

## Case Report

# Appendicular mass – a rare form of tuberculosis

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### Abstract

Tuberculosis is in the top 10 causes of death worldwide, being one of the most deadly infectious diseases. It is estimated that one of three people from the entire earth population has a latent infection with *M. tuberculosis*. This aerobic bacterium possesses the ability to persist in host tissues for years and to begin replication once immunity declines.

The lungs are most frequent site of infection as the *Mycobacterium tuberculosis* is carried by aerosol droplets and is commonly transmitted by respiratory route. The second way of transmission is by contaminated food.

Intestinal contamination coexists with pulmonary tuberculosis and only 10% represent primitive enteric diseases. The ileocecal region is involved most frequently. Even in this context isolated appendicular involvement remains rare.

We report the case of appendicular tuberculosis in a 17-year-old woman with no evidence of other location of disease elsewhere in the body.

**Keywords:** tuberculosis, extrapulmonary, appendicular mass



## Introduction

Tuberculosis is an infectious disease with a considerable incidence worldwide, especially in developing countries. It is becoming a resurgent problem in developed countries, especially in association with the immunodeficiency states. The digestive tract is the sixth most frequent form of extrapulmonary tuberculosis with predilect location in the ileocecal segment (1). Tuberculous appendicitis is rarely reported even in endemic areas (2).

Because it has a nonspecific clinical presentation, the diagnosis of appendicular tuberculosis is usually made after histopathological examination of the appendectomy specimen. We report the case of appendicular tuberculosis in a 17-year-old woman with no evidence of other location of disease elsewhere in the body.

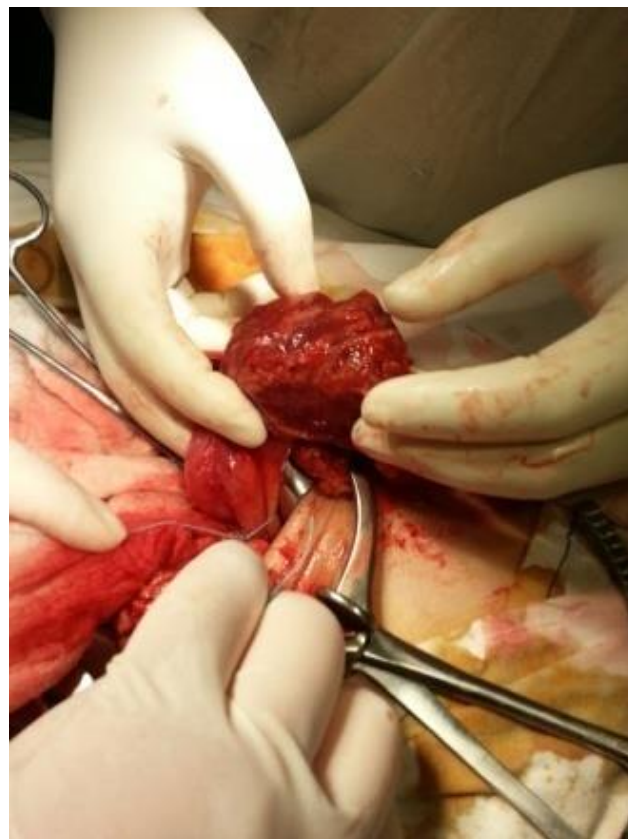
## Case Report

A patient of 17 years, young woman with no significant medical history is admitted to the hospital complaining of pain in the right lower abdomen, nausea and vomiting symptoms with a sudden onset few hours before presentation. The physical examination revealed marked tenderness in right iliac fossa. Leukocyte count was 16,580/mm<sup>3</sup>.

Laparotomy is decided and an appendicular mass about 4/5 cm is found. Exploration showed no other lesions in the ileum or cecum. (Figure 1.) Appendectomy was done and the specimen was sent for histopathological examination. (Figure 2.)

