

Surgical Management of Enteric Perforation by Using Omental Patch: A Prospective Study of 60 Patients

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Abstract

Enteric perforation is a serious complication of typhoid fever. Depending upon the bowel condition, primary closure of perforation is the treatment of choice. Development of fecal fistula is the key apprehension in primary closure. The purpose of this study is to find out the benefit of an omental patch when used over primary closure. It is a small study of 60 patients, which were divided into two groups: Group I - Primary closure with omental patch, and Group II - only primary closure. The outcomes were measured in relation to wound infection, fecal fistula and mortality is significantly lower in the group-I patients. Fecal fistula occurs in 13.33% in group II, while in only 3.3% in group I. There was no significant difference in the incidence of wound infection and wound dehiscence. Primary closure with an omental patch is a better option compared with only primary closure in enteric perforation patients. It can be suggested as an alternative method to primary closure only in selective enteric perforation patients.

Key words: Enteric perforation, fecal fistula, omental patch

Introduction

Typhoid fever, also known as enteric fever, is caused by Salmonella typhi and is characterized by fever and abdominal pain. Intestinal perforation and bleeding are the most serious surgical complications [1]. These complications occur in the third or fourth week of infection and are a result of necrosis at the initial site of Salmonella infiltration in the Payer's patches of the small intestine. Enteric perforation requires immediate surgical interference. Various treatment options are: primary closure [2], primary closure with omental patch [3], resection and anastomosis [4], ileostomy, [5] and primary closure with ileotransverse co-

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lostomy [6]. The main purpose of our study is to compare the results of simple primary closure to primary closure with an omental patch technique.

Material and Method

This prospective study was carried out at a rural medical college of northern India, during the period of January 2010 to December 2011. The study was not a controlled study, as different operative procedures (like primary suturing/suturing with omental patch/resection anastomosis/ileostomy) were decided perioperatively depending on the number of perforations and the condition of the small intestine. Only 60 patients with a single enteric perforation (with a relatively healthy bowel) were included in this study [7].

Diagnosis of enteric perforation was made on the basis of prolonged fever followed by an acute attack of abdominal pain with signs and symptoms of generalized perforation peritonitis. A Widal test, blood culture, and X-ray of the chest, including both diaphragms, were done in all of the patients. Routine investigations, like haemogram, blood sugar, blood urea, and serum creatinine, were also carried out in all of the patients. Patients were put on intravenous fluid and Ryle's tube aspiration immediately after admission. Urethral catheterization was done in every patient for strict assessment of input and output. Preoperative broad spectrum antibiotic and metronidazole (500 mg) were given. Exploratory laparotomy under general anesthesia was carried out within 4-6 hours of admission. The entire bowel was explored and its findings were noted in relation to type and amount of fluid, size, number of perforations, and condition of the adjacent bowel. Margins were freshened before suturing and tissue was sent for histopathology. A histopathology report showed mucosal shedding, lymphoid hyperplasia, lamina propria containing abundant neutrophils, macrophages, lymphocytes, plasma cells, and nuclear debris.

The surgical procedure was done according to the number of perforations and condition of bowel:

- Primary closure Single perforation with relatively healthy bowel
- Ileostomy Single or multiple perforations with unhealthy bowel and poor-risk patients
- Resection and anastomosis Multiple perforations with relatively healthy bowel.

Only those patients who fulfilled the criteria of primary closure (single perforation with relatively healthy bowel) were included in the study. These patients were divided into two groups:

- 1. Primary closure with omental patch
- 2. Primary closure without omentum

A total of 150 patients of enteric perforation were treated at the hospital during the above-mentioned period. Of them, 60 patients managed with primary closure of perforation; ileostomy was done in 60 patients, resection anastomosis in 26 patients, while drains were put in four patients under local anesthesia. Only those 60 patients who had a single perforation with a relatively healthy bowel were included in the study (Figure 1).

Figure 1. Showing single enteric perforation with relatively healthy gut.

Primary closure of perforation was done in two layers with interrupted sutures. 3-0 vicryl was used for the inner layer, while 3-0 silk was used for the outer layer. In the first group, omentum was brought down and fixed at the perforation, like a patch after the primary closure. Bowel and peritoneal cavities were thoroughly washed with the help of normal saline before applying the patch. A single drain was put in the pelvis, and abdominal closure was done in layers. Postoperatively, the patients were given third-generation cephalosporin and metronidazole for five days. The patients were monitored according to wound infection, wound dehiscence, development of intra-abdominal abscess, and fecal fistula.

Results

A total of 60 patients who underwent exploratory laparotomy with primary closure of perforation were included in the study. Patients were followed 2 months



to 2 years. Half (30) of the patients underwent primary closure with omental patch (Group I), while another 30 patients underwent only primary closure of perforation (Group II).

Of 60 patients, 30 (50%) patients were in the age group of 21 to 30 years, 24 (40%) were in the age group of 10 to 20 years, while the remaining 6 (10%) patients were more than 30 years of age. The majority of patients were males - 48 (80%).

A total of 42 (70%) patients were presented within 48 hours of the beginning of abdominal pain, while 18 (30%) were presented with 3-4 day-old perforation. None of the patients who presented after 4 days were included in our selected group. Typical history of fever followed by abdominal pain was present in 54 (90%) patients. Pneumoperitoneum was detected in 54 (90%) patients, the Widal test was positive in 42 (70%) patients, while blood culture was positive in 12 (20%) patients. All patients were monitored for early postoperative obstruction and other complications, as shown in (Table 1).

