GASTROINTESTINAL TUBERCULOSIS AS THE CAUSE OF DIGESTIVE TRACT PERFORATION

Gruźlica jelit jako przyczyna perforacji przewodu pokarmowego

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Abstract

Tuberculous bowel perforation is a rare yet severe complication of tuberculosis. Tuberculous lesions most commonly localize in the ileocecal region, leading to ulcers, mucosal hypertrophy, strictures, and intestinal perforation in extreme cases. This article presents a case of a 46-year-old patient admitted with abdominal pain, nausea, vomiting, and cessation of flatus and bowel movements. Computed tomography raised a suspicion of prepyloric perforation. Laparotomy revealed ileal perforation, approximately 15 cm proximal to the ileocecal valve. The affected bowel segment was resected, and a two-layer side-to-side anastomosis was performed. Despite effective surgical treatment and intensive postoperative care, the patient died on postoperative day 9. Autopsy revealed advanced caseating granulomas of tuberculosis.

Streszczenie

Gruźlica jelit jako przyczyna perforacji przewodu pokarmowego stanowi rzadkie, lecz istotne powikłanie gruźlicy. Ogniska gruźlicze najczęściej lokalizują się w okolicy krętniczo-kątniczej i skutkują powstaniem owrzodzeń, przerostu błony śluzowej, zwężenia, a w skrajnych przypadkach perforacją jelita. W artykule opisano przypadek 46-letniego pacjenta z bólami brzucha, nudnościami, wymiotami i zatrzymaniem gazów oraz stolca. Na podstawie wyniku tomografii komputerowej wysnuto podejrzenie perforacji w okolicy przedodźwiernikowej. W trakcie laparotomii odkryto przedziurawienie jelita krętego około 15 cm przed zastawką krętniczo-kątniczą, następnie resekowano jelito z zespoleniem dwuwarstwowym bok do boku. Mimo skutecznego leczenia chirurgicznego i intensywnej opieki pooperacyjnej pacjent zmarł w 9. dobie po operacji. Badanie autopsyjne ujawniło zaawansowaną gruźlicę serowaciejącą.

Keywords: intestinal perforation; gastrointestinal tuberculosis

Słowa kluczowe: perforacja przewodu pokarmowego; gruźlica jelit

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Introduction

Gastrointestinal tuberculosis (GITB) is very rare, accounting for only 2% of all TB cases worldwide [1]. It occurs by the ingestion of infected sputum or as a result of blood-borne infection. Although any part of the digestive tract may be affected, ileocecal involvement is observed in 1/3 of cases [2]. Appendicitis or intestinal obstruction may be the initial diagnosis [1, 3]. The disease develops slowly and insidiously [2]. Patients experience signs such as subfebrile temperature, night sweats, weight loss, diarrhoea, vomiting and abdominal pain, which may prompt diagnosis for inflammatory bowel disease (IBD), colon cancer, lymphoma, and gastritis [2, 3]. Physical examination reveals abdominal distension and tenderness in 50% of cases. Ascites, acute abdomen, abdominal organomegaly and palpable masses, as well as, in rare cases, abscesses and fistulas may be found. GI symptoms may be accompanied by episodes of cough or dyspnoea [2].

GITB causes mucosal ulceration or hypertrophy leading to intestinal stenosis and obstruction. Some patients may develop perforation after ingesting sputum containing a large dose of virulent bacilli, which usually involves the antimesenteric edge of the terminal ileum. Although advances in surgical approaches to manage bowel perfo-

ration have significantly improved treatment outcomes, it is still fatal in many cases, especially in malnourished patients [4].

The diagnosis of extrapulmonary TB poses a major diagnostic challenge due to the difficulty in collecting specimens from the affected sites and their paucibacillary nature. Histopathology is important in such cases; however, tuberculosis-like granulomas may occur in many clinical conditions, and not all TB cases are caseating [2, 3].

Causal treatment involves antituberculosis chemotherapeutics. Surgical interventions should be used in patients who do not respond to antibiotic therapy and in the case of severe complications such as obstruction, perforation, abscesses and fistulas [1].

Case report

A 46-year-old male patient was admitted to hospital as an emergency case due to severe diffuse abdominal pain accompanied by nausea, an episode of vomiting, and gas and faecal retention since the day before admission. The patient also reported fever, lack of appetite, weight loss, dyspnoea, and cough with expectoration of yellow sputum. He reported no history of chronic diseases, and denied alcohol consumption. He smoked two cigarettes a day.

