

## ORIGINAL RESEARCH

**‘To Make Stoma or No: Dilemma’s in Surgical Management of Ileal Perforation’**Nitin Nagpal<sup>1</sup>, Vikas Goyal<sup>2</sup>, Nitika Dhuria<sup>3</sup>**ABSTRACT**

**Introduction:** Enteric perforation is one the most frequently encountered acute surgical emergency in North India and always warrants operative intervention. But the kind of intervention whether primary repair vs. ileostomy is a contentious issue.

**Material and Methods:** 137 cases of ileal perforation were studied in retrospective manner from August 2013 to July 2015 to gather information on demographic profile, clinical presentation and laboratory data. Details were obtained for operative findings and kind of operative intervention done and post operative course of the patients. Based on the kind of operative intervention received patients were divided into four groups.

**Results:** Ileal perforation occurred in young (age 29.2±7.9 years) males (M:F;3.41:1). 60% of the patients had widal positive supporting typhoid aetiology. 52.5% patients underwent primary closure while 39.4% underwent ileostomy. Nature of clinical presentation, laboratory data and operative findings in both groups has been analysed.

**Conclusions:** In this controversial theme we have tried to label some simple preoperative and intraoperative factors which can serve in decision making process and act as guidelines for type of operative intervention in a specific patient.

**Keywords:** Ileal Perforation, Enteric Perforation, Ileostomy, Primary Closure

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**INTRODUCTION**

Typhoid is a febrile illness caused by faeco-oral transmission

of gram negative bacillus, salmonella enteritidis serovar typhi from chronic carrier. It can cause various surgical complications like gastrointestinal haemorrhage, ileal perforation, etc. Hollow viscus perforation is a full thickness slit in bowel wall leading to leakage of intestinal contents into peritoneal cavity, resulting in contamination with digestive enzymes, chemicals and bacteria to produce peritonitis. Ileal perforation peritonitis due to typhoid forms bulk load of surgical emergencies. To treat such a illness presents as a challenge to a surgeon as they occur in a younger age group and association with high morbidity and mortality. In the operative management of ileal perforation includes either an approximation of the perforation margins known as primary repair or by exteriorisation of the involved segment to form stoma/ileostomy. Multiple perforations may require resection and primary anastomosis in a sense that it takes out diseased segment and also it is better to have a single suture line than multiple. Also some authors have described primary closure and proximal side to side ileo-transverse anastomosis.<sup>1</sup> Several perceptions and concerns related to the stoma affect the quality of life of the patient during the interval between the primary surgery and the stoma closure. This apparently disfiguring surgery causes change in body image and significantly influences the physical, mental, emotional, and social life of the stoma patients(2). This makes decision on whether to do a primary repair or diversion ileostomy a controversial subject in emergency surgery. The study was carried out in a tertiary care teaching hospital in Malwa region of Punjab, catering patients usually belonging to low socio economic strata. There is paucity of access to clean and potable water and poor sewage system makes the population more prone to diseases like typhoid with a faeco oral route of transmission.<sup>2</sup>

**MATERIALS AND METHODS**

The study was conducted in a retrospective manner to from August 2013 to July 2015 in Surgery Department of Guru Gobind Singh Medical College and Hospital, Faridkot and data was collected from Medical Records Department. All patients admitted via emergency with a diagnosis of perforation peritonitis, who on surgery were found to have ileal perforation, were included. Patients with age less than 12 years, with peritonitis due to appendicular perforation, peptic ulcer perforation, traumatic ileal perforation, etc were excluded. Initial diagnosis of perforation peritonitis in all patients was

established by presence of peritoneal signs and/or evidence of gas under both domes of diaphragm on an erect Chest Xray PA view. Data on demographic profile, symptoms and signs was recorded. Data on widal test and blood culture was obtained from microbiology department. Relevant haematological and biochemical investigation were recorded. Operative notes were studied from medical record to obtain findings of amount and type of peritoneal contamination, number site and size of perforation, presence of bowel wall edema was recorded. Type of procedure performed was as following (table 1). Primary closure in 2 layers using 2-0 or 3-0 Vicryl full thickness and 2-0 or 3-0 Silk seromuscular(group A), Primary closure with proximal diversion ileostomy or exterioriation of perforation(group B) Resection and anastomosis(group C) Only flank drain placement(group D)

Postoperative course in the hospital like timing of starting oral feeds, day of start of ileostomy function, average length of stay was recorded. Postoperative complications like wound infection, wound dehiscence, reperforation or anastomotic leak, septicaemia, respiratory complications, mortality was recorded. Data obtained was analysed using IBM SPSS 17 software to get mean and standard deviation. Distribution of normal variables was compared using chi square test. P value of <0.05 was considered statistically significant for that variable.

