

## A study of 82 patients of non-traumatic terminal ileal perforation in Al-Kindy teaching hospital

Muhamad S. Abdullah\*  
Raid E. Rassam\*  
Tawfiq J. Almarzooq\*

CABS  
DS, FICMS  
FICMS

### Summary:

**Background** typhoid fever is the commonest cause of non traumatic terminal ileal perforation in our study with a grave postoperative morbidity & mortality depending upon preoperative time delay &/or type of surgical intervention practiced.

**Objective** to evaluate the frequency of non traumatic causes of terminal ileal perforation, their presentations, perforation-operation interval effect on complications, as well as different modalities of treatment and their complications.

**Methods** the study is a prospective study of 82 patients with perforation of terminal ileum diagnosed by explorative laparotomy in Al Kindy teaching hospital ,Baghdad, Iraq from April 2008- December 2010, all of the patients were examined clinically & investigated by plain x-ray of abdomen, ultrasound, complete blood picture, laparotomy was done for them after resuscitation and intravenous antibiotic, tissue biopsy was taken for paraffin section histopathological examination, and patients were followed for complications.

**Results:** the study of 82 patients revealed that their mean age 42 years ( $\pm 14$ ) ranging from 16-75 years, with male to female ratio is 2, 28:1. The main cause of perforation is enteric fever 59 (71.95%) of patient, non specific inflammation 17(20.74%), Chronic granulomatous lesion 5(6.1%). The main presenting symptom in all patients was severe abdominal pain associated with fever, and abdominal distention in variable degree. The operative finding was single perforation in 61 patients (74%) , two perforations in 8 patients (10%) and multiple in 13 patients (16%). The simple closure was done in 50 patients (60%), and other treated by resection and end to end anastomosis , Loop ileostomy, Resection and ileotransverse anastomosis, and follow up of patients revealed that 7(8%) died postoperatively , 3 patients (3.6%) developed wound dehiscence, 6 patients (7%) developed enterocutaneous fistula , 10 patients (12.1%) developed wound infection and 6 patients (7.3%) developed residual collection.

**Conclusion** non-traumatic perforation of terminal ileum is not uncommon and the most common cause is typhoid fever, and carries high mortality and morbidity rates specially in delayed presentation & diagnosis group of patients.

**Keywords** perforated ileum, non traumatic ileal perforation, typhoid perforation

*Fac Med Baghdad*  
2011; Vol. 53, No. 2  
Received Mar. 2011  
Accepted May. 2011

### Introduction:

Non-traumatic perforation of the terminal ileum is uncommon but can be fatal and occurs as a complication of many diseases involve the small bowel and patient usually presented as acute abdomen, complaining of abdominal pain, tenderness and rigidity, due to peritonitis. The clinical presentation is non specific (1). The diagnosis is mainly clinical, supported by radiological finding of free gas under diaphragm (1). Typhoid fever and tuberculosis are the commonest causes of such perforations in the developing countries, while in western countries non-infectious pathology is more common (2,3,4). In a significant number of cases the causes of perforation is not known and called as non specific ileal perforation.

The perforation causes gram negative aerobic and anaerobic infection leading to peritonitis (5).

Typhoid ileal perforation is the commonest cause of perforation peritonitis in the developing countries (6). The best survival rates after ileal perforation in typhoid fever are to be found in patients undergoing operation within 24 hours of the incidence of perforation. Conservative treatment of typhoid perforation, which was widely advocated after the introduction of chloramphenicol, appears to be associated with a substantially increased mortality compared to surgery (7). The overall survival of patients undergoing surgery for perforation is 70-75 % but is as high as 97 % in the best services (8). In general, despite various causes and delays in diagnosis, resection and primary anastomosis remains an effective treatment for perforation of the small

\*Dept. of surgery, Al Kindy College of medicine, University of Baghdad.

bowel. (9). The outcome of perforation peritonitis depended on the underlying cause, the duration of symptoms before treatment, and the general health of the patient.

The aims of this study are to find out the frequency of typhoid and non typhoid ileal perforation, to correlate clinical, laboratory and surgical findings along with morbidity & mortality.

