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Original Research Article

Outcome of Ileal Perforation after Primary Perforation Closure versus Resection and Ileostomy: A Comparative Observational Study

Vineeta Kumari[1], Kumar Shubham[2], Sunil Kumar Ranjan[3], Khursheed Alam[4], Ashok Kumar[5]

[1]Senior Resident, Department of General Surgery, Govt. Medical College and Hospital, Bettiah, West Champaran, Bihar.

[2]Senior Resident, Department of General Surgery, Govt. Medical College and Hospital, Bettiah, West Champaran, Bihar.

[3]Associate Professor and HOD, Department of General Surgery, Govt. Medical College and Hospital, Bettiah, West Champaran, Bihar.

[4] Assistant Professor, Department of General Surgery, Govt. Medical College and Hospital, Bettiah, West Champaran, Bihar.

[5]Assistant Professor, Department of General Surgery, Govt. Medical College and Hospital, Bettiah, West Champaran, Bihar.

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Corresponding author: Dr.Kumar Shubham

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Abstract

Background: Typhoid is the most common cause of ileal perforations in our hospital setting. The presentation and treatment of ileal perforations, particularly those caused by typhoid, nonspecific, and traumatic perforations, as well as the results in these patients and the variables influencing prognosis, are crucial. The management of ileal perforation was one of the study's goals. to evaluate the results of two distinct approaches to treating ileal perforations: primary closure versus resection and ileostomy.

Methods: From September 2025 to February 2026, the general surgery department of Govt. Medical College and Hospital in Bettiah, West Champaran, Bihar, conducted a randomized comparative observational study. The study examined 56 patients in total. The Widal test, X-ray erect abdomen, ultrasound abdomen, and intraoperative findings were used to make the diagnosis.

Results: The age groups 41–50 years old (10 patients) and 61–70 years old (10 patients) were the most often impacted. The age group of 1–10 years old (2 cases) was the least affected. Males had a somewhat higher incidence than females. The ratio of men to women was 2.5:1. The most frequent type of ileal perforation is typhoid perforation, which is followed by non-specific perforation. The primary closure group had a higher rate of post-operative problems (32.14%, 18 patients) than the ileostomy group (17.85%, 10 patients). Four patients had wound infections, six had abdominal bursts, two had fecal fistulas, and six had respiratory issues as a result of primary closure. Wound infections (eight patients) and respiratory issues (two patients) were the ileostomy group's problems.

Conclusion: The primary closure group had a higher mortality rate of 21.42% (12 patients), while the ileostomy group had a lower mortality rate of 7.14% (4 patients). This study suggests that in individuals who are moribund, ileostomy may be prioritized above alternative surgical procedures.

Keywords: Ileal perforation, Ileostomy, Resection, Typhoid perforation.

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Introduction

Ileal perforation is a prevalent issue in tropical nations. Enteric fever and tuberculosis are the most frequent causes of ileal perforation. The most common cause of high morbidity and mortality is still trauma.[1] In tropical nations like India, this illness is still linked to a high death rate and inevitable morbidity despite the availability of contemporary diagnostic tools and improvements in treatment plans. Antibiotic treatment, complete parental nourishment, and preoperative resuscitation decreased mortality from 28.5% to 10%.[2] The many surgical approaches include simple closure, which involves refreshing the margins and closure, and draining of the peritoneal cavity in moribund patients during resuscitation and surgical preparation.[3] Ileotransverse

colostomy is a straightforward closure; wedge resection or a resection anastomosis may be combined with a side-to-side ileotransverse colostomy; ileostomy is advised by some authors; Talwar et al. recommended primary closure and limited surgery; wedge resection and closure, in which a wedge of ileal tissue is resected around the perforation and the defect is closed transversely in two layers.[5–9] Suture line exteriorization, which guards against peritoneal cavity contamination in the event of a leak. If fistulae develop, they always heal with conservative treatment.[5,10] It was advised to use drains to remove pus and do thorough peritoneal lavage. It was advised to use a two-layer seal to reduce the possibility of leaks.[9]