**RESULTS**

A total of 137 patients with ileal perforation peritonitis were included .Most patients 106(77.37%) patients were male with male to female ratio(M:F) being 3.41:1. Based on the surgical management done the distribution of patients across different groups is given in Graph 1. Majority of patients had undergone primary closure( group A n=72, 52.5%)or ileostomy(group B n=54,39.4%). Only 8(group C) patients underwent resection and anastomosis due to either multiple perforation or unhealthy bowel. 3 patients(group D) despite adequate fluid resuscitation did not show improvement in systolic blood pressure needed inotropic support and were unfit for general anaesthesia were treated with placement of flank drain under local anaesthesia at bedside. As the numbers in group C & D were less further comparison was carried out between group A and group B.

Age incidence in both groups were comparable with mean age in group A 28.78±7.6 group B 30.45±8.5 years. Clinically the onset of peritonitis is taken from the time of onset of acute pain abdomen. With more delay in presentation the chances of morbidity and and mortality increases. Based on presentation timing patients were classified into early or late presentation as shown in Table 2. It suggests that more number of patients within 72 hours of onset underwent primary repair while those coming after 72 hours underwent ileostomy. Distribution of symptoms and signs, haematology and micro-

biology in both groups are represented in table 3. Fever was a consistent symptom in both groups and was predominantly of high grade and intermittent in nature, with a mean duration of 9.23±3.4 days. This point to likely occurrence of perforation in enteric fever patients in 2<sup>nd</sup> week of disease. Other symptoms like vomiting, abdominal distension, constipation were present in comparable numbers in both groups. On the basis of systolic blood pressure on admission more number of patient (group B vs A; 70.3% vs 31.9%) in ileostomy group had presented with shock (systolic BP< 90 mm). Data on hematologic profile was comparable in both groups (table 3). Microbiology investigation of both groups revealed around 3/5<sup>th</sup> patients had widal positive while only 1.5/5<sup>th</sup> had blood culture positive. This again points to disease being in 2<sup>nd</sup> week in our subset of patients.

S no	Group name	Type of procedure done
1	Group A	Primary closure in 2 layers
2	Group B	Ileostomy
3	Group C	Resection and anastomosis
4	Group D	Flank drain placement

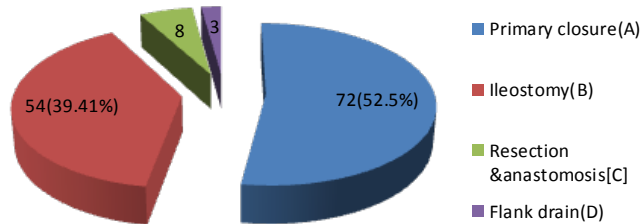
**Table-1:** Division on the basis of operative intervention

S no	Group	Early presentation (<72 hours)	Late presentation (>72 hours)
1	A	47 (65.2%)	25 (34.8%)
2	B	16 (29.6%)	38 (70.4%)

**Table-2:** Timing of presentation to the hospital

S no	Symptom/ Sign/ Laboratory test	Group A n(%)	Group B n(%)
1	Fever	61(84.7%)	50(92.5%)
2	Vomiting	63(87.5%)	48(88.8%)
3	Abdominal distension	70(97.2%)	53(98.14%)
4	Constipation	53(73.6%)	43(79.6%)
5	Systolic BP< 90mm	23(31.9%)	38(70.3%)
6	Guarding/Rigidity	69(95.8%)	42(77.7%)
7	Haemoglobin (<9 g)	55(76.3%)	49(90.7%)
8	Total WBC count (>11000/mm <sup>3</sup> )	53(73.6%)	42(77.7%)
9	Widal positive	46(58.3%)	32(59.5%)
10	Blood culture (grows <i>s typhi</i> )	22(30.5%)	15(27.7%)

**Table-3:** Clinicopathologic Profile



Graph-1: Distribution of type of operative intervention

On study of operative intervention it was found that majority 91.9 %(126) had solitary perforation while 8(5.7%) patients had multiple perforations(in 3 patients who underwent tube laparostomy data was not available). All patients with multiple perforations underwent resection and anastomosis(group C). All patients in group A and group B had solitary perforation and other operative parameters are compared in table 4. Based on intraoperative findings it was found that patients with intraperitoneal contamination >1500ml with faeculent smell, site of perforation within 10 cm of ileocaecal junction and with bowel wall edema were preferably treated with ileostomy rather than primary closure.

