Original Article

Surgery

Terminal Ileal Perforation due to Various Etiologies and their Treatment Modalities

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ABSTRACT

Background: Terminal ileum perforation is quite common in developing countries carrying high morbidity and mortality.

Study Design: Retrospective case study

Place and Duration of Study: This study was carried out at the Department of General Surgery, Allama Iqbal Memorial Hospital, Sialkot from March 2007 to March 2013.

Materials and Methods: The study was aimed to find aetiological factors of Terminal ileum perforation and different treatment modalities for such perforation.

Results: There were 34 typhoid, 6 tuberculous, 14 non-specific and 2 others of foreign body and ascariasis. Various surgical procedures like Covering ileostomy, Closure with exteriorization, Ileostomy alone, Resection of perforation with covering ileostomy and Right hemicolectomy were done depending upon the severity of disease and clinical status of the patient.

Conclusion: Treatment of Terminal ileal perforation is always surgical regardless of the techniques. Operation must be done as soon as possible and should be associated with aggressive resuscitation before operation. This results in remarkable decrease in morbidity and mortality of the patients. Response of treatment modalities varies from patient to patient depending upon the aetiological factors. The outcome is very encouraging in those who present earlier.

Key Words: Terminal ileum, Perforation, Exploratory laparotomy, Ileostomy.

INTRODUCTION

Perforation of the small bowel is a very common surgical complication in developing countries as compared to developed countries. There are also seasonal variations in the incidences within the same locality, Variations in the endemicity between different localities in developing countries.[1,2,3,4,5] Site and aetiological factors of perforation also show geographical variations.[6]

Our study was done to find the exact aetiological factors, appropriate therapeutic effects of ileal perforation and our surgical experiences are reported regarding the treatment modalities of such terminal ileal perforations according to their merits and mode of presentation.

MATERIALS AND METHODS

Our study was done on 56 patients, 45 of them were admitted through emergency with H/O, abdominal pain, fever and abdominal distension. While 10 cases were shifted from the medical unit where these cases were being treated as diarrhoea, abdominal pain, nausea, vomiting, constipation, abdominal distension and tender abdomen without any free gas under diaphragm in there 2/10 patients.

In few patients radiological evidence showed no free gas under right dome of diaphragm although guarding and rigidity was remarkable. Later on a second film after one day showed free gas. All patients were hospitalized in our surgical unit where detailed history, clinical examinations and all lab investigations were done.

Exploratory laparotomy was carried out in our 56 cases with terminal ileal perforation. In majority of them abdominal cavity was full of purulent accumulation and their toxicity was quite advanced. In very few cases gut perforation found to be stuck with surrounding gut loops localised by the omentum, pelvic cavity contained purulent material. Biopsy of the edges of the perforation was taken and draining mesenteric lymph nodes if enlarged their biopsy was also sent. The type of surgical procedure was decided on the basis of operative findings, clinical status of the patient and severity of the underlying cause.

RESULTS

56 patients with ileal perforation which was revealed on exploratory laparotomy from 2007-2011. They were comprising of 42 male, 14 female, with ratio of 3:1 their ages were between 10 to 60 years.

Majority of them belonged to poor and below average socioeconomic status with poor water supply and unhygienic and substandard sewage disposal system. Most of them got treatment of the quacks and general practitioners being treated as cases of acute peptic disorder and diarrhoea and when they developed abdominal guarding rigidity and toxicity then they landed to our hospital. Only six patients out of 56 were those who came directly to the centre as it was their first visit and most of them were on self-medication.

All perforations were localised in the terminal ileum there were single and multiple perforations located in the anti-mesenteric border of ileum 5-15cm from ileoceacal valve.

Table No.1: Variable of patients with percentage

S. #	Variable		No	%
1.	**Sex distribution**			
	Male	Child	12	20.7
		Adult	32	55.2
	Female	Child	6	10.3
		Adult	8	13.8
2.	**Age distribution**			
	10-20		18	33.3
	21-30		22	40.7
	31-40		6	11.1
	41-50		5	9.3
	Above 50		3	5.6
3.	**Socioeconomic status**			
	Poor		46	82.1
	Lower middle		6	10.7
	Upper middle		4	7.1
4.	**Clinical feature**			
	Abdominal Distension		56	20.7
	Abdominal Pain		56	20.7
	Fever		46	17.0
	Distension		56	20.7
	Constipation		42	15.6
	Diarrhoea		14	5.2
5.	**Shape**			
	Circular Pinpoint		42	75
	Oval		14	25
6.	**Friability of edges**			
	Sclerosed edges		36	64.3
	Friable edges		20	37.7
7.	**Fluid collection**			
	Reactionary		14	25
	Exudates		30	53.5
	Feacolith		12	21.4
	No collection		-	

Localised minimal contamination was found in patients without any faecal spilling while since it is the terminal part of the ileum where fluid is forced to ileoceacal valve and Majority of the patients were grossly contaminated. (purulent exudates extending from one paracolic gutter to another paracolic gutter and up to diaphragm and down to pelvis), mortality rate was higher in these groups.

