

A Comparative Study of the Outcome of Primary Repair of enteric perforation in single layer and in double layers

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Abstract

Introduction: Ileal perforation is a common surgical emergency in the Indian subcontinent and in tropical countries. It is reported to constitute the fifth common cause of abdominal emergencies due to high incidence of enteric fever and tuberculosis in these regions.

Methods: The study was conducted in deptt. of surgery LLR hospital, Kanpur. Sixty patients, fulfilling the including criteria, admitted to Surgical Emergency department were taken up for emergency surgery. The surgical management was done as primary repair in single layer(group A) and primary repair in double layers (group B). The patients were assigned into two groups by even and odd method.

Results: Among patients with primary repair ,leak from repair site was found in 10 % of patients with repair in single layer and 6.67% with repair in double layers. Wound infection was the most common complication and was found in 36.67% in single layer repair and 33.33% in double layers repair. Burst abdomen was found in 26.67% in single layer repair and 23.33% in

perforations repaired in double layers. Overall mortality with primary repair in single layer was 6.67% and in double layers was 3.33%.

Conclusion: Patients presenting within 48 hours of ileal perforation and in whom primary repair was done, primary repair in single layer was easier, less time consuming and more cost effective but complications rates are almost similar as compared to primary repair in double layers.

Key words: Enteric perforation, primary repair, single layer, double layers.

Introduction

Ileal perforation is a common surgical emergency in the Indian subcontinent and in tropical countries. It is reported to constitute the fifth common cause of abdominal emergencies due to high incidence of enteric fever and tuberculosis in these regions. In a significant number of cases the cause of perforation is not known and it is called nonspecific ileal perforation. The perforation causes gram-negative aerobic and anaerobic infection leading to peritonitis.

The aim of our study is to evaluate the outcome of primary repair enteric perforation in single and in double layers by comparing them in terms of postoperative morbidity, mortality and complications and to find out the ideal procedure. The study will help to establish the criteria for instituting the management modality according to presentation and severity of the disease and the outcome of these procedures. Effective management of the disease will help in decreasing morbidity and mortality associated with the disease.

Methods

The study was conducted on the patients admitted in the emergency of general surgery department of LLR Hospital, GSVM Medical College, Kanpur with ileal perforation from January 2018 to December 2019.

The Study was hospital based comparative prospective time bound in all those cases, who satisfied the inclusion criteria. Data was collected from the detailed history, clinical examination and investigations (both haematological and radiological) on a pre-set proforma.

Inclusion criteria

All single enteric perforations coming in emergency within 48 hours regardless of age and sex.

Exclusion criteria

- Medical illness (severe debilitated patients, chronic liver diseases, severe ascitis, hepatorenal syndrome).
- Multiple perforations.
- Large perforation.
- Ileal perforations of more than 48 hours duration.
- Rare diseases causing perforation.
- Terminal patients who are in severe shock and/or are not fit for operative procedure.

A written informed consent was taken for surgical procedure and for the possibility of stoma formation from all the patients. All the risks of surgery were explained. A thorough epidemiological data about patient was recorded. All the routine investigations and radiological investigations were preserved for the future reference. Patients were divided into two groups based on the interventions. Group A included those patients in which primary repair of perforation was done in single layer and group B in which primary repair of perforation was done in double layer. The patients were assigned into two groups on even and odd method. Prior to surgery, all the patients were resuscitated with correction of fluid and electrolyte balance. Thorough peritoneal lavage was done in all the patients before closure. All the patients were followed up closely for post-operative complications. All the data was tabulated, graphical analysis was made and subjected to statistical analysis in the form of ratios, percentages and non-parametric tests like Chi square test were used for 'p' values.

Results

From January 2018 to December 2019, 60 patients with ileal perforation were studied. Ileal perforations were most commonly observed in second and third decade of life. Among all the ileal perforations 21-40 years age group constituted the bulk of the analysis, particularly maximum being the age group 21-30 years (i.e. 41.67%). (table 1)

Table 1: Age Distribution

Age (Yrs.)	No. of Cases of Enteric Perforation (60 Cases)	Percentage
11-20	11	18.33
21-30	25	41.67
31-40	18	30
41-50	4	6.67
51-60	2	3.33

Among all the ileal perforations males were constituting the bulk i.e. 44(73.33%) as compared to females i.e. 16 (26.67%). Overall male to female ratio was 2.8:1. (Table 2)

Table 2: Sex Distribution

Patients	No. of Cases of Enteric Perforation (60 Cases)	Percentage
Male	44	73.33
Female	16	26.67

Total 60 patients underwent primary repair of ileal perforation, out of which 30 were repaired in double layers and 30 were repaired in single layer. Primary repair in double and single layer is shown in fig.3&4 respectively.



Fig.3: Ileal perforation with primary repair in double layer.