Postoperatively median day of start of oral feeds was 3<sup>rd</sup> post op day. Postoperative complications are represented in table 5. Wound infection rates(Group B:A; 42.6%:33.3%), respiratory complications(Group B:A; 20.4%:6.9%), were higher in ileostomy group, while burst abdomen was comparable in both groups. It is notable that 5(6.7%) re-perforations were recorded in primary closure group as compared to nil in ileostomy group which certainly points to an advantage of ileostomy over primary closure in avoiding a dreadful and often deadly complication. More deaths(Group B:A; 9.2%:4.2%), were recorded in ileostomy group.

## DISCUSSION

Enteric fever is a systemic disease caused by *Salmonella typhi* and *Salmonella paratyphi* and it is characterized by fever, abdominal pain, relative bradycardia with involvement of the lymphoid tissues.<sup>3</sup> The organism passes through the Peyer's patches without causing inflammation. Multiplication occurs in the reticuloendothelial system for 10-14 days. Seeding occurs in the blood stream corresponding to the clinical onset. During the 2nd week of illness, bacteria reach the gut and localize in Peyer's patches. Ulceration and "medentericadenitis" occur. Necrotic areas appear in lymphoid tissue.<sup>4,5</sup> The most deadly complication in typhoid i.e. hemorrhage and perforation happen due to necrosis of Peyer's patches in the terminal ileum. Ileal perforation peritonitis is a frequently encountered surgical emergency in North India. It is reported to constitute the fifth common cause of abdominal emergencies due to high incidence of enteric fever and tuberculosis in these regions.<sup>6</sup> Small bowel perforations most commonly affect the young males in the prime of their life. In the present study mean age was 29.2±7.9 years with a male to female ratio of 3.4:1. Similar ratio of 3:1 reported by Wani et al,<sup>7</sup> whereas a higher ratio of 6.5:1 by S Mittal et al<sup>6</sup> and 4:1 by Talwar et al,<sup>8</sup> 6.4:1 reported by Beniwal et al.<sup>9</sup> Affliction of young males has various socioeconomic implication as they often daily wage workers are sole breadwinners for their family. As pointed by duration of fever and widal positivity our study suggests usual timing of occurrence of perforation in the 2<sup>nd</sup> week of disease. Also clinching evidence of typhoid being the cause of perfora-

S no	Operative parameter	Group A	Group B
1	Peritoneal contaminant fluid(>1500ml)	25(34.7%)	43(79.6%)
2	Faeculent smell of fluid present	12(16.6%)	41(75.9%)
3	Site of perforation <10cm from ileocaecal junction	5(7%)	43(79.6%)
4	Site of perforation >10cm from ileocaecal junction	67(93%)	11(20.4%)
5	Bowel wall edema present	8(11.1%)	42(77.7%)

**Table-4:** Comparison of Operative findings

S no	Post operative complication	Group A	Group B
1	Wound infection	24(33.3%)	23(42.6%)
2	Burst abdomen	7(9.7%)	6(11.1%)
3	Reperforation	5(6.9%)	0
4	Intra abdominal abscess	1(1.3%)	3(5.5%)
5	Respiratory complication	5(6.9%)	11(20.4%)
6	Deaths	3(4.1%)	5(9.2%)

**Table-5:** Postoperative complications

tion in high percentage of patients. In western population immune mediated diseases like Crohn's disease, Celiac disease, Vasculitis, Collagenous sprue are a more common cause of small bowel perforation than infectious diseases.<sup>10</sup>

