Lepromatous leprosy presenting with type II reaction before, and type I reaction after treatment

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Abstract

Lepromatous leprosy is associated with a high bacillary load and poor cellular immune response. Early dermatologic manifestations include erythematous macules, papules, nodules, and plaques with a symmetrical distribution. Leprosy also shows two major reaction states including type I (reversal reaction) and type II (vasculitis). These reactions are usually seen in some patients who are undergoing treatment. Herein, we report an interesting patient with lepromatous leprosy who presented with skin lesions of type II reaction without receiving any anti-leprosy treatment and surprisingly showed a type I reaction eight months after the beginning of the treatment.

Keywords: erythema nodosum leprosum, lepromatous leprosy, treatment, vasculitis

Introduction

Leprosy is a chronic, granulomatous, infectious disease. It has different clinical types which depend upon the host's immune system activity such as borderline, tuberculoid and lepromatous leprosy [1]. Leprosy may also show two major reaction states including type I (reversal reaction) and type II (erythema nodosum leprosum). Multiple underlying immunological processes and genetic factors are involved in the pathogenesis of these reactions. These reactions are usually seen in some patients who are undergoing treatment but they may also occur before any anti-leprosy treatment has been given [2,3]. Herein, we reported an interesting patient with lepromatous leprosy who presented with skin lesions of erythema nodosum leprosum (ENL) without receiving any anti-leprosy treatment. Surprisingly, he exhibited a type I reaction eight months after the beginning of the treatment.

Case Synopsis

A 53-year-old man presented with symmetric erythematous papulonodules all over the body beginning one year prior. Moreover, he suffered from erythematous and ulcerative nodules and plaques on both legs for a month. He had received topical corticosteroids with no clinical improvement. His past medical history was unremarkable.

On the physical examination, we found multiple erythematous papules, nodules, and ulcers on the trunk and extremities along with infiltrated skin of the forehead (leonine face), (**Figure 1**). There was also evidence of madarosis. The examination of lower extremities demonstrated bilateral painful palpable purpuric and erythematous plaques with punched-out ulcers and pitting edema. The patient had multiple ulcers and burn scars of the upper and lower extremities. Examination of the nervous system revealed sensory disturbance of pain and temperature but no enlargement of peripheral nerves. Vital signs were within the normal range. All his family members underwent a physical examination and no abnormal signs and symptoms were detected.

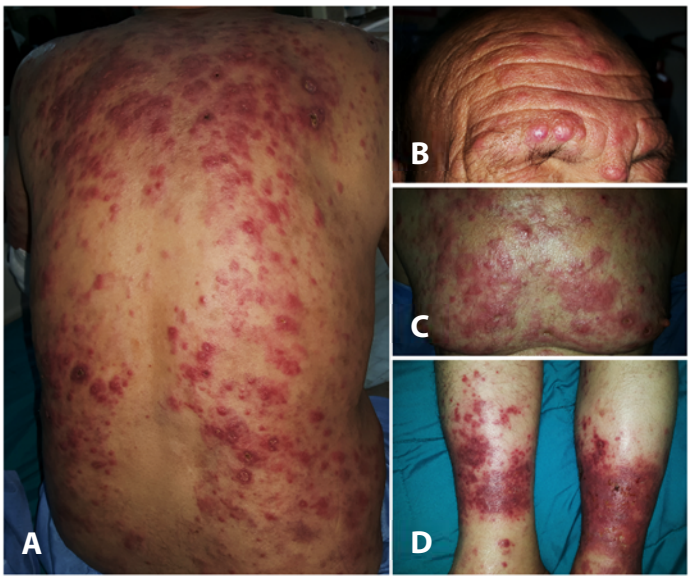

Figure 1. *Multiple erythematous papules, nodules, and ulcers are seen on **A)** & **C)** the trunk and **D)** lower extremities. **B)** Multiple erythematous nodules on forehead and eyebrow loss are also evident.*

Routine laboratory tests were normal. Imaging studies, such as chest x-ray and color Doppler ultrasound of the lower extremities did not show any abnormalities. Also, electromyogram and nerve conduction velocity were done and showed the moderate axonal changes in the upper and lower extremities.

