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Case Report

Tuberculous chancre on the left knee in a 3-year old child

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Abstract: Tuberculous chancre is a rare form of cutaneous tuberculosis. We present a case of a 3-year old child with a granuloma on the left knee with the enlargement of inguinal lymph node. The diagnosis was based on clinical evaluation, examinations and special histopathological feature and the positive intradermal reaction to tuberculin. The patient was successfully improved by surgical excision of the lesion and taking anti-tuberculosis therapy. After six month of anti-tuberculosis treatment, the patient got the paradoxical reaction presenting the enlargement of inguinal lymph node. After the surgical excision of the lymph node and the further investigation on mycobacterial culture and biopsy, we confirmed that there was no relapse of the disease and no need to change the therapy. Tuberculosis should be considered a potential diagnosis in the case of a cutaneous granuloma with free tuberculous immunization.

Keywords: Cutaneous tuberculosis, chancre, granuloma, primary inoculation, histopathology

Introduction

Cutaneous tuberculosis (CTB) is a disease resulting from chronic infection by *M. tuberculosis* complex, *M. bovis* and bacillus Calmette-Guérin (BCG), and its clinical features depend on individual immunity, environmental factors and the site of infection [1]. Tuberculous chancre is a rare form of TB, also called primary TB inoculation chancre, as it develops in individuals not previously sensitized to mycobacterium, occurring most commonly in children, especially who do not take the Bacilli Calmette-Guerin (BCG) vaccine [2]. It has also been reported in surgical wounds, tattoos and piercing sites, even sexual transmission [3-6].

In present paper, we report a case of a child with granuloma on knee. Initially suspected as granulomatous mycoses, but after negative fungal tissue culture and positive intradermal reaction to tuberculin and specific histopathological findings, it was later confirmed as a tuberculous chancre.

Case report

A previously healthy, 3 years old female child, had been admitted the out-patient department of dermatology in March 2016, presenting a granuloma on the left knee with six-month history. The current disease began as a single reddish papule lesion localized on the left knee after injury, which had failed to improve after treatment of with anti-inflammatory drugs for external use. The papule gradually developed to a unique painless granuloma with slight ulcer.

On examination, the patient's general state of health was good. There was a sign of mobile lymph node enlargement on the left inguinal region, which was coming up to less than 1 cm in diameter. The remainder of the examination was normal. No other associate diseases were detected during the general examination.

Dermatological examination showed a unique orbicular large erythematous granuloma on the left knee, about 2.5/3 cm in diameter, with regular margin, and slight ulcer on the surface. The marginal region of the lesion was hard. No other lesions were detected on the dermatological examination (**Figure 1**).

The laboratory finding of fungal tissue culture was negative. The tissue from the granuloma

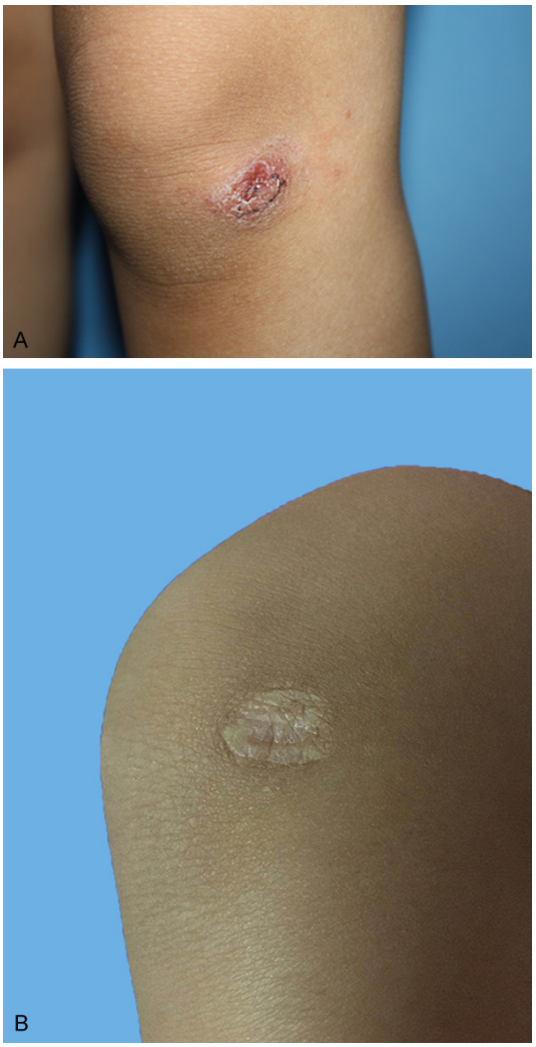

Figure 1. A. A unique radish granuloma on the left knee. B. The lesion on the left knee was totally clear.

on the knee was cultured in conventional media, resulting scare growth in fungi after 14 days.

