

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

Ullah MA¹, Rahman S²

Abstract

The aim of this study is to compare between the outcome of wedge excision of perforation site and trimming of perforation margin followed by primary repair in the management of ileal perforation in selected patients. This is an observational study with data from department of Surgery, Sir Salimullah Medical College and Mitford Hospital during February, 2007 to July, 2010. The study included 108 patients of ileal perforation of 15-67 years of age. All patients were treated by primary repair after either wedge excision of perforation site (Group I) or trimming of perforation margin (Group II). Perforation due to typhoid is common in both groups. Abdominal pain, fever, abdominal distention, constipation and vomiting were more frequent in both groups of patients. Signs of peritonitis were observed almost all the patients. Pneumoperitoneum was found 77.8% in group I and 66.7% in group II in X-ray. In ultrasonography ascitis and distended bowel loop was found 44.4% in group I and 66.7% in group II. Typhoid, tuberculosis, nonspecific ulcer and chronic nonspecific ulcer were found in histopathology. Post-operative complications were more in group II. Anastomotic leakage was found 18.5% in group I and 38.9% in group II. Prolonged ileus was observed 16.7% in group I and 33.3% in group II. Anastomotic leakage and Prolonged ileus difference were statistically significant ($p < 0.05$). The mean duration of hospital stay was significantly ($p < 0.05$) higher in group II, where the mean (\pm SD) duration of hospital stay was 14.2 ± 7.2 days in group I and 18.1 ± 8.9 days in group II. Mortality was observed 9.3% only in group II. So Wedge excision followed by primary repair is better in terms of post operative mortality and morbidity in the management of ileal perforation in selected patients.

Keywords: Ileal Perforation, primary repair, trimming, wedge excision.

1. Corresponding Author:

Dr. Md. Aziz Ullah
FCPS (Surgery)
Junior Consultant
Department of Surgery
Upzila Health Complex, Chhagalnaiya, Feni.
e-mail: drmazizullah@gmail.com

2.

Dr. Soma Rahman
M.Phil (Radiology & Imaging)
Assistant Professor
Department of Radiology & Imaging
Gonoshashto Shomajvittik Medical College, Savar.

Introduction

Perforation of terminal ileum is a fairly common surgical emergency in the tropics. It is reported to constitute the fifth commonest cause of abdominal emergencies due to high incidence of enteric fever and tuberculosis in this region. The etiological factors in ileal perforation are numerous and varied in tropical countries like Bangladesh. Typhoid enteritis has been reported to be the commonest cause of ileal perforation. Other causes are also encountered which includes-Tuberculosis, Crohn's disease and Ascariasis. In developed countries these perforations are reported to be mostly because of foreign bodies, radiotherapy, drugs, Crohn's disease, malignancies and congenital malformations¹. Perforation of terminal ileum is a cause for obscure peritonitis, heralded by exacerbation of abdominal pain associated with tenderness, rigidity and guarding, most pronounced over right iliac fossa. However for many patients in a severe toxic state, there may be obscured clinical features with resultant delays in diagnosis and adequate surgical intervention². Despite the availability of modern diagnostic facilities and advances in treatment regimen, this condition is still associated with a high mortality and unavoidable morbidity¹. It is now universally accepted that the treatment of typhoid perforation must be surgical. Adequate resuscitation, correction of electrolyte disturbance, appropriate antibiotic therapy and surgery have proven to be essential for a successful outcome³. At present every patient diagnosed to have ileal perforation is universally recommended to be treated surgically after adequate resuscitation, but how to correct the pathology is a question yet to be answered for universal acceptance¹. There is no uniformity of opinions as to the extent of surgery that should be undertaken⁴. So there is still confusion and controversy over the diagnosis and

optimal surgical treatment of ileal perforation². Bitar and Tapley in their review have advised "doing as much as necessary but as little as possible", the intention being a swift effective operation designed to halt the contamination and remove the existing collection⁵. Several surgical options are available and most appropriate operative procedure should be chosen judiciously depending upon the general condition of the patient, the site of perforation, the number of perforations and the degree of peritoneal soiling. The alternatives are closure of the perforation after freshening the edges (trimming), wedge resection of the ulcer area and closure, resection of bowel with or without anastomosis (exteriorization), closure of the perforation and side to side ileotransverse anastomosis, ileostomy where the perforated bowel is exteriorized after refashioning the edges. Thorough peritoneal lavage is essential⁶. Ileal perforation due to typhoid enteritis is one of the commonly met surgical emergencies in our country. It occurs mostly in our country due to lack of safe drinking water, poor sewage disposal, illiteracy inappropriate and inadequate treatment and it is usually associated with high mortality and morbidity as medical facilities are not readily available here⁷. There are various types of post operative sequels like wound infection (32.0%, wound dehiscence (12.0%), fecal fistula (6.0%), residual intra abdominal abscess (12.0%), septicaemia (4.0%), respiratory complication (32.0%) and cardiac failure due to pulmonary oedema (4.0%). All this complications especially most grave one; leakage and fecal fistula is directly related to the surgical technique applied to deal with the perforation⁸.

