



ORIGINAL RESEARCH PAPER

General Surgery

“MORTALITY & MORBIDITY OUTCOME OF NON-TRAUMATIC ILEAL PERFORATION MANAGEMENT: A COMPARISON B/N PRIMARY REPAIR VS ILEOSTOMY IN A TERTIARY CARE CENTRE”

KEY WORDS: Ileal perforation, Morbidity & Mortality, Primary repair, Exteriorization, Ileostomy, Complications.

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ABSTRACT

Background: Generalised peritonitis secondary to Ileal Perforation is a common surgical emergency in tropical countries. It has become the fifth most common cause of abdominal emergency due to high incidence of enteric fever, tuberculosis, non-specific enteritis in these regions. **Objective:** To compare the management approaches by evaluating the morbidity & mortality outcome of primary repair and ileostomy in non-traumatic ileal perforation with respect to pre-operative parameters, intra-operative findings & post-operative complications and mortality. **Methods:** Study is a randomized retrospective and prospective comparative observational study done from April 2022 to March 2023, 70 cases of ileal perforation fulfilling the inclusion & exclusion criteria and subdivided them into two groups. Patients who underwent primary repair & ileostomy into group 1 & 11 respectively. **Results:** In our study the median age group affected were 36-50 years, males preponderance was there. Surgical site infection is the most common complications associated with both the procedures. Leak & Burst abdomen were the most devastating complication among primary repair. In our study increased rate of Post-operative complications were observed more in group 1 than group 11, Though Cosmetic acceptance & cost effectiveness was better to be in group 1 patients. **Conclusion:** In ileal perforation, Exteriorization procedure, temporary de-functioning ileostomy plays an important role is more appropriate compared to primary repair in terms of post-operative complications & mortality. Yet the primary determinant to choose the procedure remains to be general condition of the patient & intra-operative findings.

INTRODUCTION

Peritonitis secondary to bowel perforation is one of the most common surgical emergencies in India, especially ileal perforation. It is of significance because of increased mortality and morbidity associated with it. One of the cause for obscure peritonitis³ is terminal ileal perforation⁵ and the postulated cause for ileal perforation include Enteric fever, Tuberculosis, trauma , Crohn's disease, malignancy, nonspecific inflammation, secondary to obstruction, radiation enteritis etc. In developed countries most common aetiology remains vascular strangulation, foreign body ingestion, diverticular disease of small bowel, meckel's diverticulum¹. However, in developing countries enteric fever, non-specific inflammatory aetiology & tuberculosis are being commoner ones.

Studies show nearly 86% of all nontraumatic small bowel perforation is mainly due to typhoid fever with mortality ranging upto 34%¹. Typhoid fever is an endemic disease to tropical countries, small bowel perforation and GI haemorrhage are more common and dreadful complication⁵ of enteric fever, with frequency of enteric perforation been reported from 0.8 to 18%. Most common site being ileum, as it consists of payer's lymphoid follicles where the gram-negative bacillus Salmonella typhi⁷ resides. Most patients show up with late clinical presentation and there is delay in diagnosis because of Zenker's degeneration⁶.

Intestinal tuberculosis⁹ affects ileo-caecal region because of various anatomic & physiologic reasons but as such tubercular ulcers leading to free perforations are rare. Mostly perforations encountered in these people are “blow-outs¹⁰” of small bowel, with ileum being more common, secondary to distension in due with distal obstruction (strictures or

adhesions). Recently postulated concept in contributory factor being vasculitis of mesenteric vasculature.

Non-specific enteritis⁵ attribute to small bowel perforations when the perforation cannot be classified on the basis of clinical symptoms, gross examination, serology, culture & HPE into any disease state such as enteric fever, tuberculosis or malignancy. Ulcers are usually single and commonly involve terminal ileum. It has been proposed that submucous vascular embolism¹², chronic ischemia due to atheromatous vascular disease or arteritis, or drugs such as enteric coated potassium tablets are responsible for them.

In spite of advancement in diagnostic & management facilities, still this condition is associated higher mortality and morbidity in our country. Yet most patients present to hospital late due to lack of education, facilities in rural health care centres. Preoperative resuscitation, antibiotic therapy, fluid & electrolyte imbalance corrections with adequate nutrition, surgical drainage options of peritoneal cavity in moribund patients¹⁵ has significantly reduced morbidity & mortality outcome. Various operative procedures were advocated based on preoperative & per-operative factors & findings respectively. Operative procedures including definitive procedures¹⁴ such as simple primary closure, resection & anastomosis etc and temporary or permanent Exteriorization¹³ procedures like loop ileostomy, resection & ileostomy, protective ileostomy with thorough peritoneal lavage and drain placement were done.

