

Received: 2015.05.21  
Accepted: 2015.06.29  
Published: 2015.10.09

ISSN 1941-5923  
© Am J Case Rep, 2015; 16: 719-722  
DOI: 10.12659/AJCR.894723

## Perforated Intestinal Tuberculosis in a Non-AIDS Immunocompromised Patient

Authors' Contribution:  
Study Design A  
Data Collection B  
Statistical Analysis C  
Data Interpretation D  
Manuscript Preparation E  
Literature Search F  
Funds Collection G

ABCDEF **Dedrick Kok-Hong Chan**  
ABCDEF **Kuok-Chung Lee**

Division of Colorectal Surgery, University Surgical Cluster, National University Health System, Singapore, Singapore

**Corresponding Author:** Kuok-Chung Lee, e-mail: [kuok\\_chung\\_lee@nuhs.edu.sg](mailto:kuok_chung_lee@nuhs.edu.sg)  
**Conflict of interest:** None declared

**Patient:** Male, 68  
**Final Diagnosis:** Intestinal perforation  
**Symptoms:** Abdominal pain  
**Medication:** —  
**Clinical Procedure:** Exploratory laparotomy and bowel resection  
**Specialty:** Surgery

**Objective:** Unusual clinical course

**Background:** Intestinal tuberculosis can mimic many conditions. The incidence of intestinal tuberculosis in developed countries has risen in tandem with the increase in patients with immunocompromised states. This is a condition which needs to be considered in patients who present with symptoms and signs of bowel perforation on a background of immunosuppression in order to obtain the correct diagnosis and, consequently, the correct treatment.

**Case Report:** We report a patient with a background of sarcoidosis who had been on mycophenolate mofetil, tacrolimus, and high-dose prednisolone. He presented with abdominal pain without overt peritonitis. Initial imaging showed small locules of free air in the abdominal cavity. The patient was managed with intravenous antibiotics as up-front surgery was deemed to be high risk. However, on a repeat imaging scan 3 days later, larger locules of gas were seen within the abdominal cavity, indicating progression and non-resolution of his acute condition. The patient was brought to the operating theatre and a perforation at the ileum was found. A segment of small bowel containing the perforation was resected. Histology showed the presence of acid-fast bacilli (AFB) on Ziehl-Neelsen stain, leading to a diagnosis of intestinal tuberculosis.

**Conclusions:** A high index of suspicion for intestinal tuberculosis is needed in patients who are on immunosuppression. Intestinal tuberculosis presenting with perforation is unlikely to lead to spontaneous resolution without operative management, and patients should be brought to the operating theatre for immediate surgery.

**MeSH Keywords:** Immunocompromised Host • Immunosuppression • Intestinal Perforation • Tuberculosis, Gastrointestinal

**Full-text PDF:** <http://www.amjcaserep.com/abstract/index/idArt/894723>



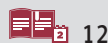
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## Background

Abdominal tuberculosis is the sixth most prevalent presentation of extrapulmonary tuberculosis [1]. It is an entity which manifests predominantly in 4 forms: tuberculous lymphadenopathy, peritoneal tuberculosis, intestinal tuberculosis, and visceral tuberculosis involving the solid organs [2]. Extrapulmonary tuberculosis is notorious for being challenging to diagnose, as signs and symptoms of the disease mimic many other conditions. Intestinal tuberculosis, in particular, can mimic malignancy, bacterial infectious disease, and inflammatory bowel disease such as Crohn's disease [3].

An increasing incidence of intestinal tuberculosis has been noted globally, even in developed countries. This has been attributed to the acquired immunodeficiency syndrome (AIDS) pandemic [4]. It is believed that the immunocompromised state may lead to both the reactivation of latent tuberculosis infection, as well as *de novo* tuberculosis infection.

