

## Abdominal tuberculosis in Ecuador, a problem that is still not solved

Christian L. Rojas<sup>a</sup>, Evelyn Carolina Polanco<sup>b</sup>, Maria Cecilia Vivar<sup>b</sup>, William G. Aguayo<sup>a</sup>, Gabriel A. Molina<sup>c,\*</sup>, Bernardo M. Gutierrez<sup>d</sup>, Maria M. Cobo<sup>d</sup>

<sup>a</sup> Grupo Digeslap Center, Quito, Ecuador

<sup>b</sup> Department of Pathology, Hospital General San Francisco de Quito, Quito, Ecuador

<sup>c</sup> Grupo Digeslap Center & Universidad Internacional del Ecuador

<sup>d</sup> Universidad San Francisco de Quito, USFQ, College of Biological and Environmental Sciences, Quito, Ecuador

### ARTICLE INFO

#### Keywords:

Laparoscopy  
Tuberculosis  
Intestinal TB

### ABSTRACT

**Background:** Tuberculosis (TB) in the gastrointestinal tract or peritoneum is an uncommon condition in clinical practice. Its rarity, combined with its nonspecific presentations, makes this kind of extrapulmonary tuberculosis difficult to diagnose as it can mimic other inflammatory or malignant conditions. Delays in treatment and frequent misdiagnosis can lead to hazardous complications. In countries like Ecuador where the disease is endemic, TB should always be considered in the differential diagnosis of a patients who present with nonspecific abdominal symptoms. In these scenarios, laparoscopy can be an invaluable tool when used with sufficiently high clinical awareness and adequate training.

**Case presentation:** We present the case of a 37-year-old female patient from Ecuador with a 1-year history of abdominal pain, nausea, intermittent vomits, night sweats, and weight loss. After clinical evaluation and a laparoscopic intervention, abdominal TB was detected and promptly treated. Antituberculosis chemotherapy was initiated, and the patient successfully recovered.

**Conclusions:** High clinical awareness is imperative when approaching abdominal TB due to its wide spectrum of clinical symptoms and its rarity. Early detection and prompt treatment are critical to minimize the possibility of hazardous complications.

### 1. Introduction

Tuberculosis (TB) can affect any part of the gastrointestinal tract, and intestinal TB accounts for up to 2% of all TB cases worldwide [1]. Intestinal TB is a challenging condition for a medical team to diagnose, given its nonspecific clinical presentation and its tendency to mimic other abdominal pathologies including malignancy [1,2]. Misdiagnosis rates are high and delays in initiation of antituberculosis therapy can lead to troublesome complications [2,4]. Laparoscopy has become an invaluable diagnostic tool, making the identification of the disease faster and more accurate. However, adequate surgical training and access to current technology are of paramount importance, especially in developing countries, to fully make use of the potential of laparoscopic techniques for TB diagnosis.

This work has been reported in line with the SCARE criteria [11].

### 2. Case report

The patient is an otherwise healthy 37-year-old woman with no medical history. She presented to the emergency room with a 1-year history of abdominal pain, nausea, intermittent vomiting, night sweats, and weight loss. The pain was initially mild and related to food intake, but became much more intense over time. Vomiting was variable, with episodes occurring from once a week to three times a day. It was also accompanied by weight loss (15 kg) and night sweats. Bowel movements were regular, and no other symptoms were recognized. 24 h prior to hospital admission, the pain increased considerably despite analgesic medication. Thus, she was immediately brought to the emergency by her family. On physical examination, a tachycardic, febrile, and dehydrated patient was encountered. Severe abdominal pain was discovered in her lower abdomen with tenderness, and multiple lymph nodes were detected in the axillary and inguinal regions. Complementary exams revealed mild leukocytosis ( $10.1 \times 10^9/L$ ) with

\* Corresponding author.

E-mail addresses: [doctorbroco@hotmail.com](mailto:doctorbroco@hotmail.com) (C.L. Rojas), [evelynpolanco@gmail.com](mailto:evelynpolanco@gmail.com) (E.C. Polanco), [maceciv@gmail.com](mailto:maceciv@gmail.com) (M.C. Vivar), [williamaguayomd@hotmail.com](mailto:williamaguayomd@hotmail.com) (W.G. Aguayo), [gabomolina32@gmail.com](mailto:gabomolina32@gmail.com) (G.A. Molina), [bgutierrezg@usfq.edu.ec](mailto:bgutierrezg@usfq.edu.ec) (B.M. Gutierrez), [mcobo@usfq.edu.ec](mailto:mcobo@usfq.edu.ec) (M.M. Cobo).