Two punch biopsies from purpuric leg and trunk nodules were examined. The trunk skin biopsy showed acanthosis and spongiosis in the epidermis. Severe infiltration of lymphohistiocytes in the dermis, particularly around cutaneous nerves, vessels, arrector pili muscles, and hair follicles were seen. We also prepared a smear from a nodule on the

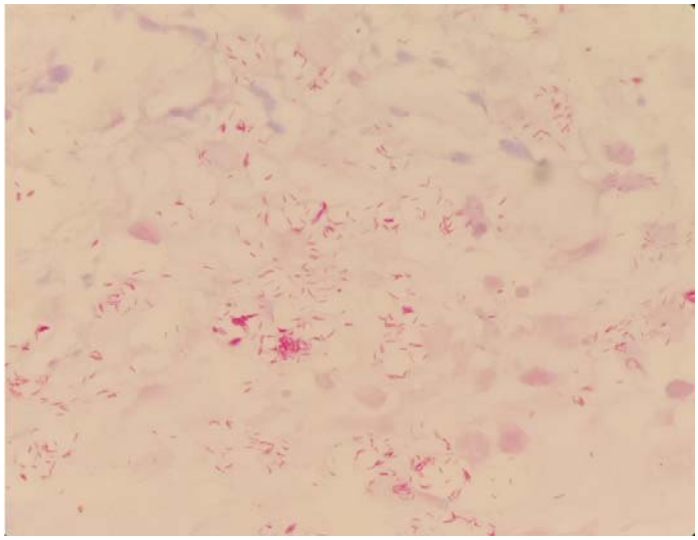

Figure 2. *Numerous acid-fast bacilli (red rods) in the slit skin smear fluid from the lesion in the initial presentation of the patient. Ziehl-Neelsen staining, 100×.*

trunk and many acid-fast bacilli were seen on Ziehl-Neelsen staining (**Figure 2**). The skin biopsy of the leg revealed edema and leukocytoclastic vasculitis associated with foamy histiocytes with large pink-bubbly cytoplasm (Virchow cells) in the dermis (**Figure 3**). These findings were compatible with the diagnosis of lepromatous leprosy along with erythema nodosum leprosum. The patient was treated successfully by the World health organization-recommended multidrug therapy (MDT) regimen (rifampin, clofazimine, dapsone), [4] and most of the skin lesions improved or disappeared after treatment. Eight months after starting multidrug therapy, some indurated papules and plaques appeared on the trunk and upper limbs (**Figure 4**). The skin biopsy from these new lesions showed multiple epithelioid granulomas with

