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Digestive Tuberculosis in Madagascar: Histopathological Aspects

Nomenjanahary Lalaina[1], Rabarison Manoahasina Ranaliarinosy[1], Rakotonaivo Mamisoa Judicaël[2], Randrianjafisamindrakotroka Nantenaina Soa[1]

[1]Department of Pathology, Joseph Ravoahangy Andrianavalona University Hospital, Antananarivo, Madagascar
[2]Department of Visceral Surgery, Joseph Ravoahangy Andrianavalona University Hospital, Antananarivo, Madagascar
Email: manoarabari@gmail.com

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Abstract

Tuberculosis is a contagious infectious disease caused by *Mycobacterium tuberculosis* complex. This illness is a major public health challenge in Madagascar and around the world. The disease can develop in the lungs and other organs. Digestive tuberculosis is rare, accounting for 10% of extrapulmonary forms. Symptoms are not specific. Diagnosis is based on anatomical pathology examination. The purpose of this study is to determine the epidemiological and anatomopathological characteristics of abdominal tuberculosis. Our study was a retrospective, descriptive study conducted at the Pathological Anatomy and Cytology Unit of the University Hospital Center of Joseph Ravoahangy Andrianavalona over a 10-year period from January 1, 2012 to December 31, 2021. Digestive localization accounted for 17 cases, which are 1.85% of extra-pulmonary localizations. The mean age of patients was 33 years with extremes of 9 and 66 years. The sex ratio was 4.67. Pain was the main symptom, accounting for 76.47% of cases. Histological aspects were caseo-follicular in 82.35% (n = 14) of cases, follicular in 11.76% (n = 2) and caseous in 5.89% (n = 1). Patients were treated with isoniazid, rifampicin, pyrazinamide, and ethambutol. Surgery has sometimes been required. Tuberculosis is a public health problem in Madagascar. Digestive localization of the disease is mainly observed in young adults especially among men. Clinical signs are not specific, and diagnosis is based on anatomopathology. Treatment is medical but sometimes surgery may be necessary.

Keywords

Digestive Tuberculosis, Anatomopathology, Madagascar

1. Introduction

Tuberculosis is an infectious disease caused by *Mycobacterium tuberculosis* bacte-

ria [1]. It is a public health problem in the world. Globally, an estimated total of 10.6 million people fell ill with tuberculosis and a total of 1.6 million died from tuberculosis in 2021. The incidence for Madagascar was 233 cases per 100,000 inhabitants in 2018, which is one of the highest rates worldwide [2]. Tuberculosis most often develops in the lungs, but can also affect other organs [3]. Extrapulmonary localizations account for 20% to 40% of cases, depending on the series. Digestive tuberculosis is rare, accounting for 10% of extrapulmonary forms [4]. Symptoms of digestive tuberculosis are not specific. Diagnosis is often based on anatomopathological examination. In our study, the purpose is to determine the clinical and anatomopathological characteristics of digestive tuberculosis.

2. Methodology

Our study was a retrospective, descriptive study conducted at the Pathological Anatomy and Cytology Unit of the University Hospital Center of Joseph Ravoahangy Andrianavalona over a 10-year period from January 1, 2012 to December 31, 2021. Lesions other than tuberculosis were not included. We included digestive localization of tuberculosis. And we excluded all poor-quality specimens. We studied the following parameters: age, sex, clinical information, lesion topography, and pathological parameters. All specimens were fixed in 10% buffered formalin, processed according to the conventional histological slide preparation technique, and stained with hematoxylin-eosin (HE). The analysis was done with Epi info 7.2.2.6 software and Microsoft Excel 2020 software.

3. Results

In our study, 917 cases of extra-pulmonary tuberculosis were diagnosed. Abdominal tuberculosis accounted for 79 cases, representing 8.62% of extra-pulmonary tuberculosis. Digestive localization accounted for 17 cases, which are 1.85% of extra-pulmonary localizations or 21.52% of abdominal tuberculosis.