Different Surgical procedures have been used in our different patients depending upon the pre-operative clinical status and per-operative findings like, degree of contamination and number of perforations. The number of complications and death also varied, a table shown above gives a better detailed insight.

Since perforation was quite near to ileoceacal valve we deliberately avoided primary closure in all cases even of small pinhole perforation with minimal contamination as reported high incidence of leak and fistula formation[7], in order to avoid this for such cases we did primary closure with covering ileostomy. In others closure with exteriorization was done, it was also done in those cases where there the distance was more than 10 cm from ileoceacal valve with minimal contamination. In grossly contaminated peritoneal cavity and friable edges of the perforation we did ileostomy and in very few such cases resection of the perforation with covering ileostomy and in only two patients right hemicolectomy was performed as these patients were having small pinpoint perforations without gross contamination of the peritoneal cavity and the gut loops were not adherent. 13 Patients developed faecal fistula out which 8 were having typhoid 3 with tuberculosis and 2 non-specific. 5 patients due to their advanced state of toxaemia/septicaemia died without any re-exploration and in rest of nine re-exploration was done and their toxicity was reduced by bringing both loops of the gut exteriorized on as ileostomy and other as mucus fistula but 4 patients because of their advanced state of toxaemia/septicaemia could not survive.

Table No.2:

Disease	No. of Patients		Primary Closure with covering Ileostomy	Closure with exteriorization	Ileostomy alone	Resection of perforation with covering ileostomy	Right hemicolectomy
Typhoid	Total	34	6	4	18	6	
	FF	8	3	1		4	
	Death	5	2	-		3	
Tuberculosis	Total	6	1		3	2	
	FF	3	1			2	
	Death	2	-			2	
Non-Specific	Total	14	2	2	8	-	2
	FF	2	2	-			
	Death	2	2	-			
Others (foreign body,Ascariasis)	Total	2	2				
	FF	-	-				
	Death	-	-				

