LEPROSY

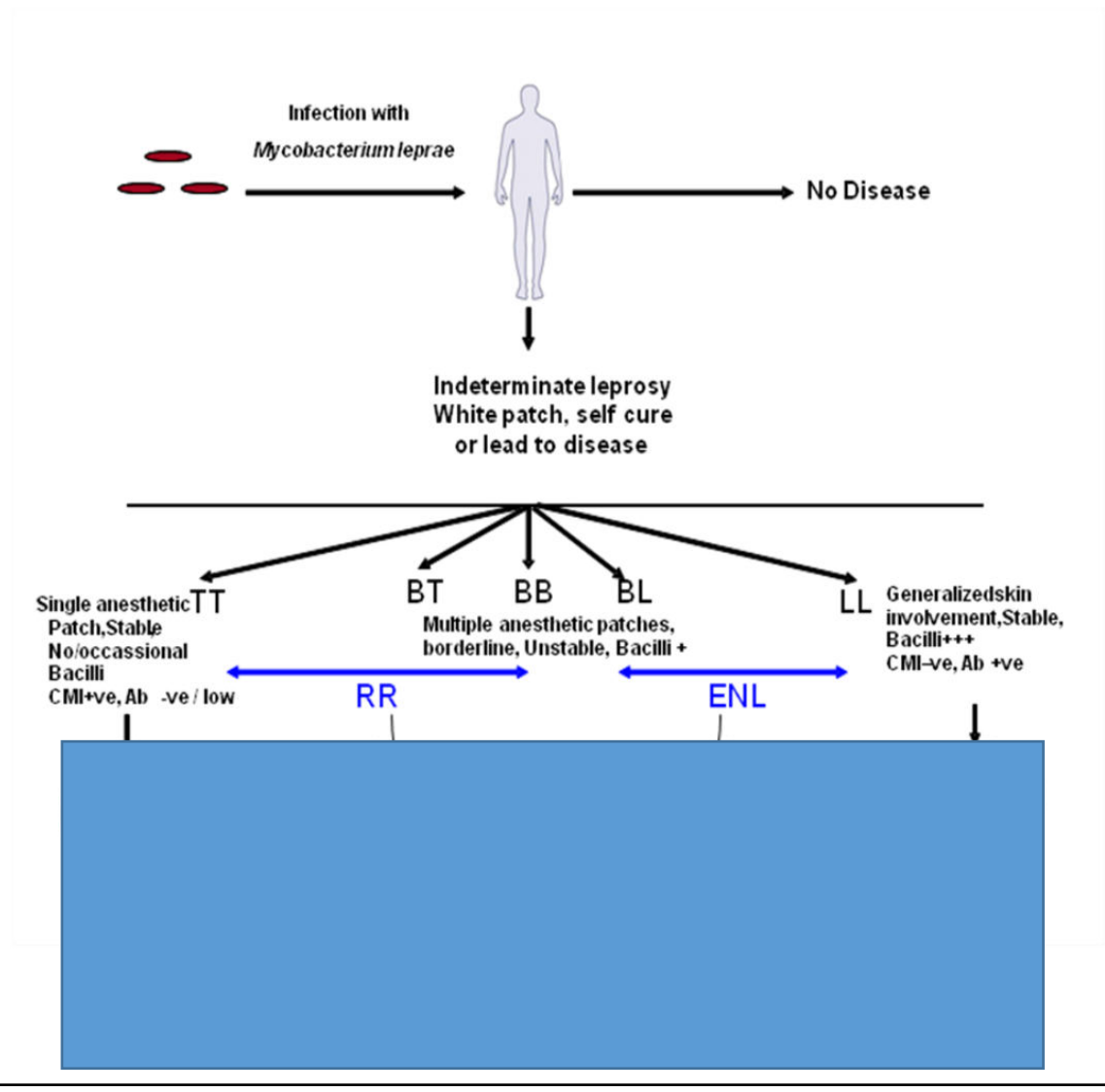
Cardinal signs of Leprosy

- 1. Anaesthetic/hypoaeshetic skin lesion or lesions
- 2. Enlarged peripheral nerve\s with impairment of sensations in the area supplied
- 3. Acid-fast bacilli in the slit skin smear

- Any one of these signs is sufficient for diagnosis of leprosy. Two of them are clinical. Therefore clinical skill of the health care worker is important for diagnosis of leprosy.

Exclusion criteria for diagnosis of leprosy

- **White (de-pigmented), dark red or black in colour**
- **Scaly lesion (regressed type 1 lepra reaction lesion may show scaling)**
- **Present since birth**
- **Seasonal or appears and disappears suddenly**
- **Hurts (discomfort may be felt in leprosy reaction)/ itches**
- **Presence of sweating**

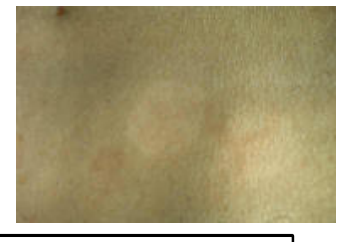


Current WHO classification.
MB; Multi bacillary. PB; Pauci bacillary.

	Criteria		
MB	≥ 6 skin lesions, or Positive bacterial index		
PB	≦5 skin lesions and Negative bacterial index		

Leprosy Spectrum

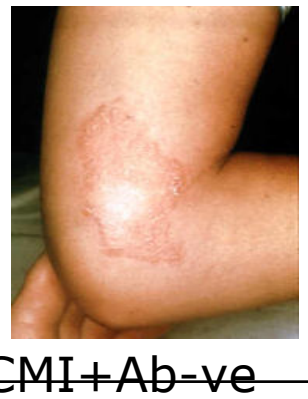
subclinical leprosy
white patch
may self cure
or lead to disease

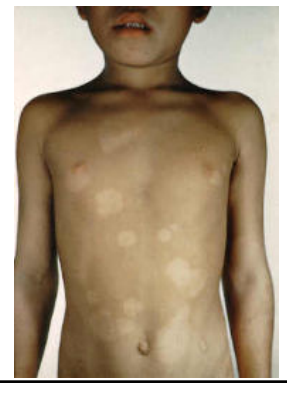


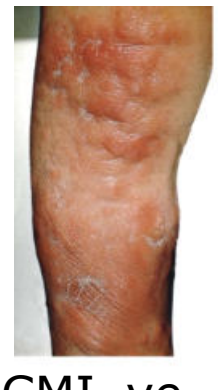
single, anaesthetic patch
Tuberculoid Leprosy
polar TT, stable
bacilli -ve

multiple anaesthetic patches,
Borderline Leprosy
unstable
bacilli+

generalised skin, organs
Lepromatous Leprosy
polar LL, stable
bacilli ++

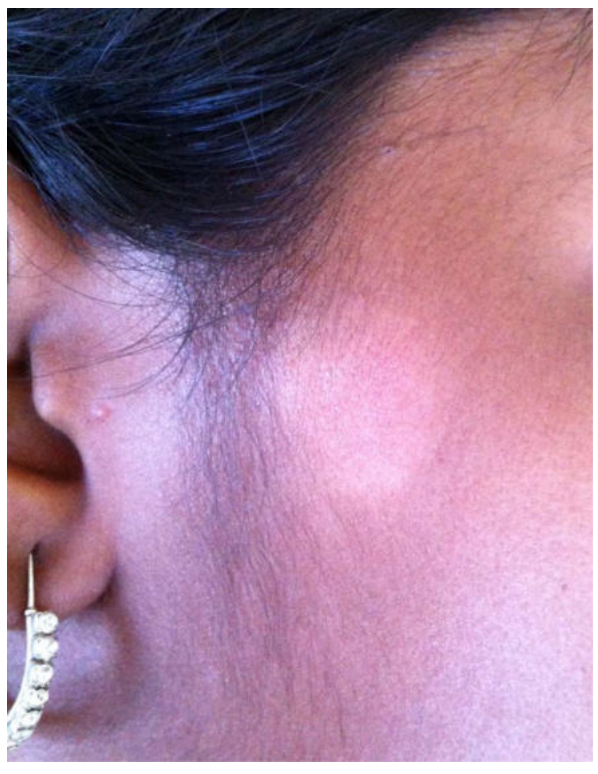






CMI+Ab-ve

CMI–ve, Ab+



- **Ill-defined patch of indeterminate leprosy**

RIDLEY-JOPLING CLASSIFICATION

THE SPECTRUM OF LEPROSY
(Ridley-Jopling Classification)

RIDLEY JOPLING CLASSIFICATION

Observation	TT	BT	BB	BL	LL
Number of lesions	Usually single (up to 3)	Few (up to 10)	Several (10-30)	Many, asymmetrical (>30)	Innumerable, symmetrical
Size of lesions	Variable, usually large	Variable, some are large	Variable	Small, some can be large #	Small
Surface	Very dry, scaly, lesions look turgid	Dry, scaly, lesions look bright and infiltrated	Dull/ slightly shiny	Shiny	Shiny
Sensations in lesions	Absent	Markedly diminished	Moderately diminished	Slightly diminished	Minimally diminished, not affected
Hair growth in lesions	Absent	Markedly diminished	Moderately diminished	Slightly diminished	Not affected initially §
AFB in lesions	Nil	Nil or scanty	Moderate in number	Many	Plenty Including globi
Lepromin reactivity	Strongly positive (+++)	Weakly positive (+or ++)	Negative/ weakly positive	Negative	Negative

Tuberculoid leprosy (plaque type)

-Single or 2 or 3

-Erythematous or coppery

-Dry surface, hairless

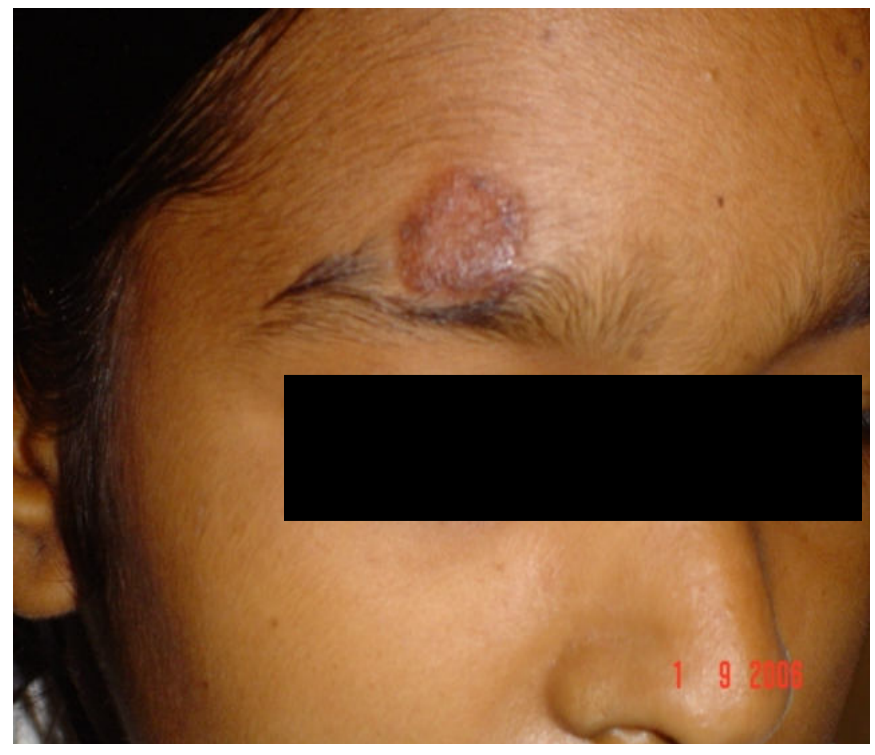
-Raised well defined edge with sharp outer margin and sloping inside & tendency of central flattening