The mean age of patients was 33 years with extremes of 9 and 66 years. There were 17.65% (n = 3) of women and 82.35% (n = 14) of men (**Table 1**). The sex ratio was 4.67. In order of frequency, the disease developed in the ileo-caecal (70.59%), anal (17.65%) and colorectal (11.76%) areas (**Table 2**). Pain was the main symptom, accounting for 76.47% of cases (**Table 2**). Macroscopically, erythematous appearance was observed in 6 (35.29%) cases, abscess in 4 (23.52%) cases, stenosis in 2 (11.76%) cases, nodosity in 2 (11.76%) cases, and one case (5.89%) respectively for polyp, ulceration and perforation. Histological aspects were caseo-follicular in 82.35% (n = 14) of cases, follicular in 11.76% (n = 2) and

Table 1. Sociodemographic characteristics.

Sex \ Age(years)	<15	[15 - 30[	[30 - 45[	[45 - 60[	[60 - 65[	≥65
Women	0	3	0	0	0	0
Men	1	4	5	2	1	1

Table 2. Clinical characteristics.

Sign / Localisation	Abdominal pain	Anal fistula	Abdominal mass
Ileo-caecal	12	0	0
Anal	0	3	0
Colorectal	1	0	1

caseous in 5.89% (n = 1). Patients were treated with isoniazid, rifampicin, pyrazinamide, and ethambutol. Two months four-drug regimen followed by four months with isoniazid and rifampicin. Sometimes it was necessary to operate, especially if a fistula had formed.

4. Discussion

The digestive tract is a rare site for tuberculosis lesions. In a 10-year study, we found 17 cases, representing 1.85% of extra-pulmonary tuberculosis, or 21.52% of abdominal tuberculosis. In the literature, Abdallah M [5] reported a rate equal to 10% of abdominal tuberculosis. These frequencies may be underestimated, as this localization is associated with a pulmonary localization in 20% - 30% of cases [6]. The latter facilitates diagnosis, as it does not require anatomopathological examination for intestinal localization.

There are three routes of digestive infection: ingestion of infected sputum or milk, hematogenous infection or local extension from an adjacent organ [4].

The average age of our patients was 33 years. Benjouad K [7] found in his study an average age of 38 years. This coincides with the literature, as this is a disease of the young adult, with a peak between 21 and 45 years of age [8].

We found a male predominance (82.35%) in our series. Benjouad K [7] and Shreshtha S *et al*. [9] showed female predominance in 60.5% and 66.6% of cases. Gender predominance varies according to geographical location and culture.

In our study, the most frequent reason for consultation was abdominal pain, accounting for 76.47% of cases. Benjouad K [7] reported abdominal pain in 79.17% of cases. Dhali A *et al*. [10] reported a frequency of 39.7%. Besides, Uzunkoy A *et al*. [11] reported ascites is the most common symptoms.

Symptoms of abdominal tuberculosis are non-specific and include abdominal pain, transit disorders, fistula or ascites. So-called pseudotumoral forms are characterized by the presence, on physical examination, of nodular abdominal masses often testifying to voluminous peritoneal granulations [12] [13]. The various symptoms can thus be explained by the inflammatory reaction caused by the tuberculosis infection. Moreover, the clinical picture may immediately be that of a complication, *i.e.* intestinal occlusion or, exceptionally, visceral perforation or digestive haemorrhage [14] [15].

The most frequently tuberculosis involvement observed in the ileo-caecal region [17]. Sharma R *et al*. [16] reported that tuberculosis was observed in 64% of cases in the ileo-caecal region. Our data are similar to literature. In our study the

ileo-caecal region (Figure 1) was the most involved (70.59%). The esophagus, stomach and duodenum are rarely involved. None of these sites were found in our study. According Debi U [17], these sites represented for 0.2% to 2.5% of cases.