Materials and Methods

This was an observational study conducted in Department of Surgery, Sir Salimullah Medical College and Mitford Hospital, Dhaka, during the period of February 2007 to July 2010. It included the patients who attended the all surgical wards of SSMC and Mitford Hospital as a case of ileal perforation which were treated by primary repair after trimming of perforation margin or wedge excision. Purposive sampling technique was done. After patients selection the surgical method was decided randomly by lottery method. The sample size was 108 cases. Clinically ileal perforation of different causes and those who were treated by primary repair after trimming of perforation margin or wedge excision of perforation site were included in the study. Patients with diffuse peritonitis due to duodenal ulcer perforation, jejunal perforation or that due to burst appendix, colonic perforation and any other causes than ileal perforation, death during resuscitation and operation and patients who were unsuitable for primary repair e.g. late cases, gross edema of intestinal wall, patient with very poor general condition, distal obstruction or adhesion, multiple perforation were excluded from the study. Informed consent was taken from all patients participating in the study. Ethical clearance was obtained from ethical review committee.

Patient unwilling to participate in the study was however got appropriate treatment without any reservation. Socio demographic variables were collected from all the patients by a thorough history. Detailed examination was done. Intravenous line was established to administer intravenous fluids-electrolytes and antibiotics and other medications. Naso-gastric tubes were inserted in all these patients. To assess renal function, hydration status the patients were catheterized by passing Foley's catheter and urinary out put was recorded and monitored. Combination chemotherapy was administered. In all these cases base line investigations like X-Ray abdomen A/P view including diaphragms, blood profile, blood grouping, Random blood sugar, serum electrolytes and serum creatinine level was done. Ultrasonography of whole abdomen was done where no gas shadow was found in X-Ray abdomen A/P view for confirming the free fluid in the peritoneum. Widal test was done preoperatively when there is a high index of suspicion of typhoid fever. Other wise it was done postoperatively when typical operating findings was noted. After proper resuscitation, the patients were subjected to exploratory laparotomy under General anesthesia by mid line incision. Operative findings was recorded. The type of surgical procedure was decided by the surgeon on the basis of operative findings like state of peritoneal soiling, gut wall edema, number of perforation, distal obstruction or adhesion and those treated by surgical methods other than trimming or wedge excision on ground of exclusion criteria was excluded from study. Surgery was done by experienced resident. In case of trimming, margin of the perforation were freshened by circumferential excision of tissue up to a healthy margin is achieved for safe primary repair. In wedge (V) excision a "V" shaped wedge of tissue including perforation in the centre and 2 cm of ileal tissue from each margin in the ante mesenteric border and the apex of the wedge were on the mesenteric border. Primary repair was done by 3.0 vicryl single layer interrupted suture. Thorough peritoneal toileting was done and abdominal drain was kept. Postoperatively the patients were followed up to observed the post operative mortality and morbidity. The clinical history of the patients, physical examination findings, relevant investigations findings, operation note, treatment, post-operative morbidity, mortality with histo-pathological examination report was recorded on a preformed data sheet. The data collected were transferred to the master tabulation sheet after proper checking, verifying and editing as per the specific objectives and key variables. Analysis of the data was done with the SPSS/PC (ver. 15.0) program of computer on the basis of different variables. Tables were made and statistical procedures were applied. Values were express as frequency, percentage and mean \pm (SD) standard deviation. Statistical significance of difference between two groups were evaluated by using chi-square and unpaired 't'-test". P value <0.05 was considered as statistical significance.

Results

Post-operative fever was observed 30(55.6%) in group I and 33(61.1%) in group II and the difference was statistically significant ($p<0.05$) in chi square test (table-I).

Table I: Post-operative fever of the study patients (n=108).

Post-operative fever	Group I (n=54)		Group II (n=54)		P value
	n	%	n	%	
Present	30	55.6	33	61.1	0.005 ^S
Absent	24	44.4	21	38.9	

S= significant

P value reached from chi square test

Wound infection was observed 28 (51.9%) in group I and 39 (72.2%) in group II and the difference was statistically significant ($p<0.05$) in chi square test (table-II).

