

Spontaneous Small Bowel Perforations Due to Intestinal Tuberculosis Should Not Be Repaired by Simple Closure

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Intestinal tuberculosis is a major problem in many regions of the world. The incidence of it is rising in Western countries due to immigration from Third World countries and human immunodeficiency virus infection. The difference between the simple closure and resection and anastomosis was evaluated in this study. Retrospectively, 12 patients with intestinal tuberculosis diagnosed histopathologically among 50 patients with free intestinal perforations operated on between 1995 and 2003 at Turgut Ozal Medical Center were evaluated. Each patient underwent routine laboratory tests and radiologic studies. The most common symptoms of patients were abdominal pain, night sweats, and weight loss. Sites of perforation were ileum in 10 patients (multiple perforation in 4) and jejunum in 2 patients (both had multiple perforations). The perforation was closed by primary closure in 7 patients. Resection-anastomosis was performed in 5 patients. Leaks occurred in overall 3 of 7 patients with primary closure. Three of the 7 patients with leaks due to septicemia died. The mortality rate among all patients was 25%. Intestinal tuberculosis should be kept in mind as a cause in free intestinal perforations. Because of high mortality rate, the resection of the affected area and anastomosis may be the treatment of choice rather than primary closure. (*J GASTROINTEST SURG* 2005;9:514–517) © 2005 The Society for Surgery of the Alimentary Tract

KEY WORDS: Intestinal tuberculosis, perforation, treatment

Despite considerable progress made in therapy and prophylaxis, abdominal tuberculosis is still a major problem in many regions of the world.^{1,2} Intestinal tuberculosis incidence is increasing in the West due to immigration from Third World countries, an aging population, and an increasing incidence of human immunodeficiency virus infection.³ Free intestinal perforations occur in 1% to 15% of patients with abdominal tuberculosis.^{1,4,5}

The present study summarizes retrospectively the outcome of treatment modalities of 12 patients diagnosed with intestinal tuberculosis.

PATIENTS AND METHODS

We reviewed 50 patients operated on for free intestinal perforations due to various causes at Turgut Ozal Medical Center between February 1995 and

December 2003. Twelve (24%) of them were diagnosed with intestinal tuberculosis (other diagnoses were lymphoma in 7, Crohn's disease in 4, typhoid perforation in 2, foreign body in 4, Behçet disease in 3, intestinal tumor in 2, femoral hernia in 2, strangulated hernia in 4, ileus related to intestinal adhesion in 6, and delayed mesentery artery ischemia in 4 patients). Their clinical history, symptoms, and preoperative investigations and details of their management were analyzed. A complete blood cell count, liver and renal function tests, plain radiograph of the abdomen, chest radiograph, and abdominal ultrasonogram were performed. There was no previous tuberculosis history in 10 patients, but patient 6 had a history of operation due to intra-abdominal abscess 1 month earlier and the pathology of intestinal mesentery lymph node diagnosed as tuberculosis, and he received antituberculosis treatment for 25 days before perforation. Patient 12 also had a history of tuberculosis diagnosed

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pathologically from right cervical lymph nodes 4 months before perforation and treated with antituberculosis drugs. In addition, patient 3 had a history of Addison's disease, and patient 7 had a history of Crohn's disease by colonic biopsy. Steroid treatment was given to both of them.

RESULTS

The median age of 12 patients with intestinal tuberculosis (6 females, 6 males) was 45 years (range, 19–75 years). The laboratory and operative findings and outcome of patients are summarized in Table 1. The most common symptoms were acute abdominal pain, night sweats, weight loss, diarrhea, and vomiting. Physical examinations showed abdominal tenderness and muscular rigidity. Chest radiograph of all patients was normal. In 9 patients, abdominal ultrasonography showed free fluid in the rectovesical or Douglas pouch and between intestinal segments. All patients underwent laparotomy after nasogastric suction and appropriate fluid replacement. In most of the patients, the serosa of the small bowel and peritoneum showed miliary tubercles and were presented with purulent peritonitis at the same time. Patient 2 had multiple perforations in an 80-cm-long intestinal segment from 10 cm proximal to the ileocecal valve. Perforations were primarily closed. At postoperative day 7, a leakage was noticed and patient underwent a reoperation and intestinal resection, right hemicolectomy, and end-ileostomy. During the postoperative period, wound infection and evisceration were realized. The patient died from sepsis. Patient 3, who had a history of Addison's disease, was admitted to the emergency department with intestinal perforation and primary closure of the perforated area