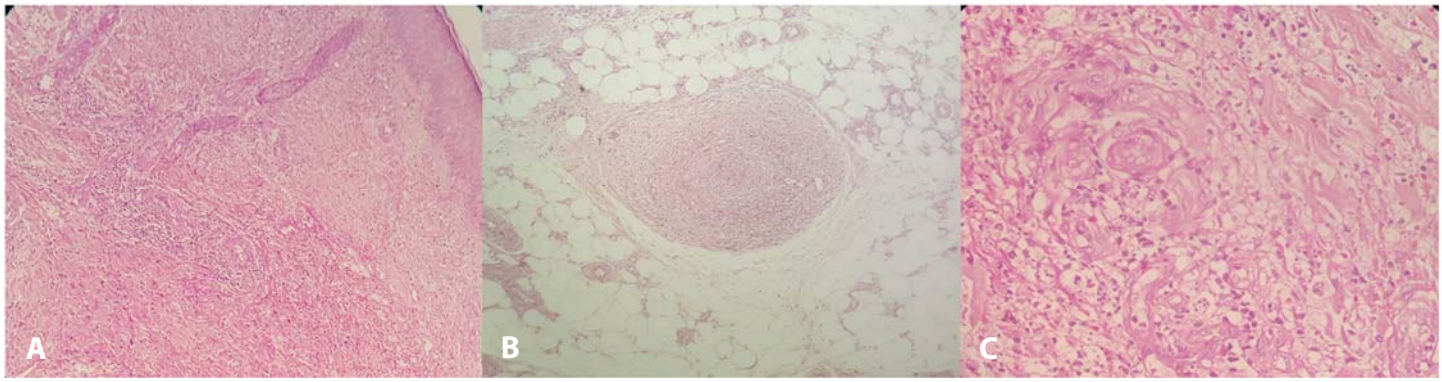

Figure 3. *A dense infiltrate which extends into the subcutis, particularly around **A)** small and **B)** medium size vasculature. H&E, 10×. **C)** In addition to neutrophilic vasculitis, foamy histiocytes with a large pink-bubbly cytoplasm are seen in the background. H&E, 40×.*

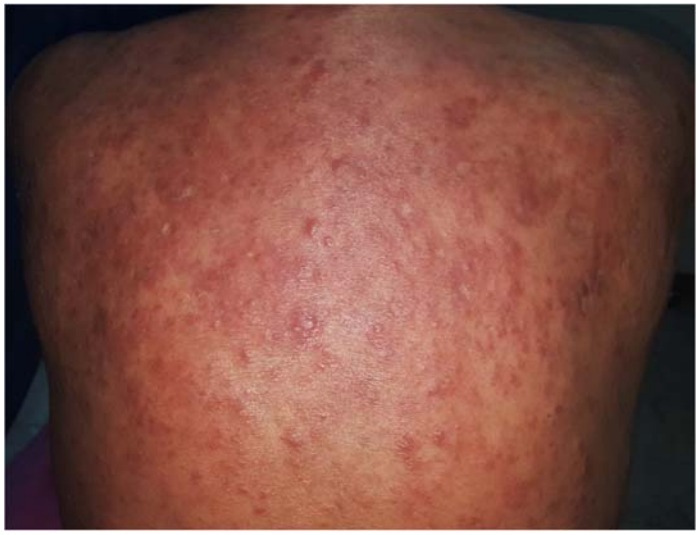

Figure 4. *Multiple indurated papules and plaques on the trunk and upper limb appeared after initial healing with anti-leprosy treatment.*

multinucleated giant cells in the upper dermis with scattered lymphocytic infiltration (**Figure 5**). Some fragmented acid-fast bacilli were also seen on Ziehl-Neelsen staining (**Figure 6**). According to the mentioned clinical and histopathological findings, the diagnosis of leprosy type I reaction was established. Therefore, 40mg of prednisolone daily was added to the patient's treatment. Over three months, the lesions resolved dramatically and the dose of prednisolone was tapered over 6 months.

Discussion

Lepromatous leprosy is a form of leprosy which has an association with high bacillary load and poor cellular immune response. Early dermatologic manifestations include erythematous macules, papules, nodules, and plaque with a symmetrical distribution. Severe pruritus was also reported in some cases [1,5]. Immunologic reactions occur owing to systemic inflammation in about 30-50% of leprosy patients. Causes of these reactions include treatment with antimicrobial drugs, pregnancy, other infections, and even mental distress. Clinical manifestations of type I reaction include erythematous swollen and indurated plaques and severe nerve injury causing pain, tenderness, and nerve dysfunction. Type II reaction presents as a small vessel vasculitis which is called erythema nodosum leprosum (ENL), [6]. Increased levels of tumor necrosis factor and other pro-inflammatory cytokines support the role of these cytokines in the inflammatory phase of ENL [7].