It was common practice to make a midline or Para median incision. When a confirmed preoperative diagnosis of perforation was present, Talwar et al. advocated a Rutherford Morrison incision.[11] A laparostomy may be performed if there is fulminant sepsis in the abdominal cavity as a result of a fecal fistula or any other cause. A laparotomy without reapproximation and suture closure of the abdominal fascia and skin is referred to as a laparostomy. There is no closure of the abdominal cavity. It aids in pus evacuation and stops harmful increases in intra-abdominal pressure. Once sepsis is under control, the wound can be closed. The potential for the exposed intestine to perforate and the development of an incisional hernia are the drawbacks. It could be used in conjunction with ongoing peritoneal lavage following surgery.[11] Stoma necrosis, bowel blockage, mucocutaneous separation, stoma stenosis, stoma prolapse, parastomal hernia, peri-ileostomy fistulas, and skin issues are some of the risks associated with ileostomy. Since primary repair has a greater risk of complications than resection and ileostomy, the current study was carried out to advance knowledge of this ileal perforation in its treatment and care. Therefore, the purpose of this study was to compare the outcomes of two distinct ileal perforation management techniques: primary repair (as opposed to resection and ileostomy).

Material and Methods

From September 2025 to February 2026, the general surgery department of Govt. Medical College and Hospital in Bettiah, West Champaran, Bihar, conducted a randomized comparative observational study. The study examined 56 patients in total. The study included all individuals, regardless of age or gender, that presented to a surgical emergency room with an acute abdomen and were determined to be cases of ileal perforation (due to any cause) based solely on operational findings. This study does not include cases where ileal perforation and peritonitis other than ileal perforation were treated with resection and anastomosis.Patients of all sexes and all ages provided the data. Patients who had laporotomy and had an intraoperative ileal perforation were monitored, and a thorough clinical history was obtained for each of these patients, with a focus on the presenting complaints. All patients with acute abdomen caused by perforations verified by abdominal X-rays and ultrasounds were first sent for laparotomy; only instances with ileal perforations were included in the study; all other cases were eliminated. The demographic information, therapeutic intervention, hospital course, and follow-up were all recorded into a proforma. Every patient underwent a comprehensive history and clinical examination, and their vital signs were noted.

All patients underwent routine pre-operative tests, including hemoglobin, random blood sugar, total leucocyte count, bleeding time, clotting time, blood urea, serum creatinine, Widal test, chest x-ray, electrocardiogram, abdominal ultrasound, and abdominal X-ray. All of the patients received proton pump inhibitors, a nasogastric tube to decompress the stomach contents, and fluid and electrolyte balance correction prior to surgery. For both the surgical treatment and the potential for a stoma, informed permission was obtained. The patients were split into two groups: the primary closure group and the ileostomy group. Primary closure and ileostomy were performed alternately, regardless of the severity of the peritonitis. Before closure, each patient underwent a thorough peritoneal lavage. Every patient was meticulously monitored for any issues following surgery.

All data was collated, graphically analyzed, and statistically analyzed using ratios, percentages, and non-parametric tests such as the Chi square test for p values.

Results

The various causes of perforations were revealed by the post-operative results. Thirty (53.57%) of the 56 patients with treated ileal perforations had typhoid perforations, fourteen (4.76%) had nonspecific perforations, ten (17.85%) had traumatic perforations, and two (3.57%) had tuberculosis. They were between the ages of 10 and 75. There were more patients between the ages of 41 and 50 and 61 and 70. Of these 56 patients, 16 (28.57%) were female and 40 (71.42%) were male. The ratio of male to female was 2.5:1.

32 patients (57.14%) had a fever, 34 patients (60.71%) had vomiting, 56 patients (100%) had abdominal pain, and 52 patients (92.85%) had distension. Abdominal pain was reported by every subject in our investigation (Table 1).

Table 1: The frequency of the symptoms

Symptoms	No. of patients (N=56)	Percentage
Fever	32	57.14%
Vomiting	34	60.71%
Abdomen Pain	56	100.00%
Distension	52	92.85%

Two of the 56 patients had a duration of one day, eighteen had a duration of two to three days, eight had a duration of four to five days, two had a duration of six to seven days, and two had a duration of more than eight days. At the time of presentation, 24 individuals had no fever. One to six days pass between the onset of abdominal pain and surgical intervention.

