□ Case report □

A case of intestinal tuberculosis complicated by miliary tuberculosis

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Intestinal tuberculosis presents with nonspecific and variable clinical manifestations. It is rarely seen in current clinical practice and the diagnosis may be missed or confused with many other disorders such as Crohns disease and intestinal neoplasms. The route of infection by tuberculous enteritis is variable and the treatment regimens used for treating pulmonary tuberculosis are generally effective for tuberculous enteritis as well. Uncomplicated tuberculous enteritis can be managed with a nine to 12- month course of antituberculous chemotherapy. If not treated early, the prognosis for intestinal tuberculosis is poor, with an overall mortality of between 19 percent and 38 percent. However, 90 percent of patients will respond to medical therapy alone if started early. Therefore, early detection and treatment is essential. Here we report a case of intestinal tuberculosis secondary to miliary tuberculosis. **(Korean J Pediatr 2006;49:1227-1231)**

Key Words : Tuberculosis, Gastrointestinal; Child, preschool

Introduction

Intestinal tuberculosis has been known to exist since antiquity[1, 3]. Since 1950, intestinal tuberculosis has been rarely seen due to the availability of effective chemotherapy, pasteurization of milk and the eradication of the bovine strain of the Mycobacterium species[2, 3]. Tuberculous enteritis is the most common extrapulmonary manifestation of pulmonary tuberculosis; it occurs in only 15-20 percent of patients with active pulmonary tuberculosis[1]. Since intestinal tuberculosis in children is rare in current medical practice and the clinical manifestations are non specific and vary, the diagnosis of intestinal tuberculosis is often missed and/or confused with many other diseases such as Crohn's disease and intestinal neoplasms[1, 2, 3, 5]. If recognized and treated early, intestinal tuberculosis has a good prognosis; however, it has a high associated mortality rate if not treated early. Intestinal tuberculosis continues to be reported in developing and impoverished countries around the world. Therefore, physicians should not overlook the possibility of intestinal tuberculosis in treatment of patients with abdominal signs and symptoms. We report a case of intestinal tuberculosis complicated by miliary tuberculosis that was treated successfully in a five-year-old boy who presented with intermittent abdominal pain and fever.

접수 : 2006년 7월 25일, 승인 : 2006년 9월 12일
본 논문의 요지는 2004년도 제55차 대한소아과학회 추계학술대회에서 포스터 발표되었음.
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Case Report

A five-year-old male presented to the emergency room with a history of abdominal pain and increasing severe abdominal distension over two weeks. Three weeks before admission, he had been examined by a local medical practitioner for a one week history of cough, productive sputum and rhinorrhea. After treatment, his symptoms were improved; however, from about two weeks before admission to our service, he had intermittent fever, abdominal pain and abdominal distension. From about two days before admission, abdominal pain and distension increased in severity. The history also included night sweats and weight loss (1.5 kg) for about one month. He was vaccinated

against BCG. His past medical and surgical histories were not significant. His father had pulmonary tuberculosis 15 years ago and was cured completely with antituberculous chemotherapy for 12 months. On physical examination, the patient appeared acutely ill. Vital signs revealed a blood pressure of 110/70 mmHg, pulse 98/min, respiratory rate 30/min and a temperature of 38℃. Neurologic, cardiovascular and pulmonary examinations revealed no abnormalities. His abdomen was somewhat distended and diffusely tender with rebound. There was no palpable mass or hepatosplenomegaly, and the bowel sounds were decreased. Laboratory studies revealed a hemoglobin of 10.6 g/dL and hematocrit of 30.7 percent. His white blood cell count was 9,200/μL with a normal differential. Serum electrolytes and glucose were normal (Na/K 137/3.8 mEq/L, BUN/Cr 10/0.5 mg/dL and AST/ALT 41/14 IU/L). His PPD 2TU was negative. Stool occult blood was negative. Chest radiographs revealed a multiple snowflake like appearance in all lung fields; abdominal radiographs showed intestinal obstruction and patterns suggestive of edematous intestinal mucosa. (Fig. 1A, 1B)

The clinical impression was miliary tuberculosis and panperitonitis. An emergency exploratory laparotomy was performed. Multiple whitish nodules and adhesions of abdominal wall layers, small bowel and appendix were observed. (Fig. 2A, 2B, 2C)

Peritoneal lavage and appendectomy were carried out. Ulcerated hypertrophic lesions were found in the lumen of appendix. Microscopic findings of the incised appendix showed several granulomatous and caseous necrotic lesions which were compatible with the diagnosis of tuberculosis (Fig. 3).

