

## Case Report

# Tuberculoid Leprosy Masquerading as Erythema Induratum

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### Abstract

#### Introduction

Erythema Induratum (EI) is a relatively rare dermatologic disorder affecting subcutaneous fat tissue, which is often associated with *Mycobacterium tuberculosis*. This report details the presentation, diagnosis and management in a 70-year-old female who presented with a painful erythematous annular rash at the clinic. The rash was later diagnosed as EI associated with *Mycobacterium leprae*, one rarely seen in literature.

#### Discussion

EI is a rare form of panniculitis that typically presents as a recurrent grouping of tender nodules and plaques on the posterior aspect of the lower legs. Although EI is considered idiopathic in most cases, it can be associated with *M. leprae*. Given the atypical presentation of a rash, a biopsy was done. It showed epithelioid granulomatous dermatitis with lobar panniculitis. A DNA polymerase chain reaction (PCR) was also sent and revealed the presence of *M. leprae*. Treatment of EI without association with *M. leprae* includes potassium iodide, non-steroidal anti-inflammatory drugs (NSAIDs), rest, elevation, compression and, in severe cases, systemic immunosuppressives. If tuberculoid leprosy is confirmed, the attending physician is encouraged to consult the infectious disease department as treatment varies with presentation.

#### Conclusions

This case details the diagnosis and management involved in a case of tuberculoid leprosy masquerading as EI. Management of the EI involved NSAIDs and potassium iodide. The leprosy was treated with dapsons and rifampin in conjunction with an infectious disease consultation. Our case highlights the importance of relying on a strong clinical suspicion based on a patient's social history in order to diagnose rare entities accurately.

#### Keywords

erythema induratum; tuberculoid leprosy; paucibacillary leprosy; leprosy; Hansen's disease; lobar panniculitis; nodular vasculitis; *Mycobacterium leprae*

### Background

Erythema Induratum (EI) is an inflammatory disorder affecting subcutaneous fat tissue and is interchangeably known as nodular vasculitis when it is not associated with tuberculosis. EI published cases are rarely seen throughout the world. The incidence and prevalence of EI has not been reported. Women ages 13 through 66 (mean age 37 and median age 56) are most commonly affected by EI.<sup>1</sup> Leprosy, which is caused by *Mycobacterium leprae* and *Mycobacterium lepromatosis*, is an infection involving

the skin and peripheral nerves. There were 0.2 cases per 10,000 people worldwide in 2015 with a majority of cases reported from developing countries.<sup>2</sup> This case report will detail the presentation, diagnosis and management of a case of EI associated with tuberculoid leprosy.

### Case Presentation

A 70-year-old Caucasian female with a medical history of type 2 diabetes mellitus, hypertension and hypothyroidism came into our dermatology clinic presenting with a painful

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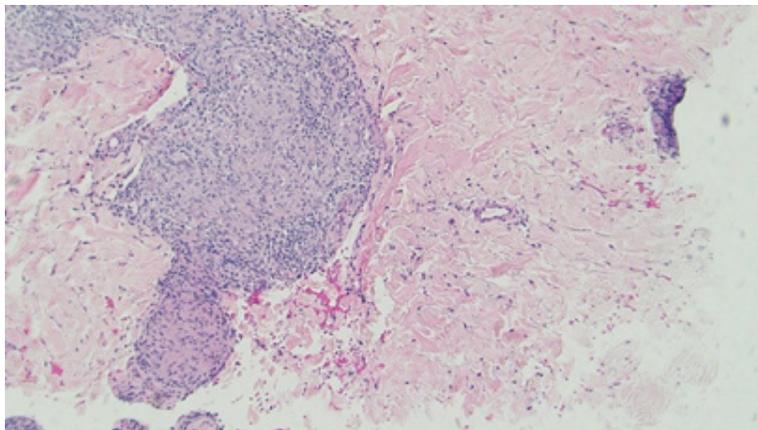


**Figure 1.** Photographs of the rash as seen on initial visit located in the right (A) lateral leg/foot and (B) anterior foot. Markings represent punch biopsy sites.

rash located on the right lateral leg and right anterior foot. The rash had been present for three weeks and was unresponsive to topical nystatin cream and doxycycline. She denied recent travel or any interactions with armadillos. Her medications included low dose aspirin, a multivitamin, fish oil, levothyroxine, lisinopril and metoprolol tartate. At the initial visit, the rash was described as erythematous annular patches/plaques with a trailing scale distributed on the right foot and right lateral lower leg. Differential diagnoses at that time included erythema annulare centrifugum, annular urticaria, erythema chronicum migrans, tinea, erythema nodosum and erythema induratum. Two, millimeter punch biopsies were taken from the right foot and right lateral lower leg. (**Figures 1A and 1B**) A prescription for 0.1% triamcinolone acetodine topical ointment and non-steroidal anti-inflammatories (NSAIDs) were given as empiric treatment.

