CASE REPORT

Erythema Induratum in a Young Woman with Latent Tuberculosis: A Case Report.

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Abstract

Erythema induratum of Bazin (EIB) is a rare, immune-mediated panniculitis historically associated with *Mycobacterium tuberculosis* infection. Reports linking erythema induratum to latent tuberculosis (TB), particularly without active pulmonary disease, remain limited. We describe a 24-year-old Malaysian woman with multiple nodules on both lower legs. She had a significant family history of tuberculosis, as her father had been treated for pulmonary TB more than 10 years ago. Histopathology revealed lobular granulomatous panniculitis with vasculitis and fat necrosis. The Mantoux test was positive, but chest imaging ruled out active TB. Based on clinical and histological findings, she was treated for latent TB infection (LTBI) with antituberculosis therapy, which resulted in no further new lesions, while existing lesions showed crusting within two months. This case highlights the importance of considering latent TB in patients presenting with erythema induratum, particularly in TB-endemic regions, even in the absence of clinical or radiological evidence of active disease.

Keywords: *Case report, erythema induratum, latent tuberculosis.*

Introduction

Erythema induratum of Bazin (EIB) is a chronic, recurrent form of lobular panniculitis characterized by tender, erythematous nodules on the lower limbs, most often affecting women [1]. Originally described by Bazin in 1861, it was characterized as a cutaneous manifestation of tuberculosis. EIB is now believed to be a hypersensitivity reaction to antigens of *Mycobacterium tuberculosis* rather than a direct infection [2,3].

Histologically, EIB shows vasculitis, granulomatous inflammation, and lobular panniculitis, sometimes with caseous necrosis [4]. There are three subtypes of erythema induratum, tuberculosis (TB)-associated EIB, EIB associated with other diseases or drugs, and idiopathic EIB. Differentiating between these subtypes requires careful assessment of the patient's clinical history, physical examination, and relevant investigations, as their clinical presentations and histopathological features are similar. The association between latent tuberculosis infection (LTBI) and erythema induratum is supported by consistent reports of improvement following anti-tuberculosis therapy [2,5]. Because tuberculosis remains endemic in Malaysia, it is important to consider rare cutaneous manifestations such as erythema induratum in patients who present with persistent nodular lesions, particularly when they do not respond to routine therapies [3,6].

Case presentation

A 24-year-old Malay woman presented in June 2025 with a three-week history of multiple, painless nodules on both lower legs. Some lesions on the right lower limb developed superficial ulceration and pruritus. She reported no constitutional symptoms such as fever, night sweats, weight loss, or cough. Her father had a history of smear-positive pulmonary TB more than 10 years ago and completed six months of treatment. However, she had never been screened before for TB as she was a child at the time.

Examination showed multiple ill-defined erythematous nodules on bilateral lower limbs, measuring 1 to 2 cm, some with central crusting and ulceration, especially on the right lower limb (Figure 1a). No lymphadenopathy was detected.

Investigations:

- **Blood investigations**: Full blood count, Haemoglobin 11.2 (12.0-15.0) g/dl, Haematocrit 34.6 (36-46)%, white cells 6.4 (4.0-10.0) $x10^3/mm^3$, platelets 304 (150-410) $x10^3/mm^3$, erythrocyte sedimentation rate (ESR) 15 (0-12) mm/Hr, fasting plasma glucose 5.1 mmol/L (3.9-6) mmol/L, urea 2.62 (2.76-8.07) mmol/L, creatinine 41 (44-80) umol/L, alanine aminotransferase (ALT) 30 (10-35) U/L, sodium 135 (136-145) mmol/L, potassium 3.9 (3.4-4.5) mmol/L, C-Reactive protein (CRP) 0.8 mg/L (<5.0) mg/L, antinuclear antibody (ANA) negative and Human Immunodeficiency Virus (HIV) with Hepatitis screening were non-reactive.
- **Histopathology** (right calf skin biopsy): The epidermis shows irregular acanthosis. The dermis displays perivascular and periadnexal lymphohistiocytic infiltration, with occasional eosinophils and neutrophils noted (Figure 2). The subcutaneous tissue shows dense septolobular infiltration by lymphoplasmahistiocytic cells with multiple multinucleated Langhans-type giant cells seen (Figure 3). Both coagulative necrosis and caseous necrosis are present (Figure 4). Neutrophilic vasculitis is observed, associated with destruction of blood vessels. There is no evidence of malignancy. Ziehl-Neelsen and Wade-Fite stains for acid-fast bacilli (AFB), and periodic acid-Schiff stain for fungal bodies, were negative.
- **Tuberculosis evaluation**: Chest radiograph was unremarkable. Bronchoalveolar lavage for AFB was negative. The Mantoux test was strongly positive (15 mm), supporting latent TB infection.