All 56 patients had guarding and pain in their abdomens. Forty-two patients had no bowel noises, while fifty-two patients had distension. Forty individuals have gas beneath the diaphragm, and forty-eight have free fluid in the abdomen. In this study, the highest amount of patients (46) had a single perforation, 8 had two, and 2 had four. A greater number of patients had perforations between 21 and 40 cm from the ileocaecal junction, 20 had perforations between 0 and 20 cm, and 12 had perforations between 41 and 60 cm from the junction.Size of perforation in 28 patients ranges from 0.6cm to 1cm, in 20 patients size of perforation ranges up to 0.5cm and in 8 patients size of perforation is more than 1cm.

In total 56 numbers of patients, 28 patients had undergone primary closure and remaining 28 patients underwent ileostomy. In this study 12 patients were having wound infection, 6 patients were having burst abdomen, 2 patients was having faecal fistula and 8 patients were having respiratory complications (Table 2).

Table 2: Post-operative complications.

Post-operative complications	Incidence	Percentage
Wound infection	12	21.42%
Burst Abdomen	6	10.71%
Faecal Fistula	2	3.57%
Respiratory Complications	8	14.28%
Stoma Complications	0	0%

As for wound infection was concerned 4 patients were in primary closure group and 8 patients were in ileostomy group. Of burst abdomen 6 patients were in primary closure group and none were in ileostomy group. 2 patients had faecal fistula in primary closure group and none were in ileostomy group. 6 patients of primary closure had respiratory complications and 2 patients was in ileostomy group. 10 patients of primary closure did not have any postoperative complications whereas 18 patients of ileostomy group were without complications (Table 3).

Table 3: Postoperative complications in both primary closure patients and ileostomy patients

Post-operative complications	Primary closure (n=28)	Percentage	Ileostomy group (n=28)	Percentage
Wound infection	4	7.14%	8	14.28%
Burst abdomen	6	10.71%	0	0%
Faecal fistula	2	3.57%	0	0%
Respiratory complications	6	10.71%	2	3.57%
Without complications	10	17.85%	18	32.14%

Chi-Square=6.81,P-Value=0.1

In this study of 56 patients total mortality was in 16 patients (28.57%) of which 12 belonged to primary closure and 4 were from ileostomy.The intraoperative procedure of Ileostomy for multiple perforation is patients were shown in the figures below.

