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When the Skin Tells What the Lungs Hide: Cutaneous Tuberculosis Mimicking Nodular Vasculitis

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Abstract **Case Report**

Background: Cutaneous tuberculosis (CTB) is a rare extrapulmonary manifestation of Mycobacterium tuberculosis infection. Erythema induratum of Bazin (EIB) is a tuberculid a hypersensitivity reaction to mycobacterial antigens presenting as recurrent nodular lesions predominantly on the lower limbs of women. Its diagnosis is challenging, particularly when classical granulomatous histopathology is absent and pulmonary investigations are unremarkable, leading to potential misdiagnosis as nodular vasculitis or panniculitis of other etiologies. ***Case Presentation:*** We report the case of a 35-year-old immunocompetent Moroccan woman who presented with a 4-month history of recurrent violaceous nodules on both lower limbs, associated with anorexia and weight loss. Skin biopsy demonstrated a non-specific lobular panniculitis with focal necrosis, without typical epithelioid or Langhans giant cell granulomas. PCR analysis of the biopsy specimen was positive for Mycobacterium tuberculosis complex. Tuberculin skin test was positive (induration 10 mm). Sputum smear microscopy, GeneXpert MTB/RIF assay, and chest radiography were all negative. ***Conclusion:*** The patient was treated with standard antituberculous therapy (2RHZE/4RH) and achieved complete resolution of skin lesions. This case highlights that cutaneous tuberculosis can perfectly mimic nodular vasculitis, that the absence of classic granulomatous histology does not exclude the diagnosis, and that PCR on skin biopsy is a decisive diagnostic tool in tuberculosis-endemic settings.

Keywords: Cutaneous tuberculosis; erythema induratum of Bazin; nodular vasculitis; tuberculid; panniculitis; Mycobacterium tuberculosis; PCR; antituberculous therapy; endemic country.

1. INTRODUCTION

Tuberculosis (TB) remains one of the leading infectious causes of morbidity and mortality worldwide, with Morocco among the countries carrying an intermediate burden of TB. While pulmonary tuberculosis constitutes the majority of cases, extrapulmonary manifestations including cutaneous forms represent a diagnostically challenging group of conditions that require a high index of clinical suspicion.

Cutaneous tuberculosis (CTB) accounts for 1–2% of all TB cases and encompasses a heterogeneous spectrum of skin conditions, broadly classified into true cutaneous TB forms (caused by direct mycobacterial invasion of the skin) and tuberculids (immunologically mediated hypersensitivity reactions to mycobacterial antigens in sensitized hosts). Erythema induratum of Bazin (EIB) is the most frequently encountered tuberculid, presenting as recurrent, tender, deep-seated nodules predominantly on the posterior and lateral aspects of the lower legs in middle-aged women. Its clinical resemblance to nodular vasculitis and other forms of panniculitis frequently leads to diagnostic delay or misdiagnosis.

The diagnosis of EIB is particularly challenging when conventional bacteriological investigations are negative as is typically the case in tuberculids and when histopathological findings are non-specific, without the classic epithelioid and giant-cell granulomatous pattern. In this context, molecular detection of mycobacterial DNA by polymerase chain reaction (PCR) on skin biopsy specimens has emerged as a critical diagnostic tool.

We present the case of a 35-year-old woman whose violaceous nodules of the lower limbs initially

suggested nodular vasculitis, but whose skin biopsy PCR ultimately unmasked erythema induratum of Bazin with complete resolution under antituberculous therapy. This case underscores the importance of close collaboration between infectious disease specialists, internists, dermatologists, and anatomopathologists in reaching a correct diagnosis.

2. CASE PRESENTATION

2.1 Patient History and Clinical Presentation

A 35-year-old Moroccan woman with no significant past medical history, no known immunosuppression, and no prior history of tuberculosis was referred to the Department of Infectious Diseases of CHR Hôpital Moulay Hassan Ben Mehdi, Laayoune, with a 4-month history of progressive, painful, violaceous subcutaneous nodules on both lower limbs. She denied any personal or familial history of tuberculosis. She reported no respiratory symptoms such as cough, hemoptysis, or dyspnea. However, she complained of constitutional symptoms including anorexia and significant unintentional weight loss over the preceding two months. No fever or night sweats were reported.

