



A COMPARATIVE STUDY OF TWO SURGICAL APPROACHES – PRIMARY CLOSURE AND RESECTION ANASTOMOSIS IN ENTERIC ILEAL PERFORATION PERITONITIS IN APACHE GROUP B PATIENTS

General Surgery

Dr. Rajeev Kumar Singh Professor, Department of General Surgery Government Medical College, Haldwani, District – Nainital Uttarakhand PIN – 263139

Dr. Akash Singh* Post Graduate Resident, Department of General Surgery Government Medical College, Haldwani, District – Nainital Uttarakhand PIN – 263139. *Corresponding Author

Dr. Prateek Shakya Assistant Professor, Department of General Surgery Government Medical College, Haldwani, District – Nainital Uttarakhand PIN – 263139.

ABSTRACT

INTRODUCTION - Perforation peritonitis is the most common surgical emergency in India. The spectrum of etiology of perforation in tropical countries continues to be different from its western counterpart. In contrast to western literature, where lower gastrointestinal tract perforations predominate, upper gastrointestinal tract perforations constitute the majority of cases in India and the Indian subcontinent. Despite advances in surgical techniques, antimicrobial therapy and intensive care support, management of peritonitis continues to be highly demanding, difficult and complex.

METHODS - Patients with APACHE II score between 10-19 were selected for this study and blindly randomized into two procedure i.e., primary closure and resection-anastomosis. The patients in study group were subjected to detailed history, complete general physical examination and selection of patients into groups by acute physiology and chronic health evaluation (APACHE II) scoring. Post-operative outcome was assessed by number of days after which patient pass flatus and stool, number of days of post-operative antibiotics requirement, duration of hospital stay, post-operative complications and mortality/morbidity.

RESULTS - In the present study male preponderance was found with male to female ratio of 5.4:1. Widal test positivity in our study was 95.56%. About 68.88% of patient presented within 48 hours of perforation and had favorable outcome from those who presented late. In our study different operative procedures – simple closure of perforation and resection- anastomosis were performed alternatively with 45 patients in each group. Wound infection was the most common post-operative complication - 13.33% (n=6) in Group I and 28.89% (n=13) in Group II (P=0.071). Most common systemic complication encountered was pleural effusion (23.33%; n=21). In primary repair group, it was seen in 8 cases (17.8%) and in resection-anastomosis group, it was seen in 13 cases (28.9%). Other systemic complications observed were pneumonia, sepsis and renal failure. Mean length of hospital stay in primary repair group was days and in resection-anastomosis group was days.

CONCLUSION - Primary closure of perforation was advocated in patients with single, small perforation (<1cm) with APACHE II score 10-19 irrespective of duration of perforation. Resection-anastomosis is advocated in multiple perforations, diseased segment of bowel. The two procedures were found to be similar in terms of morbidity and mortality. The final decision can be made based on surgeon's discretion.

KEYWORDS

Enteric perforation peritonitis, primary repair, resection-anastomosis, complications, APACHE II

INTRODUCTION

Typhoid fever is an endemic disease in India and other tropical countries. Small intestinal perforation and gastrointestinal hemorrhage are the most common and dreadful complication of enteric fever [1]. The frequency of enteric perforation in typhoid in typhoid fever has been reported variously from 0.8 to 18% [2]. The use of scoring systems to stratify patients into groups by their severity of disease has become increasingly popular in the past 25 years. They allow comparison of treatments between similar groups of patients and allow assessment of performance between units as reported by Edwards et al (1991). [3] The important features of acute physiology and chronic health evaluation (APACHE II) system over other systems is the increased weighting given to the disorders of renal function and incorporation of a score related to the patients Glasgow Coma Score. Higher the score, worse will be likely outcome.[4] Patients with APACHE II score between 10-19 were selected for this study and blindly randomized into two procedure i.e., primary closure and resection-anastomosis. The following study compared the results of two surgical treatment modalities for ileal perforation peritonitis in APACHE Group B patients and will assess the best treatment protocol in order to reduce the morbidity and mortality rates associated with the disease.

MATERIAL & METHODS

SOURCE OF DATA:

Cases of enteric perforation peritonitis admitted and operated in surgery department at Dr. Sushila Tiwari Government Hospital, Haldwani were evaluated.

METHOD OF COLLECTION OF DATA:

Data was collected in prospective manner in the Department of Surgery, Govt. Medical College, Haldwani after approval from ethical committee.

INCLUSION CRITERIA:

1. All cases of perforation peritonitis with strong suspicion of small

bowel (ileal) perforation with recent history of fever

2. Patients diagnosed with typhoid fever

3. Patients belonging to Group B according to acute physiology and chronic health evaluation (APACHE II) score 10-19.

EXCLUSION CRITERIA:

1. Patients belonging to Group A with acute physiology and chronic health evaluation (APACHE II) score 0-9 and Group C with acute physiology and chronic health evaluation (APACHE II) score > 20.