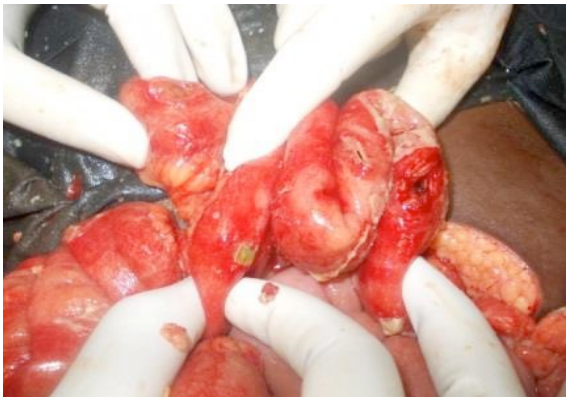

Figure 1: Primary perforation closure

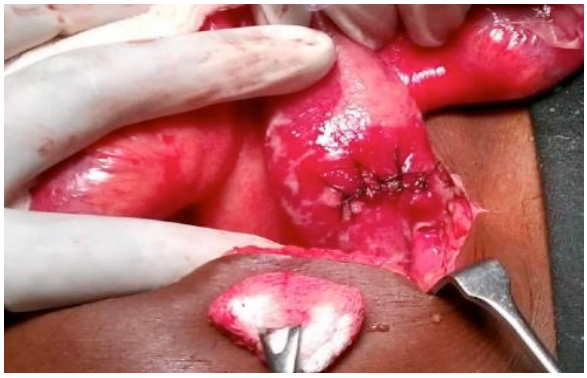

Figure 2: Multiple ileal perforations

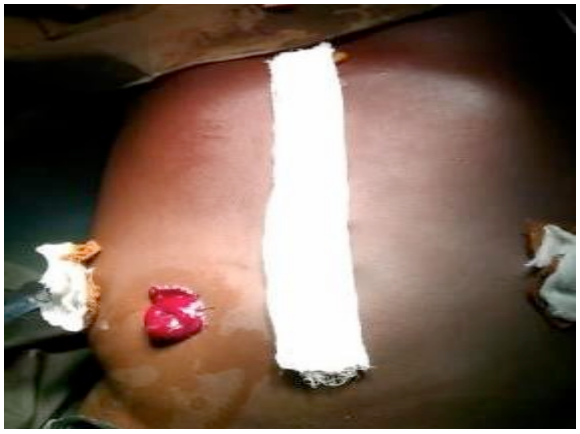

Figure 3: Ileostomy done for a patient

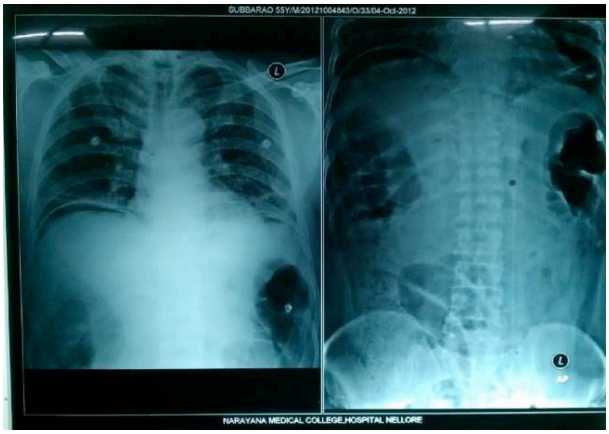

Figure 4: Chest X-ray and abdomen erect x-ray showing gas under right diaphragm

The patient was subject to chest X-ray and abdomen erect X-ray which showed gas under right side of the diaphragm.

Discussion

Numerous factors, including trauma and tuberculosis, can result in ileal perforation. However, the most frequent cause of ileal perforation and associated severe consequences in the poor world is typhoid fever, which poses a problem for surgeons. If treatment is delayed, the perforation may result in significant morbidity and occasionally death.[12,13] There are significant regional variations in the disease's incidence. In most areas, the prevalence of typhoid intestinal perforation has been documented as a sign of typhoid fever endemicity.[12, 14]

In this study group 56 cases of ileal perforations due to different causes were operated. In those cases, typhoid intestinal perforation represented 53.5%. Onset of symptoms and time of presentation in the hospital are important prognostic factors. An early presentation holds a good prognosis. Unfortunately, in developing countries, the presentation to hospital is usually late with fully blown peritonitis, some cases may present with septicemia and multi-organ failure. Current literature strongly favors the surgical management only of enteric ileal perforation.[15,16]

The age incidence is more in second decade. The perforation is common in 2nd and 3rd decade as evidenced by other studies.[17] The commonest cause of ileal perforation in this series was typhoid fever accounting for 53.5% of cases. The other causes of ileal perforation in this study are 25% nonspecific, 17.8% traumatic, 3.5% TB. Typhoid fever accounted for 56.6% of cases of ileal perforation in the series by Karmakar.[18]

Non-specific perforation was the phrase used when the cause of the perforation could not be determined. In this study, non-specific perforation accounted for 25% of cases, making it the second most common cause. Before experiencing stomach symptoms, five individuals with non-specific perforations developed fever (Table 1). In the Dixon and Bhalerao series, non-specific perforations were the most frequent cause of small bowel perforation [19,20].

Trauma accounted for 17.8% of cases of ileal perforation in this series. 8.25% of ileal perforations published by Karmakar were due to trauma.[18] The rising rate of road traffic accidents and civil violence has contributed to this increased incidence of traumatic perforations. Tuberculosis accounted for 3.5% of cases of ileal perforations in the present study. Talwar et al., have found 19% of non-traumatic small bowel perforations due to intestinal TB.[21] Most patients presented with features suggestive of peritonitis. Patients of both typhoid and nonspecific perforations had similar presentation with respect to abdominal symptoms and signs. Patients with typhoid perforation had fever, abdominal pain and vomiting. Examination revealed tenderness, guarding, distension and intraperitoneal free fluid. Eggleston reported that most patients had fever, malaise and sudden increase in abdominal pain in typhoid perforation.[12]

There was a male preponderance with the male: female ratio in this study being 2.5:1. Total number of patients in this study are 56, of which 40 patients (71.4%) are males and female patients are 16 (28.5%) in number. In agreement with other studies, ileal perforation in the present study was more common in males than in females.[22,23] The exact reason for this male preponderance is not known although it is possible that men have an increased risk of exposure to typhoid fever resulting from spending longer time and consuming more food outdoors that may lead to more frequent contact with the causative bacteria.