Concerning the histopathological appearance of tuberculosis, we observed a predominance of caseo-follicular type in 82.35% of cases. In their series, Uygur-Bayramiçli O *et al.* [18] found some features of follicular tuberculosis in 63% of cases. In Benjouad K's study [7] of 66 intestinal biopsies, 43.94% were caseo-follicular and 56.06% follicular.

The entry of bacilli within tissues triggers an inflammatory reaction that could either regress or progress into a sub-acute, predominantly cellular stage, characterized by a follicular reaction. Follicles contain a peripheral ring of lymphocytes, and histiocytic cells in the form of epithelioid cells and Langhans-type giant cells. When tubercle bacilli multiply on sensitized terrain, the exudative inflammation becomes necrotizing. This necrosis, specific to tuberculosis inflammation, is known as caseum or caseous necrosis [19]. Epithelioid granulomas, Langhans-type giant cells and caseous necrosis are the pathognomonic triads for the histological diagnosis of tuberculosis [20]. However, for tuberculous granulomas lacking caseous necrosis, as in 11.76% of our cases, the diagnosis is uncertain. The pathologist will therefore look for mycobacteria using the special Ziehl-Neelsen stain, which has a sensitivity of 72.7% [20].

A standard four-drug regimen, consisting of isoniazid, rifampicin, pyrazinamide, and ethambutol, is recommended for anti-tuberculosis treatment in intra-abdominal/gastrointestinal tuberculosis. These four drugs are used thrice weekly for the initial two months, followed by isoniazid and rifampicin for an

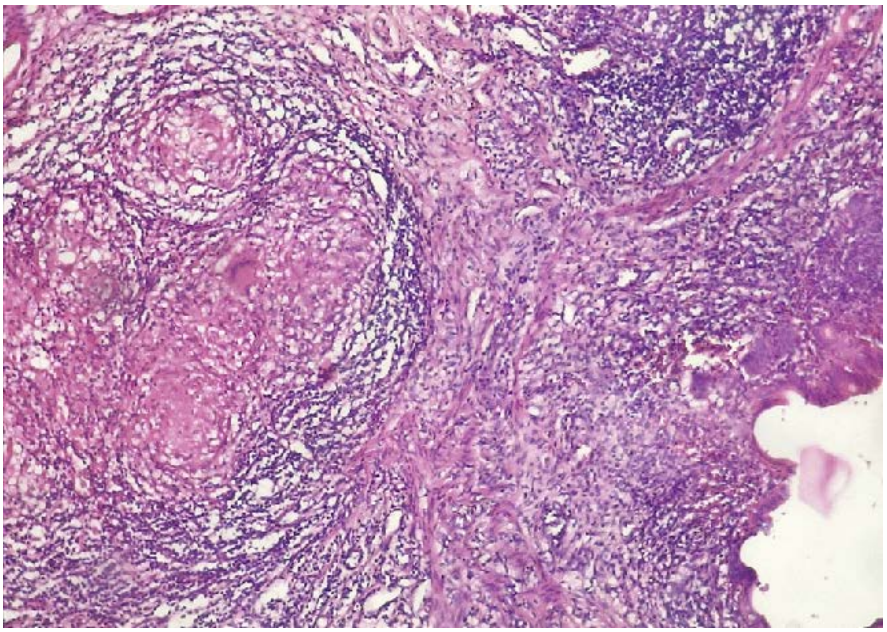

Figure 1. Ileo-caecal region: tuberculosis. HE, Gx100. Source: Pathological anatomy and cytology unit of the university hospital center of joseph ravoahangy andrianavalona.

additional four months. [21] Surgery may be needed in the setting of complications such as obstruction, perforation, and fistulation [22]. Anti-tuberculosis drugs were administered to all our patients. Those with fistulas had surgery.

5. Conclusion

Tuberculosis is a public health problem in Madagascar. Digestive localization of the disease is mainly observed in young adults especially among men. Clinical signs are not specific, and diagnosis is based on anatomopathology. Treatment is medical but sometimes surgery may be necessary.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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