Given the clinical context, histological findings, family history, and positive Mantoux test, we diagnosed latent TB infection and initiated antituberculosis treatment. The nodules regressed significantly within two months after treatment initiation, and no new lesions appeared, resulting in post-inflammatory hyperpigmentation and the formation of a crusted lesion (Figure 1b). No drug-related adverse effects were reported.

Discussion

EIB is an immune-mediated reaction to *Mycobacterium tuberculosis* antigens rather than a direct cutaneous infection [3,4]. Its pathogenesis involves both type III immune complex–mediated and type IV delayed-type hypersensitivity mechanisms. Deposition of mycobacterial antigens in dermal vessels leads to complement activation, vasculitis, and granulomatous inflammation, producing the characteristic of lobular panniculitis [4,5]. Other subtypes of EIB are not associated with TB, EIB associated with drugs or other diseases such as hypothyroidism, autoimmune disorders, inflammatory bowel disease, and idiopathic EIB.[7] Differentiating all three subtypes, requires a careful assessment of the patient's clinical history, physical examination, and relevant investigations. (Table 1). Although EIB is an inflammatory panniculitis, our patient demonstrated a mildly elevated ESR and normal CRP. Because the process is primarily a localized hypersensitivity reaction rather than a systemic infection, inflammatory markers such as CRP may remain normal, while ESR may show only mild, nonspecific elevation.

Reported cases of EIB highlight variable clinical presentations and responses to anti-tuberculosis therapy. A summary is presented in Table 2. These cases reinforce the importance of considering latent or active tuberculosis in patients presenting with erythema induratum. Histopathologically, the triad of lobular panniculitis, granulomas, and vasculitis differentiates EIB from erythema nodosum, which shows septal panniculitis without vasculitis [4]. Acid-fast bacilli were not demonstrated on Ziehl–Neelsen and Wade–Fite staining, confirming the diagnosis of erythema induratum, which represents a hypersensitivity reaction to *Mycobacterium tuberculosis* rather than direct cutaneous infection. In our patient, the characteristic histopathological features, strong contact history, positive Mantoux test, and favourable response to anti-tuberculous therapy support the diagnosis of TB-associated EIB.

Although no standardized treatment guidelines exist due to EIB's rarity, most authors recommend anti-tuberculosis therapy in cases with latent infection or epidemiologic risk [3,6]. After two months of treatment, our patient has shown a sustained positive response, consistent with findings in similar recent case reports, although treatment is still ongoing. This case contributes to the limited data on EIB in Malaysia, emphasizing the importance of considering LTBI in cases of chronic nodular panniculitis where no active TB is present, especially in endemic areas.

Conclusion

Erythema induratum of Bazin should be suspected in patients presenting with multiple erythematous nodules over the lower limbs, particularly in tuberculosis-endemic regions or those with a family history of TB. A positive Mantoux test and compatible histopathology can help diagnose latent TB infection, even if there is no radiological or clinical evidence of active disease. Early diagnosis and prompt anti-tuberculosis therapy can prevent chronicity and lead to excellent clinical outcomes.