Table II: Wound infection of the study patients (n=108).

Wound infection	Group I (n=54)		Group II (n=54)		P value
	n	%	n	%	
Yes	28	51.9	39	72.2	0.029 ^S
No	26	48.1	15	27.8	

S= significant

P value reached from chi square test

Burst abdomen was found 22 (40.7%) and 28 (51.9%) in group I and group II respectively and the difference was statistically significant ($p<0.05$) in chi square test (table-III).

Table III: Burst abdomen status of the study patients (n=108).

Burst abdomen	Group I (n=54)		Group II (n=54)		P value
	n	%	n	%	
Present	22	40.7	28	51.9	0.029 ^S
Absent	32	59.3	26	48.1	

S= significant

P value reached from chi square test

Anastomotic leakage was found 10 (18.5%) and 21 (38.9%) in group I and group II respectively and the difference was statistically significant ($p<0.05$) in chi square test (table-IV).

Table IV: Anastomotic leakage status of the study patients (n=108).

Anastomotic leakage	Group I (n=54)		Group II (n=54)		P value
	n	%	n	%	
Yes	10	18.5	21	38.9	0.019 ^S
No	44	81.5	33	61.1	

S= significant

P value reached from chi square test

The mean (\pm SD) duration of hospital stay was 14.2 ± 7.2 days varied from 5 to 26 days and 18.1 ± 8.9 days varied from 9 to 38 days in group I and group II respectively. The mean duration of hospital stay difference was statistically significant ($p<0.05$) between two groups in unpaired t-test (table-V).

Table V: Duration of hospital stay of the study patients (n=108).

Post-operative fever	Group I (n=54)		Group II (n=54)		P value
	Mean	\pm SD	Mean	\pm SD	
Hospital stay (days)	14.2	± 7.2	18.1	± 8.9	0.016 ^S
Range	(5	-26)	(9	-38)	

S= significant

P value reached from unpaired't' test Death was not found in group I and 5(9.3%) found in group II and the difference was statistically significant ($p<0.05$) in fisher exact test(table-VI).

Table VI: Distribution of mortality of the study patients (n=108).

Death	Group I (n=54)		Group II (n=54)		P value
	n	%	n	%	
Yes	0	0.0	5	9.3	0.028 ^S
No	54	100.0	49	90.7	

S= significant

P value reached from fisher exact test

Discussion

This observational study was carried out with an aim to compare between the outcome of wedge excision of perforation site and trimming of perforation margin followed by primary repair in the management of ileal perforation as well as to highlight the clinical features of frequently occurring ileal perforations; find out the underlying diseases as confirmed by laboratory investigations including histopathological examination of tissue from the lesions and to point out the management outcome of the disease.

A total of 108 patients having ileal perforation treated by primary repair after trimming of perforation margin or wedge excision age ranging from 15 to 67 years were included in the study, in the Department of Surgery, Sir Salimullah Medical College and Mitford Hospital during February 2007 to July 2010.

The post-operative fever was significantly ($p<0.05$) more in group II patients in this study. More than a half (55.6%) of the group I patients and 61.1% of group II patients had post-operative fever. Wound infection was observed 51.9% in group I and 72.2% in group II. Wound infection was significantly ($p<0.05$) higher in group II. A respiratory complication was observed 44.4% in group I and 50.0% in group II, which is not significant ($p>0.05$). Burst abdomen was found 59.3% and 64.8% in group I and group II respectively, which was significantly ($p<0.05$) higher in group II. These are comparable with Khundker⁹, Hossain¹⁰, Eggleston et al.¹¹ and Hoarder¹², where wound infection was 82.29%, 86.58%, 37.18%, 29.71%. The respiratory complications in those series were 89.28%, 28.0%, 30.76%, 66.6% respectively.

In this series Anastomotic leakage was found 18.5% and 38.9% in group I and group II respectively. The Anastomotic leakage was significantly ($p < 0.05$) higher in group II. The incidences anastomotic leakages were found 13.88%, 0.0%, 6.1% and 0.0% by Khundker⁹, Hossain¹⁰, Eggleston et al¹¹ and Hoarder¹², respectively. All these results support the present study. The mean duration of hospital stay difference was significantly ($p < 0.05$) higher in group II. The mean (\pm SD) duration of hospital stay was 14.2 ± 7.2 days varied from 5 to 26 days and 18.1 ± 8.9 days varied from 9 to 38 days in group I and group II respectively. Death was found only in group II, that was 9.3% of the patients in group II, which differ significantly ($p < 0.05$) between two groups. Rahman¹ et al have reported that the kind of surgical procedure does not appear to reduce the mortality associated with enteric perforation. Mortality according to the authors is related to toxemia, septic shock and multiple organ failure and therefore uncontrollable factors make the evaluation of any surgical procedure for this condition difficult. Atamanalp et al¹³ obtained in their study that ileostomy group had the highest mortality (7/9) followed by primary closure (2/7) with no mortality in wedge resection/resection anastomosis group.

