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Comparative Study of Outcome of Wedge Excision of Perforation Site and Trimming of Perforation Margin Followed by Primary Repair in the Management of Ileal Perforation

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Abstract **Original Research Article**

Background: Every gastrointestinal (GI) surgeon faces a significant difficulty while treating ileal perforation. Typhoid ulcer and trauma are the most frequent causes of ileal perforation. The patient with an ileal perforation poses a variety of obstacles to the gastrointestinal surgeon and understanding the relevant anatomy, physiology and metabolism is required to appropriately address these challenges. ***Aim of the Study:*** The aim of this study was to compare the outcome between wedge excision of the perforated site and perforation margin trimming followed by primary repair in the management of ileal perforation. ***Methods:*** This prospective observational study was conducted at Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh during the period from June 2018 to November 2018. In total 56 patients were enrolled in this study as study subjects. The total participants were divided into 2 equal groups as per the number of the patients. In Group I, there were 28 patients who underwent wedge excision of perforation site and in Group II, there were other 28 patients who underwent trimming of perforation margin followed by primary repair procedure. Proper written consents were taken from all the participants before data collection. As per the inclusion criteria of this study, patients between the ages of 15 and 70 years were included. A predesigned questioner was used in data collection. All data were processed, analyzed and disseminated by using MS Excel and SPSS version 23 program as per necessity. ***Results:*** After either wedge excision of the perforated site (Group I) or trimming of the perforation margin (Group II), all patients underwent primary repair. Typhoid-related perforation is frequent in both populations. Both patient groups had higher rates of epigastric pain, fever, abdominal distention, constipation and vomiting. Preoperatively, 50% of group I and 46.4% of group II's sodium electrolyte levels were found to be normal. 46.4% of group I patients had ascites and a dialeted bowel loop that had been assessed by X-ray, while 67.8% of group II patients had it. In the widal test, there was an antigen titre that was significant in 89.3% of group I and 39.2% of group II. In group II, postoperative complications were more common. 17.8% of group I's anastomotic leakage and 39.2% of group II's was discovered. In groups I and II, prolonged ileus was seen in 17.9% and 32.2% respectively. When compared between group I and II, group II's mean hospital stay was considerably ($p<0.05$) longer at 18.1 days compared to group I's 14.2 days (±SD). ***Conclusion:*** In order to handle ileal perforation in certain individuals, wedge excision followed by primary repair is preferable in terms of post-operative mortality and morbidity.

Keywords: Epidemiology, Mortality, Morbidity, Perforation, Excision, Abdominal distention.

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INTRODUCTION

In the tropics, perforation of the terminal ileum is a rather frequent surgical emergency. Due to the high prevalence of enteric fever and tuberculosis in this area, it is reported to be the fifth most prevalent cause of abdominal crisis. In tropical nations like Bangladesh, the causes of ileal perforation are various and diverse. According to reports, typhoid enteritis is most frequently to blame for ileal perforation. Ascariasis, Crohn's disease, and other conditions are also potential causes [1]. These perforations are reportedly primarily caused by foreign bodies, radiotherapy, medications, Crohn's disease, cancer, and congenital anomalies in developed countries. Unknown peritonitis is caused by a perforation of the terminal ileum, which is indicated by a worsening of the abdominal pain, which is most