Patient Consent

Written informed consent was obtained from the patient and the patient's relative for publication of this case report and associated images.

Author Contributions

MI contributed to drafting of the manuscript and collected the patient's clinical data, while NAAZ,

prepared the histopathological report. SD and OSY reviewed and edited the manuscript. All authors read and approved the final manuscript.

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Table 1. A comparison of clinical features, investigations, and treatments for three subtypes of Erythema Induratum [3,4,6,8-9]

Subtypes	***TB-associated EIB***	***Drug-induced or other disease***	***Idiopathic EIB***
Clinical history	History of tuberculosis or latent TB	Recent drug exposure Any underlying disease Recent infection	No clear trigger
Relevant investigations	Tuberculin test Interferon gamma release assay (IGRA) Chest radiograph	Serological test Autoimmune markers Culture of infection	Negative TB test No drug-induced and no systemic illness
Histopathology	Lobular panniculitis, granulomatous inflammation, epithelioid histiocytes, Langhans giant cells, caseous necrosis, vasculitis	Mixed lobular and septal granulomatous inflammatory infiltrate with fat necrosis and vasculitis.	Lobular panniculitis, granulomatous inflammation, necrosis in some cases, and vasculitis are inconsistently present.

Table 2. Summary of Reported Cases of Erythema Induratum of Bazin.[1-3,5-7]

	Clinical History	***Physical Examination***	***Treatment***	***Outcome***
Abdulla MC, 2022	4-year history of undiagnosed painful nodular leg lesions with pyrexia of unknown origin	Multiple erythematous nodules and scaly plaques on the legs, mildly tender.	Anti-TB therapy (6-month regimen)	Complete resolution after 6 months of treatment
Ammar N et al, 2023	8-year history of leg nodules, family history of TB, night sweats, weight loss	Erythematous nodules, violaceous, and sensitive on both legs	Anti-TB therapy	Rapid improvement within 2 months
Sailaja K et al, 2025	Recurrent nodular leg lesions, systemic symptoms, with a history of pleural TB 30 years ago	Tender erythematous plaques with oozing, crusting, and ulceration	Anti-TB therapy	Clinical improvement after 6 months of therapy
Yang K, 2021	An adolescent with painful nodules, later diagnosed with cavitary TB	Tender erythematous nodules on right lower leg, ankle swelling	Standard 6-month anti-TB regimen (2 months of EHRZ, followed by 4 months of EHR)	Good clinical response after 2 months of treatment
Marina GA, 2023	Elderly woman with painless nodules, no systemic symptoms, IGRA positive	Papule and violaceous plaques on anterior leg, non-ulcerated	Anti-TB therapy (EHRZ regimen)	Lesions resolved gradually
Mei X, 2017	Recurrent ulceration and pain in a 73-year-old's lower legs with a history of treated EIB with oral anti-TB for 1 month	Multiple deep-seated nodules with crusted lesions on both calves, tender.	Topical application of anti-TB drug (isoniazid) with zinc oxide – Oral anti-TBs were stopped due to thrombocytopenia and side effects after two weeks.	Significant improvement within 1 month; complete resolution after 2 months

Footnotes: EHRZ = Ethambutol, Isoniazid, Rifampicin, Pyrazinamide; EHR = Ethambutol, Isoniazid, Rifampicin; IGRA = Interferon Gamma Release Assay.

