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Cutaneous Infection Caused by The Non-Tuberculous Mycobacteria (Ntm): A Case Report

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Introduction

The diagnosis of cutaneous infection caused by Non-Tuberculous Mycobacteria (NTM) is often a challenge and may be delayed. Risk factors and incubation period are not always determined precisely. Images of lesions may not be specific. Biopsy of the affected cutaneous regions, molecular testing and culture for NTM are the main diagnostics for diagnosis of NTM. Treatment should be based on guidelines, drug susceptibility and experience. We report a case of cutaneous infection caused by the Non-Tuberculous Mycobacteria treated and followed up at Pham Ngoc Thach Hospital, Ho Chi Minh City.

Case Study

A 42- year- old male driver, living at district 9 in Ho Chi Minh (HCM) City, Vietnam, was admitted to Department A4, Pham Ngoc Thach (PNT) Hospital on September 4th, 2014 with chief symptoms of cutaneous lesions in the left buttock and groin.

The patient noticed the lesions in his left buttock and groin around 5 years ago. At the beginning, the lesions had dark color with 1-2 cm in diameter and protruded over the cutaneous surface. However, the patient denied having any symptoms of pain and itching and there was no leaking on the lesions at that time.

Then, the patient felt very uncomfortable and developed symptoms on his skin as his lesions began spreading and occupied almost all the cutaneous regions of his left buttock and groin, leaking and protruding much on the cutaneous surface. He had gone to the Dermatology Hospital many times for examination. He was diagnosed as having chronic inflammation of the skin and treated with many drugs. Unfortunately, the lesions seem not to be diminished.
One month before, he went to the Dermatology Hospital again. This time, his diagnosis was established_by doing biopsy of skin lesions 2 times and the samples were sent to the laboratory for quantitative real time Polymerase Chain Reaction (PCR) testing for *Mycobacteria tuberculosis* (*M. tb*) and Non-Tuberculosis Mycobacteria (NTM). The result of

first biopsy showed images of chronic cutaneous inflammation but the second biopsy confirmed cutaneous tuberculosis. Moreover, the PCR testing detected *M. marium* or *M. ulcerans* on the samples. The patient was then referred to PNT Hospital for treatment.

He gave a history of good health with no specific illness. He smokes an average of 20 cigarettes a day over a period of 20 years and drinks alcohol. His family history is quite normal. He is a car driver and sits in the car often. He also admits that the place where he sits is very wet. He has not been bitten by insects, has not meets ponds, lakes or water-containing tanks, and has not travelled abroad recently.

On examination, he was fit. His pulse was 86 beats/minute, blood pressure 110/70 mmHg, temperature 37 degrees Celsius, oxygen saturation 98%, weight 63 kilograms, height 163 centimeters, Karnofski 80%. The other examination was normal. On examination of the left cutaneous buttock and groin, the lesions, dark purple in color, emerged on the skin surface with distinct border leaking with water and fluid (Figure 1a-1b). He complained of being uncomfortable but not painful and itchy. No abnormal detection was found on examination of other organs.

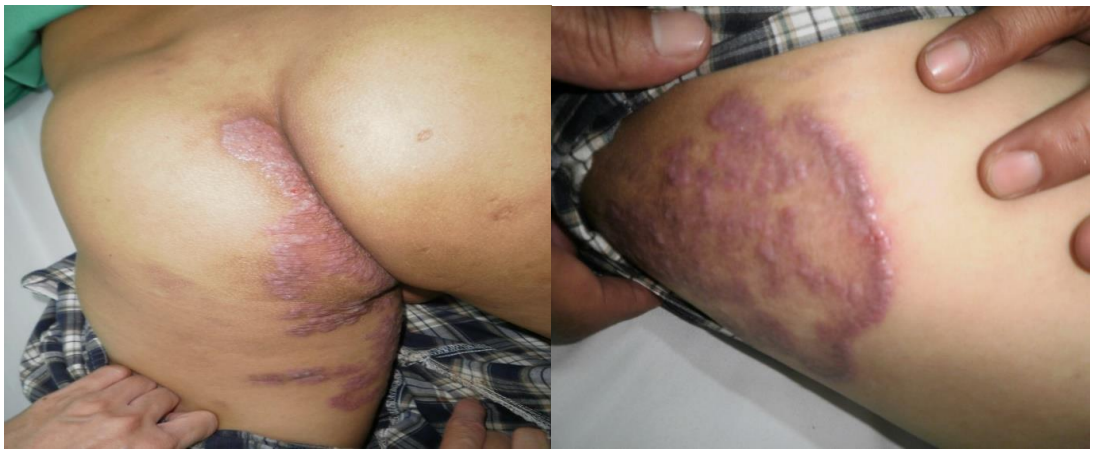

Figure 1a-b: Before Treatment.

