

# Pattern of Presentation, Complications and Outcome of Typhoid Ileal Perforation

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## ABSTRACT

**Objective** To determine the pattern of presentation, complications and outcome in patients with typhoid ileal perforation.

**Study design** Descriptive cross sectional study.

**Place & Duration of study** Department of Surgery Ward II, Jinnah Postgraduate Medical Centre (JPMC) Karachi, from February 2023 to July 2024.

**Methods** Patients who were diagnosed with typhoid ileal perforation were included. Clinical features, blood culture reports, operative findings, histopathology results, morbidity and mortality were noted. SPSS version 27 was used for data entry and analysis by application of descriptive statistics.

**Results** Total of 82 patients were enrolled in the study. There were 52 (63.41%) males and 30 (36.59%) females. Mean age of the patients was 25+10 years. Thirty-four (41.46%) patients had fever of less than 7-days duration. Free gas under diaphragm was noted in 47 (57.31%) patients. Single ileal perforation was found in 64 (78.04%) cases. Complications included burst abdomen (n=14 - 17.07%) and wound infection (n=28 - 34.14%), In four ((4.87%) patients, re-exploration was done. Ileostomy was made in thirty patients. Stoma related complications were noted in five patients. Seven (8.53%) patients who presented after 48 - hours, expired.

**Conclusion** Younger age group males were most commonly affected by typhoid ileal perforation. Number of patients presented with history of fever of less than 7-days. Mortality was more in patients who required ventilator support. Common complications included wound infection and burst abdomen.

**Key words** Typhoid perforation, Salmonella typhi, Peritonitis, Ileal perforation.

## INTRODUCTION:

Typhoid perforation is the most common cause of ileal perforation, with a mortality rate of up to 30%.<sup>1</sup> Typhoid fever is caused by salmonella typhi which is transmitted through the consumption of contaminated water and food.<sup>2</sup> Typhoid is more

common in low socioeconomic groups due to poor sanitary conditions and consumption of contaminated water.<sup>3</sup> Patients typically presents with step-ladder pattern of fever, abdominal pain, vomiting, deranged vital signs, and abdominal tenderness.<sup>4</sup> The perforation usually occurs in the distal ileum affecting the antimesenteric border.<sup>5</sup>

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Typhoid perforation is a serious complication with a high fatality rate.<sup>6</sup> Surgery in patients with typhoid perforation can result in wound infection, burst abdomen, entero-cutaneous fistula, with prolong hospital stay.<sup>7</sup> Ileostomy is frequently indicated in these patients. However, ileostomy has its own complications like prolapse, retraction, necrosis and non-functioning of stoma. Additionally, Ileostomy has

an impact on quality of life of a patient as well.<sup>8,9</sup>

Recently there were reports of increased incidence of drug resistant enteric fever from province of Sindh that has raised alarms. It is therefore important to collect data about this common infectious disease and understand the pattern of typhoid fever and its related surgical complications that are associated with significant morbidity and mortality.

**METHODS:**

**Study design, place and duration:** This descriptive cross-sectional study was conducted in the Department of Surgery Ward-II, Jinnah Postgraduate Medical Centre Karachi, from February 2023 to July 2024.

**Ethical considerations:** The study was approved by the Institutional Review Board letter no.F.2.-81/2023-GENL/12/JPMC dated 13-02-2023. Informed consent was taken from the patients.

**Inclusion criteria and exclusion criteria:** All patients diagnosed as having typhoid ileal perforation based upon clinical findings, blood culture, operative findings and biopsy report, were included in the study. Patients with other causes of gut perforation like tuberculosis, trauma, were excluded.

**Sample size estimation:** A sample size of 82 from population of 200 achieved 80.383% power to detect a difference (P1-P0) of 0.1000 using a two-sided exact test with a significance level (alpha) of 0.050. These results assumed that the population proportion under null hypothesis (P0) is 0.2000 Reference: PASS 2020 power analysis and sample size software (2020). NCSS, LLC, Kaysville, Utah, USA.

**Study protocol:** All patients diagnosed with typhoid ileal perforation who presented with fever, abdominal pain, vomiting and absolute constipation underwent a thorough examination for abdominal tenderness, rebound tenderness, rigidity, absent bowel sounds and gas under diaphragm on x-ray chest. Blood samples were taken and sent for culture and

sensitivity. A history of antibiotics intake was also recorded. Exploratory laparotomy was done and operative findings were recorded like single ileal or multiple ileal perforation, size and site of the perforation. Biopsy was taken from edge of perforation and sent for histopathology. Sample of the peritoneal fluid was taken for culture and sensitivity analysis. Primary closure of the perforation was done in patient with single perforation and loop ileostomy made in patients with multiple perforations and also in those who presented late. Postoperative complications like peritoneal abscess, wound infection, burst abdomen, were recorded. When indicated re-exploration was done and ileostomy was made. Stoma related complications as well as mortality were recorded on a pre designed form.