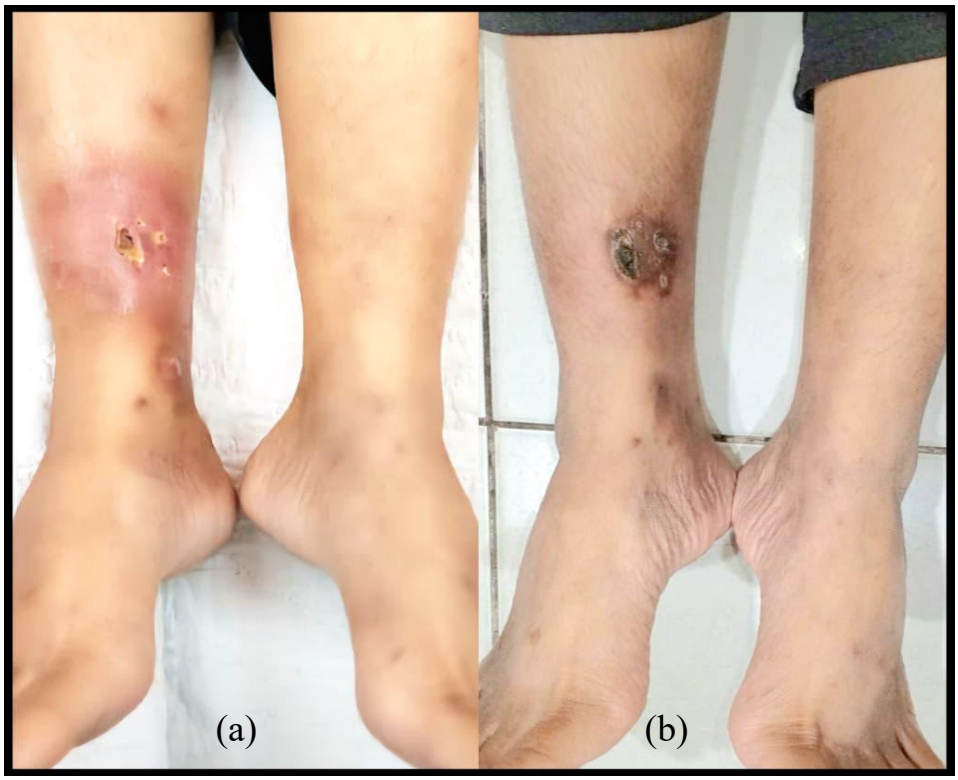

Figure 1. (a) Erythematous nodules with central crusting and ulceration of the right lower limb. (b) Crusted lesion with post-inflammatory hyperpigmentation after two months of anti-TB therapy.

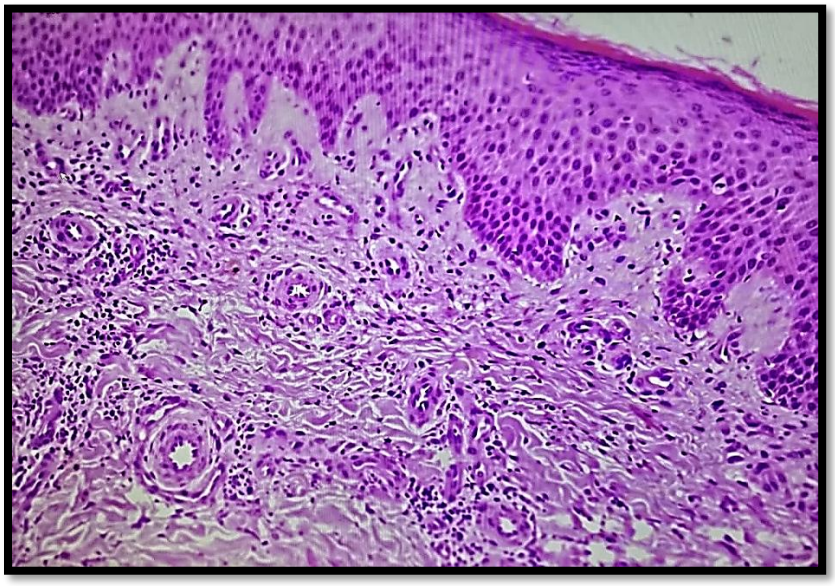

Figure 2. Epidermis with irregular acanthosis and superficial dermal perivascular lymphohistiocytic infiltration