Aim & Objectives Of Study:

To compare the morbidity & mortality outcome of Primary repair versus Ileostomy in a non-traumatic ileal perforation.

Methodology:

Source Of Data:

Cases for the clinical study will be sourced from the patients aged more than 21 years presented to Victoria and Bowring hospital, Bengaluru and undergoing emergency surgical procedure.

Study Design: retrospective and prospective comparative observational study

Sample Size: 70

Study Place: Department of General Surgery, Victoria and Bowring Hospital, Bengaluru.

Study Period: April 2022 to March 2023.

Inclusion Criteria:

Patients above 21 years of age irrespective of sex presenting with acute abdomen in emergency surgical unit with cause being Ileal perforation (per-operatively proven)

Exclusion Criteria:

Patients below 21 years of age.

Patients with peritonitis secondary to other than ileal perforation.

Patients who had underwent Protective ileostomy as exteriorization procedure.

Method:

Patients were categorized into group I & group II, as who had underwent simple primary closure & ileostomy as exteriorization procedures respectively. Collection of Demographic data with detailed clinical evaluation made. All patients had routine pre-operative investigations such as complete haemogram, random blood glucose, renal function test, serum electrolytes, liver function test, chest x-ray, erect x-ray abdomen, EKG & US of abdomen as required. Some patients had teaching CT cuts for aiding the diagnosis. All patients were resuscitated in emergency unit with correction of potentially life-threatening metabolic alterations and received broad spectrum antibiotics.

Intra-operative monitoring done and all adverse events noted along with recording if time duration of Surgery which eventually gave idea about the time duration of exposure of toxic anaesthetic drugs. Post-operative care given with appropriate management of complications, Hospital stay length recorded.

All data collected are tabulated, graphically represented & statistically analysed and put-forth in the form of ratios, percentages and non-parametric tests like chi-square test used for 'p-values'.

RESULTS:

In our study, 70 patients were observed, studied & evaluated, out of which 25 (36%) patients underwent primary repair, rest 45 (64%) patients underwent ileostomy and grouped into I & II respectively.

Table 1: Operative Procedure

Groups	Procedure	Number (n)	%
Group I	Primary repair	25	36%
Group II	Ileostomy	45	64%
Test Statistics			
	gp		
Chi-Square		3.756	
df		1	
P value		0.053	

Number of Patients (n)

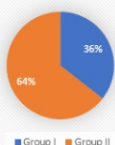


Table 2: Pre – Operation Factors

Factors	Group I (n=25)	Group II (n=45)	Chi-square	P-value
Mean Age	38 years	43 years	-	-
Anemia (Hb<10g/dl)	6 (25%)	17 (37.93%)	0.776	0.378
On set Presentation			0.267	0.606
(a) < 12 hours	17 (68.75%)	34 (75.86%)		
(b) > 48 hours	8 (31.25%)	11 (24.14%)		
(i) Sepsis	5 (18.75%)	14 (31.03%)	10.51	0.005
(ii) In shock	0	15 (34.48%)		
Co - morbidities	5 (18.75%)	32 (72.41%)	9.95	0.002

As shown above, mean age who had underwent ileostomy was higher and who had presented late, ileostomy was choice of procedure.

Table 3: Intra – Operation Factors

Factors	Group I (n=25)	Group II (n=45)	Chi-square	P-value
Number of Perforation			0.015	0.903
(a) Single	22 (87.5%)	39 (86.21%)		
(b) Multiple	3 (12.5%)	6 (13.79%)		
Duration of operation			0.388	0.533
< 120 minutes	19 (75%)	37 (82.76%)		
> 120 minutes	6 (25%)	8 (17.24%)		
Faecal Contamination	9 (37.5%)	34 (75.86%)	6.456	0.011

As shown in the Table-3, majority of patients had single perforation & percentage of patients who had longer duration of operative procedure was higher in group II. When there is high volume faecal contamination ileostomy was chosen over primary repair.