Erythema nodosum leprosum presents with skin lesions (red, painful, and tender subcutaneous lesions), fever, and systemic inflammation that may affect the nerves, eyes, joints, testes, and lymph nodes [2,3]. On histopathology study of ENL, the presence of neutrophilic and lymphocytic infiltration around granulomata with intensive leukocytoclastic small or medium vasculitis is seen [8,9]. Erythema nodosum leprosum can occur before, but more often after anti-leprosy treatment. It can also reoccur, often more than four times, in almost a half of initial ENL reported episodes. Multiple episodes were found in

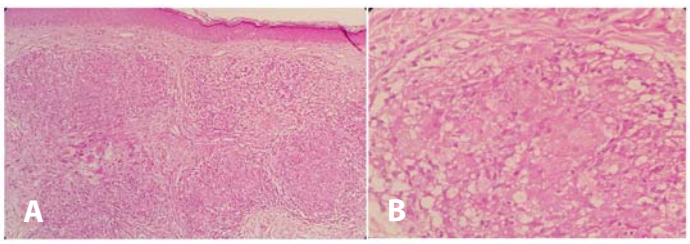

Figure 5. *Numerous granulomata in the upper and mid-dermis consisting of lymphocytes and epithelioid histiocytes admixed with foamy macrophage and Langhans-type giant cells. H&E,* ***A)*** *10×,* ***B)*** *40×.*

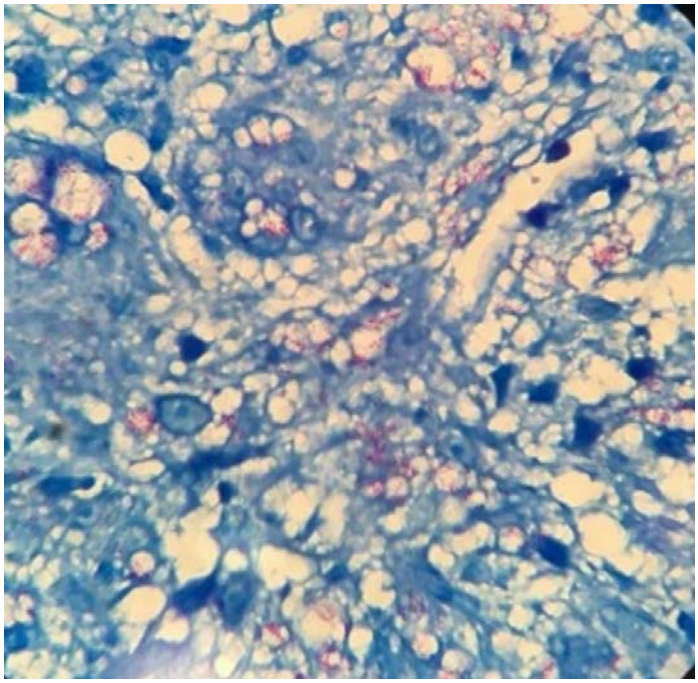

Figure 6. *Some fragmented acid-fast bacilli. Ziehl-Neelsen staining, 100×.*

39–77.3% of ENL patients. Calculations indicate an average of 2.6 episodes per ENL patient. Episodes of ENL peak during MDT, but also occur up to 7–8 years after cessation of treatment [2,10].

Our patient exhibits a distinctive presentation of lepromatous leprosy with type II reaction before treatment and type I reaction eight months after initiation of treatment. Multidrug therapy was initiated and significant improvement of all skin lesions and ENL were seen after 8 weeks follow-up. No additional therapy for ENL such as thalidomide was needed in our patient. Type I reaction appeared in our patient as multiple indurated erythematous skin lesions 8 months after treatment that responded well to oral prednisolone. It is recommended to keep in mind the diagnosis of lepromatous leprosy and its related reactions in patients with bizarre multiple or generalized infiltrated or ulcerated skin lesions especially when accompanied by paresthesia or loss of sensation.

Potential conflicts of interest

The authors declare no conflicts of interests.

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