Avicenna J Clin Microb Infec. 2018 February; 5(1):e64161. doi: 10.5812/ajcmi.64161.

Published online 2018 January 10. **Case Report**

Erythema Induratum of Bazin: A Rare Presentation of Tuberculosis

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Received 2017 April 07; **Revised** 2017 November 17; **Accepted** 2017 December 21.

Abstract

Erythema induratum of bazin (EIB) is a hypersensitivity reaction to *Mycobacterium tuberculosis* infection. The diagnosis can be difficult because tubercle bacilli are usually not found in smears or cultures of lesions. This study reports on a case of EIB in a 13-year-old female, who presented multiple tender nodules on her lower extremities. Biopsy of the nodule revealed histopathologic changes compatible with erythema induratum. QuantiFERON test was positive. The patient received a 6-month duration of anti-tuberculosis treatment. The lesions disappeared during therapy, and no pigmentation was observed at the end of treatment. After a year of follow up, there was no recurrence of the disease.

Keywords: Cutaneous Tuberculosis, Erythema Induratum, Interferon-Gamma Release Assay

1. Introduction

Cutaneous lesions are relatively rare manifestations of tuberculosis, occurring in only 1% to 2% of infected patients. The clinical pictures are highly variable, and any unexplained skin lesion, especially in the form of inflammatory papules, verrucous plaques, suppurative nodules, and chronic ulcers may be due to tuberculosis (1).

Erythema induratum of bazin (EIB) is one of the hypersensitivity reactions to tuberculids infection. The diagnosis of tuberculids could be difficult because *Mycobacterium tuberculosis* organisms are usually not found in smears or cultures of cutaneous lesions. However, *M. tuberculosis* DNA has been detected in erythema induratum skin lesions by the polymerase chain reaction (PCR) (2).

This report describes an unusual case of EIB from Hamadan, an endemic area for tuberculosis in Iran.

2. Case Presentation

A 13-year-old female was presented on the 10th of January 2016 to Sina hospital, Hamadan, Iran, with a 6-month duration of chronic skin lesions on lower extremities. She had a history of similar lesions during the last 3 years, with spontaneous healing and reappearance after several months. She had no history of tuberculosis or contact with tuberculosis patients. No constitutional symptoms were accompanied with the skin involvement.

On physical examination, some erythematous patches with tender nodules in palpation were observed on the lateral surface of both legs (Figure 1).

Routine lab tests, including complete blood count, erythrocyte sedimentation rate, C-reactive protein, renal function tests, and liver enzymes were normal. Tuberculin skin test showed an induration with a diameter of 5 mm. Chest radiograph was normal.

Paunch biopsy of a lesion of the left leg revealed skin tissue with obvious lobular panniculitis composed of lymphohistiocytic infiltration with numerous foamy macrophages in deep dermis and subcutaneous fat that was accompanied with fat necrosis and vascular reaction. Few scattered multinucleated histiocytes were noted but well-formed granuloma was absent (Figures 2 and 3). Direct smear of the specimen was negative for acid-fast bacilli. The histopathologic changes were compatible with erythema induratum.

Polymerase chain reaction test failed to detect *M. tuberculosis* DNA in tissue samples. Results from interferon-γ release assay by QuantiFERON test for tuberculosis had positive results. Due to positive interferon-γ release assay and the histological changes found in the paunch skin biopsy, cutaneous lesions were explained as erythema induratum of bazin (EIB).

The patient received treatment with standard 6-month anti-tuberculosis regimen, including isoniazid, rifampin,

