The THAI Journal of SURGERY 1999; 20:45-48.
Official Publication of the Royal College of Surgeons of Thailand

Nontraumatic Perforation of the Small Intestine

Taweewong Chulakamontri, MD, FRCST, FICS
Department of Surgery, Bangkok Metropolis Medical College
Vajira Hospital, Bangkok, Thailand.

Abstract **Nontraumatic perforation of the small intestine is rarely encountered in acute surgical abdomen. A series of 16 patients admitted to Department of Surgery, Vajira Hospital from January 1989 to December 1998 was reviewed. Underlying conditions were typhoid ulcers. adhesions, radiation enteritis, SLE, neoplasia, tuberculosis, metastasis, and diverticula. Surgical resection and end-to-end anastomosis was the preferred procedure in order to gain histologic examination of the perforated bowel segment. One anastomosis leakage with spontaneous closure was observed. Two patients in this series died (12.5 %), one from tumor metastasis and the other from complication of radiation enteritis.**

Perforations of the gastrointestinal tract are common causes of peritonitis requiring immediate surgical therapy. Perforations not resulting from external trauma have been called spontaneous or nontraumatic perforations.[1-3] The sites most frequently encountered are in the stomach and duodenum, whereas the nontraumatic perforations of the small intestine distal to the duodenum are very rarely found in contries with high hygienic standards. On the other hand in regions with poorer hygienic conditions, perforations of the small intestine caused by typhoid ulcers, intestinal tuberculosis or parasitic disease have been well recognized.[4-6]

Because of the rarity of nontraumatic perforations of the small intestine, a surgeon is unlikely to have much experience with this disease. Thus, to gain more knowledge, we have collected and reviewed all the cases treated at Department of Surgery, Vajira Hospital during a 10 - year - period from January 1989 to December 1998.

Materials and Methods

Between January 1989 and December 1998, 16 patients with nontraumatic perforation of the small intestine were admitted to the Department of Surgery, Vajira Hospital, Bangkok. Six were female and 10 were male patients with the age ranging of 17 to 71 years. Details of clinical informations were summarized in Table 1. On admission, these patients had abdominal pain 5 hours up to 5 days duration. Four patients were observed with increased leukocytes up to 20,000 cells/cumm.

Ten patients showed free air on the abdominal radiograph. Lower abdominal tenderness, guarding and rigidity were frequent clinical findings. Signs of ileus on the abdominal radiograph could be seen in all patients. Only one of the patients with radiation enteritis can be accurately diagnosed preoperatively. The preoperative diagnoses in most instances included perforated appendicitis, peptic perforation and peritonitis.

