Leprosy Misdiagnosed as Rheumatoid Arthritis: A Case Report

Qian Zhang[1], Guangming Xiang[1], Hongyue Li[1], Shirui Peng[1], Liming Wang[1], Ting Wu[2], Jian Du[3]

[1]Clinical Medicine, Guangyuan Central Hospital Affiliated to North Sichuan Medical College, Nanchong 637000, Sichuan, China
[2]Clinical Medicine, Yuechi County People's Hospital, Guang'an 638373, Sichuan, China
[3]Clinical Medicine, Nanbu County People's Hospital, Nanchong 747400, Sichuan, China

Corresponding author: Guangming Xiang (e-mail: 15182981101@163.com).

ABSTRACT A 53-year-old woman presented with an eight-year history of progressively worsening lower limb and facial edema, accompanied by a three-year history of a generalized erythematous rash that had significantly exacerbated over the preceding six months, with associated pruritus and occasional desquamation. Prior to our evaluation, she had been repeatedly diagnosed with rheumatoid arthritis at several other institutions and had received long-term corticosteroid therapy, which provided only transient symptomatic relief without halting disease progression. Skin biopsy revealed that the vacuolated cells in the dermis were negative for AB-PAS staining but positive for acid-fast bacilli, while immunohistochemical profiling demonstrated CKpan (AE1/AE3) (-), CK (-), CD68 (PGM1) (+), EMA (-), and AR (-), confirming these cells as histiocytic foam cells rather than epithelial or other neoplastic elements. The acid-fast positivity strongly suggested mycobacterial infection. Integrating the clinical presentation, physical examination findings, histopathological features, and microbiological staining results, the final diagnosis was established as leprosy, highlighting the importance of considering this entity in patients with chronic skin and systemic manifestations, especially when conventional therapies for presumed autoimmune disorders prove ineffective.

INDEX TERMS Leprosy; Edema; Rheumatoid arthritis

I. CASE PRESENTATION

A 53-year-old woman presented with an 8-year history of bilateral lower limb and facial edema and a 3-year history of generalized rash, with marked worsening over six months. Eight years earlier, she developed edema of the lower limbs and face without apparent trigger. She was diagnosed with "rheumatoid arthritis" at a hospital in Lanzhou and treated with corticosteroids, achieving partial relief. She subsequently took prednisone 1 tablet daily long-term without follow-up. Symptoms persisted and gradually progressed, but she did not seek further medical attention. Three years prior, the symptoms intensified, accompanied by a generalized rash with skin redness, swelling, and eyebrow loss, which she ignored. Over the past 6+ months, her condition deteriorated with prominent generalized swelling and rash–especially periorbital, lip, and facial swelling–and dark-red facial skin. She also developed generalized weakness, limb myalgia, cough, shortness of breath, dizziness, and recent fever. No chills, rigors, headache, nausea, vomiting, abdominal pain, diarrhea, hematochezia, or urinary symptoms were reported. There was no morning stiffness, Raynaud phenomenon, photosensitivity, or dental caries.

II. PHYSICAL EXAMINATION

Vital signs were stable. Cardiopulmonary and abdominal examinations were unremarkable. Eyebrows were absent. Facial, eyelid, and lip swelling with desquamation was noted. A generalized dark-red rash that blanched on pressure was present, with some thickened plaques and scattered desquamation; no pruritus, ulceration, or blisters. Diffuse swelling and limb muscle tenderness were observed. Upper limb mobility was unrestricted. Tenderness was present in both hips, knees, proximal interphalangeal joints of the hands, and wrists. Knee crepitus was positive bilaterally; the patellar ballottement test was negative. Muscle strength was 4/5 in all limbs, with normal tone, normal physiological reflexes, and negative pathological reflexes.