Table 4: Post – Operative Complications – Local

Complications	Group I (n=25)	Group II (n=45)	Chi-square	P-value
Surgical site infection	11 (43.75%)	25 (55.17%)	0.539	0.463
Wound dehiscence	6 (25%)	3 (6.9%)	2.924	0.087
Leak (Primary repair leak)	3 (12.5%)	0	3.794	0.051
Burst abdomen	5 (18.75%)	2 (3.45%)	2.981	0.084
Stoma related Complication	0	9 (20.69%)	3.366	0.067

As of local complications are concerned, both groups had higher rate of surgical site infection. In primary repair following SSI burst abdomen had higher % of occurrence and leak was confined to group I while stoma-related complications & skin excoriations were restricted to group II. However, group II had more local complications than group I

Table 5: Post – Operative Complications – Systematic

Complications	Group I (n=25)	Group II (n=45)	Chi-square	P-value
Electrolyte Imbalance	3 (12.50%)	14 (31.03%)	1.917	0.166
Pulmonary complication	14 (56.25%)	11 (24.14%)	4.64	0.031
Septicaemia	3 (12.50%)	3 (6.90%)	0.399	0.527
Prolonged Hospital Stay (>21 days)	8 (31.25%)	3 (6.90%)	4.656	0.031

Systemic complications were profoundly seen among group I, higher % of pulmonary complications were with group I and they had prolonged hospital stay.

Table 6: Morbidity & Mortality Pattern

Complications	Group I (n=25)	Group II (n=45)	Chi-square	P-value
Morbidity	14 (56.25%)	17 (37.93%)	1.401	0.237
Mortality	4 (18.75%)	6 (13.79%)	0.193	0.661

In Group II, there were higher Number of patients with morbidity & mortality however, in comparison, group I accounted for higher % of morbidity (56.25%) & mortality (18.75%).

DISCUSSION:

Non traumatic ileal perforation is one of common surgical emergency in India, yet considerably has high mortality and morbidity rates even with present day good surgical procedures. In our study most patients are middle aged with male preponderance which is similar to ratio reported by Dr Chakravarthy et al, Dr Pushpendra Singh et al and Talwar et al study. Most of the patients were 35-50 years. Time of presentation to emergency surgical unit plays an important role, the duration between onset of symptoms and presentation serves as an important prognostic marker. Delayed presentation had bad prognosis. In our study patients who had delayed presentation of lag period more than 12 hours underwent ileostomy and advanced lag period had been associated with deterioration of general condition and increased contamination of peritoneal cavity warranting ileostomy, in comparison with studies done by Rahman et al and Rasslan S et al respectively.

Researchers observed that bowel exteriorization procedure (ileostomy) followed by second operation is better option in cases of gross peritonitis with faecal contamination, multiple perforation within 10cms of ileocecal valve and delayed presentation. Faisal et al recommended primary repair as choice of surgery in patients presenting less than 48 hours of duration and the procedure was cost effective, cosmetically better than ileostomy.

In our study, the morbidity and mortality outcome after primary repair when compared with ileostomy was more. Although majority of perforation was single and located within 60cm of terminal ileum, ileostomy was considered due to delayed presentation and various other factors. Our study showed most common complication among both being surgical site infection, followed by leak and stoma related complications in primary repair and ileostomy respectively. Respiratory complications and septicaemia were more frequent in primary repair while electrolyte imbalance commonly documented in ileostomy.

Prolonged hospitalization (> 21days) was more frequent with patients who had underwent primary repair. Mortality in Group I is 18.75% while in Group II is 13.79% with 'p' value being 0.6661. In this study high mortality rate has been attributed to various factors such as delayed presentation, peritoneal contamination and post operative complications. With respect to above factors bowel exteriorization i.e. ileostomy had better results.

CONCLUSION:

Despite advancement in modern medicine, Ileal perforation carries high morbidity & mortality as patients present to emergency surgical unit late and yet it is considered to be one of cause for Obscure peritonitis. Early diagnosis with aggressive resuscitation & prompt surgical care are keys to lower morbidity & mortality resulting in better outcome.

Although, there can arise dilemma over choice of surgical procedure, decision regarding choice of surgery depends on pre-operative & intra-operative parameters. Choosing a best method for the given situation minimises the complications and long term morbidities.

Patients with delayed presentation, elderly aged, anaemic, has co-morbidities haemodynamically unstable, grossly

inflamed ileum, bowel oedema & faecal peritonitis with high volume of intraperitoneal contamination preferred procedure to be with lesser insult and minimal exposure to anaesthesia, hence ileostomy is considered. Primary repair is the procedure of choice in clinically stable patients with no comorbidities who present early to emergency surgical unit with minimal contamination of abdominal cavity. Complications & mortality not just related to surgery alone but depends on various non-surgical factors, which requires further studies.

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Conflict Of Interest: None declared

Ethical Approval: Study approved by our Institutional Ethical Committee

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