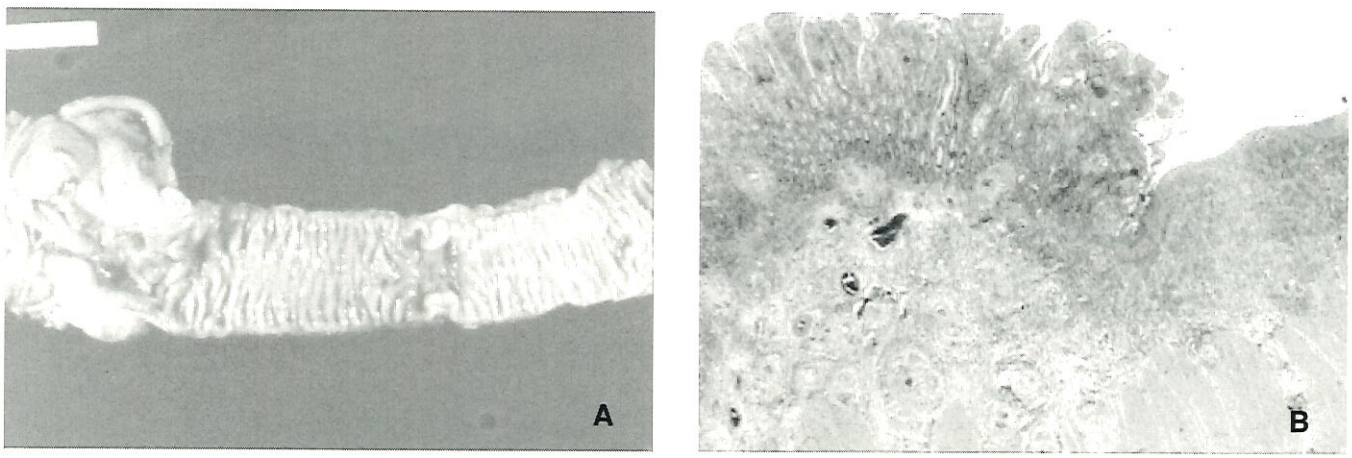


Fig. 1 A. Photograph of a surgical resected specimen of terminal ileum depicting an ulcer with perforation located about 21 cm from the ileocecal junction.
B. Photomicrograph of Tuberculous ulcer from lesion shown in (A) with caseous granulomas and positive acid fast bacilli.

Results

Typhoid ulcer was found to be the cause of perforation in four patients. The site of perforation was at proximal jejunum (30 cms from ligament of Treitz) in one patient. In other cases, perforated bowel wall involved the terminal ileum (10 cms from ileocecal valve). All of them had a rising typhoid titer.

Intestinal obstruction caused the perforation in three cases. The adhesion bands caused a close-strangulated loop obstruction in two cases. Their perforations were located in the distal jejunum and proximal ileum. Hematoma of the ileal mesentery from unknown etiology caused small bowel obstruction in the last patient with the perforation also located in distal jejunum and proximal ileum.

Table 1 Causes, surgical therapy, and postoperative course in 16 patients with nontraumatic perforation of small intestine.

Age (yr) & Sex	Cause	Therapy	Postoperative course
25 M	Typhoid	Resection	Uncomplicated
20, M	Typhoid	Resection	Uncomplicated
45 F	Typhoid	Resection	Uncomplicated
62, M	Typhoid	Resection	Small bowel fistula
17, M	Idiopathic	Resection	Uncomplicated
63, F	Radiation enteritis	Resection	Death
35 M	Adhesion	Resection	Uncomplicated
71, F	Adhesion	Resection	Uncomplicated
42, M	Adhesion	Resection-oversewing	Re-perforation
21, F	SLE	Resection	Uncomplicated
55 F	Diverticula	Resection	Uncomplicated
68 F	Metastases	Resection	Death
42 M	Tuberculosis	Resection	Uncomplicated
28 M	Tuberculosis	Resection	Uncomplicated
42 M	Neoplasia	Resection	Uncomplicated
51 M	Neoplasia	Resection	Uncomplicated

Table 2 Causes of nontraumatic perforations of small bowel in other series compared with this study.

Cause	Huttunen[1]	Markowitz[7]	Rajagopalan[9]	Author
Foreign body	4	9	2	-
Primary Neoplasia	1	3	3	2
Adhesions	5	-	-	3
Diverticula	4	2	1	1
Crohn's disease	2	1	4	-
Metastases	-	1	-	1
Tuberculosis	1	1	-	2
Typhoid	-	-	-	4
Idiopathic	3	1	5	1
Other causes	4	3	1	2
Death	10 (42%)	9 (43%)	4 (25%)	2 (13%)
Total	**24**	**21**	**16**	**16**

Three cases of perforation were related to neoplasia and metastasis. Two cases had tuberculous ulcers with perforation at terminal ileum (Figure 1). A 63-year old female with stage IIB cancer of cervix previously treated with radiation had her terminal ileum injured and perforated. One case of small bowel perforation occurred in a patient with SLE who had been on long-term steroid medication. One patient had perforation at the site of a diverticulum. A 17-year-old boy had perforation at terminal ileum in which the cause could not be definitely determined.

Their postoperative courses were completely uneventful in 13 patients. Two patients died after the operation. Reperforation was found in one patient at previous oversewing site. Small bowel fistula after bowel resection and end-to-end anastomosis occurred in one patient with spontaneous closure after 2 weeks of total parenteral nutrition therapy.

