Chapter 2

Cutaneous Examination

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INTRODUCTION

Leprosy is a chronic infectious disease caused by *Mycobacterium leprae* that mainly affects the peripheral nerves and skin.[1] The presentation of leprosy is highly variable in all its stages, which can mimic a variety of dermatological and neurological conditions. Hence, it is important to be diligent to perform a detailed clinical examination and strict observation of signs and symptoms before making the diagnosis.

Proper baseline documentation of examination findings helps a healthcare provider not only with the diagnosis but also guides to determine the clinical classification of the disease, which in turn helps in deciding the therapeutic schedules and monitoring treatment response. It is important that all the patients' details are recorded in such a pro-forma at every healthcare facility, including by private practitioners treating leprosy. This chapter will outline the salient features of the cutaneous examination of a leprosy patient and their proper documentation.

Cardinal signs of leprosy/Diagnostic criteria[2]

According to NLEP, India, at least one of the following cardinal signs must be present to diagnose leprosy:

a. Hypopigmented or reddish skin lesion(s) with definite sensory deficit
b. Involvement of the peripheral nerves, as demonstrated by definite thickening with loss of sensation and weakness/paralysis of the corresponding muscles of the hands, feet or eyes
c. Demonstration of *M. leprae* in the lesions by skin smear examination.

CHECKLIST BEFORE CUTANEOUS EXAMINATION

Prior explanation of what healthcare provider is going to do will help gain the confidence and cooperation of the patient. Informed consent to be obtained from the patient for examination, unless it is implied. Privacy of the patient is to be maintained at every stage of the management.

- Ensure the presence of an assistant of the same sex as that of the patient to assist you.
- Examine the patient from head to toe in natural light preferably. Examine from a distance initially (general survey), thereafter do a closer examination. Always compare both the sides of the body.
- In case of artificial light, the patient should face the source of light, with the examiner on the same side of the source. The skin lesions (e.g. ill-defined macules and infiltration of skin in LL disease) are better appreciated in an oblique/tangential light.

- General physical examination should precede cutaneous examination. Complete examination of a leprosy patient includes the following mentioned below; only the cutaneous examination part is dealt with in this chapter, rest are described in subsequent chapters of this section. It is recommended that examination finding should be documented in a preformatted leprosy patient record (Annexure 1) with body charting provision, at the time of initial examination and follow-up. However, note that the standard preformatted patient record recommended by NLEP and WHO is concise and focused to record essential details needed from a program point of view and does not have provision to record all the details of clinical examination.
- Cutaneous examination (skin/mucosa)
- Testing for sensations (*see* Section 1, Chapter 5)
- Examination of peripheral nerves (*see* Section 1, Chapter 3)
- Motor examination (*see* Section 1, Chapter 5)
- Examination of eyes (*see* Section 1, Chapter 6)
- Systemic examination (*see* Section 1, Chapter 6)

GENERAL PHYSICAL EXAMINATION

A swift general physical examination is performed to check patients overall health. It also gives healthcare providers a chance to talk to the patient about any ongoing pain or symptoms that they are experiencing or any other health concerns they might have. Presenting complaints and history of present illness should be sought and recorded. Past illnesses, their treatment and medications should also be noted. It helps to determine contraindications or ailments that may preclude the use of drugs recommended in the MDT. Patient's weight, pulse rate and blood pressure should be recorded.

CUTANEOUS EXAMINATION

After a quick general cutaneous survey is done, a detailed examination and recording of skin lesions should be carried out.

1. Site of lesion: Lesions can involve the face, trunk, extremities. Also look for lesions over sites like axillae, groin, genitalia, palms, soles, and buttocks.
2. Number of lesions: Record the number of all skin lesions observed and peripheral nerves involved.
   This helps to classify the type of leprosy (PB or MB), plan type of MDT and the patient follow-up for response. The number of lesions may vary in different types of leprosy; in TT (up to 3), BT (up to 10), BB (10–30), BL (>30), and LL (innumerable). Note that when skin lesions are ≤5, the patient is considered for MDT PB and when they are 6 or more, for MDT MB as per the present guidelines. Hence, appearance of new skin lesions can influence the treatment schedule. It is ideal to record the size of the skin lesions, although not mandatory, when the number is few. This would help to note change in size of lesions (Annexure 2).
3. Note the distribution of lesions: Unilateral, bilateral, symmetrical, asymmetrical. Bilateral symmetrical lesions are observed in lepromatous forms of leprosy.
4. Record morphology of lesions: Note that a variety of skin lesions can be present in a leprosy patient. Common types of skin lesions are macules, papules patches, plaques, and nodules. Occasionally ulcers, vesicles, pustules, fissures and bullae can also be present in a patient.

a. Shape of the lesions can be oval, round, annular or irregular. When it is annular or inverted saucer shaped, it is indicative of mid-borderline leprosy
b. Note the color of lesion: Hypopigmented, erythematous, coppery red or rarely hyperpigmented.
c. Surface of lesions can be dry, scaly, shiny, smooth, edematous, or ulcerated.
d. Margins and the edge of lesions: Well-defined or ill-defined, raised or flat, punched out, sloping.
e. Look for sparseness or absence of hair.
f. Look for infiltration of skin. Infiltrated skin appears shiny, edematous and slightly thickened, with prominent skin pores.