Seven days after surgery the patient could take food by mouth. Antituberculous agents including: isoniazid (INH), rifampin (RFP), pyrazinamide (PZA), and ethambutol (EMB), were started. At nine days postoperatively corticosteroids were added. The clinical findings improved rapidly. Sputum culture for acid fast bacillus (AFB) and gastric secretions,

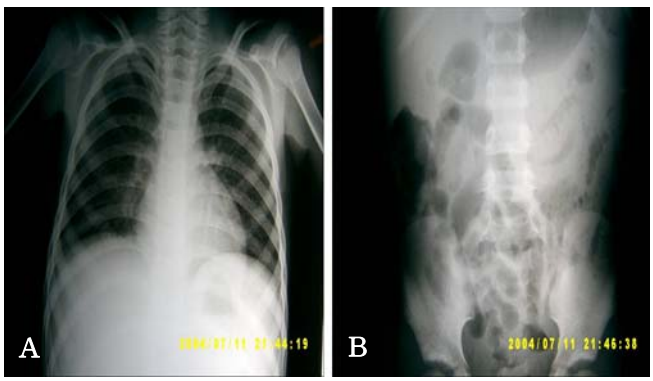

Fig. 1. (A) Plain film of the chest shows a snow flake appearance in both lungs. (B) Plain film of the abdomen demonstrates paralytic ileus with widening of the interloop distance.

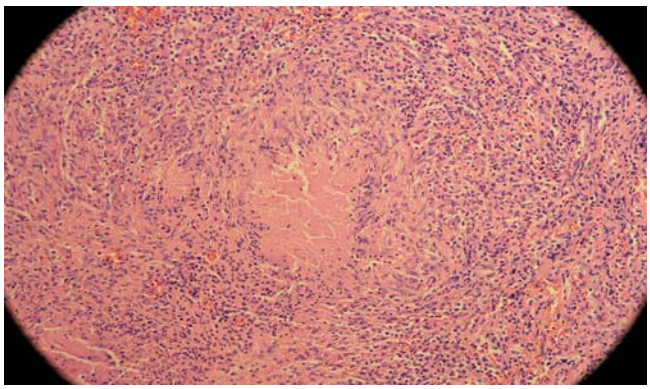

Fig. 3. Microscopic findings of the removed appendix showed chronic granulomatous inflam-mation with caseous necrosis around epithelioid histiocytes (HE stain×200).

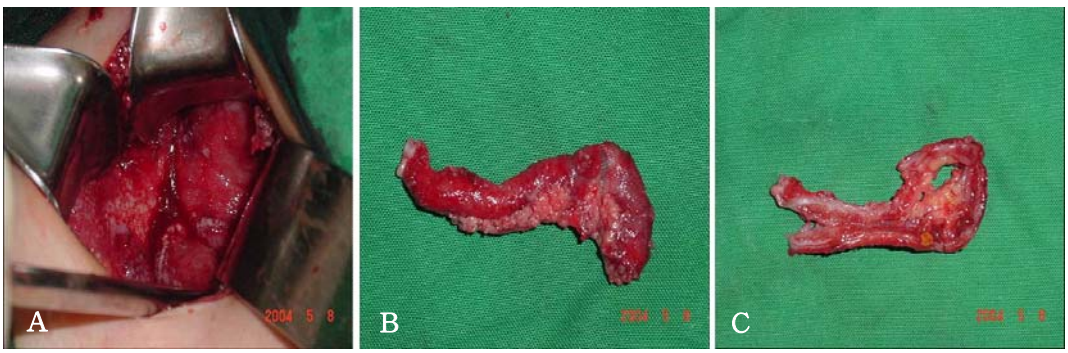

Fig. 2. (A), (B) Gross findings from the operation site; removed appendix demonstrate yellow milirary lesions nodules from the muscular wall and surface of the appendix. (C) Ulcerated hypertrophic lesions were found in the lumen of the appendix.

Polymerase Chain Reaction (PCR) for AFB and appendiceal tissue culture for AFB were positive; therefore, intestinal tuberculosis complicated by miliary tuberculosis was confirmed. Twenty one days after admission, the patient was discharged without any complications and treated as an outpatient for 12 months.