<https://doi.org/10.1016/j.jctube.2020.100172>

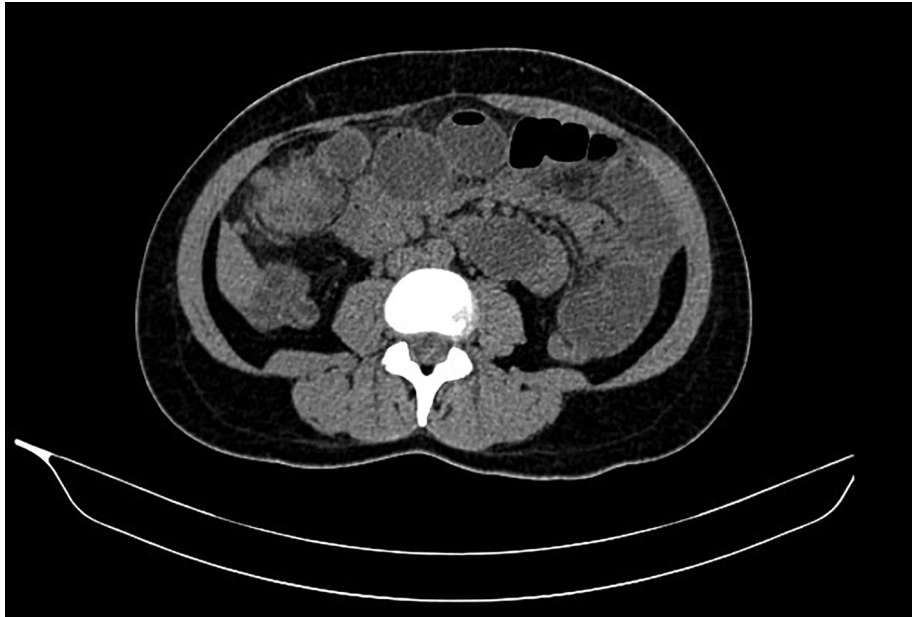


Fig. 1A. CT, showing dilated bowel loops.

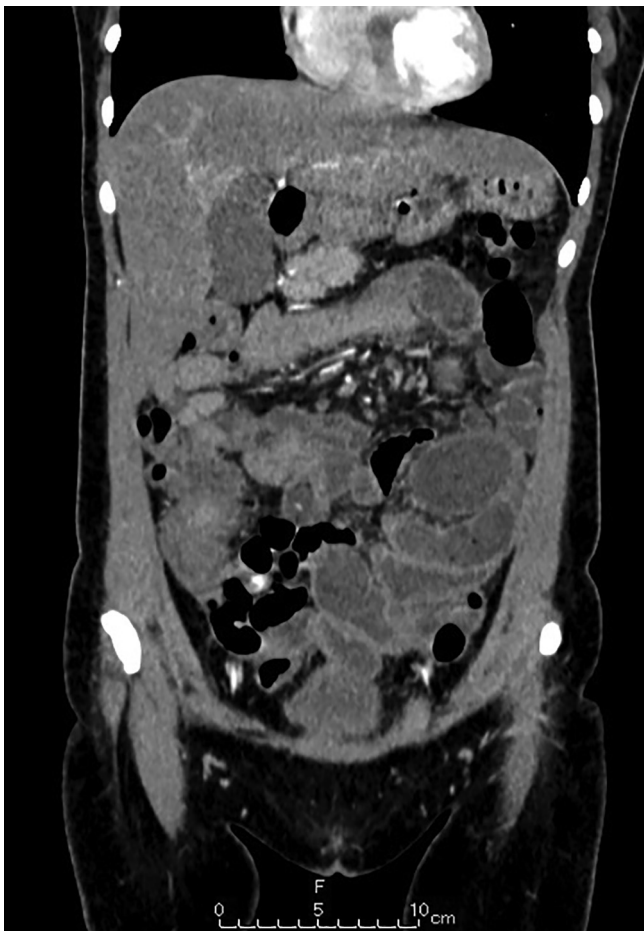


Fig. 1B. Contrast-enhanced CT, the peritoneum and the omentum is thickened.

