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Case Report

An Unusual Cutaneous Manifestation of Tuberculoid Spectrum in Leprosy

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Leprosy, caused by *Mycobacterium leprae*, is the oldest known bacterial disease to affect humans. The clinical spectrum of leprosy ranges from lepromatous leprosy (LL) or multibacillary form to tuberculoid leprosy (TT) or paucibacillary form. Lepromatous leprosy typically presents with numerous symmetrically distributed hypochromic lesions, reflecting an inability to mount an effective cellular immune response against the bacilli. In contrast, tuberculoid leprosy represents a strong cell-mediated immune response to the bacterium. Typically, this form presents as macules and plaques with asymmetrical, unilateral distribution. However, tuberculoid leprosy (TT) with near to symmetrical lesions is uncommon. We report a case of a 40-year-old woman from Kasaragod, Kerala, who visited a tertiary care center with a one-month history of asymptomatic erythematous annular plaques over both feet. Given the clinical suspicion of leprosy, a skin biopsy was performed, revealing histopathological features consistent with the tuberculoid variety. The patient was initiated on three drug Multi-Drug Therapy (MB-MDT), now recommended by WHO as uniform multi-drug treatment for all cases. This case is presented due to the unusual nature of its cutaneous manifestations.

Keywords: Leprosy, Tuberculoid Leprosy, Unusual Cutaneous manifestations

Introduction

Leprosy, or Hansen's disease, is a chronic granulomatous infection caused by *Mycobacterium leprae* (Ali et al 2011). It is categorized into paucibacillary and multibacillary types based on the number of skin lesions and nerve involvement as per operational classification recommended by WHO and followed by our National Leprosy Eradication Programme (NLEP 2013). It typically affects areas of lower temperatures such as skin, peripheral nerves, eyes, and testis (Sajad et al 2015). Leprosy manifests in five forms on the immunopathological spectrum: tuberculoid leprosy (TT), borderline tuberculoid, mid borderline, borderline lepromatous, and lepromatous leprosy (Ridley & Jopling 1966). In the TT form, patients exhibit one to three circular or oval-shaped skin lesions known as plaques. These lesions display erythema or hypopigmentation, lack of hair, scaling, dryness, and reduced sensations. TT commonly presents as an asymmetrical unilateral lesion (Pino et al 2020).

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In this case study, a 40-year-old woman exhibited symmetric lesions on both feet, prompting consideration of tinea pedis, granuloma annulare, and leprosy as potential diagnoses. However, with a negative potassium hydroxide (KOH) test and a skin biopsy revealing characteristics consistent with Hansen's disease, a diagnosis of tuberculoid leprosy was established.

Case Report:

A forty-year-old woman, previously in good health, visited our dermatology outpatient department, reporting asymptomatic erythematous lesions over both feet for one-month duration. She had no family history of similar complaints. Upon examination, an infiltrated annular erythematous plaque with central clearing, measuring 6x6cm, was observed on the right foot and a 4x4cm erythematous annular plaque was noted on the left foot (Fig. 1). Sensory perception remained intact over the lesions, and examination revealed normal sensation in both the palms of the hands and the soles of the feet. There were no other lesions on the rest of the body. Bilateral superficial peroneal nerves were palpable, with the left superficial peroneal nerve exhibiting a beaded appearance. However, the rest of the nerve examination, including the common peroneal nerve, was within normal limits. The clinical suspicion of Hansen's disease was raised along with tinea pedis and granuloma annulare as differentials. Routine laboratory investigations yielded normal results, and slit skin smears from standard sites were negative. A skin biopsy from the foot lesion revealed peri neurovascular and peri adnexal inflammatory infiltrate without epidermal changes (Fig. 2). The infiltrate exhibited a granulomatous collection of epithelioid cells and lymphocytes, including Langhans type of giant cells (Fig. 3). The Fite Faraco stain was negative, but the skin biopsy demonstrated features of Hansen's disease tuberculoid type. The patient was initiated on multidrug therapy after which the lesions started resolving after 6 months. with xerotic changes (Fig. 4). The WHO

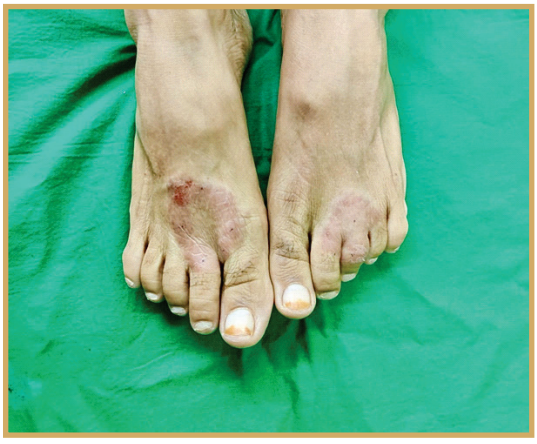

Fig. 1 : An infiltrated annular erythematous plaque with central clearing, measuring 6x6cm, on the right foot, and a 4x4cm erythematous annular plaque was noted on the left foot.