On investigation, his blood samples were taken for many different tests. Blood cell count showed his total white blood cell count was 10,900 cells per cubic millimeter with neutrophil percentage 52.9%, lymphocyte 37.8%, monocyte 7.8%, eosinophile 0.924% and basophile 0.602; hematocrit is 48%; hemoglobin 15.8g/dl; platelet count 355 k/µL. His blood glucose was 5.3 mmol/L, liver function and kidney function tests were normal. HIV test was negative. His urinalysis was normal too. Chest radiography showed no abnormality. Intradermal Reaction Test (IDR) was 00 mm. Samples from cutaneous lesions showed negative in concentrated smear for Acid Fast Bacilli (AFB), in smear and culture for fungus. LG (Lowenstein Jensen) Culture for *M. tb* showed no growth after 6 weeks.

Based on his symptoms, examination and investigations, especially results from skin biopsy and PCR for NTM, the patient was diagnosed as having cutaneous infection due to NTM (*M. marium* or *M. ulcerans*). Then, the patient was treated with Rifampicin 600 mg/day, Ethambutol 1200 mg/day and Clarithromycin 1000 mg/day. After 9 days, the patient was discharged and managed at the out-patient department for follow-up.

After 1 month of treatment, skin lesions were receded, limited and diminished in size with no leaking anymore (Figure 2a-2b). After 8 months of treatment, skin lesions were back to nearly normal, leaving skin with pale color (Figure 3a).

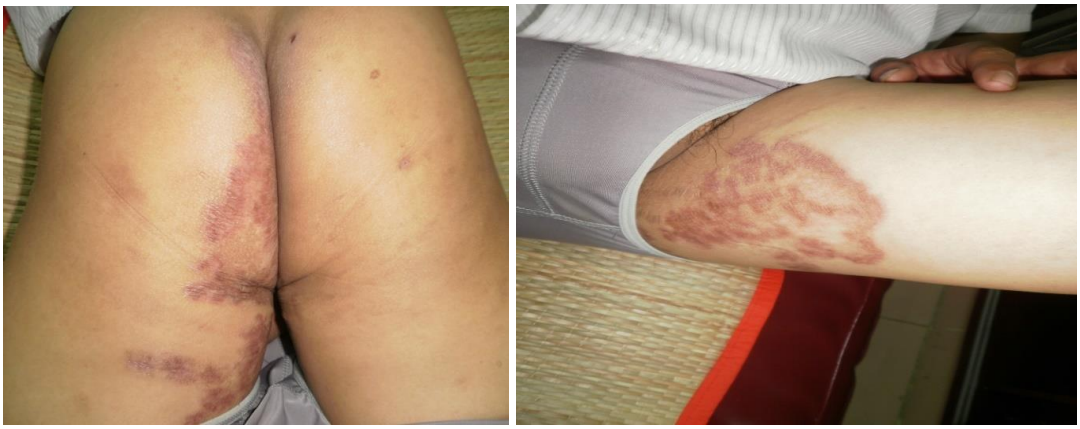

Figure 2a-b: After 1 month of treatment.

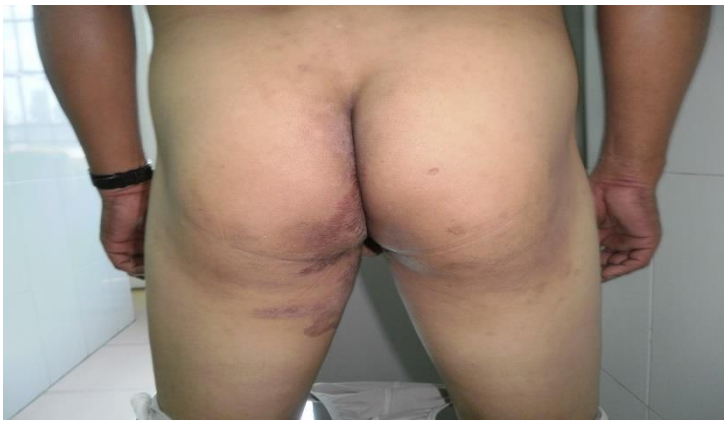

Figure 3a: After 8 months of treatment.