prominent over the right iliac fossa and is accompanied by tenderness, rigidity, and guarding [2]. However, for a large number of patients in a serious toxic condition, there may be hidden clinical signs, delaying identification and necessitating timely surgical intervention [1]. This illness is still linked to a high mortality rate and unavoidable morbidity despite the availability of advanced diagnostic facilities and advancements in treatment regimen. The need for surgery in the management of typhoid perforation is now generally acknowledged [3]. A favorable outcome has been demonstrated to depend on effective resuscitation, correction of electrolyte disruption, suitable antimicrobial therapy, and surgery [1] . .Every patient identified with an ileal perforation is currently advised to have surgery after receiving appropriate resuscitation, although the best way to treat the pathology has not yet been determined [4]. Opinions regarding the scope of the surgery that should be performed vary widely [2]. As a result, the diagnosis and ideal surgical therapy of ileal perforation are still up for debate [5]. In their review, Bitar and Tapley recommended "doing as much as necessary but as little as possible," with the goal of doing a quick operation to stop the contamination and remove the current collection. Numerous surgical alternatives are available, and the best surgical course should be chosen carefully based on the patient's overall health, the location and number of perforations, and the level of peritoneal soiling. The options include ileostomy, in which the perforated bowel is exteriorized after reshaping the edges, closure of the perforation and side-to- side ileotransverse anastomosis, wedge resection of the ulcer area and closure, resection of the bowel with or without anastomosis (exteriorization), and wedge resection of the ulcer area [6]. Lavage of the peritoneum must be thorough. One of the most frequent surgical emergencies in our nation is ileal perforation brought on by typhoid enteritis [7]. It is more common in our country as a result of improper sewage disposal, illiteracy, incorrect and ineffective treatment, and it is typically accompanied by high mortality and morbidity due to the lack of readily accessible medical facilities. Numerous post-operative complications exist, including wound infection (32.0%), wound dehiscence (12.0%), fecal fistula (6.0%), residual intra-abdominal abscess (12.0%), septicemia (4.0%), respiratory complications (32.0%), and cardiac failure due to pulmonary edema (4.0%) [8]. All of these issues, notably the two that are the most serious, leakage and fecal fistula, are directly tied to the surgical approach taken to treat the perforation. The aim of this study was to compare the operative outcome between primary closure following wedge excision of perforation site and trimming of perforation margin.

METHODOLOGY

This prospective observational study was conducted at Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh during the period from June 2018 to November 2018. In total 56 patients were enrolled in this study as study subjects. The total participants were divided into 2 equal groups as per the number of the patients. In Group I, there were 28 patients who underwent wedge excision of perforation site and in Group II, there were other 28 patients who underwent trimming of perforation margin followed by primary repair procedure. The Whole intervention was conducted in accordance with the principles of human research specified in the Helsinki Declaration [18] and executed in compliance with currently applicable regulations and the provisions of the General Data Protection Regulation (GDPR) [19]. Each case underwent a thorough physical examination, during which time findings regarding anemia, jaundice, dehydration, edema, lymphadenopathy, nutritional status, pulse, blood pressure, abdominal signs like tenderness, muscle guarding, abdominal distension, liver dullness, bowel sound, and results of a digital rectal examination were noted. Investigations such as hemoglobin, WBC total and differential counts, urine R/M/E, serum creatinine, blood urea, RBS, Widal test, plain X-ray of the abdomen in an upright position, including both domes of the diaphragm, and USG of WA were performed in each case. As the majority of the patients were dehydrated & poisoned, resuscitation was performed by IV fluid, electrolyte, & antibiotics after history taking, general, abdominal, & radiographic examination revealed a suspicion of ileal perforation. In each of these patients, an NG tube was inserted for gastric aspiration. Improvement in hydration status, catheterization with a Foley's catheter, recording and monitoring of urine output, and kidney function evaluation were all done on patients. Chemotherapy in combination was used. Following resuscitation, emergency laparotomies were performed in each patient while adhering to a conventional operating technique, such as opening the abdomen with a midline incision while under general anesthesia. Following wedge excision of the perforation site, primary closure was used to treat conditions such peritoneal soiling, gut wall edema, number of perforations, distal obstruction, and adhesion. A skilled resident performed the operation. When the perforation's margin was trimmed, the tissue was removed circumferentially until a safe primary repair margin was reached. In wedge (V) excision, a "V"- shaped wedge of tissue was removed, with the mesenteric border at the tip and the ante mesenteric border receiving 2 cm of ileal tissue from either margin. A 3.0 Vicryl, single layer, interrupted suture was used for the primary repair. A drain was kept in place, and complete peritoneal toileting was performed. Following the procedure, the postoperative period was observed for any complications, particularly the emergence of anastomotic leaking or any fecal fistula. If any subjects experienced fecal fistula or anastomotic leakage, they were carefully monitored for both local and systemic issues. A pre- designed study questionnaire was used to obtain a thorough history of each patient at admission. All data were processed, analyzed and disseminated by

MS Office and SPSS version 2 programs as per the necessity.

