

## Primary Abdominal Tuberculosis Presenting as Peritonitis: Experience at an Emergency Medical Unit in the War Zone

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### Abstract

Tubercular disease is a global health problem, but it is more prevalent in developing countries. Emergency surgery for complicated abdominal tubercular disease in a war zone is challenging as the confirmation of definite diagnosis is difficult and delayed. We are presenting a case of abdominal tubercular disease complicated with peritonitis from intestinal perforation in a young female, diagnosed as acute surgical abdomen, and undergone emergent exploratory laparotomy at a "Médecins Sans Frontières" (MSF) Emergency Medical Unit in the war zone of Lankien-South Sudan. She was managed with abdominal washouts and intestinal stoma; diseased tissues and ascitic fluid were taken for histopathology and cultures. A Bogota Bag was used for abdominal closure. The patient was timely but empirically put on anti-tubercular therapy, and she was transferred to a primary hospital on the 20th postoperative day to continue her treatment. We were informed that her primary abdominal tuberculosis was confirmed by histopathology from intraoperatively obtained tissues and she was doing well during a three-month follow-up.

**Keywords:** Abdominal tuberculosis; acute abdomen; tubercular peritonitis; intestinal perforation; emergent laparotomy; emergency medical unit.

### Introduction

Tubercular disease (TB), infection from the *Mycobacterium tuberculosis*, is a global health problem, with the highest prevalence in south-east Asia [1,2]. Abdominal tuberculosis (ATB) is defined as the TB infection in the gastrointestinal (GI) tract, intraabdominal solid organs or peritoneum [3]. ATB is one of the relatively more common non-pulmonary TB infection-sites in low-income societies, affecting in particular populations in their third and fourth decades of life [1,2,4,5]. In most studies on ATB, the majority of cases are of primary intestinal variety, while a small proportion is secondary to pulmonary TB [2,4,6]. The reviewed literature has reported variable percentages of positive family history [2,6]. Initial clinical presentation of ATB is vague and non-specific, making timely diagnosis very difficult [2,6]. ATB patients usually present late with complications resulting in acute abdomen as a surgical emergency [2-6]. In any case, long-term anti-tubercular drug (ATD) therapy

is needed [4,6].

The medical humanitarian organization "Médecins Sans Frontières" (MSF, Doctors without Borders) has a long experience in TB treatment in precarious situations, with highly skilled war surgeons to be of use. The Greek MSF Office has been fuelling the International MSF missions with many surgeons and other medical specialties who through these missions acquire useful and unique experience. One such case is the surgeon DJ from the writers of this current article. We describe a complicated case of ATB that was emergently operated, inevitably at an Emergency Medical Unit in a war zone.

### Case Report

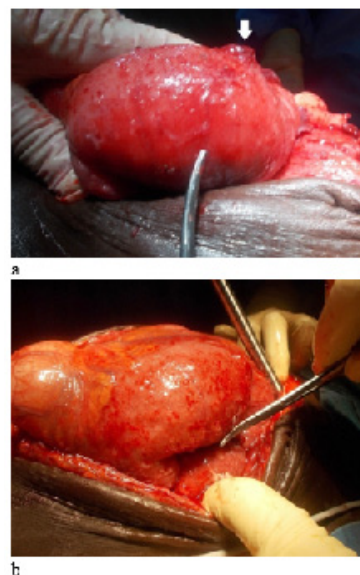
In July 2016, a gaunt malnourished woman ~30 years old was transferred to the Emergency Medical Unit of limited infrastructure and equipment in the war zone of Lankien in South Sudan (Figure 1) for acute abdomen. At admission, there have