was performed; postoperatively, steroid treatment was given. On postoperative day 5, leakage was noticed and end-ileostomy was performed at the repeat laparotomy. He was lost due to leakage and sepsis. Patient 7 had a previous colonic biopsy of Crohn's disease for 1 year. When he was hospitalized due to acute abdomen, laparotomy was performed. There was ileocecal mass, ileal stricture, and ileal perforation. Right hemicolectomy, ileal stricturoplasty, and simple closure were performed. The intestinal specimen was examined by a pathologist and diagnosed as representing Crohn's disease, and steroid treatment was given after the first operation. The patient was not examined for tuberculosis in the first resection because of previous diagnosis history. The leakage was realized at postoperative day 11, and the resection and end-ileostomy were performed by repeat operation. The histopathologic examination of the terminal ileum excised in the second operation showed intestinal tuberculosis affecting all layers of the diseased segment. Reexamination of the first specimen was also diagnosed as intestinal tuberculosis. Despite maximal medical support, the patient died from sepsis.

Patient 6, who had a history of an operation due to intra-abdominal abscess 1 month earlier, was presented to our clinics with acute abdomen and operated on with simple closure. On postoperative day 13, an enterocutaneous fistula formed, the patient underwent repeat laparotomy, and repair of perforation and loop ileostomy were performed. In all patients, histopathologic examination of the specimen of resected bowel, material from the mesenteric edge of the perforation, or mesenteric lymph nodes revealed caseating granulomas surrounded by epithelial cells and Langerhans giant cells. Acid-fast bacilli

Table 1. Laboratory and operative findings and outcome of patients

Patient	Age/gender	Radiology	Perforation site/type	Reoperation	Outcome
Simple closure					
1	30/F	Free air	Ileum	No	Discharged well
2	24/F	Air-fluid levels	Ileum/multiple	Yes	Leak, died
3	75/M	Free air	Ileum/multiple	Yes	Leak, died
4	70/M	Air-fluid levels	Ileum	No	Discharged well
5	20/F	Free air	Ileum	No	Discharged well
6	20/F	Free air	Ileum	Yes	Discharged well
7	27/F	Free air	Ileum	Yes	Leak, died
Resection and anastomosis					
8	65/M	Air-fluid levels	Jejunum/multiple	No	Discharged well
9	36/F	Free air	Jejunum/multiple	No	Discharged well
10	64/M	Air-fluid levels	Ileum/multiple	No	Discharged well
11	64/M	Air-fluid levels	Ileum/multiple	No	Discharged well
12	35/M	Air-fluid levels	Ileum	No	Discharged well

were demonstrated by Ziehl-Nielsen staining in 12 patients. We treated all patients with isoniazid 300 mg/day and rifampin 600 mg/day for 12 months and pyrazinamide 1.5 g/day and ethambutol 1 g/day were added to treatment for the first 2 months. All patients were symptom free after 12 months of treatment.

DISCUSSION

Although most patients with intestinal tuberculosis respond favorably to medical therapy,⁶ surgery should be reserved for complications such as obstruction, free perforation, confined perforation with abscess fistula, and massive bleeding.^{5,7,8}

As reported in previous studies, intestinal perforation may occur after antituberculosis treatment.^{9,10} In our study, two patients had antituberculosis treatment before perforation. Free intestinal perforations occur in 1% to 15% of patients with abdominal tuberculosis.^{1,4,5} Clinical diagnosis has been reported to be accurate in less than 50% of patients even in endemic countries like India.¹¹

The main symptoms of intestinal tuberculosis are abdominal pain (85%), weight loss (66%), diarrhea (20%), and other symptoms, including nausea, vomiting, and melena.^{6,12} Abdominal pain, night sweats, and weight loss were the main symptoms in our patients. Most radiologic images were not diagnostic. Subdiaphragmatic free air has been reported as occurring in 25% to 71% in the literature,^{1,2,13,14} but it was detected as 50% in the present study. Usually, multiple air-fluid levels are seen with intestinal obstruction.¹ In our study, they were seen in six patients.

The majority of the perforations are solitary and occur proximal to the site of the stricture.¹⁵ In 10 of our 12 patients, perforations were on the distal ileum, as mentioned in the other reports.^{4,14,15} The multiple-perforation rate was reported as 10% to 40% in previous articles,¹⁵⁻¹⁷ but it was 50% in our study. The most effective treatment of intestinal tuberculosis is resection of the diseased segment with end-to-end anastomosis.^{12,14} We performed resection and end-to-end anastomosis in five patients. Simple closure may occasionally be attended successfully,¹² but Kakar et al.¹⁵ did not recommend simple closure because of the high incidence of leak and fecal fistula formation. The overall mortality of perforation has ranged from 25% to 45%^{2,14,15}; the mortality in our study was 25%.