**Methods:**

This is a prospective interventional study of 82 patients with perforation of terminal ileum which was treated surgically with explorative laparotomy in Al Kindy teaching hospital, Baghdad, Iraq from April 2008 - December 2010.

The diagnosis of terminal ileal perforation was based on the following diagnostic criteria; acute abdominal pain fever, vomiting, abdominal distension, with tenderness & rebound tenderness mainly at right lower quadrant of the abdomen, leucocytosis ( $>10 \times 10^9/l$ ) and positive serological test (widal test  $\leq 1/320$ ) for typhoid cases. The diagnosis was supported by ultrasonographic evidence of free fluid in the peritoneal cavity & by CXR finding of free gas under diaphragm. Finally the diagnosis was confirmed by the operative finding of terminal ileal perforation.

After preliminary resuscitation with IV fluid in the form of ringer's lactate from 1 pint up to 3 liters preoperatively in cases presented with delayed history of perforation ( $> 24$  hours) & clinically dehydrated, hypotensive, oliguric or even shocked (systolic blood pressure was  $< 80$ mmHg) & anuric as was the condition of 3 patients , nasogastric tube insertion, preoperative dose of third generation cephalosporin(ceftriaxone 1gm twice daily) and metronidazole(500mg thrice daily) while meropenem antibiotic (in a dose of 1gm thrice daily) was used in cases where complications predicted from the history, general examination & operative findings .

None of our patients gave a definite history of full course treatment (correct dose of effective antibiotic for the whole period of two weeks) for typhoid.

Written consents were taken from all patients. All patients underwent explorative laparotomy by midline incision and some of patients by right paramedian incision according to surgeon's preference.

Identification of the site and number of perforation done and dealt with accordingly either by trimming the edge and simple closure, or resection and end to end anastomosis , side to side anastomosis or by loop ileostomy according to the degree of peritoneal contamination , state of the perforation site , number of perforation, general conditional state of the patient intraoperatively.

Drain was inserted in the pelvic peritoneal cavity in all patients. Biopsies were taken from the perforation sites and sent for histopathological examination to be

examined by a specialist histopathologist and results were collected and analyzed accordingly.

Patients were followed up during hospitalization and complications were recorded regarding wound complications, enterocutaneous fistula, residual collection & death.

The patients were followed up after discharging from the hospital by clinical examination & ultrasonographic examination as needed.

The data were analyzed by computer using Minitab statistical software version 14, for analysis.

P value of  $< 0.05$  was considered statistically significant.

**Results:**

There were 82 patient included in this study, 57 (70%)male and 25(30%) females ,male to female ratio is 2,28:1, the mean age was 42 years ( $\pm 14$ ) , ranging from 16-75 years ,The causes of perforation were enteric fever in 59(71.95%) patients ,non specific inflammation 17(20.74%), Chronic granulomatous lesion 5(6.1%) and others listed in **table1**.

**Table 1 no. (%) of different pathologies of the perforations**

Pathologies	Number of patients	Percentage
Enteric fever	59	71.95%
Non specific inflammation	17	20.74%
Chronic granulomatous lesion	5	6.1%
Forgin body perforation	1	1.21%
<b>Total</b>	<b>82</b>	<b>100%</b>

The presenting symptom in all patients was severe abdominal pain associated in 60(73%) patients with fever, 55(67%) patients with abdominal distention and 22(27%) patients with vomiting as shown in **table 2**.

**Table 2: no.(%) of patients with different symptoms**

Symptoms	No. Of patients	Percentage
Severe abdominal pain	60	73%
Fever	55	67%
Abdominal distention	22	27%

The investigation were done for them, ultrasonography, X-ray WBC count and widal test, and the ultrasonography shows free fluid in the peritoneal cavity and distended loops 72(88%) patients and plain x-ray of abdomen shows free gas under diaphragm in 51 (63%) patients, Leucocytosis ( $>11 \times 10^9/l$ ) in 27(33%) patients and widal test was positive (O antigen  $\leq 1/320$ ) in 40(48%) patients as shown in **table 3**

**Table 3: positive findings in different investigations**

Investigations	No. Of patients	Percentage
U/S (free fluid and distended bowel loop)	72	88 %
CXR (free gas under diaphragm)	51	63 %
Leucocytosis(>11X10 <sup>9</sup> /l)	27	33 %
Widal test (O antigen≤1/320)	40	48 %

All patients was subjected to laparotomy ,only 26(32%) patients operated within 24 hours of the estimated time of perforation others more than 24 hours ,the mean time was 40 hours delay was mainly prehospital.