neutrophilia (81%), and an abdominal echography reported some dilated loops of bowel along with free liquid. To further explore this, a contrast-enhanced computed tomography (CT) scan was performed and revealed scattered inflammation along with multiple nodules in the omentum, peritoneal thickening, and dilated bowel loops (Figs. 1A,

1B). Given these findings, surgical consultation was required, and surgery was decided upon. During laparoscopy, the peritoneum and omentum were found to be thickened with whitish patches, and the whole extent of the bowel had multiple granulomatous lesions, especially in the ileocecal region (Figs. 2A, 2B), which may have caused the patient's symptoms. The appendix had the same lesions and multiple erythematous patches. Due to this, several omental nodules were biopsied, and an appendectomy was performed. The rest of procedure was completed without complications. The histological pathology report found multiple necrotizing epithelioid granulomas with giant Langhans cells in the submucosa of the appendix. After a Ziehl–Neelsen staining, an acid-fast bacterium compatible with *Mycobacterium tuberculosis* was found. An enzyme-linked immunosorbent assay (ELISA) confirmed intestinal tuberculosis as the final diagnosis (Figs. 3A, 3B, 3C). The patient's postoperative period was uneventful; antituberculosis chemotherapy was initiated without complications. She was discharged on her third postoperative day. A chest X-ray, a colonoscopy and an endoscopy with biopsies were performed 7 days after the surgical procedure, yet the results were not conclusive. A fine needle aspiration of the lymph nodes was also considered but cancelled after TB was discovered on the pathology samples. 6 months after surgery, the patient is still under close follow-up observation. Since tuberculosis in Ecuador is required by law to be reported to national authorities and managed, she is being monitored by the TB national prevention team.

### 3. Discussion

Tuberculosis is a global disease with an annual mortality of up to 1.2 million in HIV-negative populations [1–3]. Globally, an estimated 10 million people fell ill with TB in 2018 [1]. This disease affects people of both sexes and all age groups, but the highest burden is carried by men aged greater than 15 years [1,3]. TB tends to attack patients affected by poverty and malnutrition, making it a crucial issue in developing countries [4]. *Mycobacterium tuberculosis* can affect any organ and system, and while TB of the gastrointestinal tract is an uncommon presentation of the disease, it has been observed usually affecting younger patients (less than 45 years of age). The bacteria enter the intestinal mucosa when it is ingested from the secretions of the respiratory tract, by hematogenous spread, by contiguous spread from infected nearby viscera, and infrequently by the consumption of unsanitary milk [1,2,5]. This triggers a granulomatous infection that can



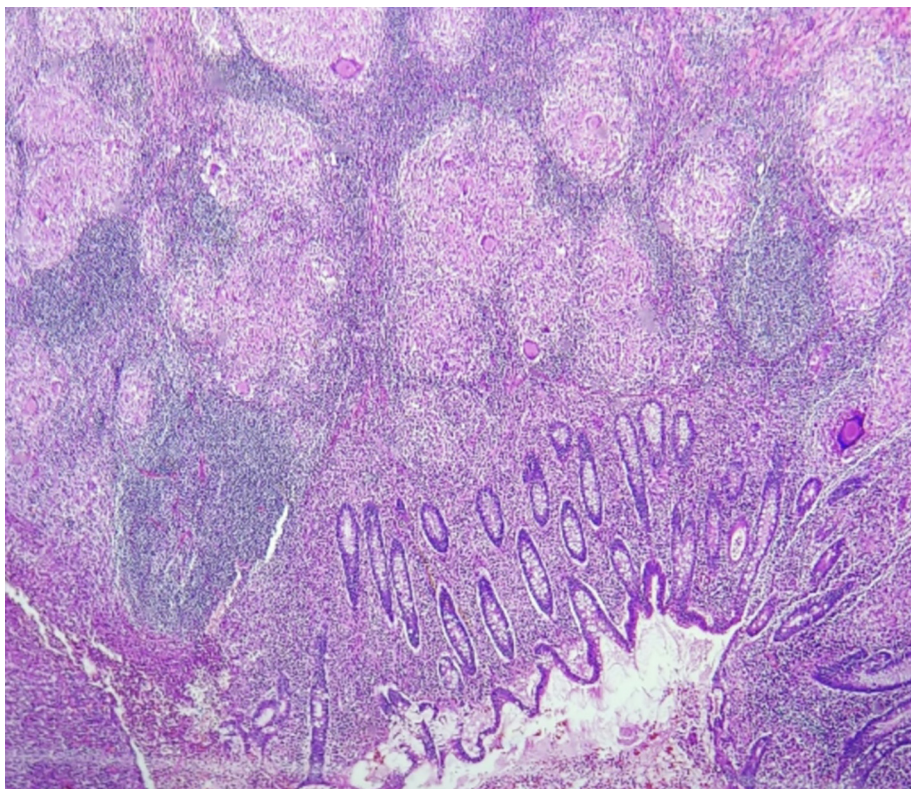
Fig. 2A. Bowel with multiple granulomatous lesions.