-Sensation(touch, temp. pain) : absent

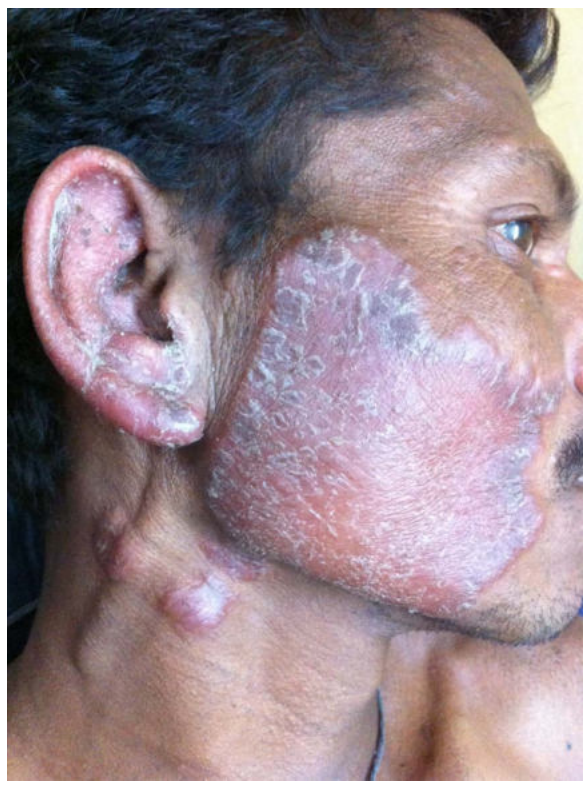
-Feeding nerve to the patch or solitary peripheral nerve may be thickened

-AFB: negative

Lepromin: +++

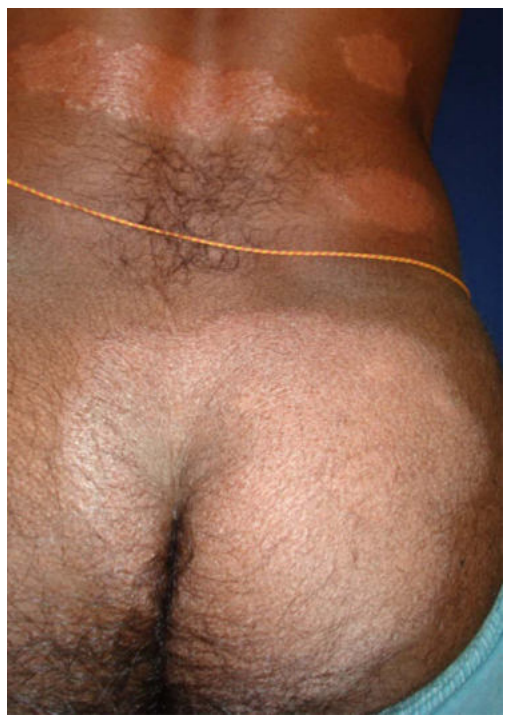


TT



- WELL DEFINED RAISED OUTER BORDER OF A TT LESION .
- ENLARGED GREATER AURICULAR NERVE
- INVOLVEMENT OF EAR

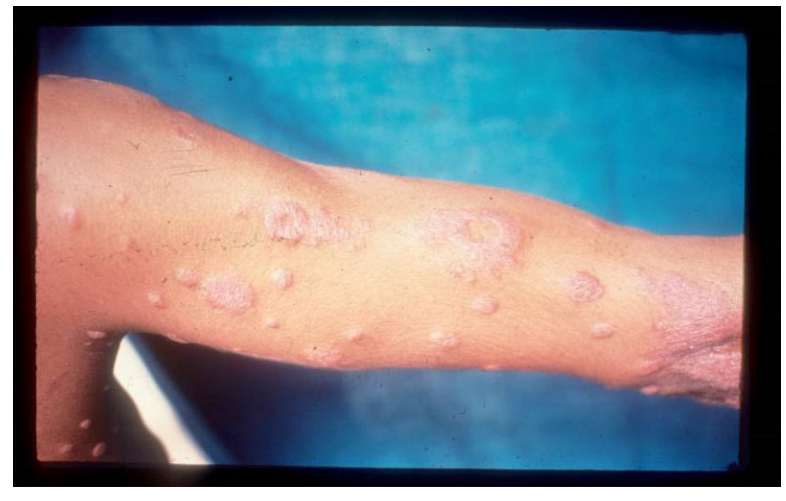
BT

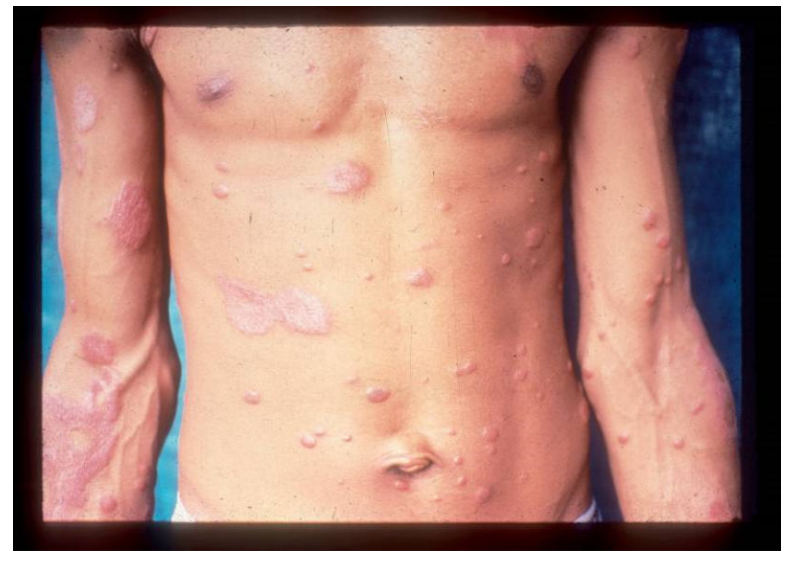


- **Large patches of BT leprosy**
- **SATELLITE LESIONS**

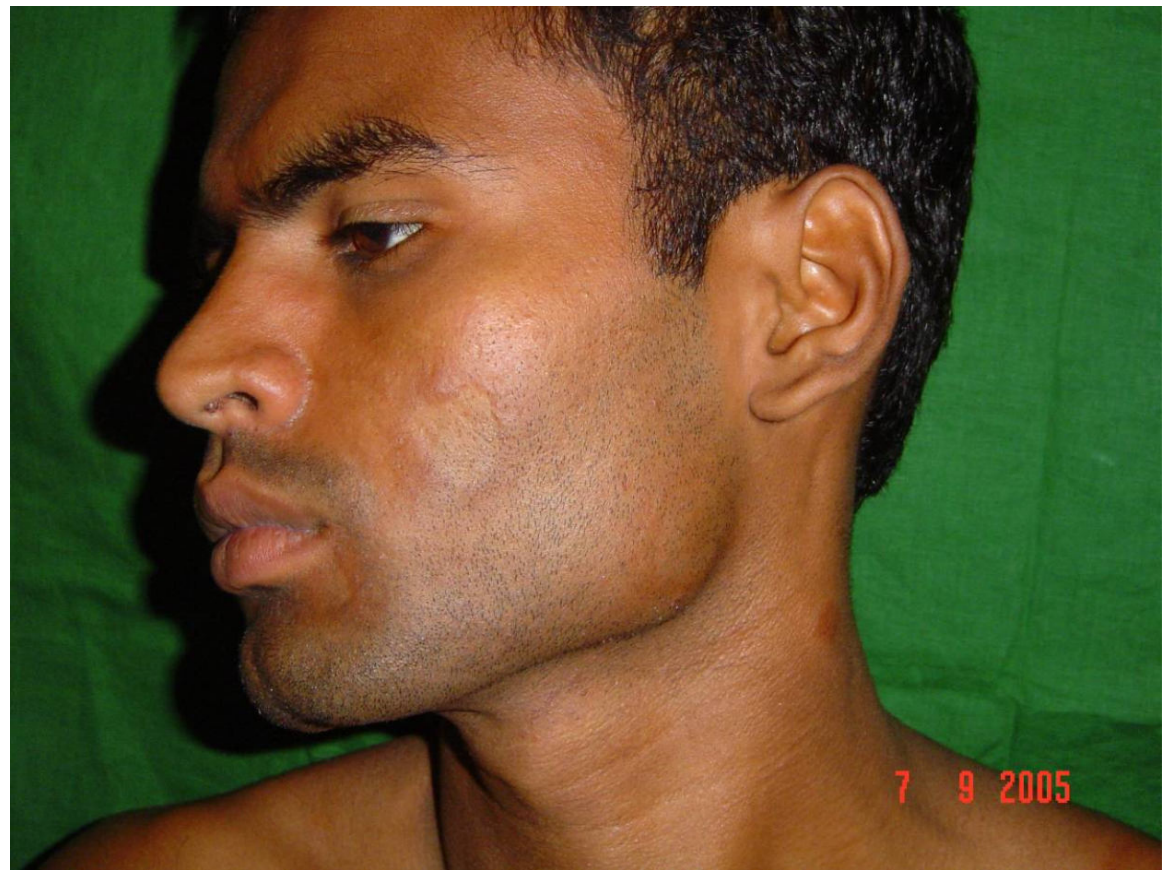
BB Leprosy (macular, plaque, inverted saucer shaped)

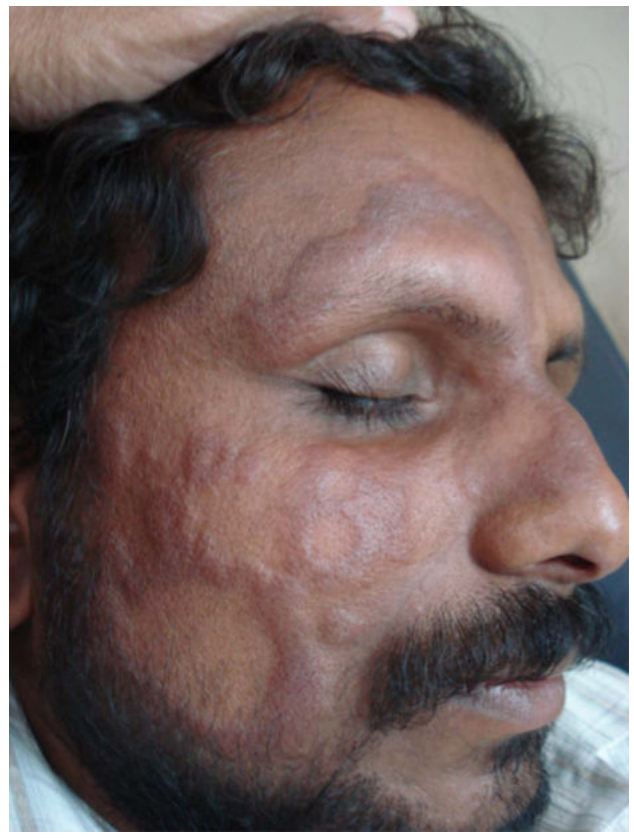
- Several number, bilateral but asymmetrical distribution
- Variable size, sloping outer edge & central punched out area
- Sensation: slightly diminished
- Slightly shiny
- Asymmetrical many nerve thickening
- AFB: moderate 2+to3+
- Lepromin: negative