2. Patients of ileal perforation peritonitis of any cause other than enteric perforation peritonitis.

3. Patients lost on follow up.

METHOD OF STUDY:

The patients were divided into study groups based on their Acute physiology and chronic health evaluation (APACHE II) scores:

- Group A : 0-9
- Group B : 10-19
- Group C : >or=20

Patients with acute physiology and chronic health evaluation (APACHE II) score between 10-19 were randomized alternatively into two procedure:

1. Group I [n=45]: These patients were managed by primary repair of the perforation.
2. Group II [n=45]: These patients were managed by resection-anastomosis.

The patients in study group were subjected to:

- a. Detailed history.
- b. Complete general physical examination.
- c. Selection of patients into groups by acute physiology and chronic health evaluation (APACHE II) scoring.
- d. All routine investigations with investigations for diagnosis of typhoid

Post-operative outcome was assessed by:

- Number of days after which patient pass flatus and stool
- Number of days of post-operative antibiotics requirement
- Duration of hospital stay
- Post-operative complications
- Reoperation(s)
- Mortality/Morbidity

OBSERVATIONS AND RESULTS**Table 1: Correlation between Age and two groups**

Age Groups	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
<=30 yrs	15	33.3%	16	35.6%	0.411
31 - 40 yrs	10	22.2%	10	22.2%	
41 - 50 yrs	8	17.8%	3	6.7%	
>50 yrs	12	26.7%	16	35.6%	
Total	45	100%	45	100%	

Table 2: Correlation between Sex and two groups

Sex	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
F	10	22.2%	4	8.9%	0.144
M	35	77.8%	41	91.1%	
Total	45	100%	45	100%	

Table 3: Correlation between WIDAL reaction and two groups

WIDAL Reaction	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
1:160	26	57.8%	24	53.3%	0.583
1:320	18	40.0%	18	40.0%	
1:80	1	2.2%	3	6.7%	
Total	45	100%	45	100%	

Table 4: Comparison of Postoperative Antibiotics Requirement between Operative Procedure

	Operative Procedure		p value
	Primary Repair	Resection and Anastomoses	
	Mean $\pm$ SD	Mean $\pm$ SD	
Postoperative Antibiotics Requirement	7.53 $\pm$ 1.82	8.92 $\pm$ 3.46	0.021

Table 5: Correlation between Wound infection and two groups

Wound infection	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
Present	6	13.3%	13	28.9%	0.071
Absent	39	86.7%	32	71.1%	
Total	45	100%	45	100%	

Table 6: Correlation between Wound dehiscence and two groups

Wound dehiscence	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
Present	1	2.2%	4	8.9%	0.167
Absent	44	97.8%	41	91.1%	
Total	45	100%	45	100%	

Table 7: Correlation between Anastomotic leakage and two groups

Anastomotic leak	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
Present	1	2.2%	3	6.7%	0.306
Absent	44	97.8%	42	93.3%	
Total	45	100%	45	100%	

Table 8: Correlation between Intraabdominal collection and two groups

Intraabdominal collections	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	0.167
Present	1	2.2%	4	8.9%	
Absent	44	97.8%	41	91.1%	
Total	45	100%	45	100%	

Table 9: Correlation between Pleural effusion and two groups

Pleural Effusion	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
Present	8	17.2%	13	28.9%	0.319
Absent	37	82.2%	32	71.1%	
Total	45	100%	45	100%	

Table 10: Correlation between Pneumonia and two groups

Pneumonia	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
Present	2	4.4%	9	20.0%	0.050
Absent	43	95.6%	36	80.0%	
Total	45	100%	45	100%	

Table 11: Correlation between Sepsis and two groups

Sepsis	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
Present	1	2.2%	3	6.7%	0.616
Absent	44	97.8%	42	93.3%	
Total	45	100%	45	100%	

Table 12: Correlation between Renal failure and two groups

Renal failure	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
Present	3	6.7%	2	4.4%	1.000
Absent	42	93.3%	43	95.6%	
Total	45	100%	45	100%	

Table 13: Correlation between Shock and two groups

Shock	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
Present	2	4.4%	1	2.2%	1.000
Absent	43	95.6%	44	97.8%	
Total	45	100%	45	100%	

Table 14: Correlation between Outcome & Operative Procedure

Outcome	Operative Procedure				p value
	Primary Repair		Resection and Anastomoses		
	Frequency	%	Frequency	%	
Expired	1	2.2%	4	8.9%	0.361
Recovered	44	97.8%	41	91.1%	
Total	45	100%	45	100%	

DISCUSSION

In this study, two surgical procedures for ileal perforation - primary closure and resection & anastomosis were compared for one of the common causes of perforation peritonitis *i.e.* ileal perforation. However, there was no uniformity of standardized operative procedure that was most effective for the offending lesion. In the present study, all the patients were scores according to the APACHE II score. There is no consensus on the type of surgery to be performed for ileal perforations in patients in where the general condition was not very poor and the degree of peritonitis was not severe. The present study in patients with APACHE II score 10-19 aimed to establish whether primary closure of the perforation and resection-anastomosis be the best treatment of choice. In the present study male preponderance was found with male to female ratio of 5.4:1 that was slightly on the higher side of the ratio 3:1 reported by Wani et al [5], 4:1 reported by Adensunkanmi [1] and Talwar et al [6]. This was however, lower than the other studies - 6.41:1

reported by Beniwal et al [7] and 6.5:1 reported by Prasad et al [8]. The mean age of patients in the study group I (Primary repair) was 40.76 ± 15.58 years and in the group II (Resection and Anastomoses) was 41.98 ± 17.32 years with range of 18-72 years. Majority of patients were in the age group 21-40 years (52.22%; n=47). The peak incidence for age was in the third decade followed by fourth decade.

