-Dec-2019. The diagnosis of typhoid ileal perforation was on the basis of physical and radiological examination; history of severe abdominal pain and fever 2-3 weeks before onset of pain, abdominal tenderness and absence of bowel sounds on physical examination and presence of air under diaphragm on plain abdominal X-rays was labelled as typhoid ileal perforation. Patients with co-morbidities such as chronic liver/renal disease were excluded. Approval was taken from hospital IRB.

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Received: February 15th, 2021 Accepted: June 07th, 2022

Primary repair was done using two layers' approach, 3-0 vicryl sutures were used for closure of inner layer while 3-0 silk sutures were used for closure of outer layer. Outcomes were noted in terms of post-surgery wound infections, intra-abdominal collection, anastomotic leakage, wound dehiscence and in-hospital mortality.

Wound infections: These are diagnosed by the clinical judgment of the surgeon using following criteria; patient has purulent drainage, pustules, vesicles or boils (excluding acne), or patient has at least two of the following localized signs or symptoms with no other recognized cause; pain or tenderness, swelling, erythema, or heat.¹¹

Anastomotic leakage was determined using following signs and symptoms; fever >100 °F, tachycardia, discharge from surgical wound, moderate or higher pain in shoulder, hypotension (BP <90/60 mmHg) and urine output <400 ml/day. Wound dehiscence was labelled if separation of all

abdominal layers occurred, along with presence of sero-sanguinous discharge, and protrusion of gut or omentum at wound area.

RESULTS

Mean age of patients was 43.5±14.7 years. Out of 170 patients, 145 (85.2%) were men and 25 (14.8%) women. Regarding co-morbid diseases, there were 09 (5.3%) patients having hypertension, 11 (6.5%) diabetes, 41 (24.1%) smokers and 19 (11.1%) had ischemic heart disease (IHD). Mean duration of illness was 6.56±3.62 days (Table 1).

Regarding complications, wound infections were diagnosed in 49 (28.8%) patients, pneumonia in 22 (12.9%), intra-abdominal collection in 11 (6.5%), anastomotic leakage in 08 (4.7%) patients, wound dehiscence (burst abdomen) in 07 (4.1%) and 6 (3.5%) patients required ICU admission. In-hospital mortality occurred in 08 (4.7%) patients (Table 2).

Table 1. Demographic and Baseline Data.

Age (years)	43.5±14.7
Gender (%)	
Male	145 (85.2%)
Female	25 (14.8%)
Co-morbidities (%)	
Hypertension	09 (5.3%)
Diabetes	11 (6.5%)
Smoking	41 (24.1%)
IHD	19 (11.1%)
Duration in illness (days)	6.56±3.62

Table 2. Outcomes of Primary Repair.

Wound Infection	49 (28.8%)
Pneumonia	22 (12.9%)
Intra-abdominal Collection	11 (6.5%)
Anastomotic leakage	08 (4.7%)
Wound dehiscence	07 (4.1%)
Complications requiring admission in ICU	6 (3.5%)
Mortality	8 (4.7%)

DISCUSSION

Pakistan is one of the few nations where there is high prevalence of typhoid fever and morbidity and mortality due to its complications. Among complications, ileal perforation is the most lethal one. Therefore, still researches are there to determine the outcomes of ileal perforation in Pakistani patients.¹² Now it's widely accepted that surgical management is the best treatment for ileal perforation.¹³ Out of various surgical methods primary repair has been reported to be safe and simple as compared to anastomotic repair. There are two methods to perform primary repair either using single or two layers' suture technique. In present study we used two layers' technique for primary closure.¹⁴

In this study, we reported the outcomes of typhoid ileal perforation after primary repair. The most common complication in present study was wound infections diagnosed in 28.8% patients.

A study conducted by Farooq et al. reported wound infections in 13.04% patients, intra-abdominal wound abscess in 4.35% patients, and mortality in 8.69% patients after primary repair.¹⁵ Qureshi et al. conducted a study on early outcomes of primary repair for typhoid ileal perforation. They reported wound infections in 24.4% patients, anastomotic leakage in 4.3%, wound dehiscence in 5.0% and intra-abdominal collection in 6.4% patients.¹² These results are comparable to present study results, in our study intra-abdominal collection was diagnosed in 6.5% patients, anastomotic leakage in 4.7% and mortality in 4.7% patients¹⁶. Reported significantly higher rate of complications after typhoid perforation repair, the authors reported wound infections in 62.5% patients, wound dehiscence in 30.0% and mortality rate of 10%.¹⁶ Another study from India also reported very higher rate of post-operative complications, they reported wound infections in 85.96% patients, wound dehiscence in 21.05%, post-op ileus in 31.58% and respiratory problems in 38.60% patients.¹⁷ In our study pneumonia was the only respiratory complication diagnosed in 12.9% patients. However, these authors used primary repair, end-to-end anastomosis and primary repair with ileostomy for surgical repair and they did not reported the complications for each procedure separately this could be the possible reason for higher complications rate in their study.

Some studies have suggested that choice of the

operative procedure do not influence the complications and outcomes rate of in patients of typhoid ileal perforation.^{13, 18} While some other studies have reported lower rate of complications in primary repair and have suggested to use primary repair as first line procedure.¹⁹

CONCLUSION

Primary repair is an easy and safe technique of typhoid ileal perforation and has acceptable rate of post-operative complications.

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DATA SHARING STATEMENT: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

CONFLICT OF INTEREST: Authors declared no conflict of interest.

GRANTED SUPPORT AND FINANCIAL DISCLOSURE:
Nil

AUTHOR'S CONTRIBUTION

The following authors full fill authorship criteria as per ICMJE guidelines;

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| Ahmad N, Akbar F: | Idea conception, drafting the work, final approval, agreed to be accountable for all the work. |
| Ali I, Abbas S: | Design of the work, data acquisition, critical revision, final approval, agreed to be accountable for all the work. |
| Khan N: | Data analysis, drafting of the work, final approval, agreed to be accountable for all the work. |
| Syed A: | Data interpretation, critical revision, final approval, agreed to be accountable for all the work. |