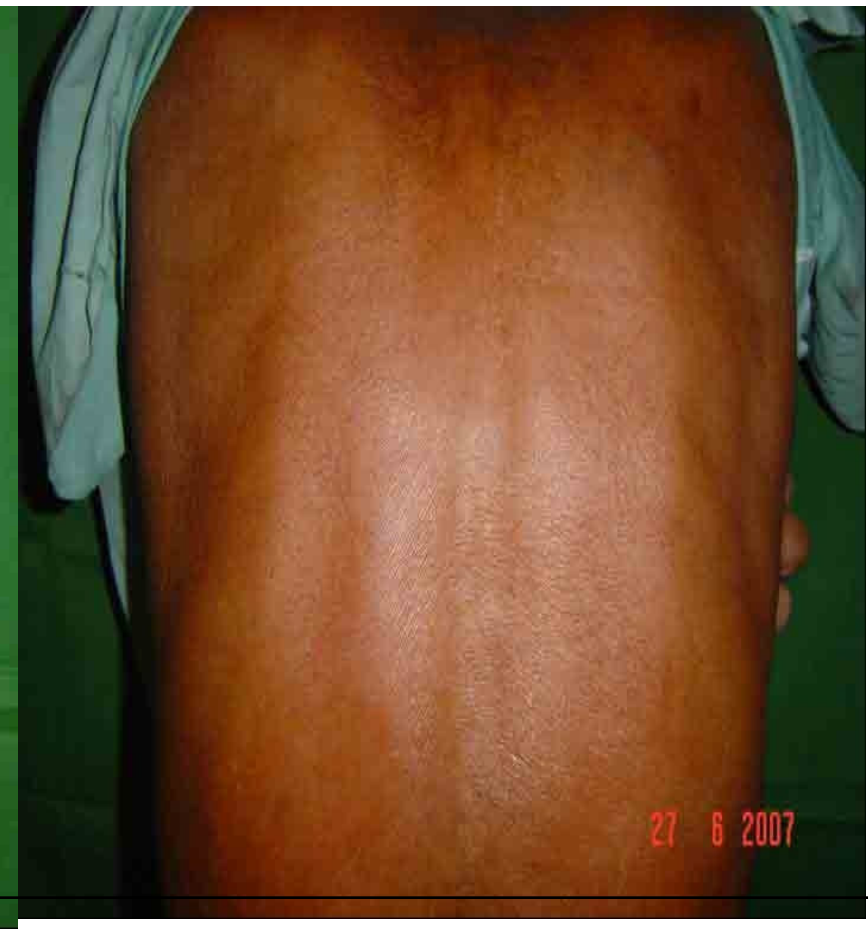


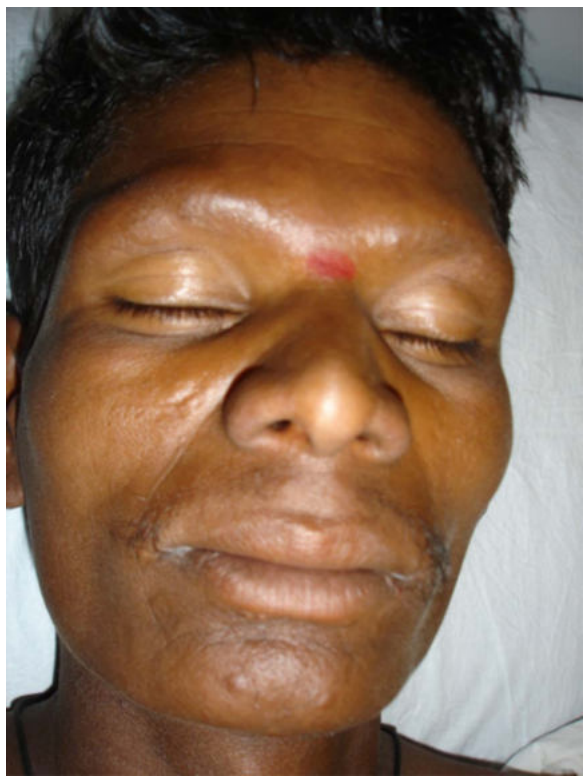
Inverted saucer-shaped lesion of BB



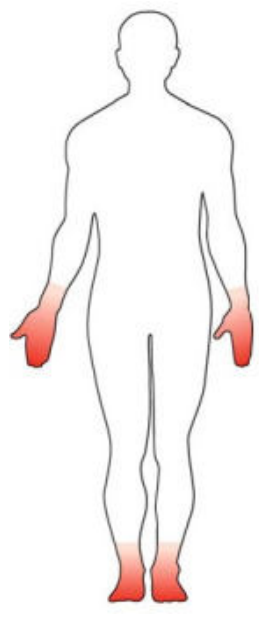


LL (Fine to course infiltration)



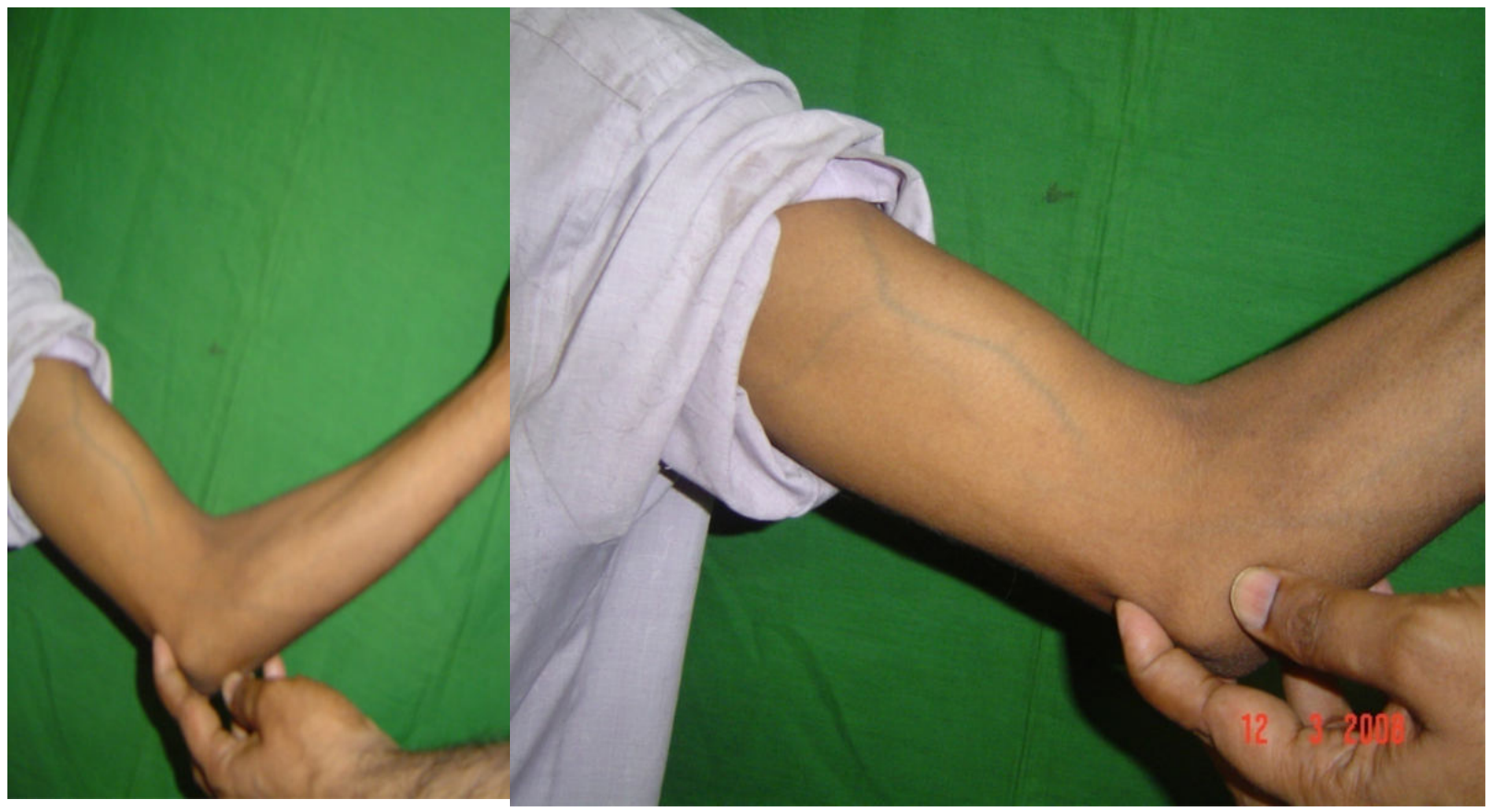


- BILATERAL LOSS OF EYEBROWS , MOUSTACHE & BEARD



- glove & stocking distribution of neuropathy.

Pure neuritic leprosy



HISTORY TAKING

- Primary goal of history taking is to establish the diagnosis by excluding other conditions simulating leprosy. History should be taken according to the following steps, mostly like any other medical history;
- Personal identification and demographic data.
- Presenting complaints.
- History of present illness.
- Past history.
- Family history.
- Personal history.

