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Acute Abdomen Revealing Abdominal Tuberculosis in a 9 Years Old Child

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Abstract **Case Report**

Introduction: Tuberculosis (TB) is a global health problem. Abdominal localization is relatively rare in our country. What makes diagnosis even more difficult is the diversity of clinical symptoms and the different modes of onset: acute, sub-acute or chronic. ***Case-report:*** A 9-year-old child with no previous pathological history presented to the paediatric emergency department of the Mohammed VI University Hospital in Marrakech with an acute abdomen. On clinical examination, we noted generalized abdominal tenderness and fever. Abdominal ultrasound showed a small amount of ascites associated with multiple lymph nodes. On surgical exploration, the peritoneum was inflamed and granular. The diagnosis of abdominal tuberculosis (ATB) was based on GeneXpert positivity in the peritoneal biopsy fragment. ***Conclusion:*** Diagnosis of ATB should be considered in children with abdominal pain, particularly in endemic areas. Early diagnosis and appropriate treatment can reduce the morbidity and mortality associated with this disease.

Keywords: Abdominal Tuberculosis (ATB), Acute Abdomen, Child, Diagnosis, Endemic Area.

INTRODUCTION

Tuberculosis (TB) remains a global public health problem, particularly in developing countries where prevalence is notably higher. It is associated with a high rate of morbidity and mortality. In fact, in 2022 TB was considered as the second leading cause of death from a single infectious agent after coronavirus (COVID-19) [1]. According to the World Health Organisation (WHO), 15% of patients with TB were children under the age of 151. In Morocco, extrapulmonary tuberculosis (EPTB) is the most common form of TB in children accounting for 81% of cases, with lymph node involvement being the most common. Abdominal localization on the other hand, remains relatively rare in our country [2].

Abdominal tuberculosis (ATB) is defined as Mycobacterium tuberculosis infection of the peritoneum, spleen, liver, pancreas, gastrointestinal tract, mesentery and its lymph nodes, or omentum3. Diagnosis is difficult, given the lack of specific clinical signs and is therefore often delayed. It is based on a combination of clinical, radiological, bacteriological, histological and sometimes immunological arguments. Early and appropriate treatment can ensure complete recovery and a good prognosis.

Although ATB often presents with an insidious course. Sometimes, the presentation can mimic an acute abdomen, leading to unnecessary surgical interventions. The aim of our case report is to describe an unusual presentation of ATB in children, and to raise awareness among physicians of this type of presentation. This in turn, will enable rapid diagnosis and early treatment.

CASE REPORT

Z.T is a 9-year-old Moroccan child with no particular pathological history. He received Bacillus-Calmette-Guérin (BCG) vaccine at birth and had no surgical history. The patient reported recurrent abdominal pain for 2 months, in a context of weight loss and asthenia. He was admitted to the paediatric emergency department with acute abdominal pain associated with vomiting and fever 2 days before his admission. The pain was initially localized to the periumbilical region, then generalized to the entire abdomen.

***Physical examination*:** apart from a fever of 39.1°C, other vital signs were normal. Abdominal examination showed a generalized abdominal tenderness. The rest of the abdominal examination revealed no organomegaly nor abdominal mass. The anal margin was intact and there was no abdomen distension. Pulmonary examination was normal and lymph node examination showed no adenopathy.

***Initial biological tests*:** Hemoglobin: 10.2g/dl, platelets: 228000/µL, WBC: 12000/mm3, CRP: 19 mg/L urea: 0.19 g/l, creatinine: 5.12 mg/l, albumin: 33 g/l electrolytes were normal.

***Imaging*:** Abdominal ultrasonography showed: Large homogeneous hypoechoic mesenteric lymph nodes (Figure 1A), the largest measuring 40 x 19 mm (Figure 1B). A small peritoneal effusion with thick contents (Figure 2A and B). Appendix of normal size (5mm), spleen of normal size and homogeneous echostructure, liver of normal size and homogeneous with regular contours.