The operative finding was single perforation in 61(74%), two perforations in 8 (10%) patients and 13(16%) as shown in **table 4**

**Table 4: no.(%) of perforations in each patient**

No. Of perforations	No.(%)
Single perforation	61 (74%)
Two perforations	8 (10%)
More than two perforations	13 (16%)

The simple closure was done in 50(60%) patients, Resection and end to end anastomosis in 21(25.6%) patients, Loop ileostomy in 5 (6%).Resection and ileotransverse anastomosis in 3(3.6%) patients Side to side anastomosis in 3(3.6%) patients as shown in table 5.

**Table5: types of surgical procedures:**

Type of surgery	No.(%)
Simple closure	50 (60%)
Resection and end to end anastomosis	21 (25.6%)
Loop ileostomy	5 (6%)
Resection and ileotransverse anastomosis	3(3.6%)
Side to side anastomosis	3(3.6%)

The postoperative complications were most in patients operated upon in more than 24 hours perforation-operation time as shown in table 6.

**Table 6: no.(%) postopetative complications correlated to perforation-operation time interval**

Complications	Within 24 hours Early group	After 24 hours Delayed group	Total no. (%)	P value
Death	0(0%)	7(8.5%)	7 (8.5%)	0.008
Wound dehiscence	0(0%)	3(3.6%)	3 (3.6%)	0.08
Enterocutaneous fistula	0(0%)	6(7.3%)	6 (7.3%)	0.01
Wound infection	2(2.4%)	8(9.7%)	10 (12.1%)	0.05
Residual collection	0(0%)	6(7.3%)	6 (7.3%)	0.01

And follow up of patient revealed death of 7 (8%) patients died postoperatively in periods ranged from 7-35 days with mean 17 days (±4) ,3(3.5%) patients developed wound dehiscence,6(7%) patients developed enterocutaneous fistulae ,10(12%) developed wound infection and 6 (7%) patients had residual collections,as shown in **table 7**.

**Table 7 postoperative complications correlated to type of surgery**

Complications	Simple Closure 50 Patients	Resection+End To End Anastomosis 21 Patients	Loop Ileostomy 5 Patients	Resection +Ileotransverse Anastomosis 3 Patients	Side To Side anastomosis 3 Patients	Total No.(%) 82 patients	P Value
Death	0(0%)	3(14%)	1(20%)	2(66.6%)	1(33.3%)	7(8%)	0.44
Wound dehiscence	0(0%)	2(9.5%)	1(20%)	0(0%)	0(0%)	3(3.6%)	0.25
Enterocutaneous fistula	1(2%)	2(9.5%)	1(20%)	2(66.6%)	0(0%)	6(7%)	0.67
Wound infection	6(12%)	2(9.5%)	2(40%)	0(0%)	0(0%)	10(12.1%)	0.01
Residual collection	0(0%)	3(14%)	0(0%)	2(66.6%)	1(33.3%)	6(7%)	0.22

The hospital stay of the patients postoperatively were rather proportional to the preoperative delay time after perforation which usually demanded more extensive surgery & consequently simple closure procedures needed shorter postoperative hospital stay, while resection & end to end anastomosis which declares more extensive involvement of the terminal ileum by the pathology & more trauma added by the surgery itself.

#### Discussion:

The perforation of the ileum is one of the causes of the peritonitis that is difficult to diagnosis preoperatively; Different pathologies may lead to perforation of the small intestine. Infection is the commonest cause of such perforations in developing countries. This includes typhoid fever and tuberculosis (1, 2, 10, and 11) Nevertheless, in industrial countries, non-infectious etiology such as Crohn's disease and malignancy is predominant. Rare cases of non-traumatic perforation of small intestine due to opportunistic infections were also reported (1,2), in our study enteric fever is the main cause like other developing country it occurred in 59 (71.95%) patients, and other causes are non specific inflammation 17(20.74%), Chronic granulomatous lesion 5(6.1%) and others.