Early diagnosis is very important. If surgical treatment is delayed, rapid progression of peritonitis and electrolyte imbalance and features of toxemia develop rapidly and worsen the prognosis. The important factors causing high morbidity and mortality in our

patients were delayed operation, presence of multiple perforations, primary closure of perforations, leak from operated area, and steroid treatment. When we compared patients according to surgical technique, the cause of death in the simple closure group was primary closure of multiple perforations in patients 2 and 3 and steroid treatment in patient 7 due to misdiagnosis with Crohn's disease.

The excised specimen should be sent for histologic examination, and a segment of diseased tissue or lymph node should be cultured for mycobacterium. This is particularly important in the elderly, in whom peritoneal tubercles may be diagnosed as disseminated malignant disease. Also, one should keep in mind that inflammatory bowel diseases (especially Crohn's disease) might interfere with intestinal tuberculosis in pathologic examination. Another important point for tuberculosis is the preventive measurements. Because the spread of intestinal tuberculosis is very low, classic preventive methods are sufficient to prevent the spread of tuberculosis to hospital and physician personnel during laparotomy and the treatment phase.

CONCLUSION

Intestinal tuberculosis might be kept in mind as a cause of free intestinal perforations. Because of a high mortality rate, the resection of the affected area and anastomosis may be the treatment of choice as surgical modality rather than primary closure. Also, patients have to be examined for intestinal tuberculosis in addition to inflammatory bowel disease (especially Crohn's) to avert misdiagnosis.

REFERENCES

1. Bhansali SK. Abdominal tuberculosis. Experiences with 300 cases. *Am J Gastroenterol* 1977;67:324-337.
2. Gilinsky NH, Voigt MD, Bass DH, Marks IN. Tuberculous perforation of the bowel: A report of 8 cases. *S Afr Med J* 1986;70:44-46.
3. Lingefelser T, Zak J, Marks IN, Steyn E, Halkett J, Price SK. Abdominal tuberculosis: Still a potentially lethal disease. *Am J Gastroenterol* 1993;88:744-750.
4. Bhansali SK, Desai AN, Dhaboowala CB. Tuberculous perforation of the small intestine. A clinical analysis of 19 cases. *J Assoc Physicians India* 1968;16:351-355.
5. Schulze K, Warner HA, Murray D. Intestinal tuberculosis: Experience at a Canadian teaching institution. *Am J Med* 1977;63:735-745.
6. Marshall JB. Tuberculosis of the gastrointestinal tract and peritoneum. *Am J Gastroenterol* 1993;88:989-999.
7. Sherman S, Rohwedder JJ, Ravikrishnan KP, Weg JG. Tuberculous enteritis and peritonitis. Report of 36 general hospital cases. *Arch Intern Med* 1980;140:506-508.
8. Chen WS, Leu SY, Hsu H, Lin JK, Lin TC. Trend of large bowel tuberculosis and the relation with pulmonary tuberculosis. *Dis Colon Rectum* 1992;35:189-192.

9. Scriven JM, Berry D. Multiple small bowel perforations in a patient on treatment of tuberculosis. *J R Coll Surg Edinb* 1996;41:353.
10. Anand BS, Nanda R, Sachdev GK. Response of tuberculous stricture to antituberculous treatment. *Gut* 1988;29:62–69.
11. Kapoor VK. Abdominal tuberculosis: The Indian contribution. *Ind J Gastroenterol* 1998;17:141–147.
12. Aston NO, de Costa AM. Abdominal tuberculosis. *Br J Clin Pract* 1990;44:58–61, 63.
13. Eggleston FC, Deodhar MC, Kumar A. Tuberculous perforation of the bowel—results in 21 cases. *Trop Gastroenterol* 1983;4:164–167.
14. Talwar S, Talwar R, Prasad P. Tuberculous perforations of the small intestine. *Int J Clin Pract* 1999;53:514–518.
15. Kakar A, Aranya RC, Nair SK. Acute perforation of small intestine due to tuberculosis. *Aust N Z J Surg* 1983;53:381–383.
16. Wig JD, Malik AK, Chaudhary A, Gupta NM. Free perforation of tuberculous ulcers of the small bowel. *Ind J Gastroenterol* 1985;4:259–261.
17. Veeragandham RS, Lynch FP, Canty TG, Collins DL, Danker WM. Abdominal tuberculosis in children: Review of 26 cases. *J Pediatr Surg* 1996;31:170–176.