Microscopical examination revealed the appendicular wall with multiple granulomas composed of epithelioid cells, lymphocytes, inflammatory infiltrate and fibrosis. Mucosa exposed ulcerations and areas with

abscesses. Giant cells were also observed in which the nuclei were lined up around the periphery as a „horseshoe” - Langhans type cells. These findings were consistent with tuberculous granulomatous inflammation. (Figure 3-5)



**Figure 1.** Appendicular mass – intraoperative aspect



**Figure 2.** Appendicular specimen

## Discussion

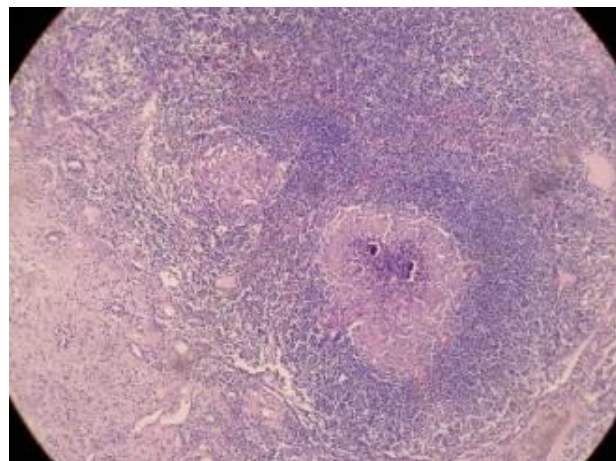
Although it is one of the oldest recorded human diseases, tuberculosis even today remains a growing concern in developed countries and a serious burden in the underdeveloped world. Concern arises from the association of infection with immunodeficiency states and also from the occurrence of multidrug-resistant bacterial strains (MDR-TB) requiring special efforts to find new therapeutic solutions.

On the other hand, socio-economic factors play a prominent role in the evolution of the disease but these are the most difficult to correct and control in underdeveloped countries. 80% of all global TB cases are reported in 22 countries. India, China and the Russian Federation have the highest incidence. It is estimated that one of three people from the entire earth population has a latent infection with *M. tuberculosis*. This aerobic bacterium possesses the ability to persist in host tissues for years and to begin replication once immunity declines (3).

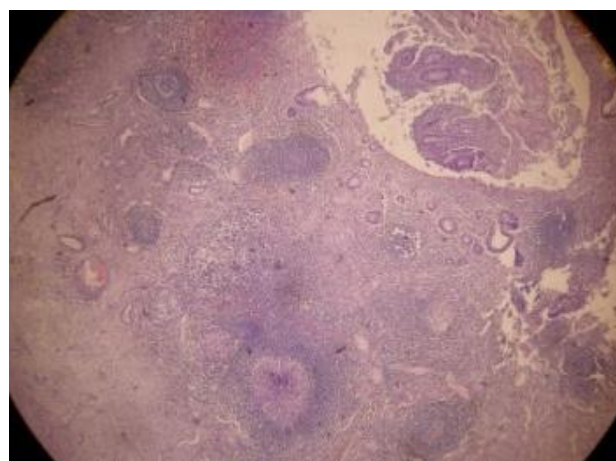
Tuberculosis remains among the top 10 causes of death worldwide, being one of the most deadly infectious diseases with an estimated 1.4 million deaths in 2015. Over 95% of all deaths occur in developing countries (4). The lungs are the most frequent site of infection as the *Mycobacterium tuberculosis* is carried by aerosol droplets and is commonly transmitted by respiratory route. The second way of transmission is through contaminated food, in particular through milk from contaminated cows. Rarely is infection transmitted transplacentally, by sexual contact or iatrogenic.

Multiplication of bacilli in the contacted tissue causes an inflammatory response. Neutrophils and macrophages are recruited, followed by cytokines release and T cell activation. The response reaction consists of tuberculous granuloma formation, which is an agglomeration of T cells, B cells, neutrophils, fibroblasts and macrophages differentiated into

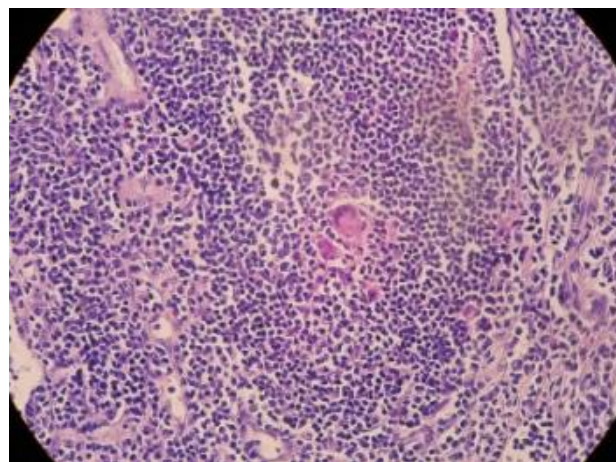
epithelioid cells delimiting and isolating the bacilli in a low active state within its center (5).



