

Comparison of Outcomes of Primary Repair Versus Ileostomy in Typhoid Ileal Perforation in Different Age Groups

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ABSTRACT

Background: Procedure of ileostomy in patients of Typhoid fever perforation with friable gut defunctions the diseased gut, repair the infected fecal matter, protects the intestinal repair done in septic tissues and reduces the anastomotic dehiscence.

Method: This was a Randomized controlled study. Started in November 2015 to May 2016 at BMC Hospital balochistan. Main objectives were to compare the infection of postoperative wound between ileostomy and primary closure in patients undergoing surgery for Typhoid fever ileal perforation.

Study done by One fifty patients who underwent Typhoid fever perforation surgery. The surgical management was done as primary repair (group-A) and ileostomy (group-B). Postoperative complications were evaluated till 5 days of hospital stay. Comparison between two groups was done using chi square. Stratification was done and p-value ≤ 0.05 was considered as significant.

Results: In group-A 47 male and 28 females and in group-B 52 male and 23 female patients were included. In group-A, 40 Percent observed wound discharge while in group-B it was 24 Percent. In group-A, acceptable cosmesis were observed for 80 Percent patients and in group-B, it was 93.3 Percent. Results showed significant association of wound discharge and acceptable cosmesis with the two study groups.

Conclusion: Better outcome in ileostomy group than primary repair group was significant observed in the study.

Keywords: Typhoid fever, Salmonella Typhi, Acceptable cosmesis, Wound Discharge, Intra Abdominal Collection, Ileostomy, Typhoid fever Ileal Perforation

INTRODUCTION

Typhoid fever is a life threatening and severe febrile disease caused by gram negative bacillus Salmonella Typhi transmitted by the oro-faecal route¹. Typhoid fever is a global health problem having a devastating socioeconomic impact but the developing countries are particularly the victims due to improper sanitation and waste disposal system with an incidence of >100 /100000 patients per year². It is endemic in many developing countries where disease occurs throughout the year³.

Typhoid fever has many complications, intestinal hemorrhage is the commonest one but perforation in terminal ileum is the most lethal one leading to high morbidity and mortality⁴. There are longitudinal ulcers of terminal ileum due to abundance of Payer's patches leading to perforation with a reported incidence of 9-39 Percent⁵. Short duration of symptoms, inadequate antimicrobial therapy, male sex, and leucopenia are independent risk factors for Typhoid perforation in patients with Typhoid fever⁶. The reported mortality rate of Typhoid fever related intestinal perforation is from 5 Percent to 62 Percent but the perioperative mortality in such patients rises up to 80 Percent who present late⁷.

Doing ileostomy in patients of Typhoid fever perforation with friable gut defunctions the diseased gut, repair the infected fecal matter, protects the intestinal repair done in septic tissues and hence reduces the anastomotic dehiscence⁸. But the main disadvantage of doing ileostomy is that it needs further surgery for its closure, leads to ileostomy related complications.

The aim of study was To compare postoperative wound infection and intra-abdominal collection between primary closure and ileostomy in patients undergoing surgery for Typhoid fever ileal perforation.

MATERIAL AND METHODS

This study was conducted at Bolan Medical Complex Hospital, Quetta, in Six months duration from November to May 2016.

A sample size of One fifty patients (Seventy five in each group) was calculated using formula of two proportions. Keeping

confidence level 95 Percent with frequency 6.67 Percent and absolute precision 4 Percent. It was a Randomized control study.

Inclusion Criteria:

- 1- Age: 25-60 years.
- 2- Patient of Typhoid fever perforation surgery.
- 3- Either gender with proper consent.

Exclusion Criteria:

- 1- Severe Lung disease FEV₁ < 70 on pulmonary function test.
- 2- Malignancy diagnosed on the basis of confirmed biopsy report.
- 3- Refused to participate in study.

These patients were divided into two groups group A and group B. Randomization was done by senior surgeons by picking up card from both the groups. The surgical management was done as primary repair (group A) and ileostomy (group B); comparative study was done between both procedures. All operations were done by group of three experienced surgeons and they all were performed the same technique. All the procedures were carried with hand sewn method. In group A primary closure was done in two layers, the inner layer closed with 3-0 poly glycolic acid (vicryl) and outer layer closed with silk 3-0. In group B loop ileostomy was done. Postoperative complications in each group like wound infection and wound intra abdominal abscess, was evaluated till 5 days of hospital stay.