Historically conservative management of enteric perforations was popular but was associated with high morbidity and mortality. Dawson found that at laparotomy there was no tendency towards walling off by the omentum or any attempt at healing of the perforation as in other reports.<sup>11</sup> Furthermore, with paralytic ileus occurring in peritonitis of this magnitude, there is continuous leak of small bowel contents into the peritoneal cavity from the dilated small bowel loops. Treatment has evolved into emergent surgical intervention. Type of operative intervention for ileal perforation has been pure prerogative of operating surgeons and a varied approach has been described. Zida et al.<sup>12</sup> recommended creation of ileostomy as primary therapy for ileal perforation peritonitis as it reduces morbidity and mortality whereas Pal et al.<sup>13</sup> recommended primary closure and side to side ileo-transverse for better results. No clinching evidence is available either in support of primary closure which has the advantage of less postoperative morbidity or ileostomy as a procedure can be life saving comes as it avoids re-perforation thus avoiding a potentially fatal postoperative complication. The decision regarding the type of surgery needs to balance the risk of an anastomotic dehiscence to the inconvenience of bowel exteriorisation.<sup>14,15</sup>

Primary repair is advantageous for less postoperative morbidity and mortality. But a small number of patients have intestinal leakage which can lead to intrabdominal abscess or enterocutaneous fistula and can be devastating. Making an ileostomy gives definitive protection from intestinal leakage but has its own inherent complication like dermatitis, stomal

retraction, parastomal herniation and also is associated with psychological impact. Pardeep sainsi et al assessed common social concerns like feeling sexually unattractive, need to know toilet location, embarrassed about body image, disturbed sleep during night, limited choice of cloths, anxiety about pouch loosening, anxiety about pouch filling, staying home away overnight which affect quality of life.<sup>2</sup> Hence risk versus benefit in a patient specific scenario should be addressed. Thus onus often lies on the operating surgeon to choose between the two procedure and 'choose wisely'. Various preoperative and intraoperative findings may help the surgeon make a decision. Among preoperative parameter timing of presentation is very important. Our study suggests that a delay of more than 72 hours increases likelihood of complications so ileostomy should be preferred in such patients. Another important finding was systolic blood pressure on admission. It is better to perform ileostomy patients who present in shock. We also suggest any patient who is anaemic and has low total serum protein is likely to have reoperation and hence should be chosen for ileostomy. Murray et al suggested that presence of anemia and hypoalbuminemia, along with an increased lag period of > 72 hours point towards a poor general condition of the patient at presentation and such patients have been shown to have better outcome with bowel exteriorisation.<sup>16</sup> Choice of surgical intervention also depends on various operative parameters, but is a test of surgeon's experience. In the present study we found certain findings like high volume of intraperitoneal contamination (>1500ml), faeculent smell of the contaminant, presence of bowel wall edema, perforations close to ileocaecal junction are likely to benefit with an ileostomy. Prashant et al explains high volume, feculent intraperitoneal collection and bowel wall oedema are unfavourable factors for holding sutures and such cases are better managed by exteriorisation.<sup>15</sup> Gupta et al suggested primary closure is only done when patient presents early, and the bowel looks healthy. Sepsis and bowel edema makes suturing hazardous so primary closure should be avoided in patients presenting late. They concluded that presence of bowel edema warranted exteriorisation.<sup>17</sup> Jain et al opined that the suture line-in procedures present a considerable risk of intestinal leakage, if the suture line does not heal satisfactorily due to the presence of one or more adverse factors. They advocated no suture line in the procedure seems to be a better option in adverse patient conditions.<sup>18</sup> According to Gurjit Singh et al degree of faecal contamination, general health status of patient, number and location of perforation were main deciding factors for selecting the type of surgical operations.<sup>19</sup> When there was minimum peritoneal contamination with single perforation quite far away from ileocaecal junction, good general health of patient was preferred for simple closure of perforation in two layers after excision of edges as seen in other studies. However in moderate peritoneal contamination with multiple perforations very close to each other and perforation in close proximity to

ileocaecal junction, resection with end to side ileotransverse anastomosis was resorted to.<sup>19</sup> Previously many authors have advocated use of a ileo-transverse anastomosis in adverse situations to reduce stress on the primary closure suture line. But the authors feel a no suture line approach would be better.

## CONCLUSION

We conclude that early surgical intervention is mandatory for good results. Although there can be dilemma's over choice of surgery but various parameters can help in guiding to make a decision over choice of primary closure vs ileostomy. Preoperative parameters namely a delayed presentation (>72hours), presence of shock at admission, anemia, hypoproteinemia should guide one to choose ileostomy over primary closure. Similarly operative findings of high volume of intraperitoneal contamination (>1500ml), faeculent smell, perforations close to (within 10 cms) of ileocaecal junction, presence of significant bowel wall edema one should prefer to make a ileostomy. Making an ileostomy in such may sometimes be equivalent to snatching patient's life from hands of death.

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