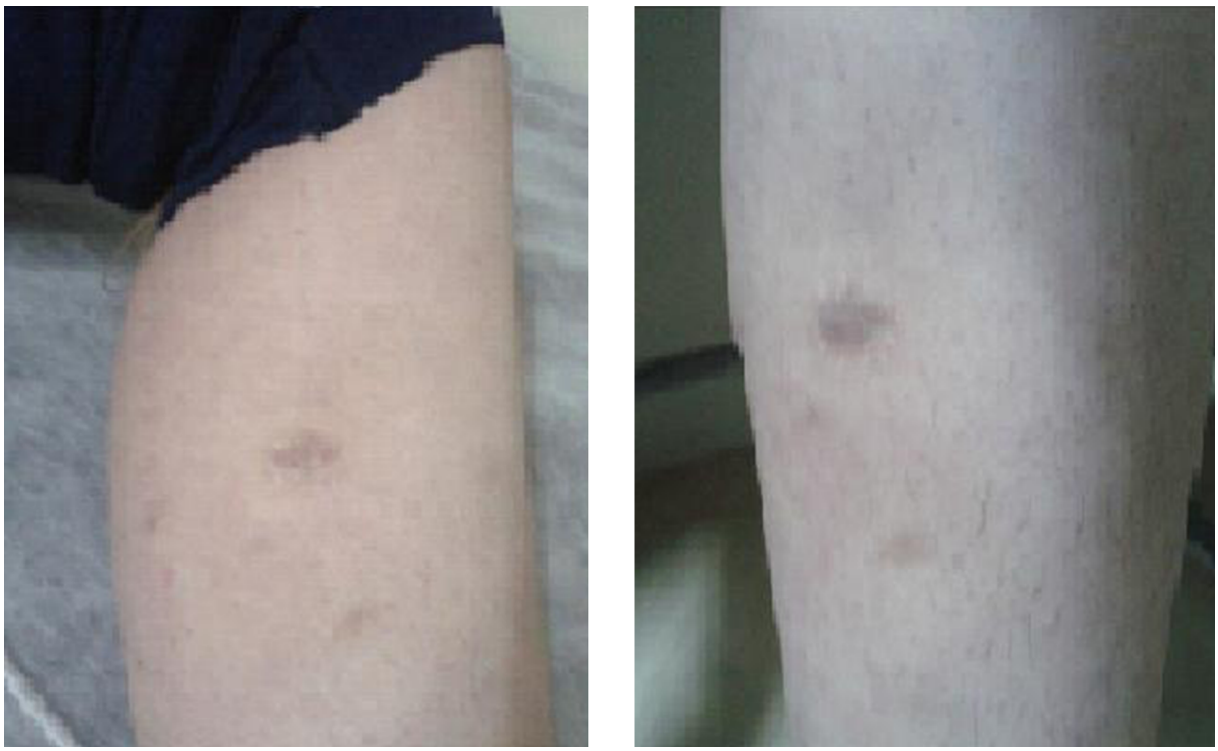

Figure 1. Photograph from Skin Lesions Showing Erythematous Patches

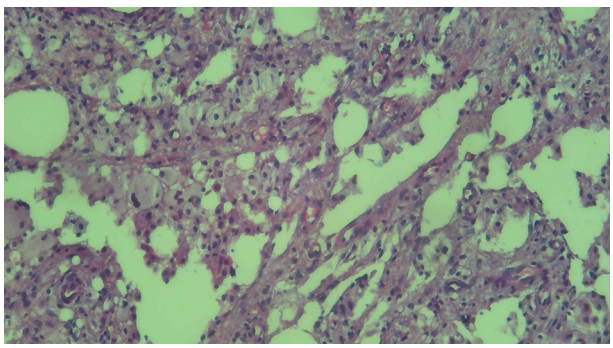

Figure 2. Lobular Panniculitis with Fat Necrosis Composed of Lymphohistiocytic Infiltration and Numerous Foamy Macrophages (H and E, × 10)

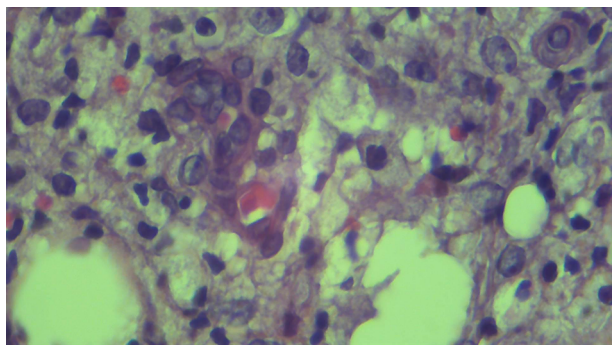

Figure 3. Vascular Reaction of Capillary Structures in Deep Dermis with Endothelial Swelling and Extravasation of Erythrocytes (H and E, × 40)

ethambutol, and pyrazinamide for 2 months and isoniazid plus rifampin for the remaining 4 months. The skin lesions resolved during therapy, and no pigmentation remained at the end of treatment. During the first year after treatment, no recurrence of skin lesions was observed.

3. Discussion

The patient was a rare case of erythema induratum of bazin. The patient's age and gender and clinical feature of the disease were similar to previously reported cases. As in this patient, EIB often present as subcutaneous nodules symmetrically distributed on both legs, mainly in young females. The nodules are soft and tender. The surrounded skin may be erythematous, and become dusky or bluish

later. The lesions gradually heal within a few months and reappear again (1).

Uncommonly, the lesions may be observed at sites other than the legs. Disseminated lesions have also been reported (3). Moreover, erythema induratum may be associated with tuberculosis of any organ. In 1988, Hassoun et al. (4) reported a case of erythema induratum occurring in a young Chinese female in the setting of active pulmonary tuberculosis. Shimizu et al. (5) described a 24- year-old Japanese female with right axillary lymphadenitis and erythema induratum of bazin. Ramdial et al. (6) reported on 2 patients with tuberculous epididymo-orchitis and erythema induratum. Sughimoto et al. (7) reported on a patient with erythema induratum and aortic valvular lesions of tuberculosis. Atypical erythema induratum of bazin has been reported in a patient with tuberculous osteomyelitis (8).

Zakeri et al. (9) reported EIB with peripheral neuropathy in a 57-year-old Hispanic female, who presented recurring tender plaques and nodules on the lower extremities, with a severe burning sensation on the feet that resolved after anti-tuberculosis therapy.

Erythema induratum of bazin is a hypersensitivity reaction to the tubercle bacillus. Tuberculin skin tests are strongly positive in most cases. *Mycobacterium tuberculosis* DNA is often detected by PCR from lesions (10). However, a negative PCR does not rule out the diagnosis (1).

The current patient had a negative tuberculin test and negative PCR of the biopsy specimen, yet a positive QuantiFERON test. The usefulness of this test was declared in a patient with tender ulcerating nodules of the legs, a normal chest X-ray, and biopsy without acid-fast bacilli, yet whose QuantiFERON was positive, leading to the diagnosis of erythema induratum that responded to anti-tuberculosis therapy (11). Xu et al. reported on a 57-year-old Chinese female with EIB, whose tissue biopsy failed to detect *M. tuberculosis* DNA, yet the interferon-gamma release assay was positive (12). Other reports have supported the utility of the interferon-gamma release assay (IGRA) for erythema induratum of bazin (13).

In conclusion, EIB is a hypersensitivity to *M. tuberculosis*. Due to negative smear and culture of biopsy specimen, the origin of the disease is difficult to diagnose. In cases the tuberculin skin test and PCR of the biopsy specimen are negative, IGRA may be useful for diagnosis of tuberculosis origin.

Footnotes

Authors' Contribution: All authors had equal contribution to the design, preparation, and editing of the manuscript.

Financial Disclosure: No conflict of interest to declare.

Funding/Support: No financial support to declare.

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