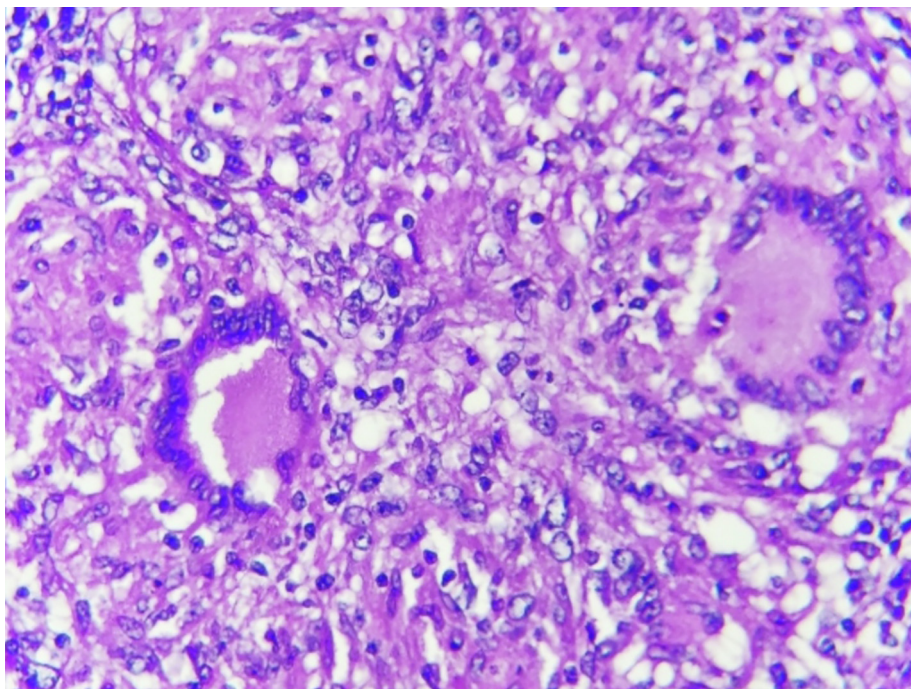
Fig. 2B. Appendix with granulomatous lesions in the serosa.

lead to ulceration, bleeding, and ultimately perforation. In some patients, the bacteria enter the Peyer's patches and remain dormant in the lymphatic and mesenteric lymph nodes [6,7]. The development of any state of immune compromise, such as diabetes, renal failure or HIV, can lead to reactivation and spread of the bacteria to the peritoneum or intestine [1,8]. In our case, the patient was not immunocompromised, highlighting the potential of TB to affect healthy patients, particularly since it's an endemic disease in Ecuador. The ileocecum region is usually the most affected region; nonetheless, any part of the gastrointestinal tract can be affected [4,3]. Symptoms are nonspecific and can mimic any inflammatory or malignant conditions [1,6]. Abdominal TB must always be considered in patients from an endemic country who are presenting with unclear abdominal symptoms [7,9], as was discovered in our patient. Abdominal pain, ascites, abdominal mass, fever,

and weight loss are usually the most common symptoms, yet some patients may present with an acute abdomen or acute bowel obstruction [1,10]. No laboratory, radiological, endoscopic, or bacteriological method can provide a definitive diagnosis of abdominal TB, hence clinical awareness is indispensable [1,7,10]. Imaging can aid in the diagnosis, and ultrasound can show ascites, hepatomegaly, or enlarged nodes, but ultimately CT provides a better view of the abdomen [1,8], as was performed with our patient. To confirm the diagnosis, it is important to obtain material for culture and histology [1,7]. Endoscopic and radiologic methods have been successful in obtaining tissue; FNAC of the omentum or lymph nodes can be an effective method to diagnose abdominal TB in patients having omental thickening or lymph nodes [12]. More recently, laparoscopy has emerged as a powerful tool for diagnosis as it allows for the exclusion of malignant conditions [1,5,7].



