

Non-Traumatic Ileal Perforation: A Retrospective Study

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ABSTRACT

Objective: To determine clinical features, operative findings and post-operative complications in patients operated for non-traumatic ileal perforation and to discuss the role of typhoid vaccination. **Materials and Methods:** A retrospective study was carried out from 2009-2010. Seven patients were admitted through casualty as cases of acute abdomen. Underlying conditions were typhoid ulcers (4 patients) and non-specific etiology (3 patients). Diagnosis was made on clinical grounds, laboratory investigations, radiology and operative findings. Exploratory laparotomy was done. Different variables studied post-operatively were wound infection, residual abscess, recurrence and delayed post-operative complications. **Results:** Tenderness, distension and rigidity were found in maximum patients. Gases under diaphragm and air fluid levels were common radiological findings. However, widal test and blood culture for *S. typhi* was positive in four patients. Six patients had single perforation and one patient had two perforations, all being on antimesenteric border of ileum. Maximum patients had peritoneal collection of less than 1000 ml. In five patients simple closure of perforation was done and in remaining two resection with end to side ileotransverse anastomosis was required. Wound infection and residual intraabdominal abscess were found in one patient each. **Conclusion:** Management criteria remain same in typhoid and non-specific perforations. Commonest cause of ileal perforation is typhoid fever in our country, so immunization against typhoid beyond 18 years of age is recommended.

Keywords: Ileal perforation, typhoid ulcer, typhoid vaccination

Introduction

Perforation of the bowel especially ileal perforation is a serious complication. It is of significance because of its association with high mortality and morbidity as it occurs mostly in developing countries in places where medical facilities may not be readily available. Perforation of terminal ileum is a cause for obscure peritonitis, heralded by exacerbation of abdominal pain associated with tenderness, rigidity and guarding, most pronounced over right iliac fossa. However, for many patients in a severe toxic state, there may be obscure clinical features with resultant delays in diagnosis and prompt surgical intervention.^[1]

A “non-specific” etiology is attributed to small bowel perforations when the perforation cannot be classified on the basis of clinical symptoms, gross examination, serology, culture and histopathological examination into any disease state such as enteric fever, tuberculosis or malignancy. These ulcers are usually single and commonly involve terminal ileum.^[2] It has been proposed that submucosa vascular embolism,^[3] chronic ischemia

due to atheromatous vascular disease or arteritis,^[4] or drugs such as enteric coated potassium tablets are responsible for them.^[5] Apart from enteric fever and “non-specific” ulcers other causes in western countries include Crohn’s disease, Behcet’s disease, radiation enteritis, adhesions, ischemic enteritis, SLE and very rarely intestinal tuberculosis.^[6]

Typhoid is the commonest cause of ileal perforation in our country.^[7] It is also a challenging surgical emergency in developing countries.^[8] The resulting peritonitis in such a seriously ill patient may be rapidly fatal unless it is treated promptly and vigorously.^[9] Nowadays, the mortality rate although decreasing, still remains very high ranging from 1 to 39% with significant morbidity in spite of therapeutic progress.^[10]

Materials and Methods

A retrospective study of ileal perforations was conducted during 2009-2010 which included seven patients. All admissions were done as cases of acute abdomen. No patient had received typhoid vaccination in 3 years prior to presentation. The diagnosis of perforation was made on standard criteria of abdominal

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pain, distension, tenderness, rigidity and the presence of free intraabdominal gas on radiography. The investigations carried out were complete blood picture, ESR, Widal test, blood culture, urine culture, stool culture, blood urea, blood sugar, serum electrolytes, abdominal and chest radiographs and abdominal ultrasound. Patients were resuscitated with intravenous fluids. Nasogastric tube and urethral catheter were placed. Intravenous antibiotics comprising ceftriaxone, and metronidazole were commenced immediately. After resuscitation all patients were subjected to exploratory laparotomy under general anesthesia within 24-48 h of hospitalization. Laparotomy was performed by a midline incision. Site of perforation was located. Peritoneal toilet was carried out with copious amount of normal saline. Peritoneal fluid culture and ulcer margin biopsy were also done. Simple closure or resection with end to side ileotransverse anastomosis were carried out as the surgical procedures. Drains were placed in right paracolic gutter and pelvic cavity. Abdomen was closed by mass closure technique with proline size 1 and skin was closed with interrupted ethilon.