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been very little communication between her and her relatives and the international medical team due to faulty understanding. We managed to find out that her abdominal complaints started 7 days ago, and her pain was accompanied with vomiting and aggravated “during the past day” without any medicine. She had no abdominal surgical history (2 normal child-births). Abdomen examination revealed rebound tenderness, mild distension, absence of bowel sounds, as well as tympany in upper abdomen and dullness in lower abdomen. The patient was rapidly resuscitated with I.V. fluids, nasogastric decompression and foley catheterization, and received a first dose of cefazolin. Available laboratory findings were only remarkable for anemia with a hemoglobin level of 9 gr/dL and hematocrit 29%, and leukocytosis (with PMN 72%) 13.700/mm<sup>3</sup>; urine pregnancy test was negative. Abdominal ultrasound, the only one imaging modality available, revealed distended hypokinetic bowel loops and peritoneal fluid in pelvis. On emergent surgery, dilated thick-walled bowel loops, dense fibrosis in interloops, innumerable nodules and plaques compatible with granulomata or tubercles in the intestine, omentum and retro-peritoneum, mesenteric lymphadenopathy, diffuse peritoneal thickening, and a large amount of ascitic fluid (“burst abdomen”) were found. A prominent stricture (“kinking”) 35 cm from the ileocaecal valve and an almost proximal to this stricture sealed intestinal perforation were also found out. Diseased intestinal tissue, mesenteric lymph-nodes and a sample of ascitic fluid were taken for histopathology and cultures to a distal referral laboratory. Abdominal washout, a limited adhesiolysis and some mobilization to achieve a difficult exteriorization of the perforated loop were done (**Figure 2a,b**). An intraabdominal drainage tube was placed in the lower pelvis and a Bogota Bag (**Figure 3**) was used to facilitate temporary closure of the residual abdominal defect. ATD therapy comprising isoniazid and rifampin per os was started empirically on the fourth postoperative day when stoma was functional and the patient received oral feeding; initial antibiotics was stopped. At the same time, intestinal edema was subsided, and the fascia and skin suturing of the abdomen was gradually achieved during the first 20 postoperative days. Soon after that, we took care of the patient’s transport to a primary Hospital in Juba (South Sudan) to complete her therapy. We were informed that, her primary ATB was confirmed by histopathology from intraoperatively obtained tissues, she had a successful reversal of the stoma, and she was doing well



**Figure 1:** Emergency Medical Unit in war zone in Lankien-South Sudan.



**Figure 2:** A ~30-year-old woman with complicated ATB (a,b): thick-walled edematous bowel, intestinal granuloma-“tubercle” (arrow), dense fibrosis (curved forceps as indicator).



**Figure 3:** A ~30 year-old woman with complicated ATB: Bogota Bag (for part of the abdominal incision) and bowel stoma (arrow).

during a three-month follow-up.

## Discussion

There are different possible pathways for the tubercle bacilli to cause ATB: (i) hematogenous spread from primary pulmonary TB, (ii) swallowing infected sputum, (iii) ingestion of infected food or drink (i.e. milk products), and (iv) direct invasion from infected adjacent lymph nodes and viscera (i.e. fallopian tubes in females) [1,2,4,7]. Rajput et al [8] and Arif et al [9] have observed preexisting pulmonary TB in 33.95% and 20% of the patients respectively.

Performing surgery at an Emergency Medical Unit in a dangerous war zone is more challenging than emergency surgery in an organized hospital in a peaceful area in that, less facilities in diagnosis and treatment are available, the surgical staff is not permanent and may have personal changes, and the patients are usually presented or transported later in the course of their disease. However, in most cases, emergency surgery in a war zone becomes inevitable in order to save a life. On the same mission in South Sudan that lasted two months we were forced to perform surgical drainage in other three TB patients, two of neck abscesses due to cervical lymphadenopathy and one of lumbosacral disease.

ATB includes the infection of GI tract, peritoneum, mesentery, abdominal lymph nodes and solid organs such as the liver, spleen and pancreas [1,2-4, 6,10,11]. Peritoneum and the ileocaecal valve are the most common sites of infection [1,4,11], and the most common mode of acute presentation is GI obstruction followed by perforative peritonitis [4,6,11]. Depending upon the prominent form of ATB, relative characteristic features may include: multiple intestinal strictures with or without intestinal perforation [1,4,6,10], dense fibrosis in interloops [10], thickenings of the peritoneum with infiltration of the mesenteric leaves [1,3], smudged or dirty appearance of the omentum [3], and ascites (exudative form)[11]. Plast(er)ed abdomen or abdominal cocoon is a form of sclerosing and capsulating peritonitis found in a small proportion of cases [4,11].