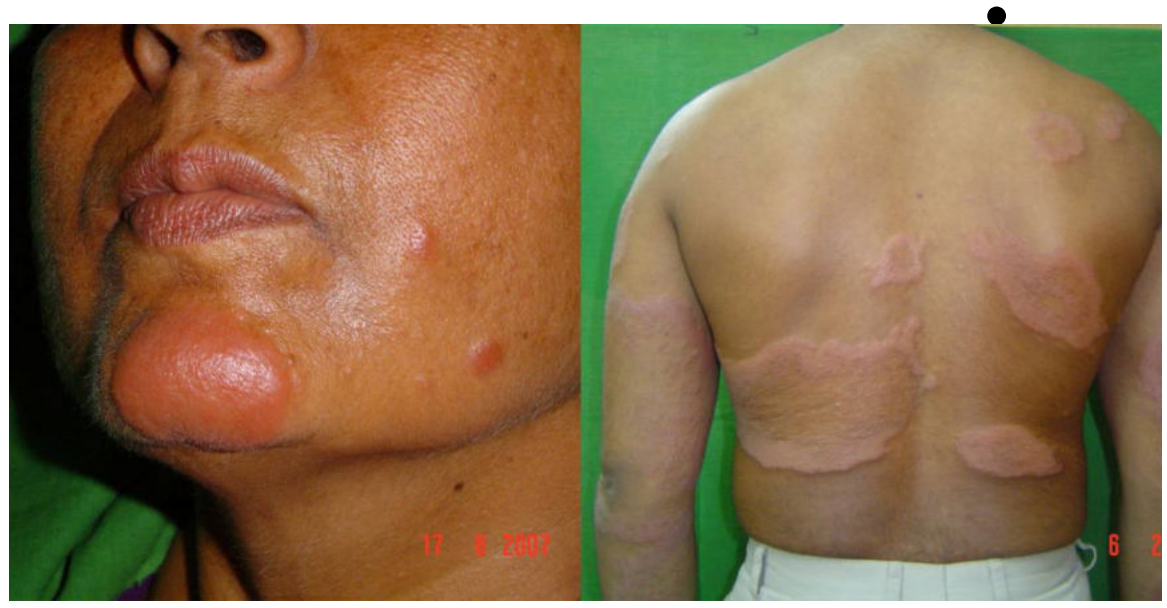
Various presenting features of leprosy

IN ABSENCE OF REACTION	1.Skin lesions: hypopigmented / erythematous, hypoaesthetic patches, skin-coloured / erythematous papules,plaques nodules, which may be waxy ± umbilication. 2. Hypoaesthesia along distribution of peripheral nerves / gloves and stockings hypoaesthesia 3. Spontaneous blisters and ulcers on the hands and/ or feet 4. Trophic changes ; dryness, ichthyosis, fissuring / trophic ulcer 5. Diffuse swelling of hands and feet (early sign of lepromatous leprosy / leprosy reactions) 6. Nasal stuffiness, epistaxis (early sign of lepromatous leprosy) 7. Irregular thickening of ear and nodules on face (lepromatous leprosy)
WHILE IN REACTION	1. Tingling and numbness of hands and/ or feet 2. Sudden weakness of hands and/ or feet / inability to close eyelids 3. Sudden redness, swelling and pain of existing lesions and / or appearance of new lesions with or without constitutional symptoms (type 1 reaction) 4. Sudden appearance of crops of evanescent, erythematous, painful nodules on apparently normal looking skin with or without constitutional symptoms (erythema nodosum leprosum / type 2 reaction) / type 2 reaction) 5. Painful swelling on the dorsal aspect of wrists (tenosynovitis) 6. Acute scrotal pain (epididymo-orchitis) 7. Pain in and around eyes, redness, photophobia or diminished vision (iridocyclitis)
IN PRESENCE OF DEFORMITY	1. Inability to use hands for precision works; e.g., button a shirt, eating rice with hands, typing, etc; 2. Inability to make a power-grip; e.g., holding a rod, carrying utensils. 3. Inability to wear slipper. (all these are indicative of peripheral anaesthesia and poor functioning of small muscles of hands and feet).

Looking for other organ involvement in leprosy

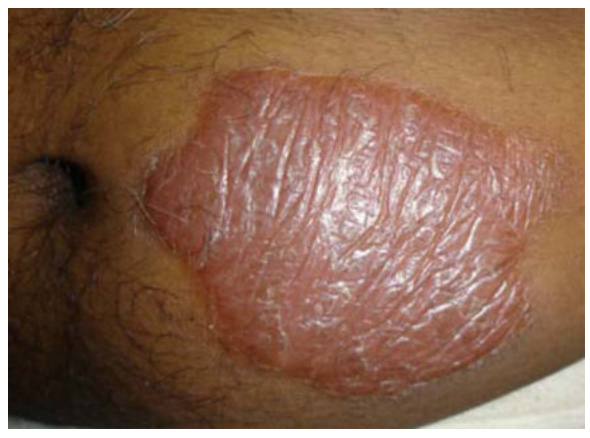
ORGAN	SPECIFIC QUESTIONS TO BE ASKED
Eye	▪ Difficulty in eye closure? (Lagophthalmos) ▪ Red eye with pain, watering and sticky discharge? (Corneal ulceration) ▪ Red eye with pain, photophobia and diminished vision? (Iridocyclitis) ▪ Localized redness, severe radiating pain to temporal region, normal/ slightly reduced vision? (Scleritis) ▪ Localized redness, mild pain, normal vision? (Episcleritis)
Upper respiratory tract	▪ Unable to perceive smell of food and scented materials? (Anosmia) ▪ Nose is blocked with occasional bleeding? ▪ Change of voice, chronic cough, and occasional breathlessness? (Laryngeal involvement) ▪ Any episode of acute respiratory distress? (Laryngeal oedema)
Cardiovascular system*	▪ Palpitation? ▪ Dyspnoea on exertion? ▪ Swelling of feet?
Adrenal glands**	▪ Features of adrenal insufficiency? e.g., hypotension, asthenia, prostration
Male reproductive system	▪ Normal / diminished libido? (Testicular atrophy) ▪ Enlarging male breasts? (Testicular atrophy) ▪ If married, whether having children? (Sterility)

*Cardiovascular involvement in leprosy is very rare and rarely gives rise to symptoms. Involvement of peripheral blood vessels, though frequent, is rarely symptomatic.
** Adrenal suppression is very rare in leprosy. However, it may occur rarely during an episode of T2R..

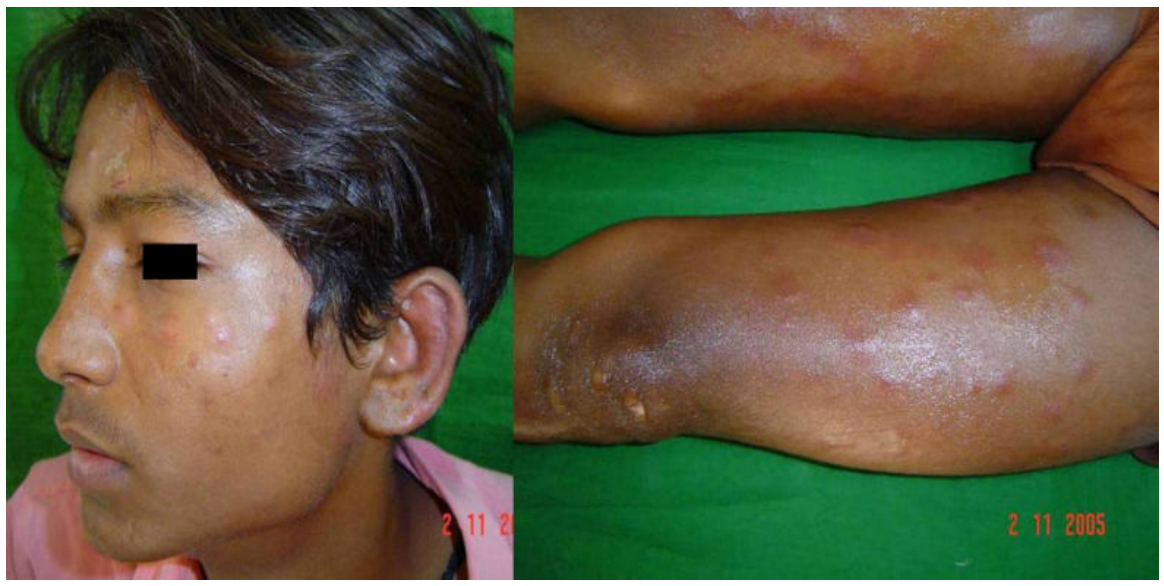


- RR in a case of BT leprosy,

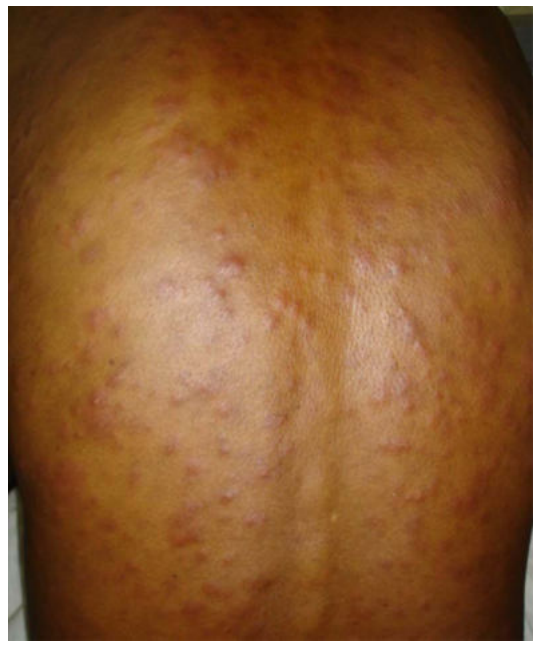
(left), RR in a case of BB leprosy (Right), note the shiny erythematous and oedematous plaques.



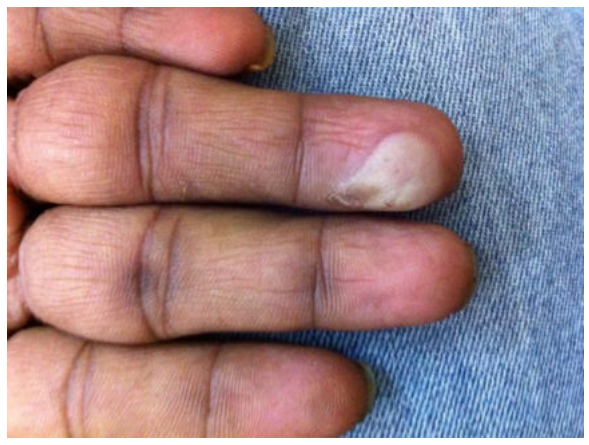
- BT lesion with type 1 reaction



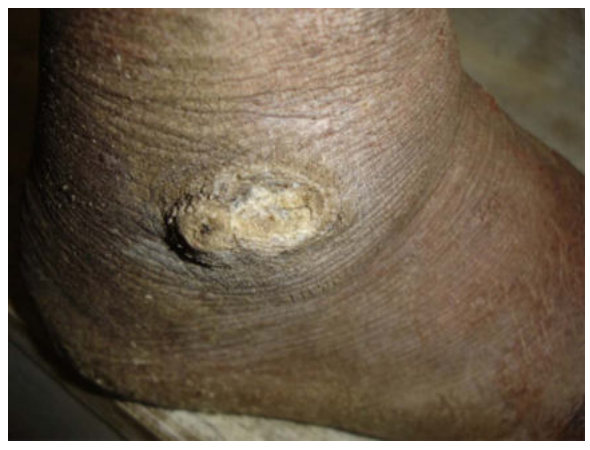
ENL in a case of LL. Note the shiny erythematous papules and nodules (usually tender) over face and thighs. The lesions are evanescent and usually associated with systemic features like fever, malaise, joint pain etc.