Post-operatively patients were kept nil orally till return of bowel sounds and at that time nasogastric tubes were removed. Following which they were started on liquid diet for a day and if no episode of vomiting occurs patients were shifted to semi-solid foods in next 7-8 days and then a gradual transition to solid foods was made such as cream toast, boiled eggs etc. Patients were continued on intravenous antibiotics (Ceftriaxone 1 gram, BD for 1 week and metronidazole 500 miligram TDS for 3 days) except in one case of residual abscess where antibiotic was changed as per culture and sensitivity report and continued for total period of 2 weeks. Drains were removed between third to tenth post-operative days depending upon the amount of drainage in 24 h. Patients were observed for any complications.

Results

Four patients matched the case definition for typhoid fever with enteric perforation while there was non-specific etiology in remaining three patients. All patients were of 3rd to 4th

decade of life. Gender distribution was five male and two female patients.

The duration of symptoms in typhoid cases was 1-15 days. The interval between presentation at emergency department and surgery was within 24 h in five patients and between 24-48 h in two patients. The delay in two patients was due to the need for adequate resuscitation before operation.

Pain abdomen, fever and constipation were the principal presenting features. Abdominal distension, tenderness and rigidity were the main physical signs.

Air fluid levels and gas under diaphragm was present in six cases on plain X-ray abdomen. Blood culture for *S.typhi* and Widal were positive in four patients.

There was only one perforation each in six cases whereas one patient had two perforations within a distance of 10 cm. Location of perforations were within 41-60 cm from ileocaecal valve in six cases and between 20-40 cms in one case. The size of perforation was between 5 to 8 mm in three patients and from 9 mm to 1.5 cm in four patients. In all cases all perforations were on the antimesenteric border of ileum [Figure 1].

Maximum patients had peritoneal collection of less than 1000 ml. Simple closure of perforation after trimming of margins was done in five patients [Figure 2] and resection with end to side ileotransverse anastomosis was done in two patients.

Wound infection and residual intra abdominal abscess were post-operative complications, found in one patient each. The complications were managed conservatively. Post-operative hospital stay ranged from 10 to 15 days and extending up to 3 weeks in patient with residual abscess.

In a follow up of upto two and half years in three patients and 1 year in two patients, no recurrence of perforation or any late post-operative complications were observed.



Figure 1: Perforation on antimesenteric border of ileum



Figure 2: Simple closure of perforation in two layers after excision of edges

Discussion

The public health burden of enteric fever in India is huge. Population based studies from urban population in India suggest that incidence of typhoid fever is 2730 per 100 000 populations per year in 0-4 year old children, 1170 per 100 000 per year in 5-19 year age group and 110 per 100 000 per year in 20-40 year age group.^[11] The Indian Academy Of Paediatric Committee On Immunization (IAPCOI) therefore recommends the inclusion of typhoid vaccines in the national immunization schedule. The IAPCOI recommends the administration of the currently available Vi polysaccharide vaccine 0.5 ml IM every 3 years beginning the age of 2 years till age of 18 years in all children/adolescents. A child with a history of suspected/confirmed enteric fever may be vaccinated 4 weeks after recovery if he/she has not received the vaccine in the past 3 years. This vaccine does not interfere with the interpretation of Widal test. The Vi conjugate typhoid vaccine is recommended in 2 doses of 0.5 ml intramuscularly at an interval of 4-8 weeks, followed by a booster every 10 years.

The most lethal complications of typhoid fever are intestinal bleeding and ileal perforations, both arising from necrosis of Payer's patches in the terminal ileum.^[12] Perforation of a typhoid ulcer usually occurs during the third week and is occasionally the first sign of the disease.^[13] Non-traumatic terminal ileal perforation is still common as a cause for obscure peritonitis in developing and underdeveloped world.

There is universal consensus that the typhoid ileal perforation is best treated surgically,^[14,15] contrary to the former belief that they are better managed conservatively.