Discussion

In our series of 16 cases, typhoid ulcers (4 cases, 25 %) was the most frequent cause of the perforation. Adhesions band was the second common cause (3 cases, 18.8 %). Several investigators[1,7-9] listed foreign body, primary neoplasia, adhesions, Crohn's disease, metastasis, tuberculosis and diverticula were among the recognized causes of non-traumatic perforation of small intestine. However, there were still a number of cases in which the cause of perforation could not be defined in all the series reported. Rajagopalan[9] used the term idiopathic perforation for those cases that the actual pathology that caused the perforation may not be disclosed intraoperatively or demonstrated by histologic study of the surgical specimens. Crohn's disease has been rarely encountered in Thailand and none was found as the cause of perforation in our series.

Potassium tablets (regular and slow-release form)[10-12] has been previously reported to be a possible cause of jejunal perforation consequent to local drug toxicity. Ingoldby[13] described a case of perforation in the upper jejunum after ingestion of slow release iron tablets but it was also found that the patient had several diverticula in his jejunum and the iron tablet happened to be trapped in one of the diverticula. In our one case listed as idiopathic perforation in the ileum did have a history of taking oral medication but a definitive correlation could not be established. One of our case took steroid for a long period of time for treatment of systemic lupus erythematosus (SLE). It was not clear to us that the cause of the perforation of jejunum might be caused by local drug reaction of steroid or by the vasculitis involved in SLE.[14,15]

Most of our 16 cases received resection of the perforated segment of the intestine at surgical exploration. Despite the present of severe local peritonitis, we experienced anastomotic leakage in only one case. Resection and end-to-end anastomosis was a safe procedure and did not require any longer operative time.[2] We prefer segmental resection over excision and oversewing of the perforation because of less compli-

cation and also to have sufficient tissue for histologic examination to elucidate the possible etiology of the perforation.

Nadkarni[3] advocated exteriorization of the affected intestine after excision and oversewing of the perforation in the situation of a rural country where patients usually came to hospital late due to problems of transportation. Such approach may be life saving and the exteriorized intestinal segment could be safely returned into the peritoneal cavity subsequently. We would regard this procedure as justifiable only for the cases with severe and late peritonitis.

References

1. Huttunen R, Kairaluoma ML, Mokka REM, Larmi TKI. Nontraunatic perforations of the small intestine. Surgery 1977; 81:184-8.
2. Farooki MA. Spontaneous perforation and rupture of the abdominal viscera. Intl Surg 1972; 57:957-60.
3. Nadkarni KM, Shetty SD, Kagzi RS, Pinto AC, Bhalerao RA. Small-bowel perforations. Arch Surg 1981; 116;53-7.
4. Badejo OA, Arigbabu AO. Operative treatment of typhoid perforation with peritoneal irrigation : A comparative study. Gut 1980; 21:141-5.
5. Asraf SM, Mital RN, Prakash A. Tuberculous bowel perforations. Am J Proctol 1976; 26:47-51.
6. Ihekwaba FN. Ascaris lumbricoides and perforation of the ileum : A critical review. Br J Surg 1979; 66:132-4.
7. Markowitz AM. The less common perforations of the small bowel. Ann Surg 1960; 152:240-57.
8. Hell K, Bachmann B, Erne P, Wegmann W. Dunndarmperforationen bei Systemerkrankungen. Helv Chir Acta 1976; 43:569-72.
9. Rajagopalan AE, Pickleman J. Free perforation of the small intestine. Ann Surg 1982; 196:576-9.
10. Lofgren RP, Rothe PR, Carlson GJ. Jejunal perforaton associated with slow-release potassium chloride therapy. South Med J 1982; 75:1154-5.
11. Treasure T. Ulceration of small intestine and slow-release potassium tablets. Br Med J 1975; 3:302.
12. Makey DA. Why prescribe enteric - coated potassium? Lancet 1977; 1:704.
13. Ingoldby CJH. Perforated jejunal diverticulum due to local iron toxicity. Br Med J 1977; 2:943-50.
14. Battle WM, Mclean GK, Brooks JJ, Herlinger H, Trotman BW. Spontaneous perforation of the small intestine due to scleroderma. Dig Dis Sci 1979; 24:80-4.
15. Smith HJ, Krupski WC. Spontaneous intestinal perforation in Schoenlein-Henoch purpura. South Med J 1980; 73:603.