X-ray erect abdomen with both domes of diaphragm is a useful investigation to detect hollow viscus perforation. In our study free gas was seen under the diaphragm in 71.4% of perforations (Figure 4). In favor of this study, Pneumoperitoneum has been reported in 52% to 82% in studies done by Acheampong and Vaidyanathan.[24,25] The value of the radiological investigation has been compared with other writers and with current radiological techniques; 80-90% of cases are correctly diagnosed. Findings from our study demonstrated free gas under the diaphragm on abdominal and chest radiographs in more than seventy percent of cases which is consistent with other studies.[26,27] A plain abdominal or chest radiograph with free air under the diaphragm is a fairly frequent but variable finding significant hollow viscus perforation, but its absence does not exclude the diagnosis. Abdominal ultrasonography has also been found to be superior to plain radiographs in the diagnosis of free intra-peritoneal air as confirmed by the present study.[28]

Widal test was positive in 53.5% cases of this study. Widal was reported positive in 30% of patients with typhoid perforation by Kaul and in 46.1% of patients by Santillana.[5,8] It was reported positive in 75.5% of cases by Jarrett and in 73% by Vaidyanathan.[6,25] Four-fold increase in titres is considered more significant.

In this study most, patients of confirmed typhoid were treated with ciprofloxacin and metronidazole. The rest had a third-generation cephalosporin (cefotaxime) and metronidazole. One of the many factors affecting the surgical outcome in patients

with intestinal perforation is time interval between duration of illness and surgical intervention (perforation-surgery interval).[29,30] Early surgery can minimize the complications while delayed surgery leads to severe peritonitis and septic shock. In the present study, the majority of patients were operated more than 24 hours after the onset of illness. Similar observation was reported by other studies done in developing countries.[30]

In the management of typhoid perforation some authors advocated conservative management.[31] Presently there is no such controversy in the treatment of typhoid perforation with the current recommendation being surgical management. The various methods in use are local drains, simple closure, closure with omental patch, wedge resection, resection and anastomosis, ileotransverse anastomosis and ileostomy.[6,8]

Orloff recommended debridement and closure in patients of traumatic perforation where the injury was small and resection anastomosis in patients with large wounds or multiple perforations. Patients with traumatic perforations had lesser complications presumably due to a healthier bowel than those patients with typhoid or non-specific perforations. In patients of traumatic perforations outcome in primarily influenced by injury to another organ.[32]

The presence of single intestinal perforation in majority (83.1%) of patients in this study is consistent with other reports.[33] The median age of the patients with single perforations in the present study was significantly higher than that of those with multiple perforations which is line with other reporters.[32,33] The number of intestinal perforation in patients with typhoid ileal perforation has been reported to have an influence on prognosis.

In the present study, patients with multiple perforations had significantly high mortality rates compared to those with single perforations (Figure 2). Beniwal et al found that the number of perforation had effect on surgical outcome.[29] Adesunkanmi et al reported high incidence of residual abscess in patients with single perforation.[34]

In this study patients underwent primary perforation closure and ileostomy. Patients with multiple perforations underwent resection and ileostomy. The overall complication rate for all patients in this series was 50% (Table 3). In this study the common complications are wound infection, burst abdomen, faecal fistula and respiratory complications. Wound infection is the commonest complication in this study (Table 2, 3), with a complication rate of 21.4% in 12 patients, Burst abdomen rates about 2 (0.7%), faecal fistula rates about 3.5% and respiratory complications about 14.2%. Santillana in his series reported a rate of 71.9% in 96 patients.[5]

In agreement with other studies, wound infection was the most common postoperative complications in the present study.[12,13] High rate of wound infection in the present study may be attributed to contamination of the laparotomy wound during the surgical procedure. Primary closure was found to have a higher complication rate in this study, but this was not statistically significant. Ileostomy patients have less complication rate in this study. In contrary to this study Eggleston reported that the procedure done did not influence outcome.[35] Talwar and Sharma reported that mortality was least with early primary closure but in this study mortality was more in primary closure.[36] In cases of primary closure there are chances of leak into peritoneal cavity leading to peritoneal contamination which lead to re-laparotomy. As patient is already moribund, a re-laparotomy may lead to increased mortality. So, ileostomy is a better choice.