Typhoid Ileal perforation is still seen with higher incidence amongst males.^[14] The mean age of our patients was 29.36 years, similar to an earlier report.^[14] Fever, abdominal pain and distension were seen in all four cases of typhoid perforation which is in accordance with other study.^[14] Widal test and blood culture for *S.typhi* were positive in four cases. Findings are similar to other studies.^[12] Leukopenia was observed in half of the cases of typhoid perforation, similar to findings in other series.^[12] Air fluid levels and gas under the diaphragm were seen in all cases, findings consistent with other studies.^[12,16]

High prevalence of antimicrobial resistance particularly to quinolones used empirically by general practitioner for other purposes has made enteric fever a difficult disease to treat. Hence, the need of treating these cases with third generation cephalosporins like ceftriaxone.

Regarding number and location of perforations in our series, six patients had single perforation and one patient had more than one perforation. These figures are close to those listed in another study.^[14] However, one of the studies has shown 14 as the highest number of perforations in a single patient.^[17] In six cases perforations were 41-60 cm from ileocaecal junction and in one case it was 20-40 cm from junction.^[18] All were

along antimesenteric border of ileum, which is similar to earlier reports.^[16,18] Similarly, perforation size was between 5 mm-1.5 cm in all cases which is again similar to other study.^[18] In one of the study, size of perforation ranges from 10-80 mm with all the perforations located within 5 to 60 cm of ileocaecal junction.^[17] In our study, amount of pus drained from peritoneal cavity was less than 1000 ml in maximum number of cases, which is similar to other studies.^[18] This feature has got bearing on occurrence of complications such as residual abscess, seen in a patient with fluid collection of more than 1000 ml. Some studies show that few cases have succumbed to second or third or even fourth perforation occurring on 42nd day after first operation. Hence, a careful inspection of distal three feet of ileum and to scan all suspicious looking areas for ulcers is advisable.

The degree of fecal contamination, general health status of patient, number and location of perforation were main deciding factors for selecting the type of surgical operations. 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.^[16,17] However in moderate peritoneal contamination with multiple perforations very close to each other in one case and perforation in close proximity to ileocaecal junction in another, resection with end to side ileotransverse anastomosis was resorted to. The mean resected ileum length was 20cm in our study. This is an important factor. One of the study shows a mean resected ileum length of less than 1 m in short resection, and greater than 1 m in massive resection cases.^[15]

In our study, we found wound infection and residual abscess as complications in one patient each. Larger series from literature show wound infection in 68%, incisional hernia in 36% wound dehiscence in 27%, enterocutaneous fistulae in 13% and intraabdominal abscess in 9% patients.^[14,18] Therefore, at laparotomy simply covering wound with abdominal packs and washing it with normal saline before closure can reduce incidence of wound contamination.^[16] However, faecal fistula remains the most threatening postoperative complication.^[18] Reasons may be dehiscence of anastomotic or primary repair, synchronous impending perforation that has been missed at the time of initial surgery or development of metachronous perforation of diseased ileum during postoperative period. Temporary ileostomy has the advantage of avoiding any intestinal sutures in septic tissues and the subsequent risk of postoperative dehiscence of anastomosis or repair that is associated with a high mortality rate. In such circumstances end to side ileotransverse anastomosis with closure of distal stump is a better option.

Histopathological study did not reveal any specific findings. Most common organisms isolated in peritoneal fluid culture were *E.coli* and *Klebsiella* species.

Enough emphasis has not been laid on diet in most of the studies. Diet has been an important consideration in typhoid

fever. No food among the numerous ones that have been tested in typhoid fever has proved as satisfactory as milk. The most satisfactory modification is probably to be found in thin gruels, as milk curdles in process of digestion. Liquid foods must be continued in typhoid fever until the danger of perforation has passed. From the semi-solid foods given during the first 7 or 10 days of convalescence, a gradual transition can be made to such solid foods as cream toast, soft-boiled or poached eggs, baked potato, baked apple, boiled rice, etc.^[19] Above mentioned regime of gradual transition from liquids to solid soft food over a period of 3 weeks is recommended and was followed in cases under study.