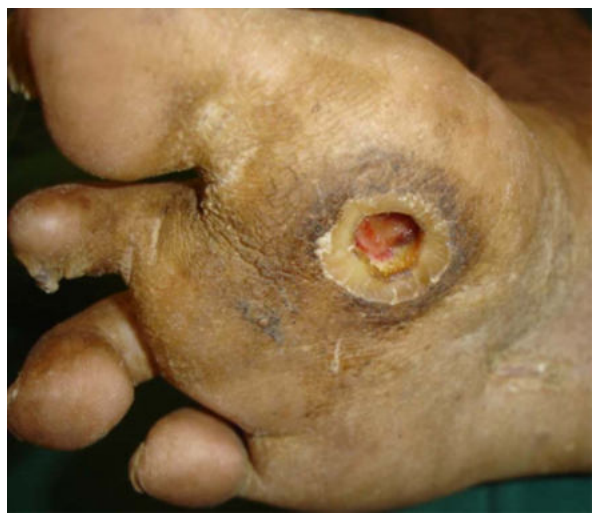
- NODULES OF ENL



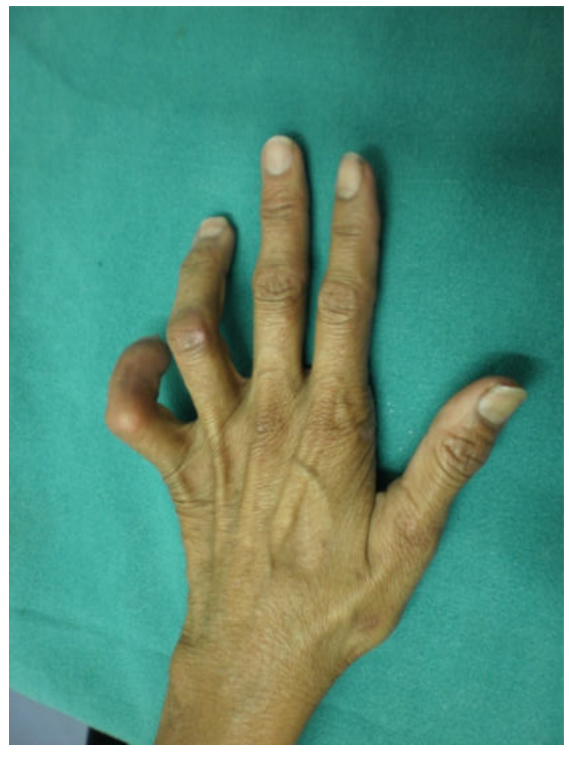
- **Spontaneous blister on finger**



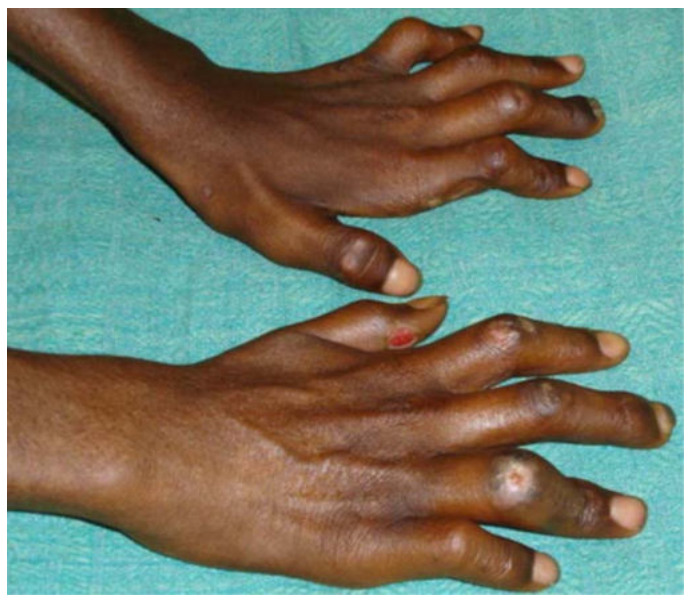
- **Callosity over lateral malleolus (pressure point)**



- **Trophic ulcer**

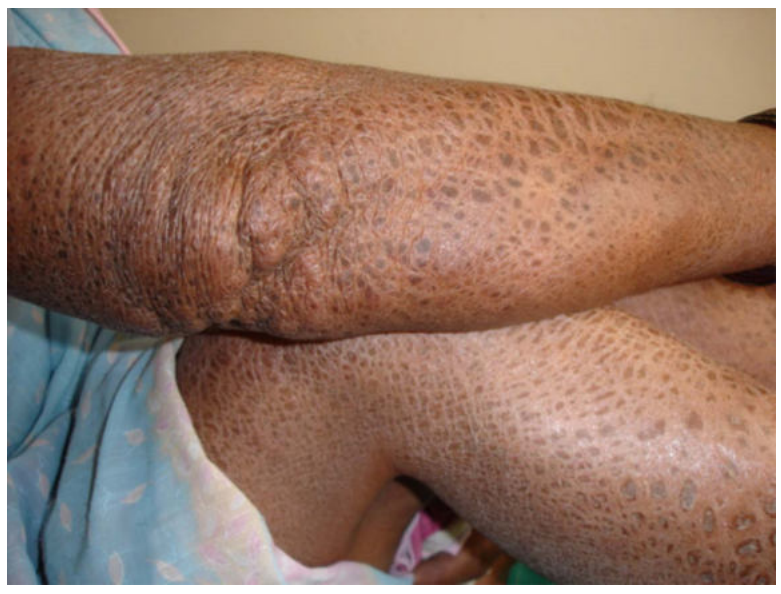


- partial or ulnar clawhand

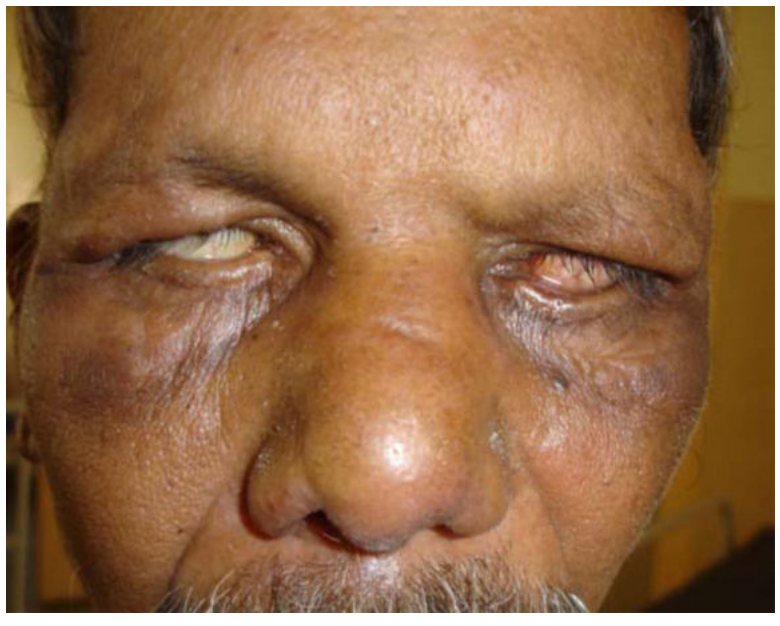


- **Bilateral complete claw hands with guttering of dorsal**
- **interosseous spaces and callosities on interphalangeal joints.**

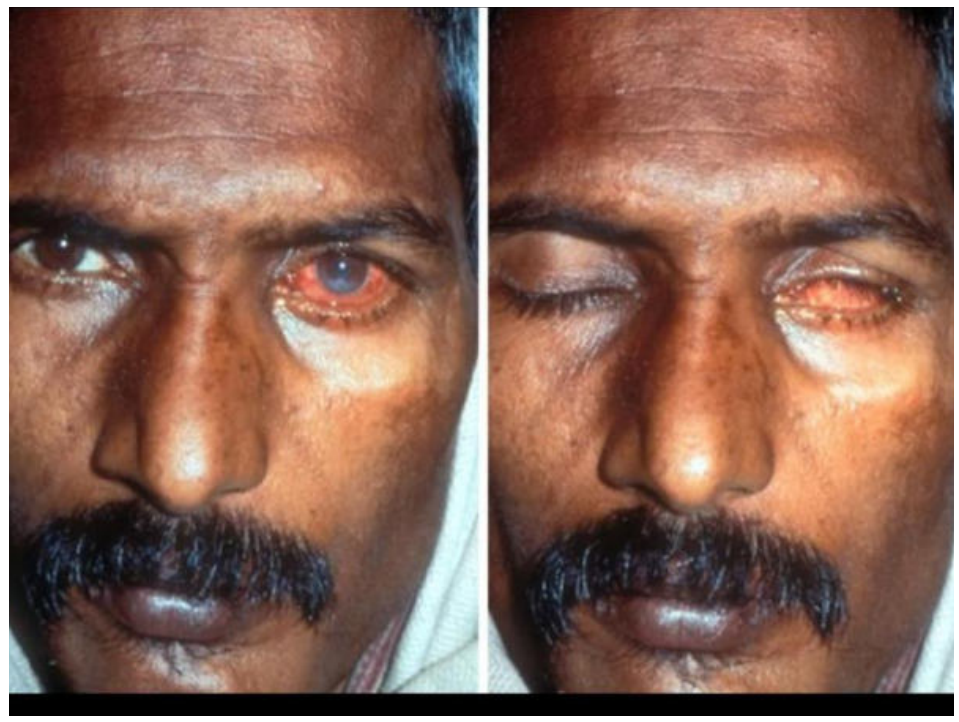
- **A case of Bell's palsy (right side). The facial paralysis in leprosy involves upper part of face (due to selective involvement of zygomatic branch of facial nerve by a leprosy lesion in the vicinity). In Bell's palsy the involvement of facial nerve is higher up, due to oedematous compression in facial canal, affecting all branches, leading to paralysis of both upper & lower parts of face.**



- **Secondary ichthyosis in lepromatous leprosy with brownish discoloration of the scales due to clofazimine.**



- LAGOPHTHALMOS



Lagophthalmos- inability to close the eyes , is in direct proportion to the extent of damage to facial nerve

If the eyes cannot be closed regularly by normal blinking, or if the eyes are not closed while sleeping , then the eyes are at risk of exposure keratitis

CLINICAL EXAMINATION

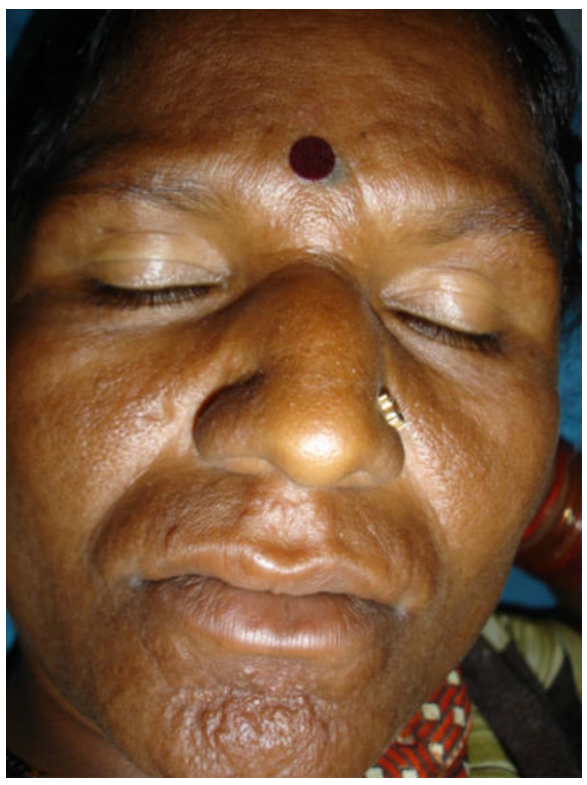
- Clinical examination involves the following steps:
- 1. General physical examination
- 2. Cutaneous and mucosal examination
- 3. Ocular examination
- 4 Palpation of peripheral nerves and testing for sensory impairment.
- 5. Examination of musculoskeletal system
- 6. Examination of external genitalia
- 7. Other systemic examination, wherever indicated.