The patient was suggested to have surgery of the granuloma excision in the out-patient department. Five-micrometer thick sections were stained with hematoxylin-eosin and processed for histological examination and evaluation. Histological features showed parakeratosis of epithelium and epidermal proliferation (**Figure 2**). There was a presence of granulomatous lesions, involving both dermis and panniculus adiposus, which were consist of lymphocytes, histocytes, neutrophils and few Langhans giant cells. In the center of the granulomas, there were some areas of fibrinoid necrosis. The acid-fast staining showed that a large number of mycobacterium with "beading" binding with various shape types of the bacterium at the periphery of the granulomas (**Figure 3**), which is positive in the acid-fast staining, while the atypical mycobacterium is longer and more plump. The PAS staining showed nothing special under the microscope. The histological findings highly suggested the diagnosis of tuberculous lesion.

The patient was referred to in the department of pediatrics in Guangzhou Chest Hospital for some further examinations and treatment related to tuberculosis. The intradermal reaction to tuberculin was performed resulting a positivity of 18 mm erythema and III induration with 5IU of purified protein derivative. The chest X-ray at presentation was normal. The antibody Ig-G of tuberculin was negative, and the lipoarabinomanan(LAM) was positive. The T-spot investigation showed that both the antigen A (ESAT-6) and the antigen B (CFP-10) were positive. Hematological investigation revealed a white blood cell count of 7.69×10^9/L, a lymphocyte count of 4.55×10^9/L. The whole rest of the laboratory examination including the total protein was normal.

Base on the clinical evaluation, dermatological exam, general exam, the histopathological results, and other laboratory exam, the diagnosis of tuberculous chancre was established. The patient was commenced on antituberculosis therapy using a HRP (Isoniazid 1×150 mg, Rifampicin 1×150 mg, and Pyrazinamide 1×250 mg) daily drug regimen for six month.

After six-month anti-tuberculosis treatment, the patient returned to the surgical department presenting a lymph node enlargement in the left inguinal region with some purulent secretion. Before sending the lymph node for histological examination, swabs were taken from the pathological content of the excised lymph node for bacterial and mycobacterial culture on the Lowenstein-Jenden medium which revealed no growth. The histological examination of the lymph node indicated the diagnosis of tuberculous lymphadenitis. The T-spot test revealed that both the antigen A(ESAT-6) is positive. The whole other laboratory examination including hepatitis B virus surface antigen (HBsAg), hepatitis C virus immune body (HCVAb), HIV (human immunodeficiency virus) serological test,

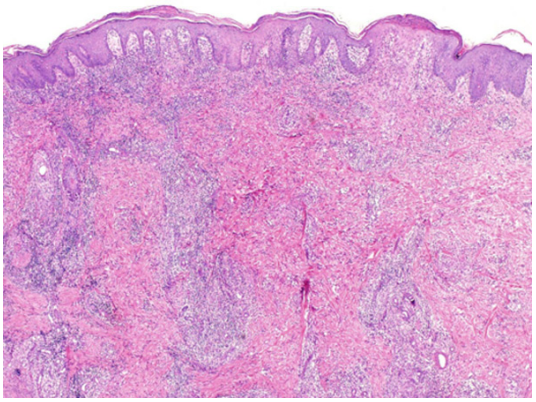

Figure 2. The granulomatous lesion in the dermis layer. (HE staining, 4×10).