On admission, the patient was in a serious general condition. Emaciation, low muscle mass, and profound malnutrition were found on physical examination. Abdominal examination revealed reduced peristalsis, board-like abdominal rigidity, tenderness on palpation, and peritoneal symptoms. Auscultation found asymmetrical vesicular murmur with right-sided bronchial murmur. Quiet heart sounds, regular heart rate. Other than that, no deviations from normal were found.

Laboratory workup on admission found mild normocytic anaemia (Hb 12.0 g/dL, MVC 82.9 fL) and high C-reactive protein (CRP 212.7 mg/L). An AP chest X-ray showed medium- and coarse patchy opacities, most likely corresponding to post-specific changes, emphysematous lung apices, and a small amount of fluid in the right pleural cavity. Supine abdominal X-ray showed dilated bowel loops in the mid-abdomen and small pelvis (Fig. 1). Due to the patient's serious condition, with clinical symptoms of GI perforation, the diagnosis was extended to include non-contrast-enhanced abdominal and pelvic computed tomography (CT). A large volume of abdominal gas and very dense intraperitoneal free fluid with gas bubbles were detected. The anterior wall of gastric antrum was considered to be the probable site of GI perforation (Fig. 2).

The patient was qualified for surgical treatment. Empirical antibiotic therapy (cefuroxime, metronidazole) was started. The procedure was performed under general endotracheal anaesthesia.

An upper median incision was performed to open the abdominal cavity. Laparotomy found an enlarged, macroscopically normal liver and some cloudy fluid, which was aspirated. The stomach and duodenum were palpated and investigated visually. No abnormalities were found. The incision of the integuments was extended. The small bowel was investigated, and an ileal perforation was found, approximately 15 cm proximal to the ileocecal valve. The intestine was resected within the margin of macroscopically healthy tissue. A two-layer side-to-side bowel anastomosis was performed, and then checked for patency, tightness and blood supply. The peritoneal cavity was thoroughly washed. After postoperative count of dressing materials and instruments, anti-dehiscence sutures were placed, the incision was closed layer-by-layer, and dressings were applied.

The patient's postoperative condition was moderately severe (Fig. 3). There was a persistent cough with expectoration of a large amount of secretion and lazy peristalsis. The GI function did not normalise. HIV screening was performed and was negative. Laboratory workup revealed signs of malnutrition with protein deficiency, lipid and ionic disorders. The patient was qualified for parenteral nutrition. The volume of the nutritional mixture was gradually increased. He received 400 mL (approx. 330 kcal), 700 mL (486 kcal), and 1200 mL (830 kcal) on subsequent days 1, 2 and 3. On the day that followed, the patient was in a serious general condition, without logi-

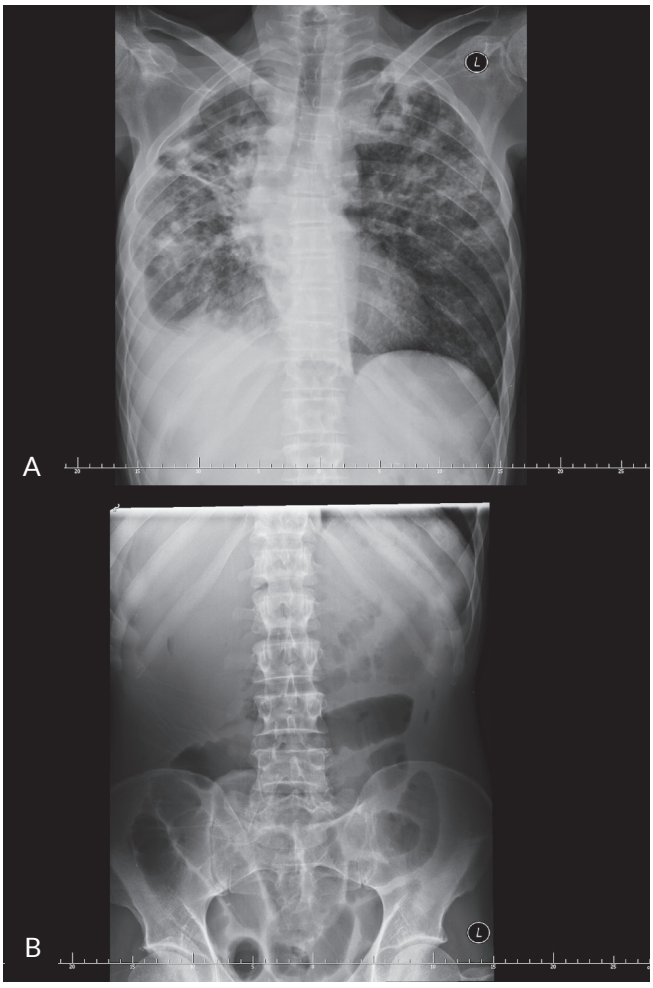

Figure 1. Plain chest (**A**) and abdominal (**B**) radiograph taken in the supine position on admission showing medium- and coarse patchy opacities, probably corresponding to post-specific changes, emphysematous clearings at the apices of both lungs, and a small amount of pleural fluid (**A**). Dilated bowel loops in the mid-abdomen and pelvis were also described (**B**)

