



Case Report

Erythema Induratum of Bazin in Four-Year-Old Boy

Sopheaktra Thea^{*}, Sovanpitou Thea¹

¹- Room consultation Heng Sokhom

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Abstract

Erythema Induratum of Bazin (EIB) is a chronic nodular eruption on the lower leg. It is a form of tuberculoid reaction hypersensitivity to tuberculosis antigen. EIB mostly occurs in young women, especially adolescents and middle-aged women, but rarely occurs in young children. The reported case was a 4-year-old boy in October 2023. The diagnosis was confirmed by tissue histopathology. The patient's EIB was successfully treated with an anti-tuberculosis agent. Hence, we report an uncommon case of chronic nodular panniculitis in a four-year-old Cambodian boy. In conclusion EIB is suspected clinically and histopathologically; therefore, IGRA should be performed. This case of a young boy vaccinated with BCG and EIB demonstrates the importance of considering EIB in children with chronic leg nodules. IGRA has proven valuable in diagnosing Mycobacterium tuberculosis infection after it is suspected clinically and histologically. The prompt initiation of antituberculosis therapy led to successful resolution of the skin lesions, highlighting the significance of early diagnosis and treatment for optimal outcomes. This case adds to the growing body of evidence supporting IGRA as a reliable tool for diagnosing cutaneous tuberculosis in children.

^{*}Corresponding author: Sopheaktra Thea sopheaktra123@gmail.com; # 99, Street 566, Sangkat Boeung Kak 2, Khan Tuol Kouk, Phnom Penh

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Introduction

Erythema Induratum of Bazin (EIB) is a hypersensitivity reaction with various etiologies, such as infection, inflammatory bowel disease, connective tissue disease, hypothyroidism, and adverse drug reactions, mainly caused by *Mycobacterium tuberculosis* (1). Cutaneous tuberculosis is rare; therefore, there are limited studies on this topic. The prevalence of cutaneous TB ranged from 1.0% to 1.5%. Magalhães et al. reported the clinical, epidemiological and laboratory profiles of 54 patients, 88.9% of whom were female, with ages ranging from 13 to 70 years (2).

The diagnosis required clinical and histopathological correlation, while the clinical features included chronic or recurrent erythematous nodules or plaque predominantly on the calves accompanied by skin atrophy or ulceration, predominantly on the calves. Histopathology revealed septate and lobular panniculitis, fat necrosis, infiltration of lymphocytes and histiocytes, multinucleate giant cells with epithelioid granuloma and vasculitis (3).

EIB is a chronic nodular eruption on the lower leg among young women between adolescence and middle age. EIB cases are rare in children. However, one interesting case was found in a 4-year-old Cambodian boy from Phnom Penh, who presented with painful tender cutaneous nodules of the calves bilaterally; this patient was hospitalized in late October 2023 and diagnosed in mid-November 2023.

Case presentation

A 4-year-old boy who walked in with a painful tender cutaneous nodule on the posterior side of both lower legs for several months. Historically, he was treated with oral methylprednisolone and oral desloratadine with the initial provisional diagnosis of an insect bite reaction or Erythema nodosum by a general practitioner. The skin lesion gradually subsided, resulting in hyperpigmentation. However, after stopping methylprednisolone, the rash and scarring reappeared over time. He had no personal or family history of tuberculosis (TB) or personal history of TB infection. Routine blood tests (CBC, LFTs, RFTs, CRP) were normal. Our clinical physician performed a full-body examination and found that the boy had bilateral symmetrical erythematous violaceous palpable nodules, approximately 10 mm for the largest and 3 mm for the smallest in size, on the calves, with sparing of the pretibial areas (**Figure 1**). The rest of the body appeared fine and healthy. The following provisional diagnoses were proposed: Erythema Induratum of Bazin, Erythema Nodosum,