The mortality rate of 23.1% in the present study is comparable to the rates reported from tropical countries such as 22.0% from Nigeria where chloramphenicol is still the drug of first choice.[13]These figures are much higher than the rates reported from other tropical countries such as 6.8% from Nepal, and 10.5% from India in another study.[29]

A high mortality rate of 39.0% was also reported in Nigeria. Exceptionally low mortality rates of 1.5-2% have been reported from some parts of the developed world, where socioeconomic infrastructures are well developed.[37] The reasons for the high mortality are multifactorial. In this study high mortality rate was attributed to delayed presentation, inadequate antibiotic treatment prior to admission, multiple perforations, severe peritoneal contamination and presence of postoperative complications.

In this series the outcome of best results in terms of mortality, morbidity and post-operative complications were found to be in patients with ileostomy. The primary closure of perforation was associated with an overall 32% complication rate whereas only 17% in ileostomy group.

Ileostomy proved to be the most successful procedure in this study in terms of overall mortality and morbidity, this is supported by Bhansali et al study, Kalid et al study, Meh et al.[38-40] There is, however a consensus that late presentation, delay in operation, multiple perforations, degree of faecal contamination of peritoneum and old age determine mortality and morbidity associated with this problem.

Conclusion

The primary closure group and the ileostomy group are compared in terms of post-operative complications and death. For patients with ileal perforations to be successfully managed, early surgery and sufficient resuscitation are crucial. This study suggests that ileostomy should be prioritized over alternative surgical choices, particularly for moribund patients with multiple perforations and severe fecal contamination of the abdominal cavity who present late in their illness. When a patient is clinically stable and has a single perforation with little to no abdominal cavity soiling, primary closure of the perforation is the recommended procedure.

References

1. A comparison of the results of loop ileostomy and primary repair in ileal perforation by Mittal S, Singh H, Munghate A, Singh G, Garg A, and Sharma J. Surg Res Pract. Mar. 27, 2024.
2. Sudheer D, Srihari G. Research on ileal perforation outcomes and prognostic variables. J Evid Based Med Healthc. 3(90):4911-7. 2016.
3. Santoshi B, Eggleston FC. Operation choice for typhoid perforation. 68(5):341-2 in Br J Surg. 2021.
4. Archampong EQ. Small bowel tropical illnesses. World J. Surg. 9(6):887-96, 2005.
5. Santillana M. Enteric perforation is one surgical consequence of typhoid illness. 15(2):170-5 in World J. Surg. 2021.
6. Attah MM, Ameh EA, Dogo PM, and Nmadu PT. Three procedures for typhoid perforation are compared. 84(4):558-9 in Br J Surg. 2017.
7. Singh G, Gupta DK, Grover AS, Singh S, Singh K, and Kumar P. A prospective analysis of 46 cases of typhoid ileal perforations with two layers of closure. 1995; Br J Surg. 82(9):1253.
8. Kaul BK. Operative treatment of pediatric typhoid perforations. Int Surg. 60(8):407-10 (1975).
9. Lizzaralde EA. Children's ileal perforation from typhoid. 16(6):1012-6 in J Pediar Surg. 1981.
10. Bitar R, Tarpley J. A review of the literature and current research on intestinal perforation in typhoid fever. 1985; 7(2):257-71; Rev. Infect Dis.
11. Talwar S, Laddha BL, Jain S, Prasad P. Incision selection in the surgical treatment of enteric fever-related small bowel perforations. Gastroenterol Trop. 18(2):78-9 (1997).
12. Chalya PL, Mabula JB, Koy M, Kataraihya JB, Jaka H, Mshana SE, et al. Typhoid intestinal perforations at a University teaching hospital in Northwestern Tanzania: A surgical experience of 104 cases in a resource-limited setting. World J Emerg Surg. 2012;7(1):4.
13. Otegbayo JA, Daramola OO, Onyegbatulem HC, Balogun WF, Oguntoye OO. Retrospective analysis of typhoid fever in a tropical tertiary health facility. Trop Gastroenterol. 2002;23:9-12.
14. Tade AO, Olateju SO, Osinupebi OA, Salami BA. Typhoid Intestinal Perforations in a Tropical Tertiary Health Facility: A Prospective Study. East Cent Afr J Surg. 2011;16(2):72.
15. Malik AM, Laghari AA, Mallah Q, Qureshi GA, Talpur AH, Effendi S, et al. Different surgical options and ileostomy in typhoid perforation. World J Med Sci. 2006;1(2):112-6.
16. Farooq T, Rashid MU, Lodhi MF, Farooq A, Ahmad S. Enteric ileal perforation primary repair versus loop ileostomy. Infection. 2011;3(13.04):9.
17. Koume J, Kouadio L, Turquin HT. Typhoid ileal perforation: surgical experience of 64 cases. ActaChir Belg. 2004;104:445-7.
18. Karmakar SR, Dwivedi Dr, Bhalerao RA. Perforations of terminal ileum. Indian J Surg. 1972;34:422-6.
19. Dixon JM, Lamusden AM, Piris J. Small Bowel Perforation. J Royal Col Surg Edinburgh. 1985;30(1):43-6.
20. Chatterjee H, Jagdish S, Pai D. Changing trends in outcome of typhoid ileal perforations over three decades in Pondicherry. Trop Gastroenterol. 2001;22(3):155-8.
21. Talwar S, R Talwar MD, P Prasad MS. Tuberculous perforations of small intestine. IJCP. 1999;53(5):514-8.
22. Ugwu BT, Yiltok SJ, Kidmas AT, Opalawa AS. Typhoid intestinal perforation in North Central Nigeria. West Afr J Med. 2005;24:1-6.
23. Koume J, Kouadio L, Turquin HT. Typhoid ileal perforation: surgical experience of 64 cases. ActaChir Belg. 2004;104:445-7.
24. Archampong EQ. Typhoid ileal perforations: why such mortalities? Br J Surg. 1976;63(4):s317-21.
25. Vaidyanathan S. Surgical management of typhoid ileal perforation. Ind J Surg. 1986:335-41.
26. Khan SH, Aziz SA, Ul-Haq MI. Perforated peptic ulcers: A review of 36 cases. Professional Med J. 2011;18(1):124-7.
27. Lee CW, Yip AW, Lam KH. Pneumogastrogram in the diagnosis of perforated peptic ulcer. Aust N Z J Surg. 1993;63:459-61.
28. Chen SC, Yen ZS, Wang HP, Lin FY, Hsu CY, Chen WJ. Ultrasonography is superior to plain radiography in the diagnosis of pneumoperitonium. Br J Surg. 2002;89:351-4.