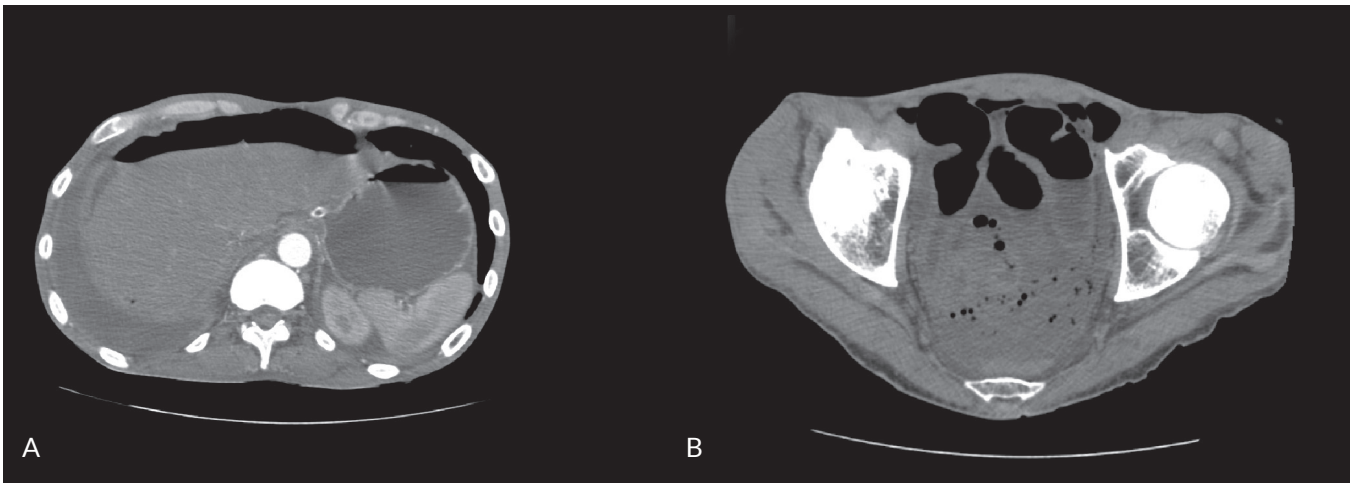

Figure 2. Non-contrast-enhanced CT on admission. A large volume of free gas in the abdominal cavity (**A**). In the pelvis, free purulent intraperitoneal fluid with gas bubbles (**B**)

cal contact and with increasing respiratory failure. Bradycardia and cardiac arrest occurred. Cardiopulmonary resuscitation was successfully performed. The patient was transferred to the intensive care unit, where pressor amines were used and antibiotic therapy was modified based on the obtained cultures: *Candida albicans* from the peritoneal fluid collected intraoperatively (Fluconazole) and *Stenotrophomonas maltophilia* from the respiratory tract (Biseptol). Parenteral nutrition was continued. Despite intensive treatment, the patient's condition deteriorated, with cardiac arrhythmias, coagulation disorders, and anaemia requiring packed red blood cell (RBC) transfusion. Hypotension persisted despite infusion of pressor amines. Death was confirmed on postoperative day 9. An autopsy was done. Advanced caseous tuberculosis, focal lung abscesses and isolated small bowel ulcers, most likely of tuberculous aetiology, were found. Status post segmental resection of the small bowel, well-sealed anastomosis.

Discussion

The incidence of tuberculosis ranged from 9.7/100,000 population in 2021 to 19.6/100,000 in 2012 in Poland. It increased to 11.4/100,000 in 2022, which means that 4,314 new TB cases were registered. Patients with simultaneous TB involvement of the lungs and other organs are registered as pulmonary TB, with 13 such cases recorded in 2022. Additionally, 10 patients were diagnosed with focal tuberculosis limited to the gastrointestinal tract. Men accounted for 73.8% of all TB cases [5].

As mentioned earlier, although TB foci can locate along the entire GI length, the terminal ileum is most commonly involved [2]. Abundant lymphatic tissue and functional slowing of intestinal transit are observed in the area of the ileocecal valve, which increases the time of mucosal adhesion of the ingested bacilli that move with the peristaltic wave. The bacilli penetrate the mucosa and cause local inflammation, which results in mucosal and serous thickening, and abscess formation, which may consequently lead to perforation and fibrosis [6].