Discussion

Since the advent of effective antituberculous chemotherapy in the 1940s, the frequency and severity of intestinal tuberculosis have markedly decreased[3]. The preoperative diagnosis of tuberculous enteritis is often missed due to its rare occurrence and its non specific presentation[4]. Although tuberculosis may involve any region of the gastrointestinal tract (from esophagus to anus)[3], the most common site is the ileocecal and jejuno-ileal areas[4]. The localization of infection to the ileocecal region is thought to be due to the static environment of well-digested intestinal contents in an area of active absorption[4, 7]. Tuberculous enteritis is the most common extrapulmonary manifestation of active pulmonary tuberculosis[3, 4, 10]. The severity of lung involvement appears to correlate directly with the incidence of clinically identifiable enteric involvement. However, fewer than half of all patients with tuberculous enteritis have chest radiographic evidence of pulmonary disease. The routes of infection for tuberculous enteritis include: swallowing of infected sputum in active pulmonary tuberculosis, ingestion of contagious milk, hematogenous spread from active pulmonary tuberculosis or miliary tuberculosis and direct extension from adjacent organs[3, 8]. Microscopic findings of lesions show caseating granulomatosis, the histological hallmark of tuberculosis[3]. The symptoms associated with tuberculous enteritis are non specific and variable; lower abdominal pain is the most common symptom and is present in over 85 percent of patients[1, 3, 4, 9, 10]. The diagnosis of tuberculous enteritis relies on a high index of clinical suspicion. There are several useful diagnostic studies available to confirm tuberculous enteritis they include: roentgenograms of the chest; tuberculous skin testing; roentgenographic contrast studies of the intestinal tract; culture of all excrement, appropriate body fluids and suspicious tissue; histological study of resected tissue; and laparoscopy and colonoscopy[3, 4]. A positive tuberculin skin test and the presence of caseating granulomas are adequate evidence for the diagnosis of tuberculous enteritis[5, 7]. A negative tuberculin skin test reduces the likelihood of tuberculosis but does not exclude it[3]: some affected patients are false negative. They may be immunologically hyporesponsive because of severe illness and malnutrition[3]. Chest and abdominal radiographs are helpful for the diagnosis. However, a negative chest radiograph cannot exclude tuberculous enteritis; up to 20 percent of patients with tuberculous enteritis have negative chest films[5, 11]. For laboratory testing, serum adenosine deaminase, acid-fast smears in sputum and gastric secretions (positive in 20-30% of patients), culture of sputum and gastric secretions (isolated from only 30-40% of patients), PCR (sensitivity 25-83%, specificity 80-100%), serologic methods such as enzyme-linked immunosorbant assay (ELISA), and the soluable antigen fluorescent antibody test (SAFA) also help support a diagnosis. In addition, paracentesis with acid-fast smears and culture, laparoscopy with biopsy, needle biopsy of the peritoneum, diagnostic laparotomy may also be used for diagnosis[1, 5]. But histopathological confirmation in abdominal tuberculosis is difficult due to suboptimal noninvasive access to the involved area[4]. Recently laparoscopy and colonoscopy provide semi-invasive access to the peritoneum, large intestine and ileocecal area[4]. Laparoscopy is safe and helps in the diagnosis peritoneal as well as intestinal tuberculosis[4]. Disease entities that by their symptoms, signs, and radiographic, morphologic, and histological features must be differentiated from tuberculous enteritis include: in the small bowel: Crohn's disease, lymphoma, vascular insufficiency and fungal infection[3]; at the ileocecal junction and colon : Crohn's disease, ulcerative colitis, cancer, lymphoma, vascular occlusive disease, sarcoidosis, periappendiceal abscess, fungal infection, actinomycosis and ameboma[3]; at the rectosigmoid: Crohn's disease, ulcerative colitis, cancer, ischemic proctocolitis, fungal infection, actinomycosis, amebomaschistosomiasis, lymphogranuloma venereum, diverticulitis, foreign body and endometriosis[3]. Complications of tuberculous enteritis include: obstruction, fistula formation, confined perforation with abscess, hemorrhage, enterolithiasis, diverticula and perforation with free air and generalized peritonitis[3]. Obstruction of the small or large bowel is common and has been reported in 10% to 60% of cases[3, 11, 12]. Obstruction may develop in several ways: contraction of collagenous tissue following healing of circumferential tuberculous ulcers; encroachment of the thickened bowel wall upon the lumen as a consequence of hypertrophy; kinking or constriction of the intestine by intraperi-