The mean age in our study was 42 years ( $\pm 14$ ), ranging from 16-75 years compared to other study where the mean age was 34.62( $\pm 14.16$ ) years (12) and the male:female ratio in our study is 2,8:1 in other study was 3:1(1).

The clinical presentation in non-traumatic perforation of small intestine is non specific All of the patients complaining of abdominal pain with variable other associated symptom like fever ,vomiting abdominal distention. The diagnosis is mainly clinical, supported by radiological finding of free gas under diaphragm (12,13), which occurs in 51 (63%) patients. Ultrasound shows free fluid in the peritoneal cavity and distended loops 72 (88%) patients which are more informative than plain abdomen. Laboratory investigations were not helpful in all cases (3, 12). Leucocytosis ( $>11 \times 10^9/l$ ) found only in 27(33%) patients and Widal test was positive in 40(48%) patients. In a series of 79 patients, Wani et al have found that only 29% of patients with non traumatic perforation of terminal ileum have leucocytosis. Furthermore, no single investigation had a high diagnostic accuracy (1).

In our study most patients 61(74%) had single perforation, Single perforation can be treated by edge debridement for histopathological study and simple closure (10, 14). Most of the patients with single perforation were treated by simple suturing in 50 (60%) patient while in others resection and end to end anastomosis in 21(25.6%) patients, and Loop ileostomy in 5 (6%) due to severe peritonitis,

resection and ileotransverse anastomosis in 3(3.6%) patients, side to side anastomosis in 3(3.6%) patients in which the perforation is near to ileo-colic region. Resection anastomosis carried high morbidity and mortality(14)., Ileostomy might be better but its maintenance is difficult and need second surgery, in such circumstances end to side ileotransverse anastomosis with closure of distal stump is a better procedure(15), which was done in 3(3.6%) patients in our study.

In our study we have 7 (8%) patients mortality all operated upon after 24 hours of perforation p value  $< 0.05$ , but in other studies found a mortality rate of 7.7 % (10) 12.5 % (11) 15% (16) and 28% (17), while others showed no mortality (18). The most catastrophic complications were faecal fistula and wound dehiscence (19) Which occurred in 6(7%) p value  $< 0.05$  and 3(3.6%) p value  $> 0.05$  patient respectively, in our study all of delayed group, the insignificant statistics could be attributed to the small no. of patients (3); other studies showed 10-42% incidence of faecal fistula & 5-15% incidence of wound dehiscence (20). wound infection developed in 2(2.4%) patients operated upon within 24 hours and 8(9.7%) patients operated upon after 24 hours which was statistically significant; others showed 35-50% incidence of wound infection(20), this high incidence of complications in F Hassan et al may be because of the late presentations in the cases of their study. Six (7%) patients developed residual collections all operated upon after 24 hours of perforation p value  $< 0.05$ , in other studies the observations were between 25-55 % (21, 22, 23) as shown in table VI.

In table VII shown the incidence of complications in relation to types of surgery, there were different incidence of complications attributed to different types of surgeries which were statistically insignificant except for the wound infection group, probably because of larger percentage (40%) of patients in the ileostomy group compared to other types of surgery regarding wound infection.

#### Conclusion:

Minor complications occurred more in the simple suture technique while major complications took place in resection and end to end anastomosis which can be attributed to more grave affection of the ileum. The most common complication in our study was wound infection(12.1%) followed by fistula and residual collection (7%) for each while the least was wound dehiscence(3.6%). The most important factor found in our study to be attributed to complications was perforation-operation time interval so early presentation & diagnosis are vital to avoid postoperative complications. Larger no. of patients may be needed to achieve significance in statistics in most groups of surgical modalities.