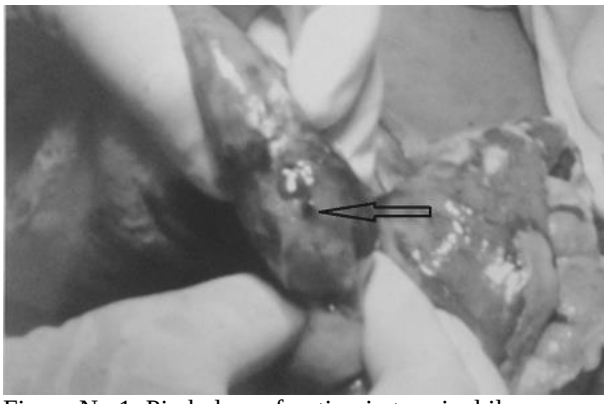

Figure No.1: Pin hole perforation in terminal ileum

Figure No.2: Terminal ileal perforation secondary to gall stone ileus

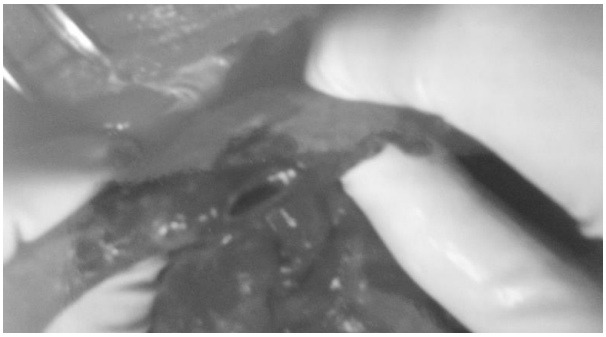

Figure No.3: Oval shaped perforation in terminal ileum

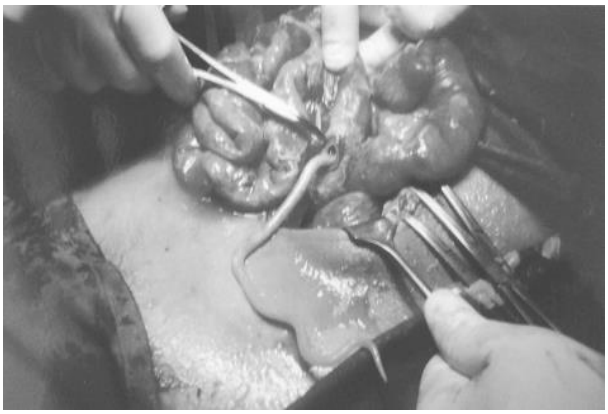

Figure No.4: Terminal ileal perforation secondary to ascariasis

DISCUSSION

Terminal ileal perforation due to typhoid, tuberculosis, non-specific inflammation, Ascariasis and foreign body still causes a lot of morbidity and mortality in developing countries because of the poor sanitary conditions and malnutrition and delayed presentation for the surgical intervention. Cases are being handled by the quacks, who with their inappropriate prescription delay their proper referral and disposal of such cases to definite care units there by endangering the lives of the patients. Majority of our patients were young adults and males with a male female ratio of 3:1 as in some other studies.[8,9] They have mostly presented after or during second week of their ailment and very few in first week.

Those who presented after three weeks of start of their ailment their morbidity and mortality rate were higher than those who presented in second or first week.[10,11]

Late presentation, delay in operation > 48 hours with multiple perforations, damage of gut loop, pus, faecal contamination in peritoneal cavity adversely raised the incidence of faecal fistula and subsequent mortality.[7,12]

Clinical feature of all these was quite similar but the intensity of these symptoms and signs increased with delayed presentation and inadequate proper treatment. 96 % of the patients presented with signs and symptoms of peritonitis and raised TLC. While 90 % showed pneumoperitoneum on investigation.

After proper investigation and x-ray chest included to rule out pulmonary tuberculosis, all patients were resuscitated, their fluid and electrolytes balance were restored, blood was arranged for each patient, exploratory laparotomy carried out in all cases by right Para-median incision.

Edges biopsy and lymph nodes if enlarged showed aetiology. While in few cases of tuberculosis, lymph nodes showed granulomatous lesion while the edges did not show any tuberculous lesion revealed a non-specific inflammation. Typhoid ileal perforation remains a very lethal condition in tropical countries[13, 14, 15], its incidence ranges from 0.9-38%.[15], and mortality rate still very high ranging from 27-77 %.[16, 17]

Morbidity and mortality in all cases do not depend upon the surgical procedure but it largely depends upon the condition of the patient, early or late presentation, virulence of the causative factor and duration of the disease diagnosis before and after surgical intervention therefore pre-operative resuscitation before exploratory laparotomy is always stressed upon.[18,19,20] Post-operative complication ranges from faecal fistula, adhesions of suture, impending perforation, missed perforations, development of meticulous of diseased ileum during post-op period. The mortality rate in our patients was 16%, i.e. 9 died out of 56 patients.

Post-operative complications like faecal fistula were same in both procedures resection with proximal ileostomy and primary closure with proximal covering ileostomy (both 6 in number). None of the patients with primary closure exteriorization did not develop any complication except wound infection. The most catastrophic complications being faecal fistula and wound adhesions.[21] Resection anastomosis associated with higher mortality and morbidity.[22] Temporary ileostomy has lot of advantage over other procedure so it is mostly adopted procedure. Ileostomy is the ideal procedure but its maintenance in underdeveloped countries carries another surgical risk. But few people say end to side anastomosis with closure of distal stump is a better procedure.[23]

Ileostomy stoma management was difficult in our set up. Malnutrition and persistent ulceration were quite frequent unfortunately the management of stoma remains difficult in developing countries because of shortage of suitable equipment.[14,16]

In this respect persistent ulceration provokes some awful pain, denutrition cachexia and death. In our cases we have dealt the problem of peristoma ulceration by using a foam and plastic colostomy appliance with Gallus which does not have any fixity problem and it is quite cheaper.