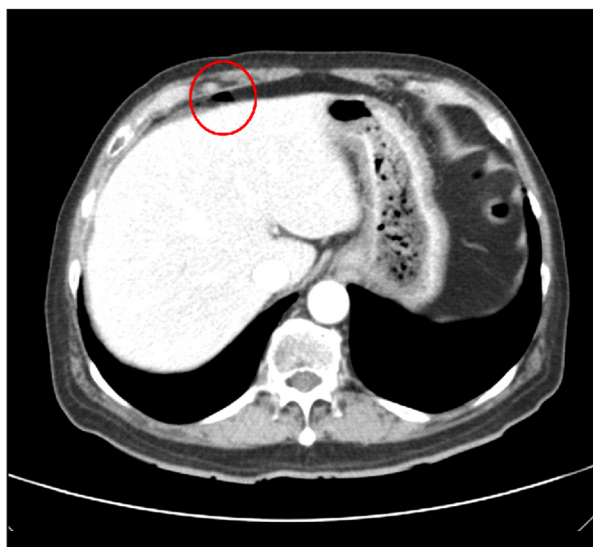
It is therefore not inconceivable that other immunocompromised states may lead to concomitant tuberculosis infections, and a high index of suspicion by the clinician needs to be maintained in order to make the appropriate diagnosis. We describe our experience managing a patient on multiple immunosuppressant agents who presented with bowel perforation secondary to intestinal tuberculosis.

## Case Report

A 68-year-old man presented to the emergency department with a 2-day history of generalized abdominal pain. He had been diagnosed 1 year ago with cardiac sarcoidosis following confirmatory cardiac biopsy and had an automatic implantable cardioverter defibrillator (AICD) inserted due to recurrent episodes of ventricular tachycardia. Pre-existing medical therapy included mycophenolate mofetil, tacrolimus, and high dose prednisolone for control of his disease. His cardiac function was evaluated and was found to have an ejection fraction of only 30%.

The patient complained of generalized abdominal pain at presentation. On examination, abdominal tenderness was elicited, but without signs of peritonism. Systemic evaluation was otherwise unremarkable. Laboratory investigations showed a slightly raised white blood cell (WBC) count of  $11.10 \times 10^9/L$  (reference range 3.40–9.60). Chest X-ray did not show free air under the diaphragm. A computed tomography (CT) examination of his abdomen and pelvis was performed.

CT showed minimal pneumoperitoneum (Figure 1). The source of extraluminal air was, however, not identifiable. Given his



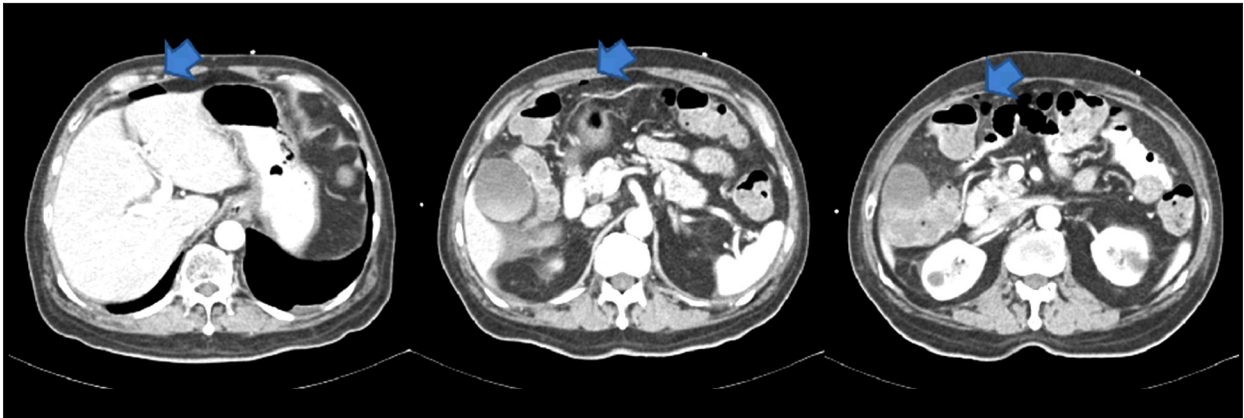
**Figure 1.** Small pockets of pneumoperitoneum (circled) on index CT scan.

cardiac sarcoidosis, and consequent low ejection fraction, the patient was at high risk for surgery. A decision was made to closely monitor the patient in the high-dependency unit, and to manage the patient with broad-spectrum antibiotics. Over the next few days, the patient continued to complain of abdominal pain, although he never manifested features of hemodynamic instability or systemic sepsis. WBC count declined with antibiotic therapy to  $8.37 \times 10^9/L$ . A follow-up CT scan was done 3 days later.