All data were entered and analyzed using SPSS Version 20.0. Descriptive statistics were used to calculate mean and standard deviation for Quantitative Variables like age. Frequencies with percentages were presented for Qualitative variable applying chi square test p value <0.05 significant.

RESULTS

Total One fifty patients of either gender with age between 25 to 60 years undergoing typhoid perforation surgery were included in the study to compare postoperative wound infection and intra-abdominal collection between primary closure and ileostomy. In Both study Groups, Group A (Primary repair) and Group B (ileostomy) Seventy five patients were Included. Descriptive statistics were calculated using SPSS version 21. Qualitative variables were presented in terms of frequency and percentages.

Quantitative variables were presented in term of mean and standard deviations. Stratification was done to see the effect of modifiers on outcome. Post stratification chi square test was applied considering p-value ≤ 0.05 as significant.

The overall mean age of study subjects was 43.73 ± 10.15 years. The mean age of study subjects in Group A was 42.29 ± 9.67 years while mean age of study subjects in Treatment Group B was 45.17 ± 10.48 years. The descriptive statistics of age are presented in Table-1 and Table-2.

The age was further stratified in two groups. 46 patients were aged ≤ 45 years and 29 patients were aged > 45 years in Treatment Group A while in Treatment Group B 31 patients were aged ≤ 45 years and 44 patients were aged > 45 years. The percentages are presented in Graph-A and B.

Descriptive Statistics of age among Group A and Group B with respect to age group are presented in Table-3 and Table-4.

Out of Seventy five patients in group A, 30(40 Percent) have found wound discharge Detailed frequency distribution is presented in Table-5. Mean duration of wound discharge was 2.76 ± 1.38 days as presented in Table-6.

Out of Seventy five patients in group B, 18(24 Percent) have found wound discharge. Detailed frequency distribution is presented in Table-7. Mean duration of wound discharge was 2.94 ± 1.39 days as presented in Table-8.

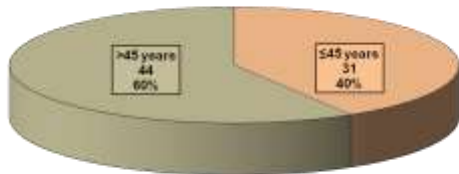
Out of Seventy five patients in group A, acceptable comesis were found for 60(80 Percent) patients. Detailed frequency distribution is presented in Table-9. Mean duration of acceptable comesis was 3.01 ± 1.22 days as presented in Table-9.

Out of Seventy five patients in group B, acceptable comesis were found for 70(93.3 Percent) patients. Detailed frequency distribution is presented in Table-10.

The outcome i.e. wound infection and acceptable cosmesis were compared with the study groups using chi-square test and results showed significant association of wound discharge was observed among study groups ($p=0.036$) and acceptable cosmesis was also associated with the two study groups ($p=0.016$). The detailed results of associations are presented from Table-11.



Graph A: Percentage of Patients According to Age Groups in Primary Repair Group (n= Seventy five)



Graph B: Percentage of Patients According to Age Groups In Ileostomy Group (n= Seventy five)

Table 1: Frequency Distribution of Gender in Primary Repair Group (n= Seventy five)

	Frequency (n)	Percent
Male	47	62.7 Percent
Female	28	37.3 Percent
TOTAL	75	

Table 2: Frequency Distribution of Gender In Ileostomy Group (n= Seventy five)

	Frequency (n)	Percent
Male	52	69.3 Percent
Female	23	30.7 Percent
TOTAL	75	

Table 3: Overall Descriptive Statistics of Age (Years) (n= One fifty)

Mean \pm SD	43.73 \pm 10.15
95 PercentCI (LB – UB)	42.09–45.37
Median (IQR)	45.00 (18.25)
Range	34
Minimum	26
Maximum	60

Table 4: Descriptive Statistics Of Age (Years) In Primary Repair Group (n= Seventy five)

Mean \pm SD	42.29 \pm 9.67
95 PercentCI (LB – UB)	40.06–44.51
Median (IQR)	43.00 (17)
Range	32
Minimum	26
Maximum	58

Table 5: Descriptive Statistics of Age (Years) in Ileostomy Group (n= Seventy five)

Mean \pm SD	45.17 \pm 10.48
95 PercentCI (LB – UB)	42.76–47.58
Median (IQR)	48.00 (19)
Range	34
Minimum	26
Maximum	60