Discussion

Nowadays, Nontuberculous Mycobacteria disease is becoming more and more common because recently physicians have shown more concern for it and laboratory techniques have been developing rapidly, especially in molecular biology [1]. Nearby, there are more than 125 NTM species that have been classified [2] and the list of these NTM species can be seen on the website www.bacterio.cict.fr/m/mycobacterium.html. NTM is distributed extensively in the environment such as soil and water [3]. NTM disease in humans has been thought to be due to contact with the environment although sometimes the specific sources have not been found [4]. NTM disease has been recognized in most of the developed countries with a prevalence rate of from 1 to 1.8 cases over 100,000 population [5]. The most common manifestation of NTM disease is in the lung, however, manifestations in lymphatic, cutaneous and soft tissues (3%) and dissemination are also important [5,6]. The most common NTM species causing infection in local skin and soft tissue are *M. fortuitum*, *M. abscessus*, *M. chelonae*, *M. marium*, and *M. ulcerans* [7].

Our patient is a car driver, often sitting still and his wet seat may be a factor for infection of *M. marinum* và *M. ulcerans*. The patient did not meet a swimming pool or fish tank

previously. According to medical literature, *M. marinum* is a cause of " swimming pool 's granuloma" or " fish tank's granuloma" [8,9]. *M. marinum* is widely distributed in the aquatic environment including salt or fresh water, especially in stagnant water such as in fish tanks and swimming pools without adequate chlorination [8]. *M.ulcerans* is distributed in tropical forests in Africa, Southeast Asia, Australia and Southern Central Africa and is now considered as the third most common mycobacteria after *M.tb* and *M. leprae* in patients without immunodeficiency [10]. The lesions have been thought to be linked to scratched skin or contacted contaminated soil or water.

M. marinum and *M. ulcerans* have been described in medical literature and case series studies. *M. Marinum* causes soft tissue in immunosuppressed or immunocompetent patients. The lesions usually appear as papules in limbs, especially in elbows, knees, legs and arms and then extend to superficial ulcers and heal scars [11]. The lesions caused by *M. ulcerans* are often painless, gangrenous in cutaneous and subcutaneous tissues with unrestricted border like " clam shell " known as buruli ulcer [12]. The lesions commonly affect children and adults and heal with severe scars and deformity of limbs [8]. Our patient has cutaneous lesions, with distinct border, seen on the surface of the skin, located on the internal side of the left buttock and groin, leaking water and fluid (figure 1a-b). Lesions on this patient seem to be different from lesions of other patients reported in the medical literature.

Diagnosis of infection of *M. marinum* and *M. ulcerans* on this patient was made by PCR testing and biopsy of the lesions showing tuberculosis granuloma. However, tests for concentrated smear and culture for *M. tb* on fluid from lesions are negative. According to previous studies, diseases related to *M. marinum* are usually located and has paucity of bacilli so 95% of samples tested for AFB are negative [1]. In one study, 30 patients with cutaneous ulcer due to *M. ulcerans*, were administered PCR tests but only 13 (43%) of them had positive results in culture [13].

For treatment, according to medical literature, based on drug susceptibility testing, *M. marinum* is usually sensitive to rifampicin, rifabutin, ethambutol, clarithromycin, sulfonamides or trimethoprim sulfamethoxazole. There have been no clinical trials for treatment of infection of *M. marinum*, but it would be appropriate to use a combination of 2 drugs during 1 to 2 months after symptom recovery, for a total of 3 to 4 months of treatment duration. Treatment failure is usually in some cases with deep lesions. In some cases, surgical treatment should be recommended and applied. Cryotherapy, X-ray therapy, electrodessication…have been reported as effective treatment alternatives [14]. For *M. ulcerans*, Clarithromycin and Rifampicin could be good choices to treat and control the complication of ulcers. Medications, excision surgery and autologous skin graft are common therapies [15]. Our patient, infected with *M. marinum* or *M. ulcerans* based on real time PCR, was treated with Rifampicin, Clarithromycin and Ethambutol for 8 months and had favorable response to treatment. His skin lesions receded and healed to nearly normal without leaking and the patient felt comfortable after 8 months of treatment. In one case study, a patient infected with *M. marinum* was treated with Rifampicin and Ehambutol for 12 months and his lesions recovered completely [16]. Also, in another study with skin infection due to *M. ulcerans*, the authors treated it successfully with an 8-month regimen consisting of a combination of Rifampicin and Clarithromycin replacing a regimen with Rifampicin and Streptomycin, so the treatment is much simpler because it was painless and non-invasive. Moreover, treatment could be managed at the local health unit [13].

Summary

Infection caused by *M. marinum* should be considered in patients with a history of fish tank, swimming pool, sea and fresh water contact. For *M. ulcerans*, contaminated water and soil contacts are risk factors. Samples from skin lesions should be collected and sent to laboratory for culture, molecular biology and biopsy. Treatment should be based on guidelines for NTM treatment together with experience. Surgery is also an additional choice when necessary.

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