RESULT

Total fifty-six patients were selected for this experimental study. All the patients were divided into two groups. The mean age difference was not statistically significant (p>0.05) between two groups. Abdominal pain, H/O fever, abdominal distension, constipation, & vomiting reveled were almost similar in both groups of patients. Post-operative fever was observed 15 (53.5%) in group I & 23 (82.2%) in group II & the difference was statistically significant (p<0.05) in chi square test. Wound infection was observed 15(53.5%) in group I & 22 (78.5%) in group II. And the difference was statistically significant (p<0.05) in chi square test. Anastomotic leakage was observed 5 (17.8%) in group I & 15 (39.2%) in group II. And the difference was statistically significant (p<0.05) in chi square test. Death was found 1 (3.5%) in group I & 6 (21.5%) found in group II and the difference was statistically significant (p<0.05) in chi square test. The mean (±SD) duration of hospital stay was 14.2 ± 7.2 days varied from 5 to 26 days & 18.1 ± 8.9 days varied from 9 to 38 in group I & group II respectively. The mean duration of hospital stay difference was statistically significant (p<0.05) in unpaired't' test. Prolong ileus was observed 5 (17.9%) in group I & 12 (42.8%) in group II, and the difference was statistically significant (p<0.05) in chi square test.

Table 1: Distribution of the respondents by age (N=56)

Age in Years	Group I (n=28)		Group II (n=28)		P Value
	n	%	n	%	
15-20	7	25	6	21.4	0.553^{NS}
21-30	12	42.8	13	46.5	
31-40	4	14.3	5	17.9	
41-50	1	3.5	3	10.8	
≥50	4	14.3	1	3.5	
Mean ± SD	32.1 ± 17.1		28.9 ± 11.8		
Range	15-67		15-55		

Table 2: Distribution on clinical presentation of ileal perforation (N=56)

Clinical presentation	Group I (n=28)		Group II (n=28)		P Value
	n	%	n	%	
Abdominal pain	28	100	28	100	0.883^{NS}
Fever	26	92.8	27	96.4	
Abdominal distension	21	75	18	64.3	
Constipation	17	60.7	19	67.8	
Vomiting	16	57.1	11	39.3	

Table 3: Post-operative fever of the study patients: (N=56)

Fever	Group I (n=28)		Group II (n=28)		P Value
	n	%	n	%	
Present	15	53.5	23	82.2	0.022^{S}
Absent	13	46.5	5	17.8	

Table-4: Wound infection of the study patients: (N=56)

Wound infection	Group I (n=28)		Group II (n=28)		P Value
	n	%	n	%	
Yes	15	53.5	22	78.5	0.048^{S}
No	13	46.4	6	21.5	

Table-5: Anastomotic leakage status of the study patients: (N=56)

Anastomotic leakage	Group I (n=28)		Group II (n=28)		P Value
	n	%	n	%	
Yes	5	17.8	15	39.2	0.005^{S}
No	23	82.2	13	60.8	

Table-6: Duration of hospital stay of the study patients: (N=56)

Traits	Group I (n=28)		Group II (n=28)		P Value
	Range	Mean ± SD	Range	Mean ± SD	
Hospital Stay (Days)	5-26	14.2 ± 7.2	9-38	18.1 ± 8.9	0.016S

Table-7: Distribution of mortality of the study patients: (N=56)

Mortality	Group I (n=28)		Group II (n=28)		P Value
	n	%	n	%	
Yes	1	3.5	6	21.5	0.043 S
No	27	96.5	22	78.5	