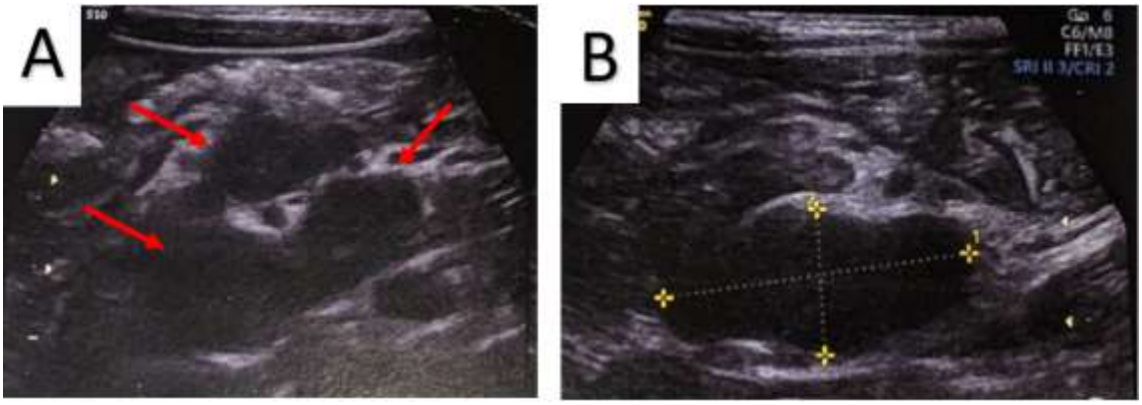

Figure 1: A: Multiple large mesenteric lymph nodes (arrows), appearing hypoechoic,
Figure 1: B: showing a very large lymph node measuring 40 x 19 mm

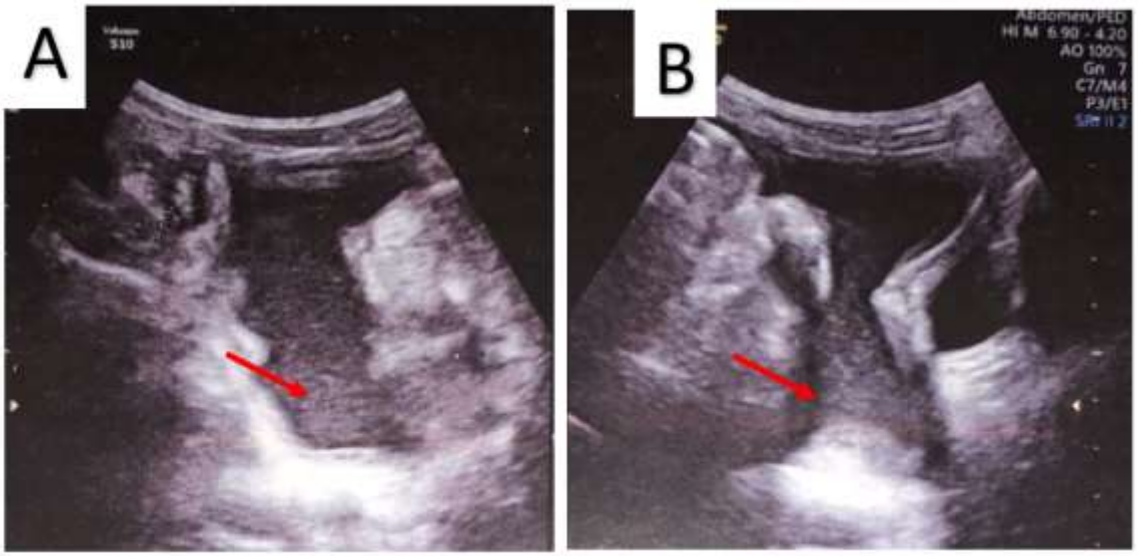

Figure 2: A and B: a small amount of intraperitoneal fluid that appears hyperechoic (arrows)

Surgery: a mini-laparotomy was performed, on opening: the peritoneum appeared inflamed with multiple granulations. In addition, an inflammatory appearance with multiple granules scattered over the epiploons (Figure 3A) and the mesentery (Figure 3B) was observed. A small amount of intra-peritoneal fluid and numerous adenopathy were observed. Biopsies were taken from the peritoneum and lymph nodes. We also took swabs of the peritoneal fluid.

Bacteriology: GeneXpert MTB/RIF on the peritoneal biopsy sample showed the presence of a low level of Mycobacterium Tuberculosis DNA. The swab culture came back negative in standard media and on Lowenstein-Jensen medium. We also performed a GeneXpert on the gastric aspiration fluid to look for a pulmonary localization, but it came back negative. The child's HIV status was negative.

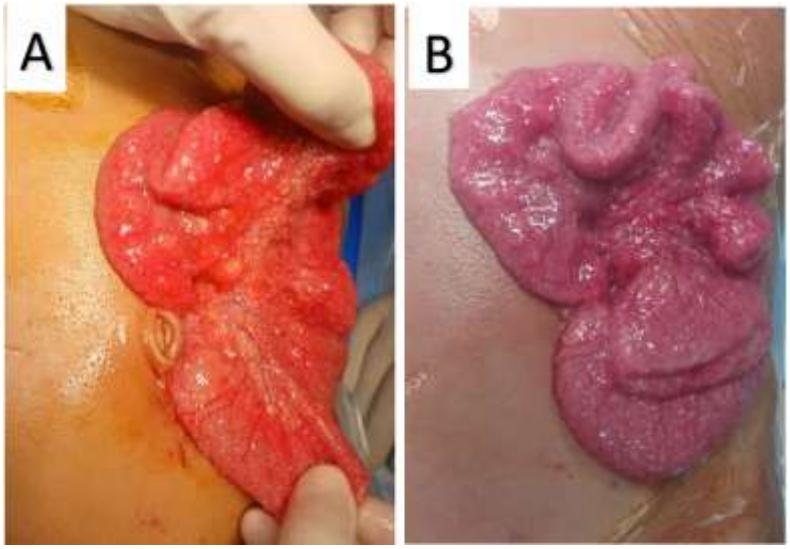

Figure 3: Multiple granulations on the epiploon (Figure 3A) and mesentery (Figure 3B)