CONCLUSION

Treatment of Terminal ileal perforation is always surgical regardless of the techniques. Operation must be done as soon as possible and should be associated with aggressive resuscitation before operation, which results in remarkable decrease in morbidity and mortality of the patients. Response of treatment modalities varies from patient to patient depending upon the aetiological factors. The outcome is very encouraging in those who present earlier. Procedure like ileostomy is still considered to be ideal, especially in the hands of inexperienced and those who are working in the periphery may become a lifesaving procedure. Public awareness of urgent and good sanitation should be advised.

REFERENCES

1. Ameh EA. Typhoid ileal perforation in children: A scourge in developing countries. Ann Trop Paediatr 1999;19:267-72.
2. Uba AF, Chirdan LB, Ituen AM, Mohammed AM. Typhoid intestinal perforation in children: A continuing scourge in a developing country. Pediatr Surg Int 2007;23:33-9.
3. Oheneh-Yeboah M. Postoperative complications after surgery for typhoid ileal perforation in adults in Kumasi. West Afr J Med 2007;26:32-6.
4. Abantanga FA. Complications of typhoid perforation of the ileum in children after surgery. East Afr Med J 1997;74:800-2.
5. Kouame J, Kouadio L, Turquin HT. Typhoid ileal perforation: Surgical experience of 64 cases. Acta Chir Belg 2004;104:445-7.
6. Agarwal S, Gera N. Tuberculosis:An underestimated cause of ileal perforation. J Indian Med Assoc 1996;94:341-52
7. Veeragandham RS, Lynch FP, Cant TG. Abdominal tuberculosis in children: review of 26 cases. J Pediatr Surg 1996; 31: 170-6.
8. Adesunkanmi AK, Badmus TA, Fadiora FO, Agbakwuru EA: Generalised peritonitis secondary to typhoid ileal perforation: Assesment of severity using modified APACHE II score. Indian J Surg 2005,67:29-33.
9. Adesunkanmi, Abdul Rashid K, Badmus, Tajudeen A, Olukayode O. Causes and determinants of outcome intestinal perforations in a semi urban African Community. Surgical Practice 2003,7(4):116-123.
10. Chatterjee H, Jagdish S, Pai D, Satish N, Jayadev D, Reddy PS. Changing trends in outcome of typhoid ileal perforations over three decades in Pondicherry. Tropical Gastroentrol 2001;22:155-8.
11. Aziz M, Qadir A, Aziz M, Faizullah Prognostic factors in typhoid perforation. J Coll Physicians Surg Pak 2005;15(11):704-7.
12. Ersumo T, W/MESKEL Y, Kotisso B. Perforated peptic ulcer in Tikur Anbessa Hospital; a review of 74 cases. Ethiop Med J 2005;43(1):9-13.
13. Akung Y, Ferry B, Boylu S, Aban N, Tacyildiz I. Typhoid enteric perforation. Br J Surg 1995;82: 1512-5.
14. Sanou D, Sanou B, Sanou A. Les péritonites d'origine typhique en milieu africain: A propos de 239 cas au CHU de Ouagadougou. Rev Afr Chir 1999;2:6-9.
15. Singh S, Sing K, Grover AS, et al. Two-layer closure of typhoid ileal perforations: A prospective study of 46 cases. Br J Surg 1995;82:1253-55.
16. Nguyen S. Typhoid perforations in a tropical environment. J Chir 1994;131: 90-95.
17. Padonou N, Toure P, Benchekroun A, Seck B, Diop A. Perforations intestinales d'origine typhique: A propos de 26 observations. Dakar Med 1979;24:42-6.
18. Talwarr S, Sharmad A, Mittala IND, Prasad P Typhoid enteric perforation. Aust N Z J Surg 1997; 67: 351-3.

19. Foster EC, Lefor AT. General management of gastro-intestinal fistulas: recognition, stabilization and correction of fluid and electrolyte balances. Surg Clin North Am 1996; 76: 1019-33.
20. Naorani M, Sial I, Pain V. Typhoid perforation of small bowel: a study of 72 cases. JR Coll Surg Edinb 1997; 42: 274-6.
21. Eggleston FC, Santoshi B: Typhoid perforation: choice of operation. Br J Surg 1981; 68:341-342.
22. Shah AA, Wani KA, Wazir BS: The ideal treatment of the typhoid enteric perforation - resection anastomosis. Int Surg 1999;84:35-38.
23. Chowdri NA, Wani RA, Wani NA, Wani KA, Malik AA, Fowzia F. A comparative study of Simple Closure versus resection with end to side ileotransverse anastomosis in nontraumatic terminal ileal perforation. Tropical Doctor 2004;34(4):233-34.

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