5. Feel for warmth and tenderness of the lesions, especially for those which are erythematous.
   Rarely, well-defined smooth shiny, hemispherical, dome-shaped, non-tender soft to firm papules and nodules of skin colour or with slight erythema, can be seen appearing on otherwise normal-looking skin on trunk and limbs in lepromatous leprosy, which is characteristic of histoid leprosy (Fig. 2.1). Rarely, they can be seen over face, buttocks and over bony prominences, especially around the elbows and knees (Table 2.1).

Examination of nasal cavity: The nasal mucosa is characteristically involved in lepromatous leprosy, and almost never in tuberculoid leprosy. The earliest nasal mucosal changes are oedema, submucosal granulomatous infiltration and crusting of anterior inferior turbinate and nasal septum. This can be associated with increased secretions, sometimes with a blood tinge and occasionally with episodes of frank bleeding (epistaxis). The involvement can rarely progress to septal perforation, especially during ENL reactions. In advanced stages anosmia, atrophic rhinitis and saddle nose deformity can occur.

Oral cavity: Oral mucosal involvement is uncommon in leprosy. However, BT leprosy patch can involve lips, and it can become erythematous and prominent during phases of T1R. Rarely diffuse enlargement of lips in lepromatous leprosy (Macrocheilia) can be observed.[5] Palatal ulceration/perforation is a very rarely encountered complication of lepromatous leprosy, which was more common in pre-MDT era.

Fig. 2.1: Histoid leprosy: Multiple, discrete, well-defined, shiny, dome shaped papules over: (A) Abdomen; (B) Face

Table 2.1: Characteristics of clinical types of leprosy based on Ridley-Jopling classification[3]

	Indeterminate	*TT (Tuberculoid)*	*BT (Borderline tuberculoid)*	*BB (Mid borderline)*	*BL (Borderline lepromatous)*	*LL (Lepromatous)*
Morphology	Macules	Infiltrated plaques	Infiltrated plaques	Plaques or dome-shaped punched-out lesions	Macules, plaques, papules, infiltration	Macules, papules nodules diffuse infiltration
Number	One or few	Up to 5	Few with satellite lesion or more than 5 (up to 10)	Several (10–30)	Many, >30	Numerous
Distribution	Variable	Localized, asymmetrical	Not diffuse, asymmetrical	Evident asymmetry	Tendency to symmetry	Symmetrical
Size	Small to moderate	Variable, usually large	Variable, some are large	Variable	Small, some can be large	Small
Border	Not always defined	Well-defined with sharp borders	Well-defined with sharp borders	Vague, poorly defined borders	Vague, less well defined border	Vague, difficult to distinguish normal and affected skin
Surface	Normal	Very dry, scaly, turgid	Dry, scaly, bright and infiltrated	Dull/slightly shiny	Shiny	Shiny
Sensation	Absent	Absent	Markedly diminished	Moderately diminished	Slightly diminished	Minimally diminished, not affected
Hair growth	Absent	Absent	Markedly diminished	Moderately diminished	Slightly diminished	Not affected initially

Note that pure neuritic leprosy (PNL) and indeterminate leprosy are not included in R-J classification.

Clinical Examination Findings in Patients with Lepra Reactions

1. Patients with type 1 reaction (T1R)[4] (Fig. 2.2)
   History usually corroborates with patches becoming swollen recently or becoming erythematous. Occasionally, appearance of new skin lesions is also observed. On examination, some or all of the existing leprosy lesions in T1R show signs of acute inflammation. (erythema, pain, tenderness, and edema). They can be associated with recent increased or new motor nerve function impairment/paralysis. During the phase of regression, desquamation can be observed on these patches. Rarely, necrosis and ulceration occur in severe cases.
2. Patients with type 2 reaction (T2R) [Erythema nodosum leprosum (ENL)] (Fig. 2.3).
   Classical history of developing recurrent crops of bright erythematous, tender, slightly raised papules to nodules, (aptly named as erythema nodosum leprosum), which are evanescent, (lasting usually for 2–3 day) in a febrile patient, more so in the evenings would be present. The distribution is bilateral, symmetrical; usually on arms and thighs. While the flexor aspects of forearms and the medial aspects of thighs are favored, but can present on the trunk and face as well. They regress leaving a blue-black pigmentation at their site, which causes occasional desquamation. New crops can keep appearing in chronic ENL. At times, vesicles and bulla develop on them spontaneously that rupture to form ulcers known as erythema/ENL necroticans.