**Fig. 3A.** Histopathology showing multiple epithelioid granulomas with Langhans giant cells in the submucosa of the appendix. H&E stain (4X).



**Fig. 3B.** Histopathology showing caseating epithelioid cell granulomas with Langhan's giant cells. H&E stain (40X).

It is an effective tool for diagnosis of peritoneal and intestinal TB with a greater than 75% accuracy; other methods like ELISA provide a diagnostic accuracy of 84% [7,9]. Nonetheless, as TB has a broad spectrum of clinical symptoms, selection of the most suitable tests for detection of *M. tuberculosis* infection should be based on the context, patient symptoms, test availability, and overall cost effectiveness of testing [8,10].

Anti-tuberculosis chemotherapy is the standard treatment for abdominal TB; treatment is usually effective if a timely diagnosis is made and treatment is promptly initiated. Surgery is necessary when complications arise, and can be employed to obtain tissue samples to confirm the diagnosis [1,2,6]. In our case, laparoscopy proved to be a valuable instrument that allowed the medical team to reach the final diagnosis and guarantee the necessary treatment. Furthermore, it is the

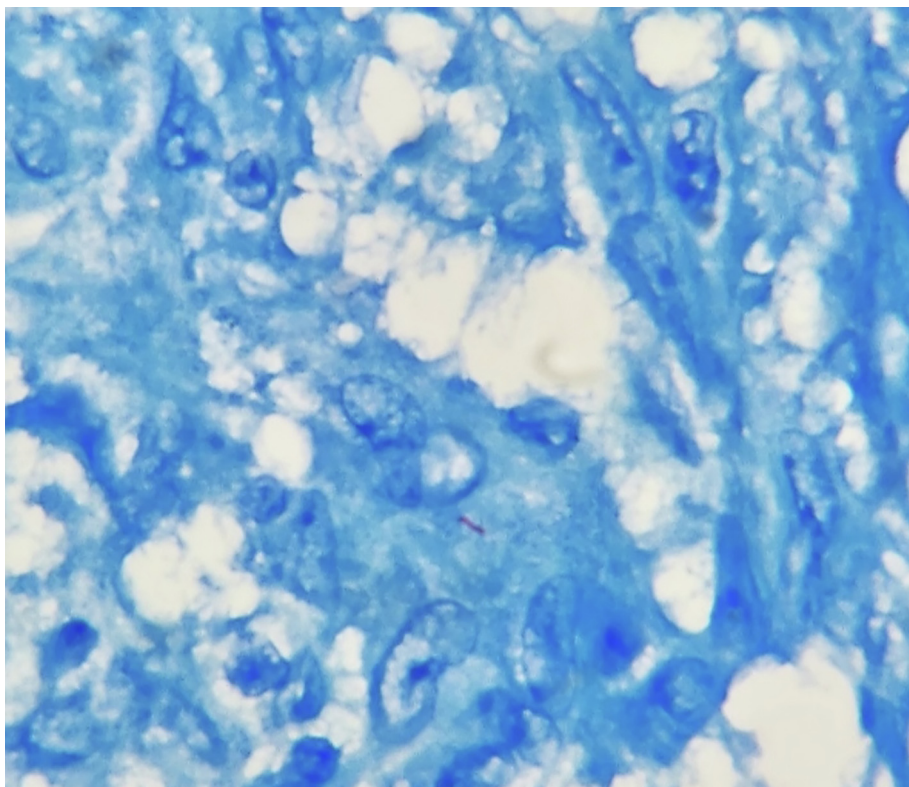


Fig. 3C. Ziehl-Neelsen stain positive for acid-fast positive bacilli (60X).

first-ever reported case in which the diagnosis of abdominal tuberculosis was reached using laparoscopy in a developing country like Ecuador.