**References:**

1. Wani RA, Parray FQ, Bhat NA, et al. Nontraumatic terminal ileal perforation. *World J Emerg Surg.* 2006; 24;1:7.
2. Kimchi NA, Broide E, Shapiro M, et al. Non-traumatic perforation of the small intestine. Report of 13 cases and review of the literature. *Hepatogastroenterology.* 2002; 49:1017–1022.
3. Kapoor VK, Mishra MC, Ardhanari R, et al. Typhoid enteric perforations. *Jpn J Surg.* 1985;15:205–208.
4. Sharma MP, Bhatia V. Abdominal tuberculosis. *Indian J Med Res.* 2004; 120:305–315.
5. Rathore AH, Khan IA, Saghir W. Prognostic incidences of typhoid perforation. *Annu Tropical Med Parasitol* 81, 1987, 283-9.
6. Nuhu Ali, Bata Mtaku Gali. Causes and treatment outcome of perforation peritonitis in north eastern Nigeria *Surgical Practice* Volume 14, Issue 3, pages 92–96, August 2010
7. Richens J. Management of bowel perforation in typhoid fever. *Trop Doct.* 1991 Oct;21(4):149-52.
8. D.J Weatherall, J.G.G Ledingham, D.A Warrell, *Oxford Textbook of Medicine 3rd Edition Vol-1 Oxford University Press London – 1996: 560-7*
9. Elliot L. Chaikof MD aBoston, Massachusetts USA Nontraumatic perforation of the small bowel *The American Journal of Surgery* Volume 153, Issue 4, April 1987, Pages 355-358.
10. Atamanalp SS, Aydinli B, Ozturk G, et al. Typhoid intestinal perforations: twenty-six year experience. *World J Surg.* 2007;3:1883–1888.
11. Ahmed HN, Niaz MP, Amin MA, et al. Typhoid perforation still a common problem: situation in Pakistan in comparison to other countries of low human development. *J Pak Med Assoc.* 2006;56:230–232.
12. Shah AA, Wani KA, Wazir BS. The ideal treatment of the typhoid enteric perforation -resection anastomosis. *Int Surg.* 1999;84:35–38.
13. Noorani MA, Sial I, Mal V. Typhoid perforation of small bowel: a study of 72 cases. *J R Coll Surg Edinb.* 1997;42:274–276.
14. Akgun Y, Bac B, Boylu S, et al. Typhoid enteric perforation. *Br J Surg.* 1995;82:1512–1515.
15. Chowdri NA, Wani RA, Wani NA, et al. A comparative study of Simple Closure versus resection with end to side ileotransverse anastomosis in nontraumatic terminal ileal perforation. *Tropical Doctor.* 2004;34:233–34.
16. Edino St, Yakuba AA, Muhammad AZ, et al. Prognostic factors in typhoid perforation: a prospective study of 53 cases *J Natl Med Assoc.* 2007 Sep; 99: 9: 1042-5.
17. Adesunkunami AR, Ajao OG. The prognostic factors in typhoid ileal perforation: a prospective study of 50 patients *J R Coll Surg Edinb* 1997; 43: 6: 395-9.
18. Muhammad Tayyab, Mahmud Aurangzeb, Tariq Saeed Akhuzada, et al. Perforation-operation interval as a prognostic factor in Typhoid ileal perforation. *Pak J Surg* 2010; 26(1):24-27.
19. Eggleston FC, Santoshi B. Typhoid perforation: choice of operation. *Br J Surg.* 1981;68:341–342.
20. F. Hassan, Rajan Kr Sinha, J. Pd, et al. Ileostomy in management of typhoid enteric perforation presenting late. *Pak J Surg.* 2010; 26(2):108-100.
21. Memon AS, Memon JM, Shah MA. Gastrointestinal perforation, Frequency presentation and management, *J Surg Pak Oct-Dec.* 1996: 35: 170-73.
22. Iqbal A, Siyal KH, Memon M. Typhoid perforation of bowel, *J Surg Pak.* April-June 1994: 10, 45-8.
23. Khalid K, Durrani KM. Typhoid bowel perforation lesson learned at Sheikh Zayed Hospital Lahore, *J Surg Pak* 1995: 11: 3: 133-6.