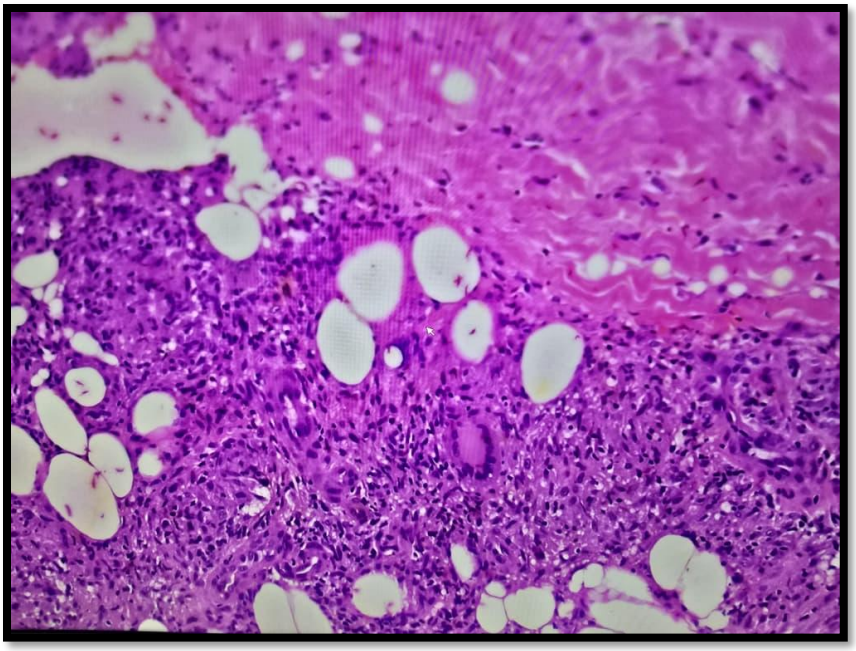

Figure 3. Septolobular panniculitis with a few Langhans-type multinucleated giant cells seen.

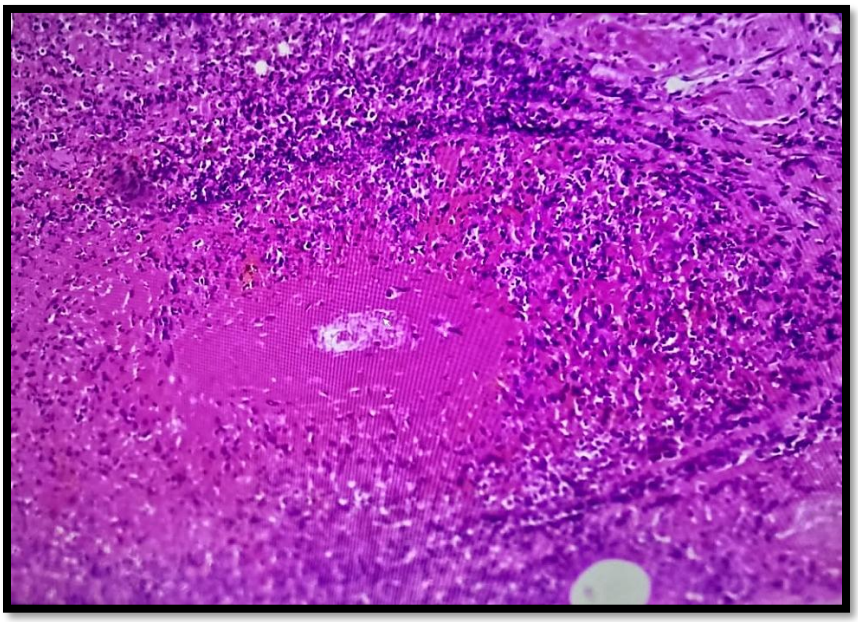

Figure 4. Granulomatous inflammation with central caseating necrosis.

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