III. INVESTIGATIONS

Erythrocyte sedimentation rate: 112 mm/h. Rheumatoid factor: 84 IU/mL (elevated; reference <18.0). Anti-cyclic citrullinated peptide antibody: positive. Antinuclear antibody: 293.10 AU/mL (positive). Anti-SSA antibody: positive. Anti-CENPB antibody: positive. Anti-streptolysin O: 1867.2 IU/mL (markedly elevated; reference <116.0). IgG: 26.20 g/L (elevated; reference 0.70–16.00). IgM: 162.00 IU/mL (∼16.2 g/L; markedly elevated). IgA: normal. Complement C4: 0.52 g/L (elevated; reference 0.10–0.40). Liver

function tests: total bilirubin 177 μ mol/L (elevated), direct 82 μmol/L, indirect 95 μmol/L; albumin 31.3 g/L (decreased), globulin 39.3 g/L (elevated), A/G ratio 0.8 (inverted); cholinesterase 3876 U/L (decreased; reference 4000–12600); total bile acids 25 μmol/L (elevated); glycocholic acid 65 mg/L (elevated); glutathione reductase 170 U/L (elevated); lactate dehydrogenase 264 U/L (mildly elevated). Electrolytes: potassium 3.46 mmol/L, sodium 133.4 mmol/L, chloride 98.2 mmol/L (all mildly decreased). ALT, AST, GGT, ALP, and CK were normal.

IV. IMAGING

Bilateral hand X-rays showed no typical rheumatoid arthritis changes–no erosions, joint space narrowing, or subluxation.

V. HISTOPATHOLOGY

Initial biopsy showed an unremarkable epidermis and dermal vacuolated cells with lymphocytic infiltration; immunohistochemistry and special stains were advised. On review: AB-PAS negative; acid-fast stain positive. Immunohistochemistry: CKpan (AE1/AE3) (-), CK (-), CD68 (PGM1) (+), EMA (-), AR (-). The vacuolated cells were histiocytes (foam cells), and acid-fast stain demonstrated mycobacteria. These findings are most consistent with leprosy; TB-DNA testing was recommended to exclude tuberculosis.

VI. DISCUSSION

This patient's chronic course featured widespread but asymmetric dry, infiltrative erythematous plaques with atrophic scarring. The disproportionate subjective symptoms–mild in early stages relative to rash severity–argued against common disorders such as dermatitis, eczema, or psoriasis. Sensory dullness on cotton-swab testing and subsequent neurological examination revealing reduced pain, temperature, and touch sensation over the lesions raised high suspicion for leprosy. Borderline tuberculoid leprosy, a rare subtype, manifests as hypopigmented macules or erythematous plaques, sometimes with satellite lesions or annular morphology, well-defined inner and outer margins, and a central immune zone.

Leprosy predominantly affects populations with poor healthcare access, disproportionately burdening the poor. These groups generally have low educational attainment and live in areas where under-resourced primary care facilities leave patients marginalized by the health system [1]. Leprosy remains at a low endemic level in China; Wenshan Prefecture continues to be one of the hardest-hit areas in Yunnan Province, reporting the highest annual number of new cases. Transmission occurs through close household and neighborhood contact. As a chronic infectious disease with a long incubation period, protean manifestations, and no biomarker to reliably distinguish infection from active disease, leprosy poses a diagnostic challenge. Diagnostic delays are common, sustaining transmission chains, with most transmission occurring before treatment initiation [2]. That two physicians did not suspect leprosy at the initial encounter underscores gaps in recognizing suspected symptoms. Strengthening training for primary healthcare workers, enhancing comprehensive prevention and control capacity, and reinforcing the public health network are essential. Scaling up community health education and leprosy awareness can promote timely self-referral, enabling early detection, early diagnosis, early treatment, and prevention of disability.

REFERENCES

[1] J. S. Nery, A. Ramond, J. M. Pescarini, et al., "Socioeconomic determinants of leprosy new case detection in the 100 Million Brazilian Cohort: a population-based linkage study," Lancet Glob. Health, vol. 7, no. 9, pp. e1226–e1236, 2019, doi: 10.1016/S2214-109X(19)30260-8.

[2] M. M. Ozorio and N. D. Cristina, "Leprosy post-exposure prophylaxis: innovation and precision public health," Lancet Glob. Health, vol. 9, no. 1, pp. e8–e9, 2021, doi: 10.1016/S2214-109X(20)30512-X.