Fig.4- Ileal perforation with primary repair in single layer



Fig.1: Ileal perforation



Fig.2: Ileal perforation

Among patients with primary repair ,leak from repair site was found in 10 % of patients with repair in single layer and 6.67% with repair in double layers. Wound infection was the most common complication and was found in 36.67% in single layer repair and 33.33% in double layers repair. Burst abdomen was found in 26.67% in single layer repair and 23.33% in perforations repaired in double layers.(table 3).

Table-3: Post Op Complication.

Complication	Primary Repair In Single Layer (30 Cases)		Primary Repair In Double Layers (30 Cases)	
	Number	Percentage	Number	Percentage
Leak From Repair Site	3	10	2	6.67
Wound Infection	11	36.67	10	33.33
Burst Abdomen	8	26.67	7	23.33
Septicemia And Shock	3	10	2	6.67
Reexploration	3	10	2	6.67
Mortality	2	6.67	1	3.33

Discussion

Ileal perforations were most commonly observed in second and third decade of life. Among all the ileal perforations 21-40 years age group constituted the bulk of the analysis, particularly maximum being the age group 21-30 years (i.e.41.67%).

Talwar S et al⁴ (1997) reviewed the maximum no. of patients (42.7%) were in the 21-30-year age group.

Among all the ileal perforations males were constituting the bulk i.e. 44(73.33%) as compared to females i.e. 16 (26.67%). Overall male to female ratio was 2.8:1.which is the almost similar of the ratio 3 : 1 reported by Wani et al.¹, 3.5 : 1 reported by F C Eggleston et al² 4 : 1 reported by Adesunkanmi et al.³and Talwar et al. ⁴, 6.4 : 1 reported by Beniwal et al.⁵, and 6.5 : 1 reported by Prasad et al. ⁶.

In our study 60 patients underwent primary repair of ileal perforation who presented with in 48 hrs of perforation and had single perforation with repair done in single and double layers alternatively. Enteric perforation is best managed surgically as it prevents further peritoneal contamination by intestinal contents.

A wide variety of operative procedures were tried in enteric perforation cases but all have a high morbidity and mortality. Repair of perforation should be the choice of treatment in enteric perforation that too repair in single layer because this is a simple, quick and cost-effective procedure. Ileostomy is more expensive as all the patients have to undergo re-operation for closure of ileostomy and it further needs specialized care prior to closure. Ileostomy should be considered as a secondary procedure in patients who have developed leak from repair site.

Overall mortality with primary repair in single layer was 6.67% and in double layers was 3.33%.Factors significantly affecting mortality were general status of the patient, virulence of the organism, duration of the disease before surgical treatment and the development of leak.

In previously published studies mortality reported with repair of perforation was 48% by Bhansali⁷, 14.6% by Purohit⁸ and 28% by A.R.K. Adesunkanmill³, K.P. Singh and Kohli⁹ reported no mortality in 8 patients of enteric perforation treated with temporary ileostomy while overall mortality was 14.2%. Prasad et al⁶reported 20% mortality with repair of perforation and ileo-transverse bypass. Shah A.A., Wani and Wazir¹reported 37.5% mortality with resection anastomosis. Thus in comparison with previous studies our mortality rates were lower, especially in patients treated with a repair of the perforation.

Beniwal et al⁵ (2003) in their comparative study of operative procedures in typhoid perforation found that repair of perforation is better procedure than temporary ileostomy.

Shukla et al¹¹ (2004) A hundred cases of enteric perforation, treated surgically by single- or double-layer closure, were studied prospectively. Mortality

and morbidity rates were 10–18 and 37–42% and comparable in the two groups.. Hence it is good closure of the perforation rather than single- or double-layer closure that determines the outcome in patients with enteric perforation.

Shyam Kumar Gupta et al¹² (2010) conducted study on patients of perforation peritonitis and performed Primary closure of the perforation as most commonly done procedure.

In present study, most common complication is surgical site infection (35%) followed by burst abdomen (25%), septicemia (8.33%) and mortality (5%) while enterocutaneous fistula and anastomotic leak is seen only in 8.33 % patients .

Talwar S et al⁴ (1997) observed That the total of 79.1% of patients developed wound infection and 10% of patients developed faecal fistula. The overall mortality rate was 16.4%.

Chatterjee H et al¹⁴ (2003) treated found Wound infection, wound dehiscence, enterocutaneous fistula and septicaemia were the principal postoperative complications.

Oheneh-Yeboah M¹⁵ (2007) highlighted the complications in his study. The most common postoperative complication was wound infection (52.4 %). The most serious were persistent peritonitis (34.7%) and enterocutaneous fistula (10.0%) with a mortality of 33.3 % and 22.2 % respectively. The overall mortality was 10.9%.

Conclusion

Post-operative complications and mortality was compared in between primary repair in single layer and double layers group. Early surgery and adequate resuscitation were the important factors for successful management of patients with ileal perforation. This study proposes that primary closure of perforation is a

preferred technique in clinically stable patients with a single perforation with minimal soiling of the abdominal cavity. In this study it is found that primary repair of ileal perforation in single layer or in double layers has almost equal rates of morbidity and mortality but repair in single layer is easier, less time taking and more cost effective.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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