



## Case Report

# Two cases of exorbitant clinicohistopathological discordance of leprosy

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### ABSTRACT

Leprosy is a chronic infectious disease caused by *Mycobacterium leprae*. It is an infectious disease primarily affecting the skin and the nerves. It presents with varied clinical presentation and their histopathological examination is considered as the gold standard for diagnosis, since cellular characteristics in leprosy lesions are related to the immunological status of the patient. Ridley and Jopling proposed a classification which includes the clinical, histological and immunological spectrum and it has been widely accepted. But rarely, the clinical presentation does not correspond with the histopathological classification, which is known as “discordance of leprosy”. We report two cases of leprosy where there was an extreme degree of discordance, because the patients presented with clinical features of lepromatous leprosy but turned out to have tuberculoid leprosy on histopathology.

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## 1. Introduction

Leprosy, known as the great imitator as it presents with different clinicopathological forms and primarily affects the skin and the nerves. The great variety of presentations make the diagnosis of leprosy a difficult challenge. The histopathology of leprosy lesions reflects the immunological status of the patient. In majority of cases, there is concordance, that is similarity between clinical findings and histopathological findings. But in few cases, there is discrepancy between the clinical and histopathological characteristics, which is known as discordance, and it can complicate the diagnostic process. This is of importance as categorizing leprosy in a particular spectrum is necessary to decide the plan of management.

## 2. Case Report 1

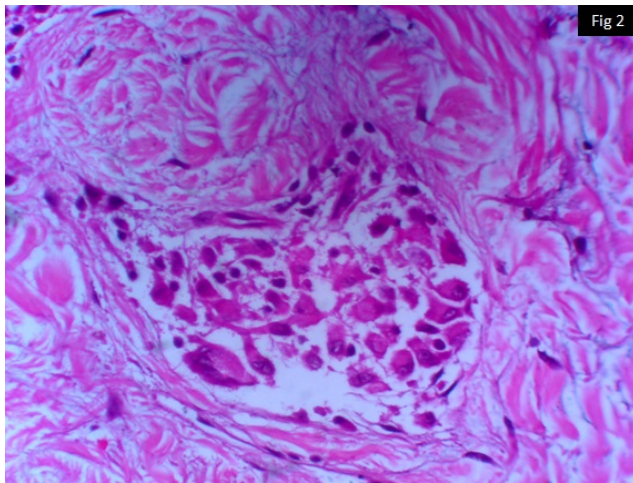
We report a case of 37 years old female with multiple (20-25), well defined, annular, hypopigmented to erythematous, plaques size ranging from 2\*2 cm to 4\*5cm present over face, nape of neck, chest, back & bilateral upper limbs. We examined all peripheral cutaneous nerves and all of them turned out to be non-enlarged, non-palpable, non-tender. The hot and cold, fine and crude sensations were normal over the lesions and on other parts of the body. Biopsy was taken from a lesion on back keeping in mind the differential diagnosis as granuloma annulare and lepromatous leprosy. AFB was negative. The biopsy showed thinning of epidermis. The upper and mid dermis showed ill-formed granuloma comprised of epithelioid cells and giant cell with marked lymphocytic infiltrated around neurovascular and adnexal structures, which were atrophied suggestive of Tuberculoid leprosy.

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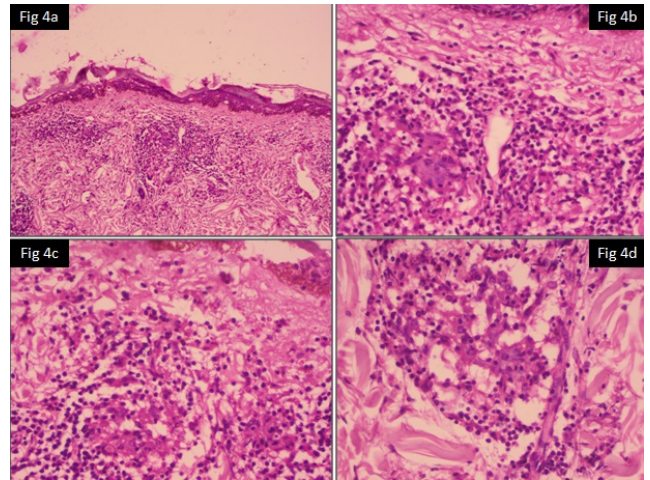
**Fig. 1:** **a:** Few well defined, annular, hypopigmented to erythematous, plaques size ranging from 1\*2 cm to 2\*2 cm present over face; **b:** Multiple, well defined, annular, hypopigmented to erythematous, plaques size ranging from 2\*1 cm to 3\*2 cm present over chest



**Fig. 2:** Thinning of epidermis & upper and mid dermis showed ill-formed granuloma comprised of epithelioid cells and giant cell with marked lymphocytic infiltrated around neuro-vascular and adnexal structures, which were atrophied



**Fig. 3:** **a:** Multiple, well defined, erythematous plaques size ranging from 1\*2 cm to 2\*3 cm and nodules of diameter 1 cm present over face and lip; **b:** Multiple, well defined, erythematous plaques size ranging from 1\*2 cm to 4\*3 cm present over back; **c:** Multiple, well defined, erythematous plaques size ranging from 1\*2 cm to 3\*3 cm present both forearms.



**Fig. 4:** **a:** No sub-epidermal grenz zone; **b&c:** Multiple granulomas comprising of langhans and epithelioid giant cell surrounded by a rim of lymphocytes; **d:** Perivascular granuloma formation.