2.2 Physical Examination

Physical examination, conducted in collaboration between the infectious diseases, internal medicine, and dermatology teams, revealed multiple erythematous to violaceous, indurated, tender subcutaneous nodules measuring approximately 1–3 cm in diameter, distributed bilaterally over the lower legs (Figures 1–3). Some lesions demonstrated superficial crusting and scaling. No ulceration, fistulization, or regional lymphadenopathy was noted. Cardiopulmonary and abdominal examinations were unremarkable. The patient was afebrile and hemodynamically stable.

Figures 1–3: Multiple erythematous-violaceous indurated subcutaneous nodules distributed bilaterally on the lower limbs. Note the superficial scaling and crusting visible on some lesions (Figures 2 and 3)

2.3 Investigations

The tuberculin skin test (Mantoux test) was positive with an induration of 10 mm at 72 hours. Chest radiography was normal, with no evidence of pulmonary infiltrates, cavitary lesions, or hilar adenopathy. Sputum smear microscopy for acid-fast bacilli on three consecutive samples was negative. Rapid molecular testing using GeneXpert MTB/RIF (Cepheid®) on sputum was negative for Mycobacterium tuberculosis complex and rifampicin resistance. HIV serology was negative.

A skin punch biopsy of one representative nodular lesion was performed and submitted for histopathological analysis and PCR testing. PCR targeting the IS6110 insertion sequence specific to Mycobacterium tuberculosis complex was positive on the biopsy specimen, providing the decisive molecular evidence of mycobacterial infection within the skin tissue.

2.4 Histopathological Findings

Histopathological examination of the skin biopsy revealed a lobular and septal panniculitis with a mixed inflammatory infiltrate predominantly composed of lymphocytes, histiocytes, and neutrophils within the subcutaneous fat. Focal areas of fat necrosis were identified. Notably, no well-formed epithelioid granulomas and no Langhans-type multinucleated giant cells were observed a finding that, in isolation, could readily suggest nodular vasculitis or non-specific panniculitis. Ziehl-Neelsen staining for acid-fast bacilli was negative. In the context of a positive PCR for M. tuberculosis complex and a positive TST in a tuberculosis-endemic country, the histopathological picture was interpreted as consistent with erythema induratum of Bazin (Figures 4–6).

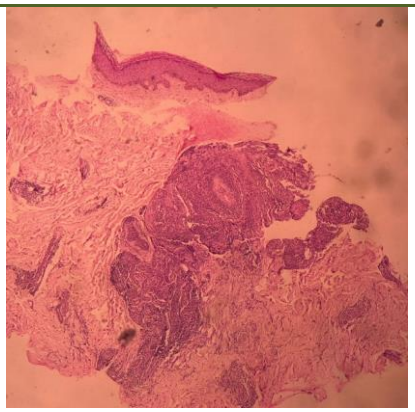

Figure 4: Low-power view of the skin biopsy (H&E stain) showing the overall architecture of the specimen with epidermis, dermis, and subcutaneous tissue involvement by dense inflammatory infiltrate

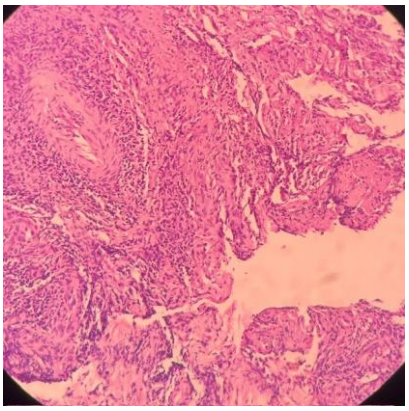

Figure 5: Medium-power view (H&E stain) demonstrating lobular panniculitis with dense mixed inflammatory infiltrate of lymphocytes, histiocytes, and neutrophils within the subcutaneous fat lobules, with areas of fat necrosis

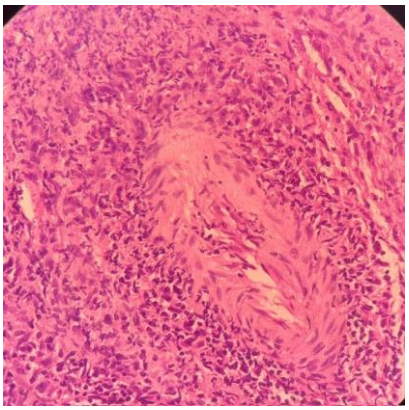

Figure 6: High-power view (H&E stain) showing the inflammatory infiltrate in detail. No well-formed epithelioid granulomas or Langhans-type giant cells are identified. The inflammatory pattern is non-specific, consistent with a tuberculid reaction

2.5 Treatment and Outcome

Given the convergence of clinical, epidemiological, immunological, and molecular evidence and given the clinical mimicry of nodular vasculitis that could have led to inappropriate immunosuppressive therapy the diagnosis of erythema induratum of Bazin was established and standard antituberculous therapy was initiated. The patient received the WHO first-line regimen: an intensive phase of two months combining isoniazid (H), rifampicin (R), pyrazinamide (Z), and ethambutol (E), followed by a continuation phase of four months with isoniazid and rifampicin (2RHZE/4RH). Pyridoxine supplementation was co-prescribed.