toneal adhesions; and retraction of the mesentery and shortening of the right colon by scar tissue with resultant kinking and obstruction at the ileocecal junction. Fistulas develop in 1% to 33% of patients[3, 12, 16]. Obstruction may develop between loops of bowel or between the abdominal wall, urinary bladder or female adnexal organs. Perforation with free air peritonitis develops in 1% to 26% of patients, with most occurring in the 2% to 7% range[3, 12, 13]; over 90% are located in the distal 10cm of ileum or in the appendix. Confined perforation with abscess formation is an occasional complication of tuberculous enteritis, although its frequency is uncertain[3, 15]. Intra-abdominal abscess may also be caused by rupture of caseous lymph nodes[3, 13, 16]. Massive hemorrhage, enterolithiasis, and traction diverticula are rare complications. Malnutrition is a frequent problem. Multiple factors can contribute to protein-calorie malnutrition including: anorexia, inadequate food intake (often on a background of poverty), and malabsorption.

The preferred treatment of tuberculous enteritis is with antituberculous drugs; surgery is reserved for cases with complications[1, 4]. Drug regimens used for treating pulmonary tuberculosis are also effective for extrapulmonary tuberculosis[1, 4]. A commonly used, effective treatment regimen is isoniazid (INH) and RFP daily for nine months[1, 4]. Alternatively, INH and RFP can be given daily for the first two months and then on a twice-weekly schedule for seven additional months[1, 4]. For patients in whom drug resistance is a concern, pyrazinamide plus streptomycin or ethambutol is added until the results of a drug sensitivity test become available. Increasingly, six month regimens are being used to treat active tuberculosis with INH, RFP and PZA given daily for two months, followed by INH, and PZA daily or twice weekly for four more months[1, 4]. However, for generally uncomplicated tuberculous enteritis a nine to 12- month course of antituberculous chemotherapy is indicated. It is also suggested that EMB or streptomycin be included in the initial regimen until the results of the drug susceptibility test are available; unless there is little possibility of resistance to INH[1, 4]. Current information suggests that about 90% of patients with GI tuberculosis and an even higher percentage of patients with peritoneal tuberculosis will respond to medical therapy alone if it is started early[1, 17]. Good nutrition also plays an important role. Corticosteroids have also been shown to be useful for treatment in some children with tuberculous disease. Prednisone, 1-2 mg/kg/24hr in one to two divided does orally for four to six weeks, may be used for severe miliary tuberculosis, endobronchial tuberculosis, tuberculosis pericardial effusion and tuberculous pleural effusion. The indications for surgery in patients with intestinal tuberculosis are for the most part limited to cases with disease complications such as: perforation with free air from an ulcer, confined perforation with abscess or fistula formation, obstruction caused by stenosis or kinking of the bowel and massive hemorrhage[3]. The prognosis for patients with intestinal tuberculosis is poor, with an overall mortality of between 19% and 38%[6]. However, 90% of patients will respond to medical therapy alone if it is started early. This case illustrates the need for a high-index of suspicion for the diagnosis of tuberculosis enteritis. Tuberculous enteritis should be considered in the differential diagnosis of patients presenting with abdominal symptoms especially with a history of past or current pulmonary tuberculosis. The case we present had intestinal tuberculosis complicated by military tuberculosis. The diagnosis of intestinal tuberculosis is confirmed on the basis of the emergency exploratory laparotomy and biopsy. The patient was treated by antituberculosis agents and corticosteroids. Twenty one days after admission, the patient was discharged without any complications and treated as an outpatient for 12 months.

한 글 요 약

파종성 폐결핵을 가진 남아에서 합병된 장결핵 1례

한일병원 소아과

정민국 · 최정호 · 유정석 · 안승인
이 진 · 김봉림 · 김정아 · 장진근

소아에 있어서 복부 및 위장관 결핵은 매우 드문 질환이며 임상증상도 복통, 설사, 체중감소, 발열 등 비특이적이어서 크론병, 맹장염 및 다른 위장관 질환의 증상과 크게 다르지 않아 복부 질환의 진단에 있어 간과하기 쉽다. 특히 결핵성 장염은 사망률이 19-38%에 이르지만 조기에 진단, 치료하면 예후가 좋아 조기 진단의 중요성이 높다. 저자들은 복부팽만, 발열을 주소로 내원한 환아에게 속립성 폐결핵에 합병된 결핵성 장염 1례를 경험하였기에 보고하는 바이며, 아직도 결핵 유병율이 높은 우리나라에서는 위장관 증세를 호소하는 환아에게 위장관 결핵의 가능성을 고려해야 하겠다.

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