The repeat CT showed that there was marked progression of pneumoperitoneum (Figure 2). In view of non-improvement with conservative management, the patient was taken to the operating theatre for an exploratory laparotomy. This showed the presence of a 10-mm perforation at the ileum 140 cm from the ileocecal valve. No obvious source of perforation, such as foreign body or malignancy, was noted. This region, together with the contiguous region of small bowel which appeared congested, was resected and anastomosed (Figure 3). Histology of the lesion showed the presence of acid-fast bacilli (AFB) on Ziehl-Neelsen stain. The patient was eventually confirmed to have concomitant pulmonary tuberculosis on AFB culture of the sputum, and was started on isoniazid, rifampicin, pyrazinamide, ethambutol, and pyridoxine for treatment of tuberculosis. The patient was eventually discharged in healthy condition without complications.

## Discussion

An increase in the use of immunosuppressants, as well as the AIDS pandemic, has resulted in increasing numbers of patients diagnosed with tubercular disease, even in developed



**Figure 2.** Interval progression of pneumoperitoneum (arrowed) on subsequent scan.



**Figure 3.** Resected specimen.

countries. Abdominal tuberculosis already constitutes 12% of cases of extra-pulmonary tuberculosis, and 1–3% of cases of all tubercular disease [5]. This increase in the immunosuppressed state is believed to lead to a reactivation of latent tuberculosis in hosts. Gonzalez et al. recently reported their experience in managing 2 patients who developed intestinal tuberculosis while undergoing immunosuppressive therapy for systemic lupus erythematosus [6]. In a similar way, our patient, who was recently diagnosed with cardiac sarcoidosis and placed on high-dose steroids and immunosuppressants, also developed intestinal tuberculosis.

Early recognition of the condition is key to minimizing morbidity and mortality. However, the identification of features in immunocompromised patients who have tuberculosis can be expected to be even more challenging than in immunocompetent hosts. Untreated and undiagnosed intestinal tuberculosis can carry a mortality rate of as high as 60% [7], whereas treated abdominal tuberculosis carries a mortality rate of about 15% [8]. In particular, intestinal tuberculosis can lead to perforation, which carries a mortality rate of 30% [9]. Factors which suggest a higher likelihood of mortality include multiple perforations, increased duration between symptoms and

perforation, presence of comorbidities, delayed surgery, and use of steroids [6,9,10].

Common symptoms in patients with abdominal tuberculosis include abdominal pain, abdominal distension, ascites, and loss of weight [11]. Apart from some abdominal pain, our patient did not have any of these other features. In fact, our patient presented already having had a perforation of his small intestine, but without the classical features associated with a perforated viscus. He did not manifest hemodynamic instability or worsening abdominal pain, even as there was progression of disease. We hypothesize that this was largely due to receiving high doses of immunosuppressants and steroids, thereby preventing the patient from mounting a large enough immune response to manifest as sepsis.

## Conclusions

A conservative approach to bowel perforation is occasionally attempted when the patient does not manifest signs of sepsis or hemodynamic instability. An alternative approach includes the use of diagnostic laparoscopy in patients who manifest pneumoperitoneum on radiographic imaging. Our experience in managing this patient underscores the importance of having a low threshold for taking the patient into surgery for definitive management, because the use of immunosuppressants and steroids makes reliance on clinical signs unreliable. Small bowel perforation is uncommon, and the etiology can be attributed to infections, autoimmune disease, and malignancies [12]. In an immunocompromised patient, in addition to the abovementioned etiologies, a high index of suspicion for the possibility of tuberculosis is necessary.

## Conflict of interest

The authors disclose no conflicts.

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