### 3. Case Report 2

An 80 years old male presented to the opd with multiple, well defined, erythematous plaques size ranging from 1\*2 cm to 4\*3 cm and nodules of diameter 1 cm over face, lip, abdomen, back, buttocks, both upper and lower limbs. Infiltrated lesions present over both ear, nose, lips and face. On nerve examination, bilateral ulnar nerves were thickened, palpable and tender and bilateral superficial radial nerves were thickened, palpable and non-tender. Glove and stocking anesthesia was present, while sensations were increased on the lesions over the body. Few changes of leonine face were present. Biopsy was taken from a lesion on back keeping in mind the differential diagnosis as histoid leprosy and lepromatous leprosy. The biopsy showed no sub-epidermal clearing zone and full thickness of underlying dermis showed multiple granulomas comprising of langhans and epithelioid giant cell surrounded by a rim of lymphocytes. The biopsy was suggestive of Tuberculoid leprosy. Occasional lepra bacilli were seen on wade fite staining. The slit skin smear showed no AFB.

### 4. Discussion

Leprosy is a classic “spectral disease” being manifested in a variety of clinical forms related to the type and strength of the immune response.<sup>1</sup> The causative organism, *Mycobacterium leprae* was discovered by Gerhard Henrik Armauer Hansen, a Norwegian Leprologist in 1873.<sup>2</sup> Three cardinal signs have remained the basis for the clinical diagnosis of leprosy:<sup>3</sup> A) Anaesthetic/ hypoanesthetic skin lesion(s), B) Thickened peripheral nerve(s) with impairment of sensations in the area supplied and C) Acid-fast bacilli in the skin smear. Because of its broad spectrum of clinical manifestations, leprosy classification is complex and

may include clinical, histopathological, microbiological, and immunological features as proposed by Ridley and Jopling (R&J).<sup>4</sup> This classification is widely accepted by histopathologists and leprologists. Other classification include Madrid classification and Indian classifications have also been used. Ridley and Jopling proposed a histological classification for leprosy as indeterminate (I) leprosy, tuberculoid (TT), borderline tuberculoid (BT), mid-borderline (BB), borderline lepromatous (BL), and lepromatous (LL) leprosy.<sup>5</sup> However, in 1982, the World Health Organization classified leprosy as multibacillary (MB) and paucibacillary (PB) on the basis of bacillary index (BI). I, TT, and BT cases of leprosy were classified as PB, and BB, BL, and LL cases of leprosy were classified as MB.<sup>6</sup> The discordance between clinical and histopathological diagnosis was noticed because the clinical diagnosis was made on the lines of Ridley Jopling classification, even when a histopathological examination had not been done.<sup>7</sup> In one extreme of the spectrum lies the polar tuberculoid leprosy form (TT) with low bacterial load, predominant cell-mediated immunity, and low or absent production of specific antibodies. The polar lepromatous form (LL) is in the other extreme, in which patients show high bacterial load and respond to infection with high production of antibodies and lower or absent M. Leprae specific cell mediated immunity. Between the polar forms, lie the immunological and clinical unstable forms known as borderline tuberculoid (BT), borderline borderline (BB), and borderline lepromatous (BL).<sup>8</sup> Single or upto 3, hypopigmented lesions, large in size with absent sensations is characteristic of Tuberculoid leprosy. Borderline tuberculoid leprosy is characterised by a few (upto 10), Dry, scaly, look bright, and infiltrated lesions of variable size with markedly diminished sensation or hair growth. Mid borderline leprosy is similar to borderline tuberculoid leprosy with more number of lesions, dull or slightly shiny surface and slightly diminished sensation and hair growth. Borderline lepromatous leprosy has numerous, asymmetrical, small, shiny lesion with slightly diminished sensation and hair growth. Lepromatous leprosy has innumerable, symmetrical, small shiny lesion with minimal sensation loss and no effect on hair growth initially. Histopathology of skin lesions varies from compact granulomas to diffuse infiltration of dermis, which largely depends upon the immune status of the patient and may not be in agreement with the clinical diagnosis. However, clinical and histopathological disparities are seen due to varied clinical manifestations even in established leprosy and individual lesions may differ microbiologically and histologically.<sup>9</sup> Taking any of the clinical signs, clinical types, histopathological parameters or histopathological types as a gold standard is not ideal. Various factors also influence the histopathological diagnosis such as differences in sample size, choosing the biopsy site, age of the lesion,

immunological and treatment status of the patient at the time of biopsy.<sup>10</sup> In a study by Bhatia, et al concordance between the clinical and histopathological diagnoses for different types of leprosy was: indeterminate (I) = 36%, tuberculoid (TT) = 50%, borderline tuberculoid (BT) = 77%, borderline (BB) = 26%, borderline lepromatous (BL) = 43%, and lepromatous (LL) = 91%, which supports the fact that there were many cases of discordance in the study.<sup>7</sup> Rodrigues et al in a study concluded that major disagreement between the clinical and histopathological Ridley and Jopling classification was uncommon, perfect agreement occurred in less than half of the cases, and was even lower for the borderline lepromatous and tuberculoid forms.<sup>11</sup> Shruti Semwal et al found 43 cases of clinically diagnosed leprosy to be discordant, in a study of 116 patients.<sup>12</sup>

## 5. Conclusion

Discordance is rare in case of leprosy. The reason can be that most of the cases of leprosy are treated based on clinical presentation without histopathological examination. Thus histopathological examination is mandatory in all cases of leprosy to arrive at a definite diagnosis of leprosy and to classify the type of disease, which is very important to start proper treatment regimen.

## 6. Conflict of interest

The authors declare they have no conflict of interest.

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