By primary repair of perforation after wedge excision of perforation site, in this series, the mortality had been reduced but over all morbidity has not been reduced considerably. In statistical analysis it was proved that wedge excision followed by primary repair is safer than trimming followed by primary repair.

Conclusion

In the management of typhoid ulcer perforation urgent resuscitative measure followed by definitive surgery can reduce the risk of both morbidity and mortality. As the chance of re-perforation and other complications are more in trimming of perforation margin followed by primary repair, so wedge excision followed by primary repair is the procedure of choice in the management of ileal perforation in selected patients. The aim of surgery is to resect out the affected part of ileum with at least two cm healthy margin on each side and repair. The peritoneal contamination should be cleared off by thorough peritoneal toileting by normal saline. Abdomen should be closed with one or two drain in the peritoneal cavity. The post operative wound infection can be minimized by use of appropriate antibiotics. Respiratory complications can be reduced by routine breathing exercise and early mobilization. As the disease is associated with hyper catabolism, so parenteral nutrition supply should be continued until the patient is able to take oral feedings. The mortality pattern shows that this disease is deadly and is better prevented than treated. This can only be achieved by drawing serious attention of the health care workers to the prevention of the disease by health education, maintenance of personal hygiene, providing sanitation and clean drinking water for all the people of this region. By primary repair of perforation after wedge excision of perforation site, in this series, the mortality had been reduced but over all morbidity has not

been reduced considerably. In statistical analysis it was proved that wedge excision followed by primary repair is safer than trimming followed by primary repair.

Acknowledgement

I pay my respectful thanks and gratitude to my guide Professor A N M Zia-Ur Rahman, Head of the department of Surgery, Sir Salimullah Medical College and Mitford Hospital, Dhaka. My special thanks to Dr Md Al Azad (MS Resident), my colleagues, honorary medical officers and interns of the department of surgery for their enormous help. Lastly I pay my respect and gratitude to my patients who participate in this study.

References

1. Rahman A. Spontaneous ileal Perforation: An experience of 33 cases. *JPMI*. 2003;17(1):105-10.
2. Wani RA, Parry FQ, Bhat NA, Wani MA, Bhat TH, Farzana F. Nontraumatic terminal ileal perforation. *World J Emergency Surg*. 2006;24(1):7.
3. Adesunkanmi AR, Ajao OG. The prognostic factors in typhoid ileal perforation: a prospective study of 50 patients. *J R Coll Surg Edinb*. 1997;42:395-9.
4. Li FW. Surgical treatment of typhoid perforation of the intestine. *British Journal of Surgery*. 1963;50:239-40.
5. Mohil RS, Sing T, Arya S, Bhatnagar. Risk adjustment is crucial in comparing outcomes of various surgical modalities in patient with ileal perforation. *Biomed central*. 2008;2:31.
6. Pradip KD, Pawanindra L, Sanjay DB. Surgery 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; 2008: 69.
7. Azad MA. Study of etiological pattern and management procedure resulting the better outcome in ileal perforation, Thesis, DU, Dhaka, 2009.
8. Paul TK. Outcome of local repair and segmental resection with anastomosis in the management of typhoid ulcer perforation-A study. Dissertation, BCPS, Dhaka, 2006:88.
9. Khondoker SH. Aetiology of spontaneous small bowel perforation-a clinic-pathological study. Thesis. BSMMU. 1983.
10. Hossain MJ. Outcome of primary repair of typhoid ulcer perforation-A study of 50 cases. Dissertation, BCPS, 2006.
11. Eggleston FC, Santoshi B, Singh CM. Typhoid perforation of the bowel: experience in 78 cases. *Ann Surg*. 1979;190:31-5.
12. Hoarder RH, Siddiqui MI, Awwal R, Ahmed DF, Rahman M. Ileal perforation; A review of 74 cases. *The Professional Medical Journal*. 2001;8:136-42.
13. Atamanalp SS, Aydinli B, Ozturk G, Oren D, Basoglu M, Yildirgan MI. Typhoid intestinal perforations: twenty-six year experience. *World J Surg*. 2007;31(9):1883-8.