Precautions for examination of skin lesion

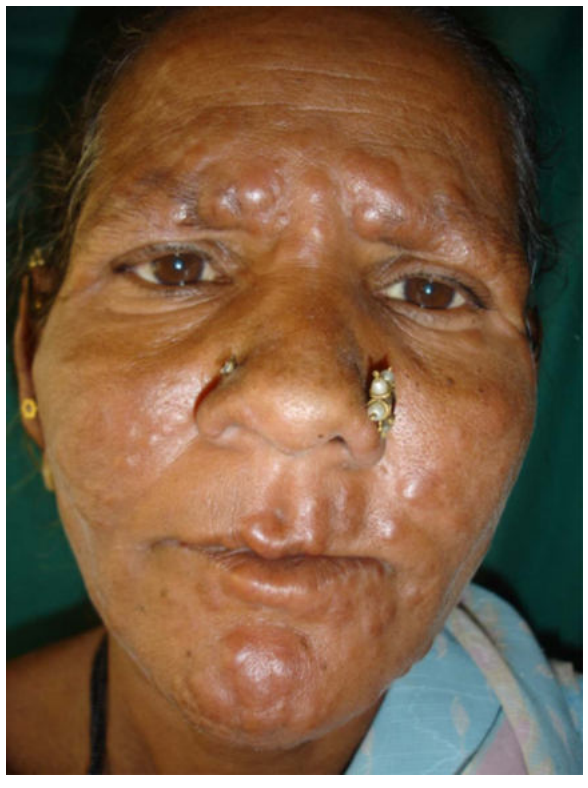
- Examine patient under good light (preferably natural light)
- Provide privacy to the patient
- Examine the whole skin from head to toe as much as possible.
- Always use the same order of examination, so that you do not forget to examine any part of the body.
- Ensure presence of an assistant of the same sex as that of the patient to assist you. Especially, if the patient is of the opposite sex.

- A quick general cutaneous survey should be done followed by examination of individual skin lesions.

- Prior explanation to the patient along with gaining his / her confidence is of immense importance in achieving patient cooperation.

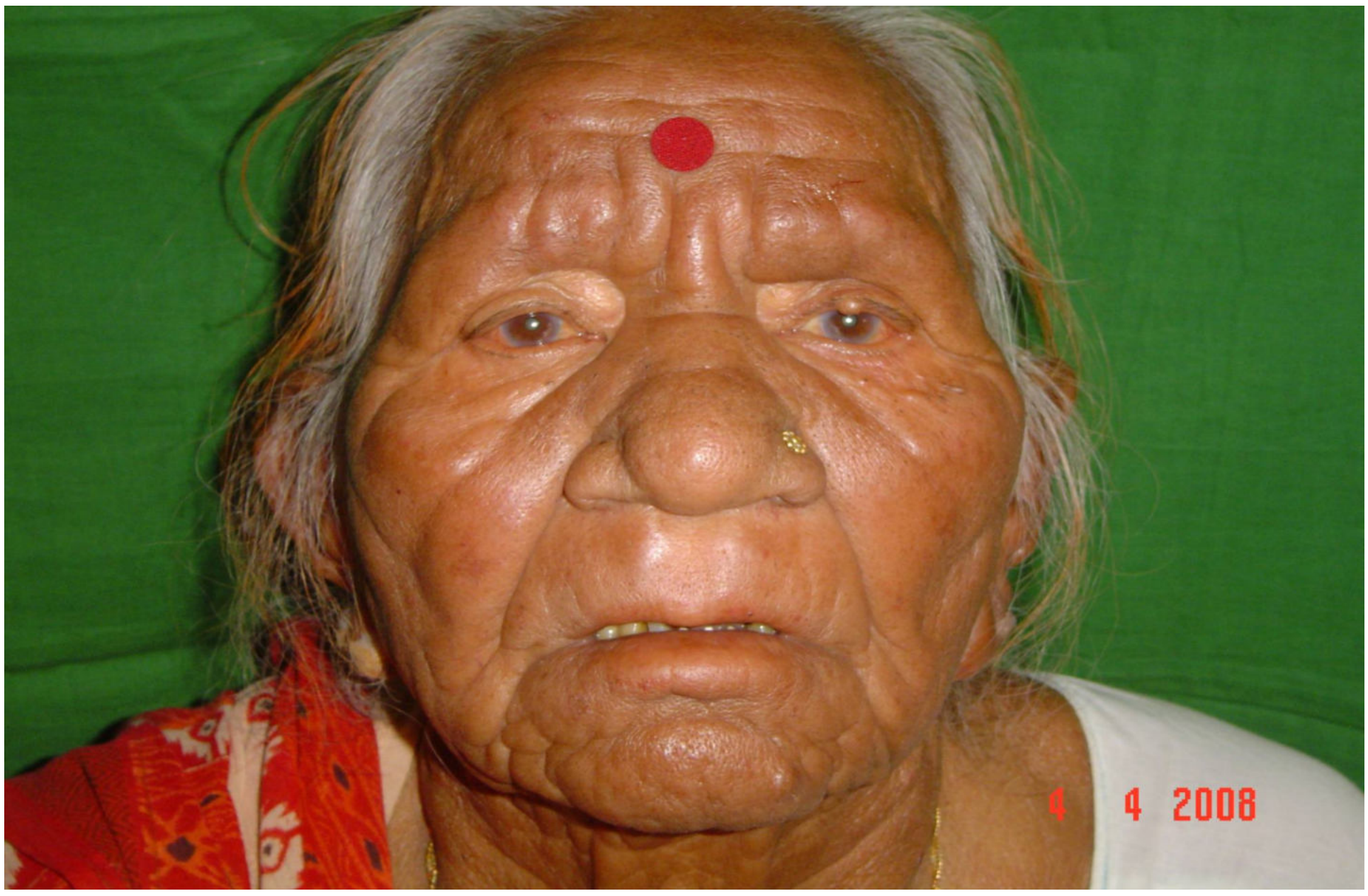


- DIFFUSE COARSE INFILTRATION OF THE SKIN- LL

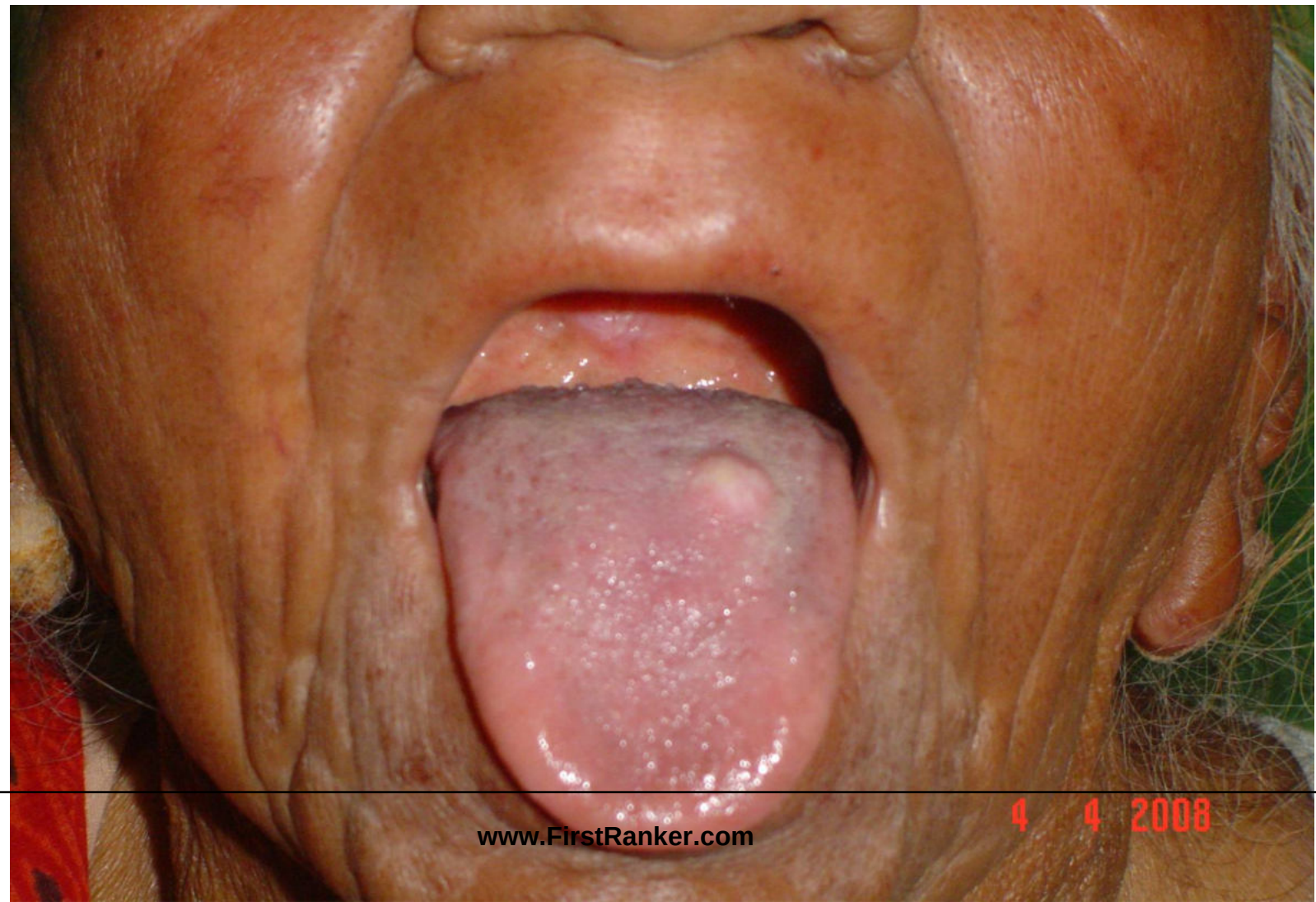


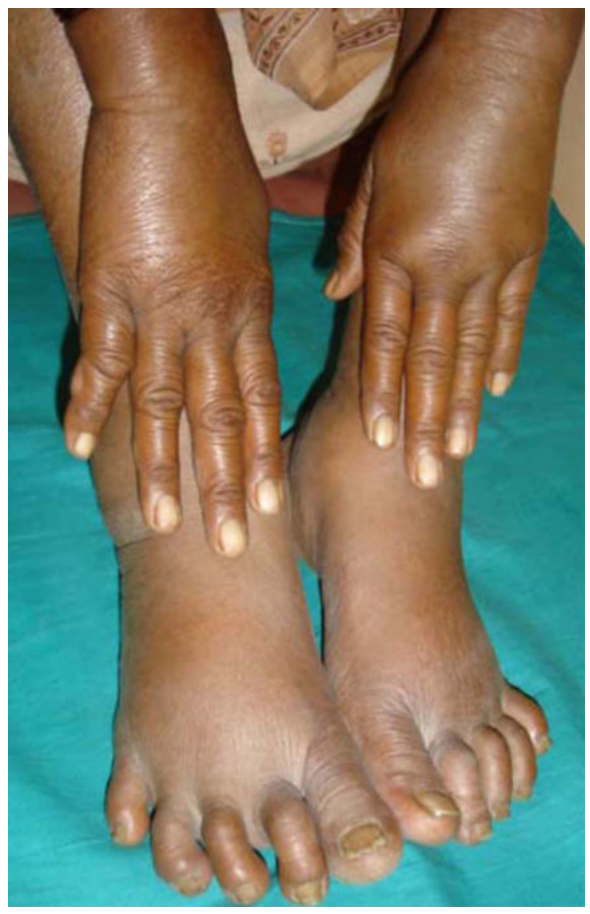
- MORE SEVERE INFILTRATION WITH NODULAR LESIONS (LEONINE FACIES)

LL (Leonine face)