Arthropod bite, Cutaneous Polyarteritis Nodosa, and Lupus panniculitis. Then, our clinician decided to perform a biopsy to obtain histopathological confirmation. The histopathological results revealed lobular associated with septate panniculitis, infiltration of lymphocytes and histiocytes, multinucleate giant cells with epithelioid granuloma and vasculitis (**Figure 2**). As the patient had already received BCG vaccination, we did not perform a tuberculin skin test (TST). Chest X-rays were obtained, which showed normal results. Moreover, the results of the interferon-gamma release assay (QuantIFERON TB Test Gold plus) were positive, with interferon gamma TB1 = 1.51 IU/ml and TB2 = 1.98 IU/ml, and the cutoff value of this assay was 0.35 IU/ml. Treatment for tuberculosis was initiated with two months of isoniazid (H), rifampicin (R), pyrazinamide (Z), and ethambutol (E), followed by another four months of isoniazid (H) and rifampicin (R) to establish a six-month treatment regimen. As a result, the skin lesion subsided after the second month of antituberculosis therapy (**Figure 3**). The patient was still receiving anti-tuberculosis treatment for the next four months to complete the treatment regimen.



Figure 1: Bilateral symmetrical multiple erythematous painful erythematous papule and nodule on the calves.



Figure 3: The skin lesion resolves after second month of anti-tuberculosis treatment.

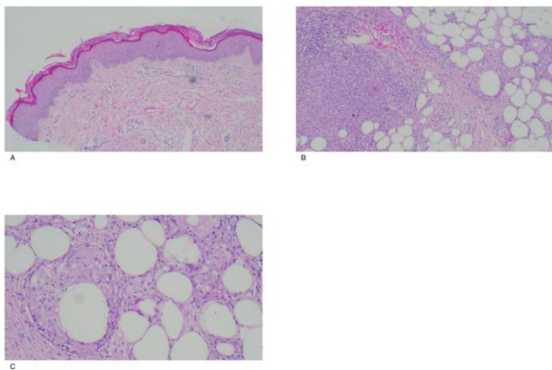


Figure 2. (A, B, C) Histopathology specimen for skin biopsy. A: Normal finding on the surface epidermis and dermis. B&C: Panniculitis predominantly lobular with septate widened with a mix inflammatory cell, lymphocytes, histiocyte and a few multinucleated giant cells without area of necrosis.

Discussion

In this patient, the typical clinical characteristic was chronic recurrence. The clinical distribution of the skin lesion correlated with histopathological findings and showed an excellent response to antituberculosis therapy, supporting the diagnosis of EIB. This case was similar to a previous report of a 10-year-old Korean boy. Typical skin lesions were observed, and

skin biopsy results suggested EIB. He responded well to anti-tuberculosis treatment (4).

The relationship between EIB and the TB antigen has been confirmed by many different methods for extrapulmonary TB, such as tuberculin skin tests, tissue polymerase chain reaction (PCR), tissue culture and acid-fast bacilli (AFB), and interferon-gamma release assays (IGRAs) (2). However, the tuberculin skin test is not recommended for many Asian countries due to false positives resulting from neonatal BCG vaccination (5). Tissue PCR has the advantage of identifying slowly growing M-tuberculosis, but PCR is limited by variable positivity rates. Tissue culture and AFB staining have shown low sensitivity in cutaneous TB (6). Due to the limitations of AFB-negative detection, IGRA has emerged as a key tool for diagnosis, as it offers high sensitivity and specificity that are unaffected by prior TB inoculation (7). Lighter et al. demonstrated a strong positive result with the QuantiFERON Gold plus test in diagnosing cutaneous tuberculosis (8). A systematic review and meta-analysis illustrated that the sensitivity and specificity of QTF-(plus) were 94% (95% CI: 89-97) and 96% (95% CI: 94-98), respectively (9). A systematic review and meta-analysis reported that the prevalence of TB in Asia is greater than that in the West. Therefore, IGRA is preferred for detecting TB infection, including cutaneous TB, in Asia (10).

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Contribution

Sopheaktra Thea and Sovanpitou Thea wrote and revised the entire manuscript. They both are medical doctors working at Room Consultation Heng Sokhom.

Declaration

Informed consent was provided to a child's guardians as they agreed to the case publication.

Abbreviations

CBC: Complete Blood Count, CRP: C-Reactive Protein, EIB: Erythema Induratum of Bazin, IGRAs: Interferon-Gamma Release Assays, LFTs: Liver Function Test, RFTs: Renal Function Test.

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