DISCUSSION

This observational study's goals were to: identify the underlying diseases as confirmed by laboratory investigations, including histopathological examination of tissue from the lesions; compare the outcomes of wedge excision of the perforation site and trimming of the perforation margin followed by primary repair in the management of ileal perforations; and highlight the clinical features of frequently occurring ileal perforations. In this study, it was shown that for 56 patients, the mean ((±SD) age of those with ileal perforation was 32.1 ± 17.1 years, ranging from 15-67 years and 28.9± 11.8 years, ranging from 15-65 years for group I and group II respectively. According to research from [1, 9-11] most of the patients in both groups were between the ages of 21 and 30. This suggests that younger age groups made up most ileal perforation patients [16, 17] shows perforation due to Crohn's disease, foreign body, diverticulitis, lymphoma, amyloid, chemotherapy, radiotherapy & idiopathic cause rather than typhoid & tuberculosis in developed countries. Therefore, in developing countries the incidence of ileal perforation mostly due to typhoid fever & tuberculosis. In the current investigation, there was stomach pain in both groups of patients. However, group I had a 92.8% h/o fever rate while group II had a 96.4% h/o fever rate. In groups I and II, the percentage of abdominal distension was 75 and 64.3%, respectively. In groups I and II, constipation rates were 60.7% and 67.8%, respectively. Vomiting rates in groups I and II were, respectively, 57.1% and 39.3%. The clinical presentation was likewise the subject of similar observations by [10, 12, 13]. The current study is supported by the presence of [10, 12, 13] series fever in 75%, 89.5%, and 80% of cases, respectively. A noteworthy finding was that taking antibiotics and antipyretics while presenting could cause your temperature to drop, as could going into cepticaemic shock. In this study, group II patients had considerably ($P < 0.05$) greater post-operative fever. Post-operative fever was present in 82.2% of group II patients and 53.5% of patients in group I. 53.5% of those in group I and 78.5% of those in group II had wound infections. In group II, wound infection was considerably ($P < 0.05$) greater. There were 42.9% in group I and 50.0% in group II who experienced a respiratory problem, which is not statistically significant ($P > 0.05$). 32.1% of group I participants had a burst abdomen, compared to 64.2% of group II participants, which was considerably ($P < 0.05$) greater in group II. These are comparable to the wound infection rates reported by [9-11, 14] which were 82.29%, 86.58%, 37.18%, and 29.71%, respectively. In those series, the respiratory problems were, in order, 89.28%, 28.0%, 30.76%, and 66.6%. Anastomotic leakage was discovered in this series in groups I and II at a rate of 17.8% and 39.2%, respectively. In group II, the anastomotic leakage was considerably ($P< 0.05$) greater. Anastomotic leakage occurrences were discovered by [9-11, 14] to be 13.88%, 0.0%, 6.1%, and 0.0%, respectively. According to [1], the type of surgical procedure does not seem to lower the mortality linked to intestinal perforation. In their study, [15] discovered that the group with ileostomies had the highest mortality (7/9), followed by the group with primary closure (2/7) and 3.5% mortality in the group with wedge resection/resection anastamosis. In this series, the mortality was decreased with primary perforation repair following wedge excision of the perforated site, although the overall morbidity was not significantly decreased. It has been demonstrated through statistical analysis that wedge excision is safer than trimming followed by primary repair.

Limitation of the Study

This was a single centered study with small sized samples. Moreover, the study was conducted at a very short period of time. So, the findings of this study may not reflect the exact scenario of the whole country.

CONCLUSION & RECOMMENDATION

This investigation revealed the need for a longitudinal study with a large sample size to determine the extent of ileal perforation in our nation. To assess the causes, early diagnostic and therapeutic approaches, and consequently decrease mortality and morbidity, a prospective study with multinuclear and a sizable sample size should be carried out. In statistical analysis it was proved that wedge excision followed by primary repair is safer than trimming followed by primary repair.