**Figure 3.** TB granulomas with epithelioid cells H.E. ob x 20



**Figure 4.** Appendicular mucosa with granulomas col H.E. ob x 4



**Figure 5.** Giant cells with lined up nuclei around the periphery H.E. ob x 40



After infection, *M. tuberculosis* dissemination is determined by the balance between bacterial genetic factors that give its virulence and the host immune response. First barrier in bacterial replication is the host innate immune response and subsequently a T cell mediated response occurs.

Bacterial dissemination is facilitated by a multitude of conditions that may alter the immune response of the host, e.g. gene mutations such as those encoding IFN- $\gamma$  receptor, IL-12 receptor, the nutritional and physiological state, or HIV infection. HIV positive patients have a 5 times higher risk of developing extrapulmonary TB than HIV negative patients due to reduced count of CD4<sup>+</sup> T cells and less cytokine production (6).

Correlation of other parameters such as age or ethnicity with extrapulmonary TB incidence leads to inconsistent findings or to other determinantal factors such as prevalence of HIV infection or a lower socioeconomic status. There are many parameters that influence the proportion of pulmonary to extrapulmonary tuberculosis: geographical, social, ethnic and economic (7).

In relation to gender, female patients more frequently have extrapulmonary disease compared to male patients, probably due hormonal factors. These differences are also correlated with health care deficiencies in economically disadvantaged regions (8).

The large majority are intestinal TB infections – 90% coexist with pulmonary tuberculosis and only 10% represent primitive enteric diseases. The intestinal contamination can occur in several ways. Dissemination by hematogenous path leads to diffuse forms exposing multiple tuberculous lesions along the intestinal wall with no predilect location and following distribution of blood vessels.

The lymphatic means of contamination may occur when the source of infection is in an adjacent

organ of the intestine: peritoneum, mesenteric lymph nodes or genital organs. Direct contamination of enteral mucosa is made with swallowed germs with sputum in the presence of pulmonary TB or, in the absence of it, by contaminated food. The latter represents the primitive form of intestinal TB.

The ileocecal region is involved in 64% of cases of gastrointestinal TB. This predilection is given by the local conditions such as the abundance of lymphatic tissue and intestinal transit slowing. Even in this context isolated appendicular involvement remains quite rare (9).

The contact of tubercle bacilli with the intestinal wall leads to local lesions consisting of epithelioid tubercles within the submucosa. Starting from this lesion the evolution can be developed in two directions. One can take place within the intestinal wall which after a stage of caseation can lead to ulceration or sclerosis. The other path is represented by lymphatic dissemination with lymphangitis and lymphadenopathy (10).

Symptoms of tubercular infection of the digestive tract are given by its location and anatomical form and these are correlated with the antituberculous treatment efficiency and possible complications that may arise. Ulcerative forms can lead to intestinal perforation and peritonitis while sclerosis can cause stenosis and bowel obstruction. In these situations surgery is required (11).

Tuberculosis of the appendix is a rare condition occurring more frequently secondarily from ileocaecal tuberculosis. Isolated appendicular involvement has an incidence of 0.1%- 0.6% (12). Clinical presentation of appendicular tuberculosis can be as a palpable mass in right iliac fossa with moderate local pain or as a typical acute appendicitis with marked tenderness in right iliac fossa, vomiting and fever.

Surgery is imposed most often by clinical considerations, and diagnosis of tuberculosis is possible

after histopathological examination of the appendectomy specimen.

Once the diagnosis of tuberculosis is made, anti-tubercular therapy is required using standard antituberculous drugs (13, 14).

## Conclusions

Tuberculosis of the gastrointestinal tract occurs most often in the context of lung disease and rarely as a primitive form. The predilect location of lesions is in the ileocecal region.

Appendicular tuberculosis is a rare condition even in endemic areas. It has a nonspecific presentation and deffinitive diagnosis is possible after histopathological examination.

After solving acute surgical complications medical therapy with antituberculous drugs is required.

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