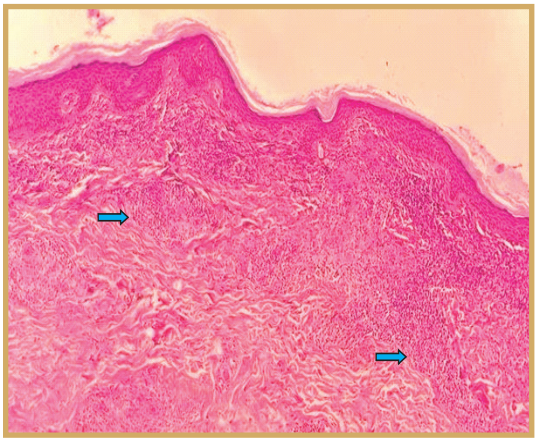

Fig. 2 : Peri neurovascular and peri adnexal granulomatous infiltrate of epithelioid cells (H & E,10x).

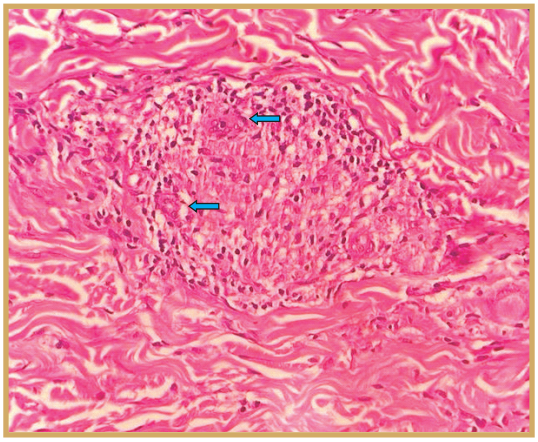

Fig. 3 : Langhans type of giant cells seen (H & E, 40x).

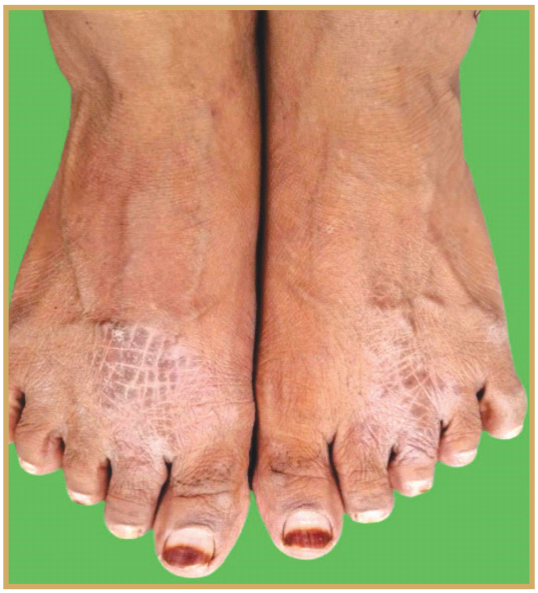

Fig. 4 : Lesions resolving with xerotic changes after 6 months of treatment.

recommends the 3-drug regimen with rifampicin, dapsone, and clofazimine for all leprosy patients, with a duration of treatment of 6 months for Paucibacillary leprosy and of 12 months for Multibacillary leprosy. (Guidelines for the diagnosis, treatment and prevention of leprosy -WHO 2018), this was used to treat this case.

Discussion

Leprosy has a long history marked by misconceptions and is burdened with societal stigmas associated with physical deformities and fear of contagion. In 1873, Norwegian scientist Gerhard Henrik Armauer Hansen gained recognition for discovering *Mycobacterium leprae* as the infectious agent responsible for leprosy (Ghosh & Chaudhuri 2015). In 1966, Ridley and Jopling classified leprosy based on clinical, pathological, bacilloscopic, and immunological criteria into different forms, including indeterminate, tuberculoid, borderline tuberculoid (BT), mid borderline (BB), borderline lepromatous (BL), and lepromatous leprosy (LL) (Ridley & Jopling 1966, Rodriguez Júnior et al 2016). Indian classification relies on clinical assessment and grading within the spectrum with special focus on pure neuritic cases important in India (IAL 1982). The clinical manifestations of leprosy range from a limited number of skin lesions to widespread involvement. Those with good cellular immune responses to *Mycobacterium leprae* typically exhibit fewer skin lesions. In contrast, individuals unable to generate an efficient cellular-mediated response to the bacterium may develop numerous and symmetrically distributed hypochromic lesions, attributed to the hematogenous spread of the bacilli (Talhari et al 2015). Unusual manifestations documented in the literature include instances of leprosy presenting with a solitary nodule or a confined region of papules and nodules, as well as the emergence of verrucous plaques, annular bullous lesions, nonhealing ulcers, infiltrated linear lesions, nerve abscess, lupus vulgaris, erythema multiforme-like lesions, and lesions resembling Granuloma annulare (Chintagunta & Jaju 2021). Our patient did not exhibit the

characteristic clinical features of tuberculoid leprosy, which typically includes macules and plaques with an asymmetrical and unilateral distribution but showed an unconventional morphology of lesions reminiscent of granuloma annulare.

Despite the ongoing endemic nature of leprosy in India, diagnosing leprosy in our patient proved to be exceptionally challenging due to the short duration of symptoms and the absence of sensory symptoms and other related manifestations. Recognizing these atypical presentations poses a diagnostic challenge, emphasizing the importance of being familiar with various unusual manifestations of leprosy to prevent both morbidity psychological distress for the patient and their family members.

Conclusion

The review of existing literature indicates a scarcity of instances where tuberculoid leprosy presents as a symmetrical annular plaque on both feet. Recognizing this unusual presentation is essential for clinical suspicion. Procrastination in diagnosing and addressing leprosy can lead to the advancement of the disease into disability and increase the risk of transmission.

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