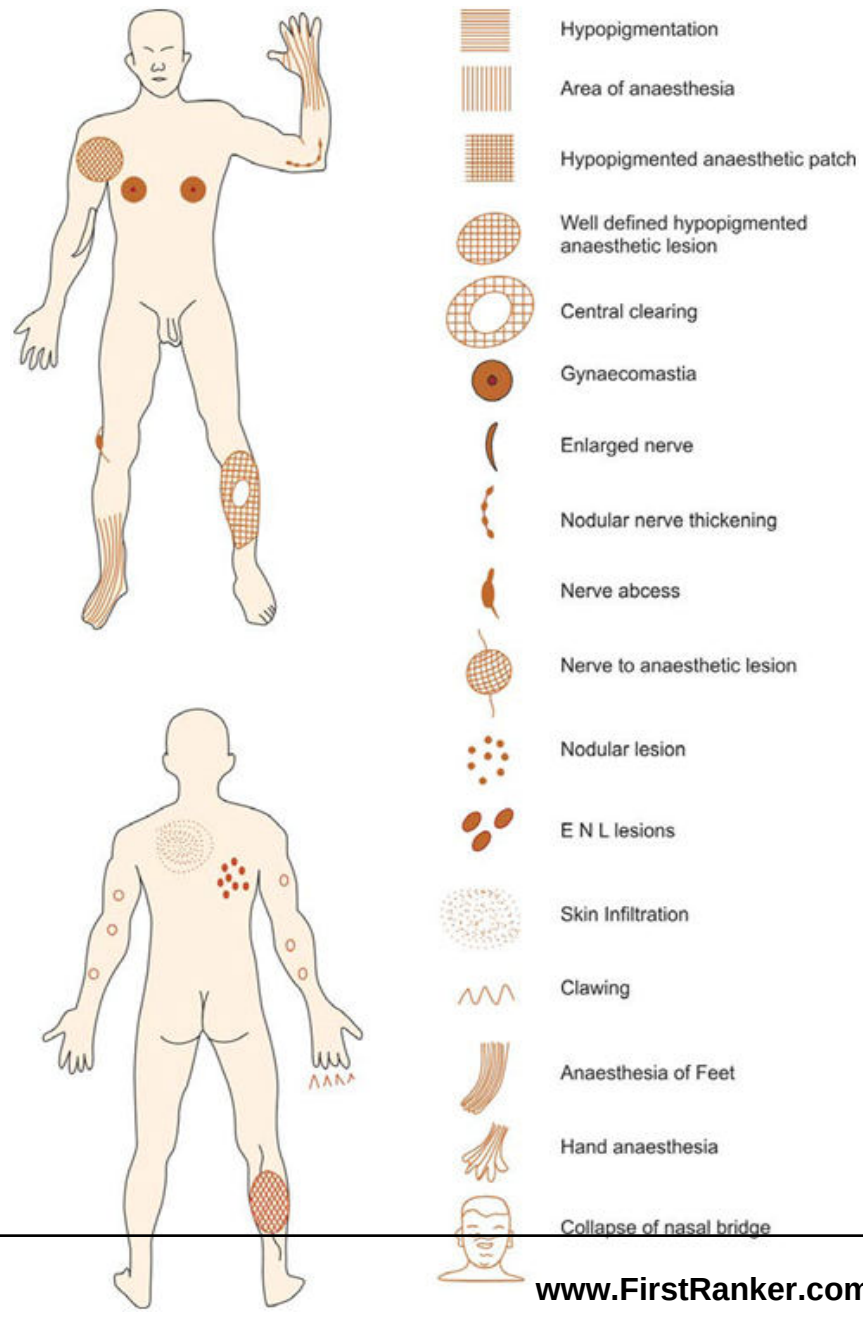
Lepromatous nodule on tongue and palate (same pt.)

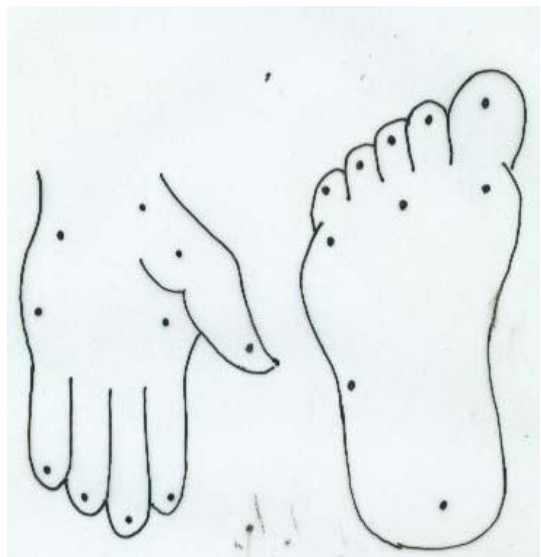




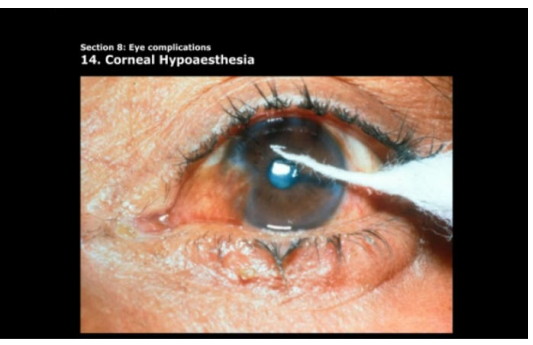
- **Oedema of hands and feet in a patient with**

  untreated LL





- Recommended sensory testing sites (WHO) on palms and soles



OCULAR EXAMINATION

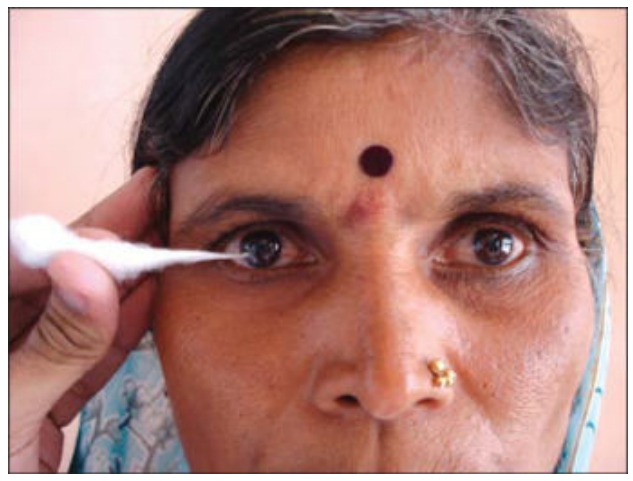
- Tested by-

- fine wisp of cotton

- lightly blowing a puff of air into each cornea (Hutchison's 21 ed)

- aesthesiometer (fine filament –calibrated)

- observing infrequent blinking (because the stimulus for eye closure is decreased)



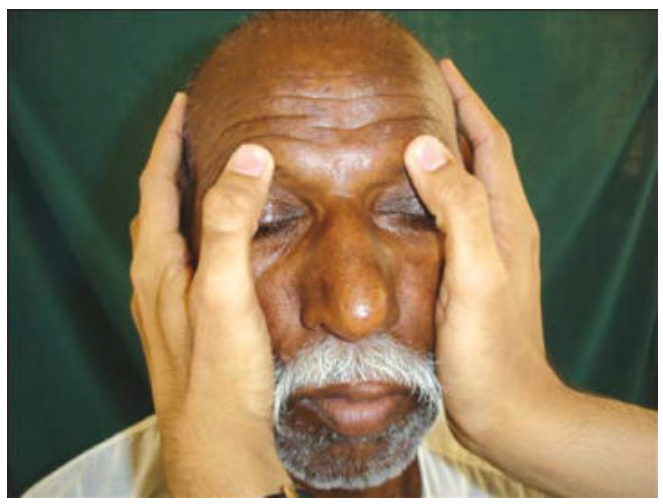
- TESTING CORNEAL SENSATION

PALPATION OF PERIPHERAL NERVES

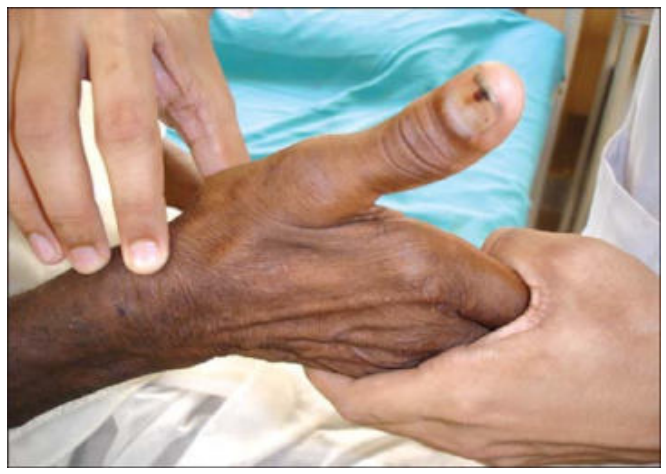
- Clinician should be well aware of the specific sites / bony land-marks along which the peripheral nerves commonly involved in leprosy are to be palpated, as well as the area of distribution of sensory nerves.

- Nerve palpation should be gentle (using pulps of fingers rather than tips) to avoid causing pain to an inflamed nerve (neuritis).

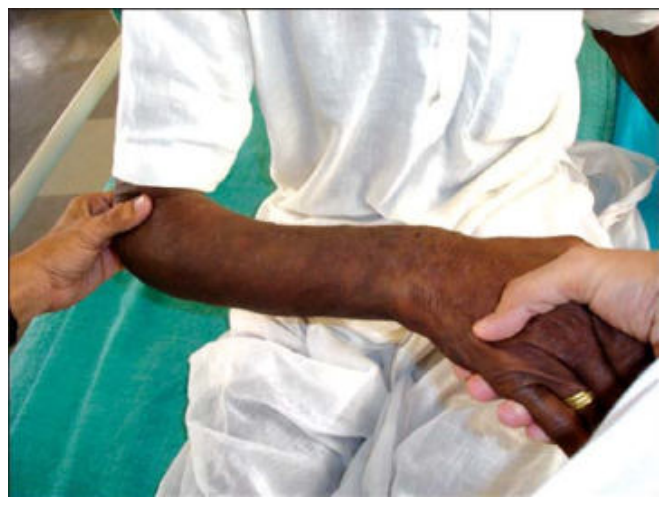
Nerve	Site / bony landmark	Patient position	Method
Head & Neck			
Supraorbital	Supraorbital notch at the junction of medial 1/3rd and lateral 2/3rd of supraorbital ridge	Sitting / standing with head kept straight.	Palpate with both thumbs on both sides (Fig 38)
Supratrochlear	Medial to the supraorbital nerve	Same as above	Same as above
Infraorbital	Infra orbital foramen, just below the medial part of inferior orbital margin	Same as above	Same as above
Branches of facial nerve: Zygomaic & temporal.	Zygomatic arch	Same as above	Same as above
Great auricular	Lateral side of neck, crosses sternomastoid muscle, from lateral side to infra-auricular area.	Sitting / standing with head turned completely to opposite side	Easily visible, crossing sternomastoid obliquely. May be palpated with 2 fingers
Clavicular (3 sets)	Shaft of clavicle	Sitting / standing straight	Fingers rolled along the shafts of both clavicles
Upper extremity			
Radial	Spiral groove on humerus, posterior to the deltoid insertion.	Sitting / standing with elbow flexed at 90˚. Examiner's right hand holds patient's right hand in shaking-hand manner (& vice versa).	Examiner's left fingers roll the nerve in the radial groove.
Ulnar	Ulnar groove on medial epicondyle of humerus, medial to the point of elbow.	Same as above. (Both the nerves may be palpated simultaneously for better comparison)	Examiner's left little finger locate the nerve in the groove; other fingers palpate the nerve upwards along medial aspect of arm (Fig 39).
Radial cutaneous	Lateral border of radius, just proximal to the wrist; thereafter along the proximal part of extensor pollicis longus tendon, which stands out prominently on ulnar side of the anatomical snuff box	Same as above. Patient is asked to extend the thumb to visualize the anatomical snuff box.	Examiner's left fingers roll the nerve against radius (Fig 40). It can be further traced and rolled from side to side on extensor pollicis longus tendon &dorsum of hand.
Median	Proximal to the flexor aspect of wrist joint (proximal to flexor retinaculum), between the tendons of palmaris longus and flexor carpi radialis	Sitting / standing with elbow flexed at 90˚, & wrist in supination. Examiner's left hand stabilizes patient's right hand and vice versa	Examiner's right fingers palpate the nerve deep between the tendons.