The following day, histopathology from both biopsy sites showed epithelioid granulomatous dermatitis with lobular panniculitis. (**Figure 2**) Periodic acid-Schiff (PAS) and Fite special stains for fungus and mycobacteria were negative. The differential diagnosis was narrowed to Darier-Roussy's sarcoid and erythema induratum. Due to suspicion of leprosy, the tissue block was sent for *M. leprae* and *M. lepromatosis* DNA polymerase chain reaction (PCR) tests, but the results were not expected for several weeks.

The patient returned to the clinic one week later and had a hepatitis panel, an interferon-gamma release assay, and a thyroid stimulating hormone (TSH) test ordered. She was prescribed potassium iodide 130 mg to take three times a day (TID) for 21 days for the treatment of EI and NSAIDs as needed for pain. Laboratory tests were negative for tuber-



**Figure 2.** Pathology slide read as epithelioid granulomatous dermatitis with lobular panniculitis. Differential diagnosis included Darier-Roussy's sarcoid and erythema induratum.



**Figure 3.** Follow up approximately 3 months after initial visit for rash, after potassium iodide and topical triamcinolone treatment, located in the right (A) lateral leg/foot and (B) anterior foot.

culosis, hepatitis A, B and C. Her TSH was within normal range. The patient's potassium iodide was increased to 520 mg from the prior 390 mg daily. The patient reported that her pain improved, and the NSAIDs were discontinued. Physical examination noted residual erythema.

At her 7-week follow-up, the patient reported that her EI was significantly better and less painful. Her physical examination noted residual erythema without any swelling or tenderness. She reported completing the initial course of potassium iodide. She was given another course of potassium iodide 260 mg TID for one week with subsequent taper over several weeks to decrease the risk of altering thyroid function.

Approximately 10 weeks after the initial visit, PCR results revealed the presence of *M. leprae*, confirming a diagnosis of tuberculoid lepro-

sy-induced EI. At this point, the patient had asymptomatic post-inflammatory hyperpigmentation without any evidence of nerve damage. (Figures 3A and 3B) Upon further questioning, the patient reported that she often gardens and has noticed armadillos in her yard. However, she denied any direct contact. She was referred to the infectious disease department and started on dapsone 100 mg and rifampin 600 mg for 6 to 12 months for tuberculoid leprosy with intact cell-mediated immunity. Her EI showed continued improvement one month into treatment with dapsone and rifampin. (Figures 4A and 4B) The state health officials were notified.

### Discussion

EI is a rare form of panniculitis with female preponderance that typically presents as recurrent crops of tender, violaceous nodules and



**Figure 4.** Rash, after 1 month into treatment with dapsone and rifampin, located in the right (A) lateral leg/foot and (B) posterior leg.

plaques on the posterior aspect of the lower legs with or without ulcerations.<sup>3</sup> In most cases, no inciting factor can be identified, but it can be associated with *M. leprae* infection. The most recent date that leprosy was recorded in the United States (US) was 2015. There were 178 new cases that year with a vast majority of them being in individuals who immigrated from developing countries.<sup>4</sup> The only known reservoirs of *M. leprae* are humans and wild armadillos in the southern part of the US. Given the atypical presentation of EI in our patient and the fact that she lived in rural Florida, which is known to be inhabited by armadillos, a PCR test was used to diagnose tuberculoid leprosy causing EI. The PCR test for *M. leprae* is highly specific but has relatively variable sensitivity ranging from 34% to 90%.<sup>5</sup> Tuberculoid leprosy is associated with permanent nerve damage. Thus, clinical suspicion is critical for management. Treatment of EI without association with *M. leprae* includes potassium iodide, NSAIDs, rest, elevation, compression and, in severe cases, systemic immunosuppressives.<sup>6-8</sup> If tuberculoid leprosy is confirmed, it is imperative that local health officials are notified. The treatment regimen for tuberculoid leprosy with intact cell-mediated immunity consists of dapsone and rifampin in conjunction with an infectious disease consult.

## Conclusion

In this case report, a 70-year-old woman presented with an erythematous annular rash located in the right lower leg and foot, which was found to be EI in association with a diagnosis of leprosy. Management of the EI involved NSAIDs and potassium iodide. The leprosy was treated with dapsone and rifampin in conjunction with an infectious disease consultation. Our case highlights the importance of relying on a strong clinical suspicion based on a patient's social history in order to accurately diagnose rare entities.

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## Conflicts of Interest

The authors declare they have no conflicts of interest.

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