The patient tolerated treatment well. Monthly clinical follow-up documented progressive improvement of skin lesions beginning from the second month of therapy. Complete resolution of all nodular lesions was achieved at the end of the six-month treatment course,

with no adverse effects and no recurrence observed at follow-up. The therapeutic response itself constituted a final confirmatory argument for the diagnosis.

3. DISCUSSION

This case illustrates a classic diagnostic pitfall: violaceous nodules of the lower limbs in a young woman, with normal chest imaging and negative sputum investigations, can easily be attributed to nodular vasculitis or idiopathic panniculitis, diverting clinicians away from the correct tuberculosis-related diagnosis. The present case demonstrates how cutaneous tuberculosis can perfectly mimic nodular vasculitis, and how the skin rather than the lung may be the only organ that reveals the underlying mycobacterial etiology.

The diagnosis in our patient rested on four converging pillars: (1) a characteristic clinical presentation recurrent, tender, violaceous nodules on the lower limbs of a middle-aged woman with constitutional symptoms; (2) a positive tuberculin skin test (10 mm induration); (3) a positive PCR for M. tuberculosis complex on skin biopsy; and (4) complete clinical response to standard antituberculous therapy the ex juvantibus argument, which is particularly important in tuberculids where therapeutic response itself constitutes a diagnostic criterion.

The negativity of pulmonary investigations is entirely consistent with the immunopathogenesis of tuberculids. Unlike true cutaneous TB forms, tuberculids do not involve viable bacterial invasion of the skin but rather represent delayed hypersensitivity reactions to circulating mycobacterial antigens in a host with intact cellular immunity. This explains why conventional bacteriological methods applied to respiratory samples are frequently unrevealing in EIB.

The histopathological findings in our case are particularly instructive. As illustrated in Figures 4–6, the biopsy showed a lobular panniculitis with mixed inflammatory infiltrate and focal fat necrosis, but without the classic caseating epithelioid granulomas expected in EIB. This non-granulomatous pattern has been documented in a significant subset of EIB cases and represents a major diagnostic pitfall, as it is indistinguishable from nodular vasculitis of other etiologies on histology alone. PCR on the biopsy specimen is therefore the decisive diagnostic tool in such cases, with reported positivity rates of 50–80% in EIB series.

The epidemiological context should never be underestimated. Morocco, as a TB-endemic country, significantly shifts the diagnostic balance toward a tuberculous etiology in any compatible clinical presentation. The multidisciplinary collaboration between the infectious diseases department the internal medicine department dermatology, and anatomopathology was essential in integrating all available data and avoiding the diagnostic trap of premature closure on a non-tuberculosis diagnosis. It is also worth emphasizing the therapeutic implications: misdiagnosing EIB as nodular vasculitis could lead to inappropriate immunosuppressive therapy, which would worsen the underlying tuberculosis infection.

4. CONCLUSION

When the skin tells what the lungs hide, clinicians must listen carefully. This case reinforces three key messages: first, cutaneous tuberculosis can perfectly mimic nodular vasculitis and must be considered in any chronic nodular lesion of the lower limbs in endemic settings; second, the absence of classic epithelioid granulomas on histology does not exclude EIB; third, PCR on skin biopsy is the decisive diagnostic tool when conventional investigations are inconclusive. A multidisciplinary approach involving infectious disease specialists, internists, dermatologists, and anatomopathologists is essential to ensure timely, curative antituberculous treatment.

Patient Consent Statement

Written informed consent was obtained from the patient for the publication of this case report and the accompanying clinical photographs. The patient was informed that her identity would remain fully confidential.

Competing Interests

The authors declare no competing interests.

Authors' Contributions

DK: clinical management (infectious diseases), case workup, manuscript drafting and revision. TS: clinical management (internal medicine), literature review, manuscript revision. AA: dermatological assessment, clinical photographs, critical revision of the manuscript. EWA: histopathological analysis and interpretation, histological photographs, critical revision of the manuscript. All authors read and approved the final manuscript.

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