ATB is a diagnostic challenge, particularly in the absence of evidence of pulmonary infection and family history or the lacking of a specialized laboratory [1,3,6,10], as in our case. Initial clinical features are insidious, vague and non-specific, frequently resulting in misdiagnosis or making an accurate diagnosis delayed [1,3,6,7]; an overlooked diagnosis may result in significant morbidity and mortality [2,7]. The most common clinical symptoms and signs are abdominal pain or distention, malaise/anorexia, body weight loss, ascites, fever (low-grade), and menstrual abnormalities (females) over the past few weeks or months [1,3,6,7]. In that time, laboratory results may show only leukocytosis, hypoalbuminemia and C-reactive protein elevation [3,6,7]. Tuberculin skin tests are not always positive [7]. In most cases sputum or ascitic fluid (obtained via paracentesis or laparoscopy) for acid-fast bacilli (AFP) staining are also negative [6,7]. Chest X-rays may or may not suggest the presence of pulmonary disease [3,6,12], and abdominal computed tomography (CT) (if available) can reveal irregular nodular thickenings of the peritoneum, omentum or the bowel, a mesenteric mass or ascites [3,6,7]. Moreover, in elective cases, diagnosis can be confirmed with positive results from histopathology and cultures of tissues or peritoneal fluid obtained via ultrasound- or CT-guidance, laparoscopy or colonoscopy [3,7]. TB and ATB are variably associated with immunodeficiencies / immunosuppression (HIV/AIDS infections) [1,4,6,7] or Vitamin D deficiency [4]; HIV serology testing can be useful [6,7].

The emergency of acute abdomen due to GI obstruction or perforation or abscess should fasten the establishment of the diagnosis [1,6,7,13]. In this case, diagnosis is suspected based on the macroscopic appearance of abdominal tissue suggestive of ATB during emergent surgery (as in our case that was forced to be treated in the poor-health condition war zone), helped by laboratory results and radiologic findings and confirmed with AFP staining (if available) or, later, with positive cultures/histopathology results from tissue biopsies or peritoneal fluid [1,3,6,7,11].

During the process of diagnostic evaluation, it is necessary to differentiate between the intestinal form of ATB and other granulomatous diseases which have predilection for the ileocaecal valve (Crohn's disease) [1,5,12], as well as between its peritoneal form and the disseminated carcinomatosis, primary liver disease, mesothelioma or lymphoma [1,3,7,11].

For both elective cases and emergent complicated cases, permanent cure can only be achieved by a full course of ATD therapy

[3,6,11]. This medication may include isoniazide, rifampin, ethambutol and pyrazinamide (occasionally, streptomycin), it is ensured by supplementation with Vitamins B6 and D and lasts for 6-18 months (mean, 12) [2, 4,7]. Traditionally, the role of surgery has been described as being limited to managing the complications of ATB [2,6,7]. The choice of surgical procedure depends on a variety of factors, such as the site and the extent of disease, the status of remaining gut, the general condition of the patient, and the surgeons expertise [4,6,7]. In toxic and unstable patients ("burst abdomen", septicemia), intense resuscitation is mandatory [2]. Commonly, emergent surgery is a two-stage open procedure involving segmental resection(s), exteriorization of bowel ends, adhesiolysis/stricturoplasty, and abdominal washouts [2,4,6,13]. Tissue for histopathological examination is taken [4]. Less commonly, a primary repair involving intestinal anastomosis can be chosen [2,4,6]. In some cases (i.e. peritonitis, prolonged sepsis), the abdominal closure is impossible or it is simply avoided to safeguard against early postoperative abdominal dehiscence (as in our case) or to facilitate postoperative visits; in this case, a Bogota Bag can be used, and a delayed closure is successively achieved. Redo surgery for reversal of a defunctioning stoma is undertaken after 10-12 weeks of ATD therapy [2,4,6]. Postoperative complications include wound infection or dehiscence, anastomotic leak, stoma retraction or prolapse, respiratory tract infection and incisional hernia [2,4,6,7]. In-hospital early mortality ranges 2.14%-18% [2,4,8,13].

## Conclusion

ATB with an acute abdomen presents as an enormous challenge to the surgeon on poor areas at risk. Awareness for diagnosis, emergent surgery and early administration of ATDs are of paramount importance.

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**Authors' contributions:** DJ (MSF surgeon)- surgical operation, manuscript conception; CA-manuscript conception and design, reference research, and manuscript writing/submission; GK-data processing.

**Conflict of interest:** None declared.

**Ethical approval:** This study was approved by Médecins Sans Frontières- Greek Section.

**Informed Consent:** Written informed consent was obtained from the patient.

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