#### 4. Conclusions

Abdominal TB is a complex disease, mostly due to its nonspecific symptoms and its multiple uncommon presentations. In endemic regions, it should always be considered as a potential differential diagnosis as it can mimic many abdominal pathologies.

This case highlights that laparoscopy is a safe, effective, and feasible tool for TB diagnosis, even in developing countries. Social and economic changes with manufacturers, surgeons, policymakers, and health authorities are necessary to enable deprived individuals and countries to access adequate surgical care.

Laparoscopy is an invaluable tool when dealing with TB, as tissue samples can be obtained and malignancy can be excluded. In endemic regions like Ecuador, this alternative is particularly relevant if other methods are unavailable. Comprehensive knowledge of TB is of paramount importance for all healthcare providers, and prompt and accurate treatment along with close follow-up is vital to prevent life-threatening complications.

#### 5. Ethics statement

The publication of this article is essential for development of coherent and respected network of knowledge. Therefore agreed upon standards of expected ethical behavior.

#### Declaration of Competing Interest

The authors declare that they have no known competing financial

interests or personal relationships that could have appeared to influence the work reported in this paper.

#### References

- [1] World Health Organization; Geneva: 2019. Global Tuberculosis Report 2019. License: CC BY-NC-SA 3.0 IGO.
- [2] Tan K-K, Chen K, Sim R. The spectrum of abdominal tuberculosis in a developed country: a single institution's experience over 7 years. *J. Gastrointestinal Surgery* 2008;13(1):142–7. <https://doi.org/10.1007/s11605-008-0669-6>.
- [3] Malikowski T, Mahmood M, Smyrk T, Raffals L, Nehra V. Tuberculosis of the gastrointestinal tract and associated viscera. *J. Clin. Tuberc. Other Mycobact. Dis.* 2018;12:1–8. <https://doi.org/10.1016/j.jctube.2018.04.003>.
- [4] Raviglione M, Sulis G. Tuberculosis 2015: burden, challenges and strategy for control and elimination. *Infect. Dis. Rep.* 2016;8(2):6570. <https://doi.org/10.4081/idr.2016.6570>.
- [5] Weledji EP, Pokam BT. Abdominal tuberculosis: is there a role for surgery? *World J. Gastrointestinal Surgery* 2017;9(8):174. <https://doi.org/10.4240/wjgs.v9.i8.174>.
- [6] Singh A, Sahu MK, Panigrahi M, Behera MK, Uthansingh K, Kar C, et al. Abdominal tuberculosis in Indians: still very pertinent. *J. Clin. Tuberc. Other Mycobacterial Dis.* 2019;15:100097 <https://doi.org/10.1016/j.jctube.2019.100097>.
- [7] Kentley J, Ooi JL, Potter J, Tiberi S, O'Shaughnessy T, Langmead L, et al. Intestinal tuberculosis: a diagnostic challenge. *Trop. Med. Int. Health: TM & IH* 2017;22(8):994–9. <https://doi.org/10.1111/tmi.12908>.
- [8] Schaffner VD. Intestinal tuberculosis. *Can. Med. Assoc. J.* 1947;57(6):561–6.
- [9] Khan R, Abid S, Jafri W, Abbas Z, Hameed K, Ahmad Z. Diagnostic dilemma of abdominal tuberculosis in non-HIV patients: an ongoing challenge for physicians. *World J. Gastroenterol.* 2006;12(39):6371–5. <https://doi.org/10.3748/wjg.v12.i39.6371>.
- [10] Rai S, Thomas WM. Diagnosis of abdominal tuberculosis: the importance of laparoscopy. *JRSM* 2003;96(12):586–8. <https://doi.org/10.1258/jrsm.96.12.586>.
- [11] Agha RA, Fowler AJ, Saetta A, Barai I, Rajmohan S, Orgill DP. For the SCARE Group the SCARE statement: consensus-based surgical case report guidelines. *Int. J. Surg.* 2018.
- [12] Kumar S, Gupta P, Sharma V, et al. Role of ultrasound-guided fine-needle aspiration cytology of omentum in diagnosis of abdominal tuberculosis. *Surg. Infect. (Larchmt)* 2019;20(1):91–4. <https://doi.org/10.1089/sur.2018.165>.