***Histology*:** The peritoneal tissue showed a granulomatous formation consisting of an epithelioid giganto-cellular nodule with no caseous necrosis (Figure 4). Peripheral tissue showed moderate fibrosis with a moderate, predominantly lymphocytic, inflammatory infiltrate. Lymph node biopsy showed reactive lymphadenitis with no evidence of specificity or malignancy.

***Treatment*:** we initiated anti-tubercular treatment based on the suggested regimen, which comprise 2 phases: an intensive phase combining 4 drugs (isoniazid, rifampicin, pyrazinamide, ethambutol) for 2 months, followed by a maintenance phase combining 2 drugs (rifampicin and isoniazid) for 4 months [4]. Also, providing essential nutritional support witch is a critical component in the management of ATB.

Evolution: after 2 months of quadruple therapy, weight gain and a return to appetite were noted. An abdomen ultrasound was required after 4 months of treatment and noted a clear reduction in the lymph nodes previously described. Complete recovery was declared after 6 months.

DISCUSSION

The diagnosis of ATB is a real challenge, especially when pulmonary involvement is absent [5]. The most frequently described clinical presentation of ATB is a sub-acute, sometimes chronic course that includes general signs (fever, anorexia, weight loss, asthenia) and digestives signs. Digestive signs depend on the abdominal localization and may include: vomiting, abdominal pain, diarrhoea, abdominal distension, sub-occlusive syndrome, abdominal mass, gastro-intestinal bleeding, perianal lesions…[6-7]. Acute presentations are less common in children, and have rarely been described in the literature [8-10]. Regardless of the mode of presentation, ATB can simulate other pathologies such as: lymphoma, chron's disease, sarcoidosis, or other infectious pathologies (Giardiasis, typhoid fever, actinomycosis...) [8-11].

Imaging by abdominal ultrasound or CT scan can show different aspects of ATB: thickening of the peritoneum, ascites, abdominal mass or abscess, enterocutaneous fistula, intestinal wall thickening particularly in the ileo-caecal region, adhesions, enlarged lymphadenopathy with central necrosis, etc [12]. Liver involvement is rarely reported, nodular lesions or o thickened liver capsule may be seen. When TB is disseminated, as in the case of hematopoietic tuberculosis, the spleen is involved. in this case, imaging may show splenomegaly, nodular lesions or outright splenic abscess [12-13].

Despite the relevance of imaging data, it does not provide a confirming diagnosis of ATB. GeneXpert MTB/RIF and culture identification are the gold standard for the diagnosis of ATB, but as TB is a pauci-bacillary infectious disease, these tests may be negative. The use of real-time PCR (RT-PCR) in tissue biopsy fragments or in biological fluids has high specificity and sensitivity and allows EPTB to be confirmed or excluded in a short time [14]. Compared with GeneXpert, RT-PCR showed higher sensitivity in detecting TB in pathological biopsy specimens or biological fluids [14-15].

Granuloma with caseous necrosis is the typical histological finding in ATB on biopsy tissues. However, biopsies may show a granuloma without caseous necrosis, the presence of Langerhans cells in granulomas, or a lymphocytic infiltrate around the granuloma. Acid fast bacilli (AFB) can be detected in the granuloma, especially if it contains caseous necrosis [16]. Occasionally, a vasculitis-like appearance may be described in fragments of intestinal biopsies [17].

Other investigations may be useful in the diagnosis of ATB, such as endoscopy in cases of gastrointestinal tract involvement. It allows visualization

of the macroscopic appearance of the mucosa, and taking biopsies for diagnostic purposes. Macroscopic findings may include: ulcers, nodules, polypoidal and/or luminal narrowing [18].

Surgery during ATB should be limited to diagnosis by tissue biopsy, except in the case of complications (perforation, excessive bleeding, intestinal ischemia, fistulas, occlusions, etc.) [8-19].

Early treatment will reduce the morbidity and mortality associated with ATB, ensuring a complete cure and limiting the spread of this pathology to other organs [20]. In addition to anti-tubercular therapy, the treatment of ATB involves the management of nutritional deficiencies. In the paediatric population, malabsorption is the most serious complication of TB. Children receive a nutritional support to improve their prognosis and to ensure an optimal growth [21].

CONCLUSION

Through this case study, we conclude that ATB can have several modes of presentation in children. The diagnosis of TBA should involve several tests to confirm the presence of Mycobacterium tuberculosis whenever possible, and also to rule out other differential diagnoses. Whatever the mode of presentation of the ATB, treatment is based on anti-tubercular drugs.

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