The etiology of perforations was concluded on the basis of Widal reaction and operative findings. Widal test positivity in our study was 95.56%. About 68.88% of patient presented within 48 hours of perforation and had favorable outcome from those who presented late. Twelve patients out of 28 who presented 3-4 days after perforation, developed systemic complications including pleural effusion, pneumonia, sepsis, shock and renal failure. Peritonitis was present in all and the contamination was feco-purulent in nature. All perforations were single (100%) and majority of size less than 0.5 cm (77.77%) and located within 30 cm of terminal ileum (54.44%). The terminal ileum is rich in lymphoid follicles (Peyer's patches). These undergo swelling and ulceration as a result of disease process and progress to capillary thrombosis and subsequent necrosis.

Different operative procedures were performed alternatively with 45 patients in each group. Wound infection was the most common post-operative complication - 13.33% (n=6) in Group I and 28.89% (n=13) in Group II ($P=0.071$). Next most common complications were wound dehiscence and intraabdominal collections which was in accordance with previous studies. Anastomotic leak occurred in 1 (2.22%) case with primary repair and in 3 (6.66%) cases with resection anastomosis. However, the difference was not found to be statistically significant ($P=0.167$). Three out of 45 patients (6.7%) in the primary repair group required relaparotomy whereas, 4 out of 45 patients (8.9%) in the resection-anastomoses group required relaparotomy. Cause of second intervention was mostly anastomotic leakage. This difference was not found to be statistically significant ($P=1.000$). Most common systemic complication encountered was pleural effusion (23.33%; n=21). In primary repair group, it was seen in 8 cases (17.8%) and in resection-anastomosis group, it was seen in 13 cases (28.9%). Other systemic complications observed were pneumonia, sepsis and renal failure. One out of 45 patients (2.2%) in the primary repair group and 4 out of 45 patients (8.9%) in the resection-anastomoses group expired during the course of treatment. Cause of death was mostly septicemia, shock and respiratory failure. This difference was not found to be statistically significant ($P=0.0361$). Remaining patients made complete recovery following surgery. Mean length of hospital stay in primary repair group was days and in resection-anastomosis group was days. This was found to be statistically significant ($p=0.001$).

CONCLUSION

In conclusion, primary closure of perforation was advocated in patients with single, small perforation (<1cm) with APACHE II score 10-19 irrespective of duration of perforation. Resection-anastomosis is advocated in multiple perforations, diseased segment of bowel. The two procedures were found to be similar in terms of morbidity and mortality. The final decision can be made based on surgeon's discretion.

Although complications were seen more often following resection-anastomosis in comparison with primary repair, but no statistically significant difference could be proved on the basis of available data. Thus, further studies are recommended for longer duration.

REFERENCES

- Gupta S, Kaushik R. Peritonitis-the eastern experience. *World J Emerg. Surgery.* 2006 Apr; 26; 1:13.
- Nadkarni KM, Shetty SD, Kagzi RS, Pinto AC, Bhalera RA; Small bowel perforation. A study of 32 cases *Arch Surg.* 1981; 116(1):53-57.
- Edwards AT, Ng KJ, Shandall AA, Price Thomas JM. Experience with the APACHE II severity of disease scoring system in predicting outcome in a surgical intensive therapy unit. *JR Coll Surg. Edinb.* 1991 Feb; 36(1):37-40.
- Knaus WA, Draper EA, Wagner DP, Zimmerman JE. APACHE II: a severity of disease classification system. *Crit Care Med.* 1985 Oct; 13(10):818-29.
- Adesunkanmi ARK, Badmus TA, Fadiora FO, Agbakwura EA. Generalized peritonitis secondary to typhoid ileal perforation. Assessment of severity using modified APACHE II score. *Indian J Surg.* 2005; 67(1):29-33.
- Talwar S, Sharma RK, Mittal OK, Prasad P. Typhoid enteric perforation. *Aust N Z J Surg.* 1997 Jun; 67(6):351-3.
- Sandeep Thakre, Kamal Singh Mandloi, Madan Mohan Mudgal, Achal Gupta. A Comparative Study of Morbidity and Mortality in Typhoid Ileal Perforation with Primary Repair or Ileostomy *SAS J. Surg.*, Volume-1: Issue-1 (May-Jun, 2015); p-21-24
- Prasad PB, Choudhary DK, Prakash O. Typhoid perforation treated by closure and proximal side to side ileo-transverse colostomy. *J Indian Med assoc.* 1975 Dec.; 65 (11):297-9.