29. Beniwal US, Jindal D, Sharma J, Jain S, Shyman G. Comparative study of operative procedures in typhoid perforation. Indian J Surg. 2003;65:172-7.
30. Kella N, Radhi PK, Shaikh AR, Leghari F, Qureshi MA. Factors affecting the surgical outcome in typhoid intestinal perforation in children. Paed Surg. 2010;16(4):567-70.
31. Rains AJ, Ritchie HD. Bailey and Love's Short Practice of Surgery. 17th Edition. Chapman and Hill, London; 1977:979.
32. Orloff MJ, Charters AC. Injuries of the small bowel and mesentery and retroperitoneal hematoma. Surg Clin North Am. 1972;52(3):729-34.
33. Uba AF, Chirdan LB, Ituen AM, Mohammed AM. Typhoid intestinal perforation in children: A continuing scourge in a developing country. PediatrSurg Int. 2007;23:33-9.
34. Adesunkanmi ARK, Ajao OG. Prognostic factors in typhoid ileal perforation: a prospective study in 50 patients. J R CollSurgEdinb. 1997;42:395-9.
35. Eggleston FC, Santoshi B, Singh CM. Typhoid Perforation of Bowel. Ann Surg. 1979;190(1):31-5.
36. Talwar S, Sharma RK, Mittal DK, Prasad P. Typhoid enteric perforation. Aust N Z J Surg. 1997; 67(6):351-3.
37. Carmeli Y, Raz R, Scharpiro JAC. Typhoid fever in Ethiopian immigrants to Israel and native - born Israelis: a comparative study. Clin Inf Dis. 1993;16:213-5.
38. Bhansali SK. Gastrointestinal perforation: a study of 50 patients, 42: clinical study of 96 cases. J Post Grad Med Inst. 1967;395-9.
39. Khalid S, Irfan A. Outcome of ileostomy in cases of typhoid perforation presenting after 48 hours. J. Rawal Med. Coll. 2000;4:17-9.
40. Meh EA, Dogo P. Comparison of three for typhoid enteric perforation, a technique favored by operations for typhoid perforation. BJS. 1997;84:558.