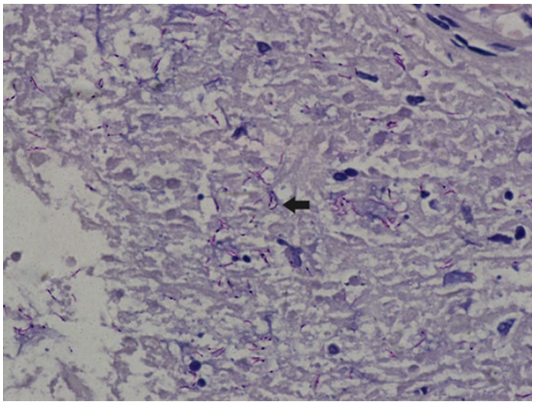

Figure 3. A large number of mycobacterium in the dermis layer and adipose layer presenting as various shape types with "beading" binding with of the bacterium where the arrow points. (Acid-fast staining, 10×100).

Syphilis serological test of rapid plasma reaction (RPR) were negative. The clinical evaluation, dermatological examination and the histopathological results were very suggestive of tuberculous lymphadenitis. The patient was adjusted on the dosage of ATT (anti-tuberculosis therapy) using HRP (Isoniazid 1×200 mg, Rifampicin 1×200 mg, and Pyrazinamide 1× 500 mg). In the reevaluation period up until present day, the patient's general state had been very good, and the lesion on the left knee was totally clear (**Figure 1B**).

Discussion

Cutaneous tuberculosis is rare, comprising 1-1.5% of all extra-pulmonary tuberculosis manifestations, which manifests only in 8.4-13.7% of all tuberculosis cases [7, 8]. The extrapulmonary tuberculous lesions are quite difficult to be diagnosed clinically [9-11]. Primary inoculation tuberculosis is an infection of Mycobacterium tuberculosis, which usually results from direct introduction of the bacterium into the skin of a tuberculosis-free person [12]. For this to occur, a portal of entry, such as a skin lesion, must exist, although there may be no clear clinical history or signs of it. In most cases, minor injuries are found on skin [12-14]. Reddish papule lesions appear two to four weeks after the inoculation, later develop to shallow painless ulcer or granulomatous microabscesses or thick crust. This lesion, which is usually accompanied by painful regional lymphadenopathy, forms the primary tuberculous complex of the skin [1, 14, 15].

In our case, the patient had a definite clinical story of injury which later caused the reddish papule. Because of the unique painless granuloma on the knee, we have to rule out the possible diagnosis of granulomatous mycoses which also may present such clinical picture. So we suggested the patient to take the fungal tissue culture but got scare growth of fungi.

The histopathological and laboratory examination related to tuberculosis were essential for the positive and diagnosis. The presence of granulomatous lesions, involving both dermis and panniculus adiposus, which were consist of lymphocytes, histocytes, neutrophils and few Langhans giant cells, supported the establishment of diagnosis and treatment. The positive acid-fast staining revealing numbers of mycobacterium at the periphery of the granulomas helped us to confirm the diagnosis.

There are also many granulomatous disorders can present such histological feature of granulomas with necrosis, such as Wegener granulomatosis (granulomas with necrosis, infarction), Churg-Strauss granulomatosis (granulomas, necrosis) or sarcoidosis (granulomas without necrosis). Among these, tuberculosis is the most common disease developing granulomas with fibrinoid necrosis [16].

Among case particularities, we count: a child, no previous contact with tuberculosis, negative fungal and bacterium culture, positive intradermal reaction to tuberculin, normal X-ray exam, the typical histopathological picture of the

lesion and lymph node. The more convincing reason was that after six-month anti-tuberculosis treatment, the lesion on the knee was almost completely healed.

Paradoxical reaction (PR) during tuberculosis (TB) treatment is defined as a transient worsening of pre-existing clinical and/or radiological lesions, or as the formation of a new tuberculous location, during appropriate treatment that is being taken correctly [17, 18]. In our case, after six-month of the anti-tuberculosis treatment, paradoxical reaction occurred, which required us to review the inguinal land that represented no growth of bacterial and mycobacterial culture on the Lowenstein medium. Thus we confirmed that there was no development of new lesions, no worsening and relapse of the disease. Regarding the enlargement might be from the poor compliance, there was no need to establish a new anti-tuberculosis treatment scheme, just adjusting the initial scheme to double dosage.

The differential diagnoses of tuberculous chancre should be sporotrichosis, leishmaniasis, atypical mycobacteriosis, syphilis, cat scratch disease and tularemia [1, 19, 20].

Disclosure of conflict of interest

None.

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