Conclusion

Ileal perforation still carries high morbidity and mortality unless treated promptly and aggressively. A short duration of symptoms prior to admission, leucopenia, inadequate treatment and male gender are independent risk factors for perforation among patients with typhoid fever.

Management protocol remains the same in typhoid or non-specific perforation. Primary care physician must have a high index of suspicion and arrange prompt evacuation to the nearest available treatment facility which will help in reducing morbidity and mortality. They should emphasize the need for protection by immunization against typhoid amongst all age groups. Since commonest cause of ileal perforation in our country is typhoid fever, there exists a need for extending immunization against typhoid fever beyond 18 years of age.

References

1. Karmacharya B, Sharma VK. Results of typhoid perforation management: Our experience in Bir Hospital, Nepal. Kathmandu Univ Med J (KUMJ) 2006;4:22-4.
2. Chulakamontri T, Wattanasrichaigoon S, Hutachoke T, Wanishayathanakorn A, Pornchareonpong S. Nontraumatic perforations of the small intestine. J Med Assoc Thai 1996;79:762-6.
3. Chaterjee H, Pai D, Jagdish S, Satish N, Jyadev D, Srikanthreddy P. Pattern of nontyphoid ileal perforation over three decades in Pondicherry. Trop Gastroenterol 2003;24:144-7.
4. Evert JA, Black BM, Dockerty MB. Primary nonspecific ulcers of the small intestine. Surgery 1948;23:185-200.
5. Finkbiner RB, Decker JP. Ulceration and perforation of the intestine due to necrotizing arteriolitis. N Engl J Med 1963;268:14-8.
6. Gupta S, Kaushik R. Peritonitis- the Eastern experience. World J Emerg Surg 2006;1:13.
7. Wani RA, Parray FQ, Bhat NA, Wani MA, Bhat TH, Farzana F. Nontraumatic terminal ileal perforation. World J Emerg Surg 2006;1:7.
8. Talwar S, Sharma RK, Mittal DK, Prasad P. Typhoid enteric perforation. Aust N Z J Surg 1997;67:351-3.
9. Noorani MA, Sial I, Mal V. Typhoid perforation of small bowel: A study of 72 cases. JR Coll Surg Edinb 1997;42:274-6.
10. Singh Y, Khakure M. Typhoid perforation in adults. J Inst Med 1998;20:3-4.
11. Immunization schedule online- Vaccines, vaccination, vaccination India, vaccination schedule, immunization, immunization schedule, immunization schedule in India. Available from: <http://www.vaccineschedule.in/typhoidvaccines.aspx> [Last accessed on 2013 Sep 8].
12. Hosoglu S, Aldemir M, Akalin S, Geyik MF, Tacyildiz IH, Loeb M. Risk factors for enteric perforation in patients with typhoid fever. Am J Epidemiol 2004;160:46-50.
13. Tayyab M, Aurangzeb M, Hussain A, Ahmad N. Prognostic factors in typhoid ileal perforation. J Med Sci 2010;18:79-82.
14. Ansari AG, Naqvi SQ, Ghumro AA, Jamali AH, Talpur AA. Management of typhoid ileal perforation: A surgical experience of 44 cases. Gomal J Med Sci 2009;7:27-30.
15. Kouame J, Kouadio L, Turquin HT. Typhoid ileal perforation: Surgical experience of 64 cases. Acta Chir Belg 2004;104:445-7.
16. Oheneh-Yeboah M. Postoperative complications after surgery for typhoid ileal perforation in adults in Kumasi. West Afr J Med 2007;26:32-6.
17. Nuhu A, Gali B, Dawha S. Postoperative complications of typhoid ileal perforation in children in Azare, Nigeria. Internet Journal of Surgery 2009;21:17.
18. Adesunkanmi AR, Ajao OG. The prognostic factors in typhoid ileal perforation: A prospective study of 50 patients. JR Coll Surg Edinb 1997;42:395-9.
19. Nutrition online- Choice of foods for typhoid fever. Available from: <http://www.chestofbooks.com/health/nutrition/Dietetics-5/Group-II-Choice-Of-Foods-For-Typhoid-Fever.html>. [Last accessed on 2013 Aug 28].

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