Table 6: Descriptive Statistics of Age According to Age Groups in Primary Repair Group (n= Seventy five)

	≤ 45 years (n=46)	> 45 years (n=29)
Mean \pm SD	35.91 \pm 6.10	52.41 \pm 3.78
95 PercentCI (LB – UB)	34.09–37.72	50.97–53.85
Median (IQR)	35.00 (10.25)	53.00 (6.50)
Range	19	12
Minimum	26	46
Maximum	45	58

Table 7: Descriptive Statistics of Age According to Age Groups in Ileostomy Group (n= Seventy five)

	≤ 45 years (n=31)	> 45 years (n=44)
Mean \pm SD	34.09 \pm 5.62	52.97 \pm 4.02
95 PercentCI (LB – UB)	32.03–36.16	51. Seventy five –54.20
Median (IQR)	34.00 (8)	53.50 (5)
Range	19	14
Minimum	26	46
Maximum	45	60

Table 8: Descriptive Statistics of Duration of Wound Discharge (Days) in Primary Treatment Group (n=30)

Mean \pm SD	2.76 \pm 1.38
95 PercentCI (LB – UB)	2.25–3.28
Median (IQR)	2.00 (2)
Range	4
Minimum	1
Maximum	5

Table 10: Frequency and Association of Wound Discharge with Study Groups (n= One fifty)

	Study Group		Total	P-Value
	Primary Repair (n= 75)	Ileostomy (n= 75)		
YES (n=77)	30	18	48	0.036*
NO (n=73)	45	57	102	
TOTAL	75	75	150	

Chi Square Test was applied.

P-value ≤ 0.05 considered as Significant

* Significant at 0.05 levels

Table 11: Frequency and Association of Acceptable Comesis with Study Groups (n= One fifty)

	Study Group		Total	P-Value
	Primary Repair (n= Seventy five)	Ileostomy (n= 75)		
YES (n=77)	60	70	130	0.016*
NO (n=73)	15	5	20	
TOTAL	75	75	150	

Chi Square Test was applied.

P-value ≤ 0.05 considered as Significant

* Significant at 0.05 levels

DISCUSSION

Typhoid perforation is a major problem in worldwide and carries a high mortality and morbidity⁹. To improve survival in typhoid perforation, attention should be focused on preoperative resuscitation and early intervention. The most lethal complications of typhoid perforation are intestinal bleeding and ileal perforations, both arising from necrosis Peyer's patches in the terminal ileum¹⁰.

Onset of symptoms and time of presentation in hospital are important prognostic factors. An early presentation holds a good prognosis even with primary repair of perforation¹¹. Unfortunately, in developing countries, the presentation to hospital is usually late with fully blown peritonitis; some patients may present with septicemia and multiorgan¹². Various operative procedures were advocated by different authors, such as simple primary repair of perforation, repair of perforation with ileotransverse colostomy, primary ileostomy, single layer repair with an omental patch, and resection and anastomosis¹³.

Typhoid intestinal perforation is the most common cause of acute generalized peritonitis followed by perforated acute appendicitis¹⁴. Prognostic factors include age, the cause of perforation, amount of pus, fecal fistula and intraabdominal abscesses. Mortality and morbidity after surgical treatment of typhoid ileal perforation remain very high in developing countries¹⁵.

Repair of the perforation is a better procedure than temporary ileostomy in Typhoid perforation due to its cost effectiveness and absence of complications related to ileostomy¹⁶. There is a less morbidity rate (20 Percent) in primary surgical repair compared with loop ileostomy which is (31 Percent). Ileostomy and ileo-transverse bypass should be considered as a treatment option in patients with unhealthy gut. Ileostomy is a life saving to be used judiciously, accepting inconvenience to the patients¹⁷.

Typhoid disease is mainly effecting the young average age mentioned in literature is about 28 years. Typhoid ileal perforation commonly effects young adults in the second and third decades of life, and usually occurs in the second and third week of fever¹⁸.

Ileal perforation peritonitis is a common surgical emergency in the Indian subcontinent and in tropical countries²⁰. It is reported

to constitute the fifth common cause of abdominal emergencies due to high incidence of Typhoid fever and tuberculosis in these regions.

CONCLUSION

We found better outcome in different groups of different age after analyzing the data of different age categories in ileostomy group than primary repair group and significant difference in outcome i.e. wound discharge and acceptable comesis between both primary repair and ileostomy groups of treatment was observed in the study.