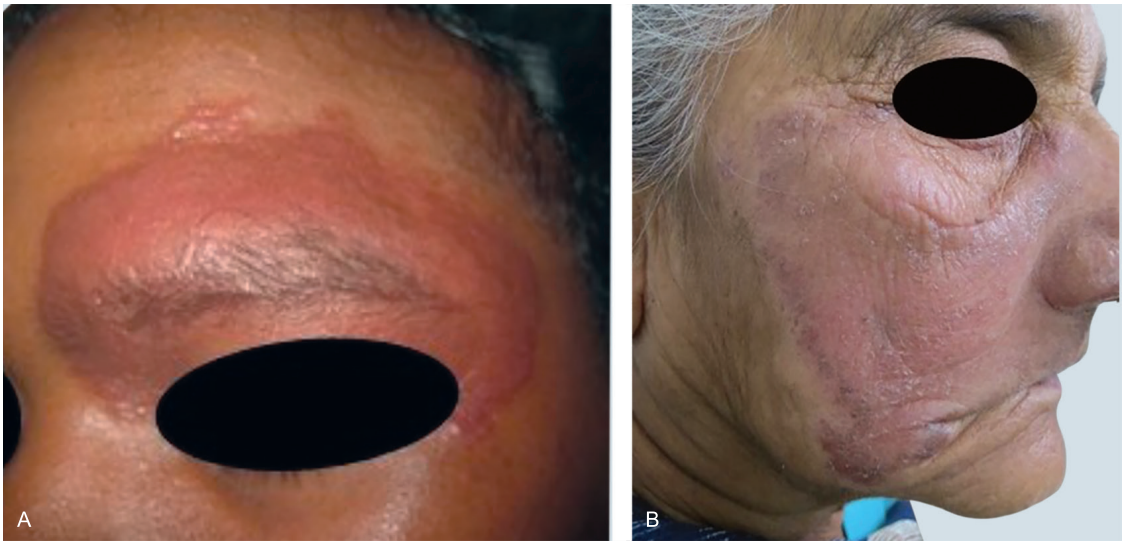

Fig. 2.2: Type 1 reaction: (A) Well-defined, raised outer border of erythematous, tender plaque over left forehead; (B) Erythematous, tender plaque over right face

Fig. 2.3: (A and B) Multiple, discrete, erythematous, tender, papules and nodules occurring in crops; (C and D) Necrotic ulcers over ENL lesions (erythema necroticans)

Special Sites for Examination and Attention

Face: Look for following features:

- Erythematous facial patches—indicative of impending T1R.
- Watering of eyes, red eye, lidlag and lagophthalmos—indicative of facial and ophthalmic nerve involvement.

- Diffuse coarse infiltration of the face with papules with thick skin folds, loss of eyebrows and nodularity—Leonine facies in lepromatous leprosy (Fig. 2.4A and B)
- Depressed nasal bridge, due to loss of nasal septal cartilage and inferior nasal spine-advanced lepromatous leprosy
- Mega-lobules of ear in lepromatous leprosy (Fig. 2.4C and D)

Hands and Feet:[6,7] (Fig. 2.5)

- Test for sensations on hands and feet
- Check for trophic changes and loss of muscle mass.
- Note clawing of fingers and toes and inability to extend fingers fully or to bring fingers close together
- Observe for callosities over bony prominences or pressure points.
- Record blisters, fissures and ulcers, if any
- Check for loss of tissue and resorption of fingers tips and toes.
- Look for any other signs and features of disability and deformity.

Fig. 2.4: (A and B) Coarse infiltration of face with papulonodular lesions in case of histoid leprosy; (C and D) Infiltrated earlobe

Fig. 2.5: (A and B) Trophic ulcers over bilateral feet; (C) Spontaneous blister over right foot

CONCLUSION

Diagnosis of leprosy and its classification warrants thorough clinical examination of all suspected cases. It is a prerequisite for planning management and administration of appropriate therapy. Findings of initial examination and each follow-up should also be recorded in the pre-formatted leprosy proforma and follow-up sheets. These records, either physical or electronic should always be stored safely for their future use and reference.

REFERENCES

1. World Health Organization. (2009). Microbiology of *M. leprae*. [online] Available from www.who.int/lep/microbiology/en/index.html. [Accessed May, 2014].
2. NLEP Training Manual for Medical Officers, CLD, MoH&FW, Govt of India-2019.
3. Jopling WH, McDougall AC. The disease. In: Jopling WH, McDougall AC (Eds). Handbook of Leprosy,6th Edition: 2020Delhi: CBS Publishers and Distributors; 2020.pp.10-53.
4. Guidelines for the diagnosis, treatment and prevention of leprosy. New Delhi: World Health Organization, Regional Office for South-East Asia; 2018.
5. Singh G, Nagaraja, Prabhu S. Leprosy presenting as macrochelia. Indain J Lepr. 2000;72(1):341-2
6. Indira D, Kaur I, Sharma VK, et al. Palmoplantar lesions in leprosy. Indian J Lepr. 1999;71(2):167-72.
7. Srinivasan H, Dharmendra. Treatment of ulcers in leprosy patients. In: Dharmendra (Ed). Leprosy. Bombay: Kothari Medical Publishing House;1978.pp.599-616.