REFERENCES

1. Rahman, A. (2003). Spontaneous ileal Perforation: An experience of 33 cases. *JPMI*, 17(1), 105-10.
2. Wani, R. A., Parray, F. Q., Bhat, N. A., Wani, M. A., Bhat, T. H., & Farzana, F. (2006). Nontraumatic terminal ileal perforation. *World Journal of emergency surgery*, *1*(1), 1-4.
3. Adesunkanmi, A. R., & Ajao, O. G. (1997). The prognostic factors in typhoid ileal perforation: a prospective study of 50 patients. *Journal of the Royal College of Surgeons of Edinburgh*, *42*(6), 395-399.
4. Li, F. W. (1963). Surgical treatment of typhoid perforation of the intestine. *Journal of British Surgery*, *50*(227), 976-979.
5. Mohil, R. S., Singh, T., Arya, S., & Bhatnagar, D.

(2008). Risk adjustment is crucial in comparing outcomes of various surgical modalities in patients with ileal perforation. *Patient Safety in Surgery*, *2*(1), 1-9.

6. Pradip, K. D., Pawanindra, L., & Sanjay, D. B. (2008). Surgry in the tropics in Norman SW, Christopher JKB. Roman O'connl P, editors. Baily & Love's short practice of surgery. *25th ed.London: Arnold Publishers;* 69.
7. Azad, M. A. (2009). Study of etiological pattern and management procedure resulting the better outcome in ileal perforation, *Thesis*, DU, Dhaka.
8. Paul, T. K. (2006). Outcome of local repair and segmental resection with anastomosis in the management of typhoid ulcer perforation-A study. *Dissertation, BCPS, Dhaka*, 88.
9. Hoarder, R. H., Siddiqui, M. I., Awwal, R., Ahmed, D. F., & Rahman, M. (2001). Ileal perforation; A review of 74 cases. *The Professional Medical Journal*, 8, 136- 42.
10. Khundker, S. H. (1983). Aetiology of spontaneous small bowel perforation; A clinicopathological study. Thesis. BSMMU.
11. Eggleston, F. C., Santoshi, B., & Singh, C. M. (1979). Typhoid perforation of the bowel: Experience of 78 cases. *Ann Surg*, 190, 31-5.
12. Nadkami, K. M., Shetty, S. D., Kaqzi, R. S., Pinto, A. C., & Bhalerao, R. A. (1981). A study of 32 cases. *Arch Surg*, 116(1), 53-7.
13. Dickson, J. A. S., & Cole, G. J. (1964). Perforation of the terminal ileum. A review of 38 cases. *Journal of British Surgery*, *51*(12), 893-897. PMID: 14226047.
14. Hossain, M. J. (2006). Outcome of primary repair of typhoid ulcer perforation- A study of 50 cases. *Dissertation, BCPS.*
15. Atamanalp, S. S., Aydinli, B., Ozturk, G., Oren, D., Basoglu, M., & Yildirgan, M. I. (2007). Typhoid intestinal perforations: twenty-six year experience. *World journal of surgery*, *31*(9), 1883-1888.
16. Oringer, R. D., Collar, J. A., & Veidenheimer, M. C. (1983). Spontaneous free perforation of the small intestine. *Dis colon rectum*, 26, 323-26.
17. Rajagopalan, A. E., & Pickleman. (1982). Free perforation of the small intestine. *J. Ann Surg*, 196(5), 576-9.
18. World Medical Association. (2001). World Medical Association Declaration of Helsinki. Ethical principles for medical research involving human subjects. Bulletin of the World Health Organization, 79 (4), 373 - 374. World Health Organization https://apps.who.int/iris/handle/10665/268312.
19. Voigt, P., & Axel von dem, B. (2017). "Enforcement and fines under the GDPR." The EU General Data Protection Regulation (GDPR). Springer, Cham, 201-217.