Complications	Group I (30)	Group II (30)	P value
Wound	6	8	>0.05
infection	(20%)	(26.6%)	(non-significant)
Wound	1	2	>0.05
dehiscence	(3.3%)	(6.6%)	(non-significant)
Fecal fistula	1	4	<0.05
	(3.3 %)	(13.33%)	(significant)

Table 1. Showing post-operative complications.

Differences in the incidence of complications in two groups were assessed with the help of a 2-sided Fischer's exact test to know whether they are statistically significant or not. The p value <0.05 is taken as significant.

The most common complication following the procedure was wound infection, which was almost equal in both of the groups. There is not much difference in the complication rates in both of the groups, except the occurrence of fecal fistula that is statistically significant.

None of the patients developed postoperative obstruction because of omentum. Duration of hospital stay was 10 to 21 days.

Discussion

The gravest complication of enteric fever is ileal perforations, which are best managed by early surgical intervention. Delay in treatment adds to morbidity. Optimal operative management of Typhoid perforation has been debatable since the eighteenth century [8]. Various surgical options available are peritoneal drainage with a tube drain/corrugated drain to decompress the abdomen, simple primary closure of perforations, primary closure with omental patch, resection anastomosis, closure with ileotransverse colostomy, and ileostomy.

Surgical treatment is done depending upon the preoperative condition of patients and on perioperative findings. All of these different procedures were done to decrease the incidence of fistula formation and its associated morbidity and mortality. Primary closure is still the procedure of choice, because it is simple, quick, and cost-effective [9]. Stoma care after ileostomy is quite challenging for these patients.

Omentum is a highly vascular organ with a rich source of angiogenic factor that promotes the growth of blood vessels into whatever tissue it is placed close to, as well as providing an excellent plastic material against inflammation [10].

Other causes of ileal perforation due to tuberculosis, trauma, and Meckel's diverticulitis should be excluded [11]. Preoperative diagnosis of enteric disease was made on the basis of history as well as clinical and surgical findings. Chest X-rays may show evidence of associated pulmonary lesions in less than 25 percent of cases, but X-rays of the chest were normal in all of the patients [12].

Enteric perforation was more common in males than in females. Enteric perforation is more common in the age group of 21 to 30 years [5]. The majority of our patients were males (80%), like in other studies [13-15].

Most of the studies showed delayed presentation after the acute abdominal pain. Mean duration of 1 to 7 days was reported by Mansoor et al.[9], whereas it was 5.4 days in a series by Naaya et al. [16]. Most of our patients - 42/60 (70%) - presented within 48 hours of abdominal pain.

The diagnosis of enteric perforation was made

Surgeries are undoubtedly modified according to perioperative findings. Primary closure is not an option

of enteric perfora

mainly on the basis of symptoms and signs, abdomen X-ray, and the Widal test. The Widal test was positive in 75% of our patients, whereas Beniwal et al. showed a positivity of 80.5% in their series. Pneumoperitoneum could be detected in 90% of patients, which is consistent with other reports like Beniwal et al., reporting a detection rate of 91.7% [15].

We evaluated the results of two groups and found that the leak rate is lower in patients with primary closure with an omental patch. As shown in different studies, the incidence of fecal fistula is 11.9% according to Singh et al., 8% according to Adensunkanni et al., 16.5% according to Beniwal et al., 7% according to Mansoor et al., 7.7% in group II and 1.1% in group I according to Hussian et al., 16.6% according to Olurin et al., 20% according to Akhtar et al., and 7.8% according to Karmacharya et al. [5,7,9,11,12,15,17,18]. In our study, the incidence of fecal fistula formation in the primary closure group is 4/30 (13.33%), which is similar to other studies; however, it is 1/30 (3.3%) in the primary closure with omental patch group, which is also analogous with other series [7].

The mortality depends on the number of perforations and on development of fecal fistula [15,16]. As reported by different studies, incidences of mortality are Purohit 14.6%; Singh et al. 20%; Prasad et al. 14.2%; Chowdhury et al. 20%; Adensunkanni et al. 28%; Beniwal et al. 10.5%; Hussain et al. 3.3% in group II and 1.1% in group I; and Karmacharya et al. 6.8% [3,5,7,8,13,15,18]. The reason for no mortality in primary repair groups in our study may be because of early presentation, a relatively healthy bowel of these patients, and proper case selection.

The incidences of other complications are almost the same in both groups, like wound infection being 6 (20%) in group I and 8 (26.6%) in group II, wound dehiscence being 1 (3.3%) in group I and 2 (6.6%) in group II. Many factors such as delayed presentation, inadequate preoperative hydration, electrolyte imbalance, high blood urea, number of perforations, and extent of fecal peritonitis decide the prognosis of a disease [19].

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in all cases of enteric perforation, but primary closure of perforation is still the mainstay of treatment in few cases, depending on the bowel condition. Knowing the usefulness of omental covering, we have used it in enteric perforation and have found that the omental patch technique is a good option compared with only primary closure. It is undoubtedly a small study; however, we still recommend that it can be done in all cases of enteric perforation that fit the criteria of primary closure, because of its obvious benefits: it is a very simple, quick procedure with minimal complications.

Conflict of interest statement

The authors do not declare any conflict of interest or financial support in this study.

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