Further, ileostomy in patients of any age group of ileal perforation plays an important role in reducing the incidence of complications. But, ileostomy related complications increase the postoperative stay of the patient. However these complications can be reduced, if not outright eliminated, by proper fashioning of the stoma and care of the stoma.

REFERENCES

- Wain J, Hendriksen RS, Mikoleit ML, Keddy KH, Ochial RL. Typhoid fever. *Lancet Lond Engl*. 2015 Mar 21;385(9973):1136–45.
- Buckle GC, Walker CL, Black RE. Typhoid fever and paratyphoid fever: Systematic review to estimate global morbidity and mortality for 2010. *Journal of global health*. 2012 Jun;2(1).
- Sánchez-Vargas FM, Abu-El-Haija MA, Gómez-Duarte OG. Salmonella infections: an update on epidemiology, management, and prevention. *Travel Med Infect Dis*. 2011 Nov;9(6):263–77.
- Cunha BA. The death of Alexander the Great: malaria or typhoid fever? *Infect Dis Clin North Am* 2004;18(1):53e63.
- Center for Disease Control (CDC). Salmonella surveillance: annual summary 2006.
- Qamar FN, Azmatullah A, Kazi AM, Khan E, Zaidi AKM. A three-year review of antimicrobial resistance of Salmonella Typhoida serovars Typhi and Paratyphi A in Pakistan. *J Infect Dev Ctries*. 2014 Aug;8(8):981–6.
- Crump JA, Mintz ED. Global trends in typhoid and paratyphoid fever. *Clin Infect Dis*. 2010 Jan 15;50(2):241–6.
- Kothari A, Pruthi A, Chugh TD. The burden of Typhoid fever. *J Infect in Develop Ctries*. 2008 Aug 1;2(04):253–9.
- Ochial RL, Acosta CJ, Danovaro-Holliday M, Baiqing D, Bhattacharya SK, et al. A study of typhoid fever in five Asian countries: disease burden and implications for controls. *Bull World Health Organ*. 2008 Apr;86(4):260–8.
- Crump JA, Luby SP, Mintz ED. The global burden of typhoid fever. *Bull World Health Organ*. 2004 May;82(5):346–53.
- Edelman R, Levine MM. Summary of an international workshop on typhoid fever. *Rev Infect Dis*. 1986 May 1;8(3):329–49.
- Effa EE, Lassi ZS, Critchley JA, Garner P, Sinclair D, Olliaro PL, et al. Fluoroquinolones for treating typhoid and paratyphoid fever (Typhoid fever). *Cochrane Database Syst Rev*. 2011 Jan 1.
- Parry CM, Hien TT, Dougan G, White NJ, Farrar JJ. Typhoid fever. *N Engl J Med* 2002; 1770–82.
- Rahman BA, Wasfy MO, Maksoud MA, Hanna N, Dueger E. Multi-drug resistance and reduced susceptibility to ciprofloxacin among Salmonella Typhoida serovar Typhi isolates from the Middle East and Central Asia. *New Microbes New Infect*. 2014 Jul;2(4):88–92.
- Mirza SH, Beeching NJ, Hart CA. Multi-drug resistant typhoid: a global problem. *J Med Microbiol* 1996; 44: 317–9.
- Crump JA, Youssef FG, Luby SP, Wasfy MO. Estimating the incidence of typhoid fever and other febrile illnesses in developing countries. *J Emerg Infect Dis* 2003; 9: 539–44.
- Bakr WM, El Attar LA, Ashour MS, El Touky AM. The dilemma of widal test—which brand to use? A study of four different widal brands: a cross sectional comparative study. *Ann Clin Microbiol Antimicrob* 2011; 10: 7–15.
- Korzeniewski K. The epidemiological situation in Iraq. *Przegl Epidemiol* 2006; 60: 845–55.
- Al-Sanouri TM, Paglietti B, Haddadin A. Emergence of plasmid-mediated multidrug resistance in epidemic and non-epidemic strains of Salmonella Typhoida serotype Typhi from Jordan. *J Infect Dev Ctries* 2008; 2: 295–301.
- Srikantiah P, Vafokulov S, Luby SP. Epidemiology and risk factors for endemic typhoid fever in Uzbekistan. *Trop Med Int Health* 2007; 12: 838–47.