Patients diagnosed with GITB most often present with abdominal pain (74%), nausea and vomiting (31%), altered bowel habits (24%), and symptoms resulting from the ongoing inflammatory process, such as weight loss (59%), fever (19%), and night sweats (18%). Some patients may also experience cough and dyspnoea, with most of them reporting more than one of the above symptoms [3, 7]. Case reports show that patients seek medical attention late [2], reporting with abdominal pain, fever, weight loss, diarrhoea or constipation, and a history of cough or dys-

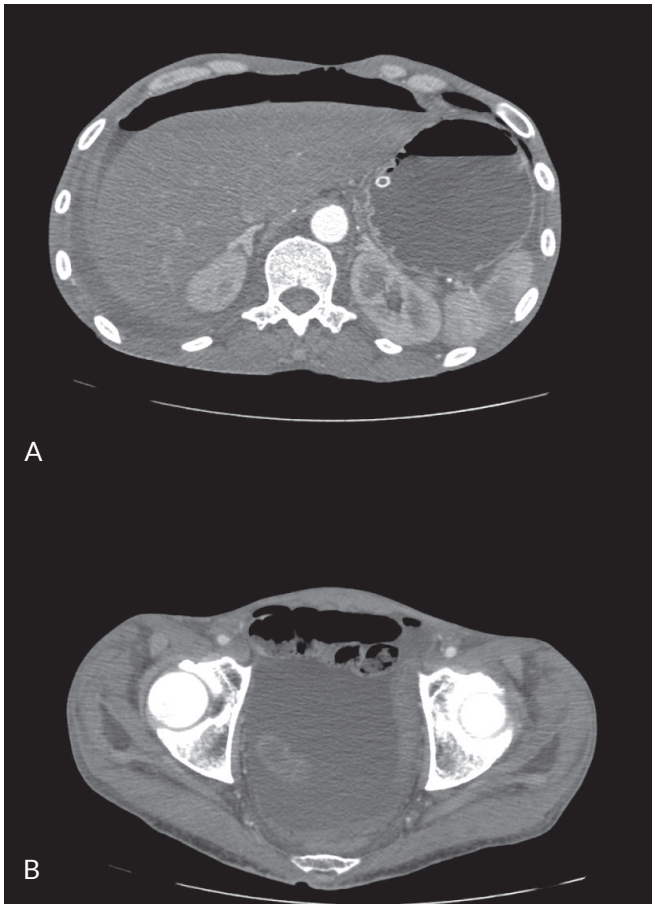

Figure 3. Follow-up CT on postoperative day 2. Free gas at the anterior abdominal wall (residue after recent surgery) (**A**), and free fluid in the abdominal cavity, mainly between the pelvic loops (**B**)

pnoea [7, 8]. They also report due to symptom exacerbation in the period immediately preceding admission [9]. Serious GI complications may be the first manifestation of the disease, and a case of asymptomatic perforation has also been reported [8]. CT may show thickening of the intestinal wall and/or peritoneum, intra-abdominal lymphadenopathy, and fluid collections. Magnetic resonance imaging (MRI) may also show intraabdominal fistulas and ileitis, while ascites or thickening of the intestinal wall can be observed on ultrasound [7].

Gastrointestinal perforation usually develops as a complication of tuberculosis shortly after the initiation of antituberculosis treatment [4], or as a consequence of surgical intervention [10]. Regardless of the cause, GI perforation is associated with approximately 11% mortality, which depends on the patient's clinical status, especially shock on admission, elevated creatinine and severe leukocytosis [11]. In Poland, TB mortality rates were 1.2/100,000 population in 2022, with 426 and 14 fatal cases due to pulmonary and extrapulmonary TB, respectively. At the same time, TB deaths account for 0.1% of all deaths and 20.1% of deaths caused by infectious and parasitic diseases [5]. Due to the small research sample, it is not possible to draw conclusions about the coexistence of TB and perforation or their mutual influence on the risk of death, with long-term outcomes depending on the individual clinical case. There is no doubt, however, that survival prognosis is poor in such cases [10, 12].

Conclusions

Due to the poor prognosis for tuberculosis complicated with perforation, especially when perforation is a manifestation of the disease, measures to improve patient's health status and eliminate the risk of death should be directed at the earliest possible diagnosis of the disease. Diagnosis of asymptomatic tuberculosis is, however, extremely difficult, as the lesions resemble those seen in inflammatory and neoplastic processes.

Considering GITB in patients presenting with abdominal symptoms already at the time of hospital admission and paying special attention to the possible coexistence of respiratory symptoms could contribute to therapeutic efficacy.

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