**Statistical analysis:** The data were entered and results analyzed by SPSS version 27. The numerical variables like age were reported as mean+SD. For the categorical variables namely the frequency of causes, complications, data were presented as number and percentages.

**RESULTS:**

A total of 82 patients with typhoid ileal perforation were included in this study, Majority of the patients were males (n=52 – 63.41%). Mean age of the patients was 25+10 years. Fifty-two (63.41%) patients presented with symptoms and signs acute peritonitis of 48-hours duration. Blood culture was positive in 16 (19.51%) patients. Ileostomy was made in thirty patients and primary repair of perforation was done in 52 cases.

Histopathology report of all patients showed features of enteric fever. Seven (8.53%) patients died in this series. Those who expired presented late with shock and required ventilator support. Stoma related complications were observed in five patients namely a nonfunctioning stoma and stoma prolapse. Pattern of presentation of typhoid ileal perforation is shown in table I, and the associated morbidities are outlined in table II

<b>Presentation</b>	<b>Number of patients (n)</b>	<b>Percentage (%)</b>
History of fever less than 7-days	34	41.5 %
History of fever more than 7-days	48	58.5%
Pneumoperitoneum	47	57.3%
Single perforation	64	78.0%
Multiple perforation	18	21.9%

**Table II: Morbidity in Typhoid Ileal Perforation (n=82)**

Morbidity	Number of patients (n)	Percentage (%)
Burst abdomen	14	17.0%
Paralytic ileus	03	03.6%
Wound infection	28	34.1%
Re-exploration	04	04.8%
<b>Stoma related complications (n=30)</b>	<b>05</b>	<b>16.6%</b>

Typhoid perforation most commonly involves male patients between 16 to 30 years of age.<sup>10</sup> In this study the mean age of the patients was 25 years and predominantly males were involved as reported in literature. This may be akin to their eating habits as most of them work in outdoors and use food that is contaminated. This also highlights poor quality control of food department on eateries. As a public health measure the employees of the hotels and restaurants who are involved in the cooking should be screened for *Salmonella typhi* as carriers can transmit the disease to the general population. Complications of typhoid occur in 10% to 14% of MDR, and in 15% of XDR cases.<sup>11</sup>

Number of complications were noted in our series as reported in the literature. A study has reported wound infection (28%), pneumonia (12%), anastomotic leak (4.7%), wound dehiscence (4%), abscess formation (6.5%), ICU care (3.5%), and mortality rate of 4.7%.<sup>12</sup> In our study the wound infection occurred in 34.1% cases. However, no anastomotic leakage was noted. Re-exploration rate was quite low in this study. Frequency of burst abdomen in the index study was high. Number of factors contributed to it, most important being intra-peritoneal abscess and wound infection.

Loop ileostomy is often indicated in typhoid ileal perforation. In a study more than 50% of patients had stoma formation.<sup>13</sup> In our study ileostomy was made in 30 (36.58%) patients. Few complications were noted with stoma formation; stoma prolapse (n=2) and nonfunctioning of bowel (n=3). Ileostomy stoma related excoriation is a common observations and local stoma care helps in decreasing the morbidity. Similar pattern is reported in other studies.<sup>14,15</sup>

A less common pattern observed in this study was ileal perforation occurring early in 34-patients within two weeks. Early recognition and treatment of typhoid fever in the first week is important to avoid this incident. While blood culture report is awaited specific antibiotics should be started in an optimal dose and

continued after fever has settled. Ileal perforation and peritonitis is reported in the first week as well. In a study typhoid ileal perforation was found with fever of less than 7-days in 83.52% cases.<sup>16</sup> Typhoid fever and its related surgical complications in Pakistan cause economic burden. This can be prevented by vaccination and other measures related to the public health.<sup>17</sup>

**Limitations of the study:** A small sample size in a tertiary care center for a common surgical condition in our region. A multicenter study may reflect actual pattern and outcome.

#### CONCLUSION:

Typhoid ileal perforation was most commonly observed in young males, with a significant number occurring during the first week of fever. Patients who required ventilator support had higher risk of mortality. Common complications included wound infection, burst abdomen, re-exploration and paralytic ileus.

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Moazam Safiullah: Data collection and analysis.

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