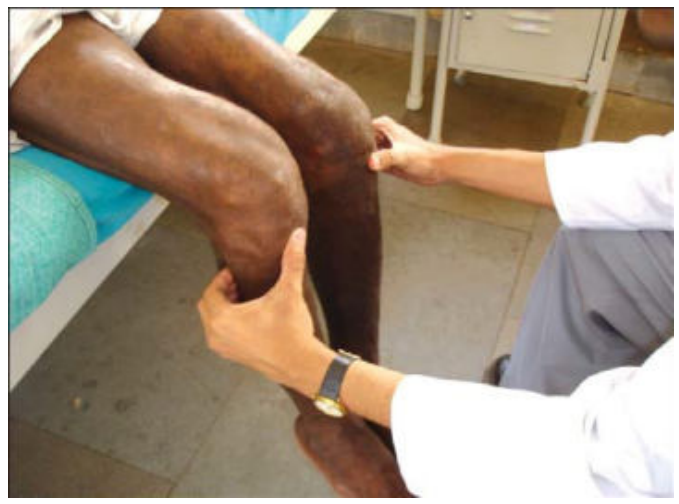
- **Palpation of supraorbital nerve with; fingers are used to stabilize the head.**



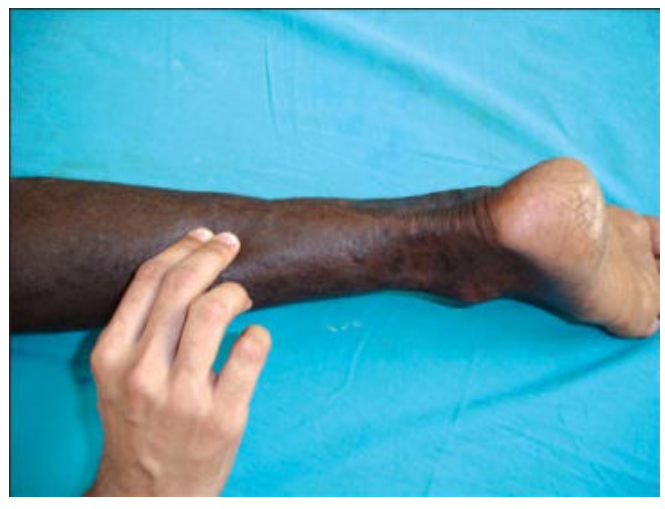
- **Palpation of radial cutaneous nerve.**



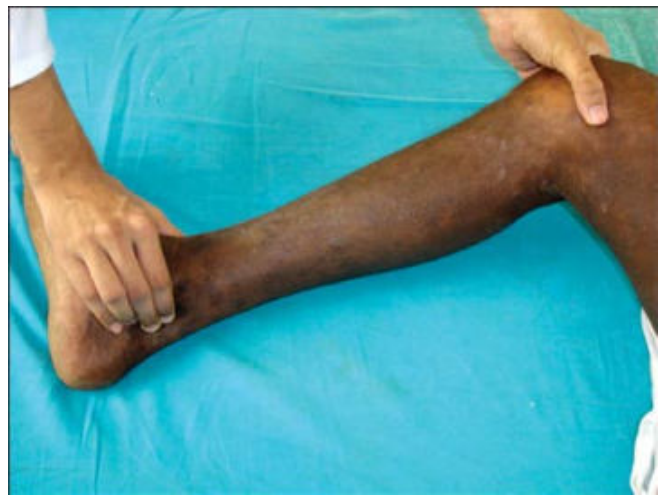
- **Palpation of ulnar nerve**



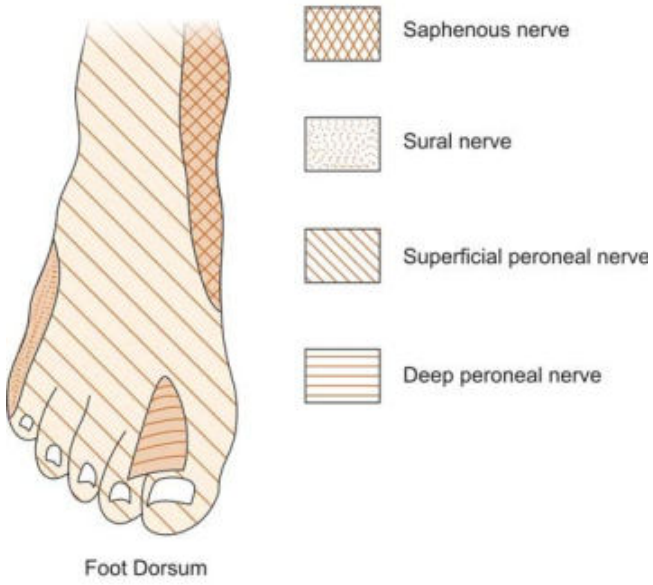
- **Palpation of lateral popliteal nerve.**

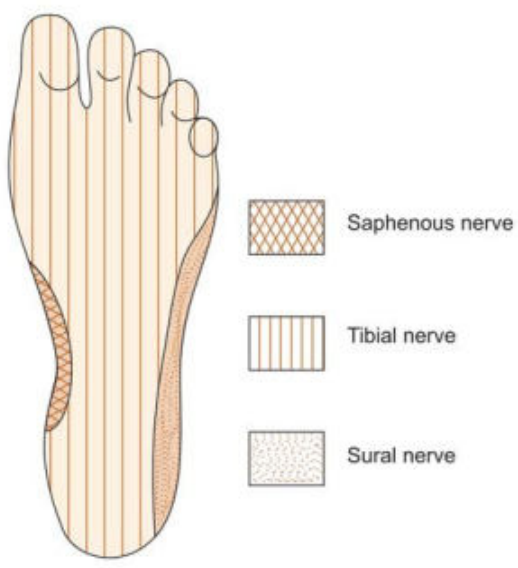


- **Palpation of sural nerve.**

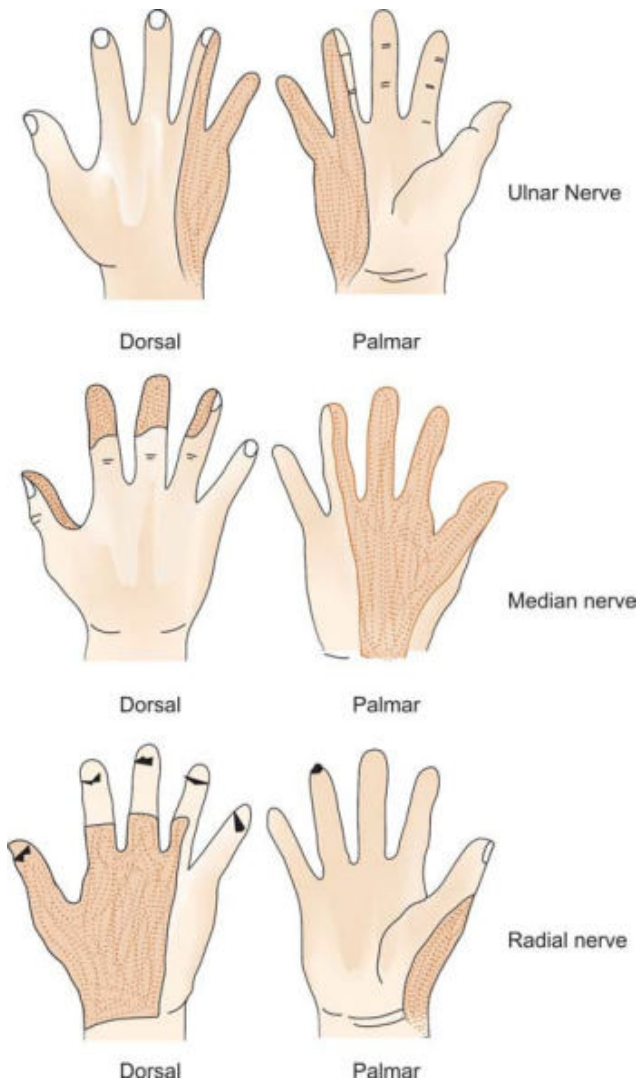


- **Palpation of posterior tibial nerve.**

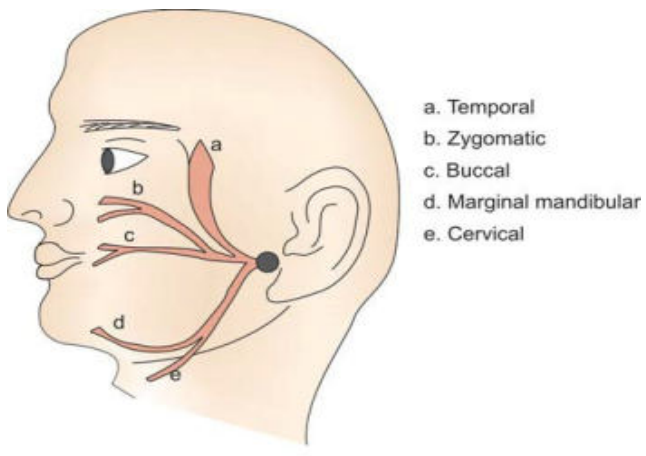




- **Sensory distribution of feet by various nerves**

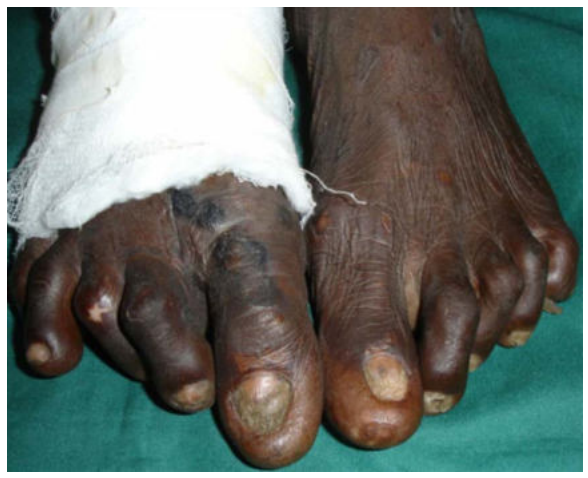


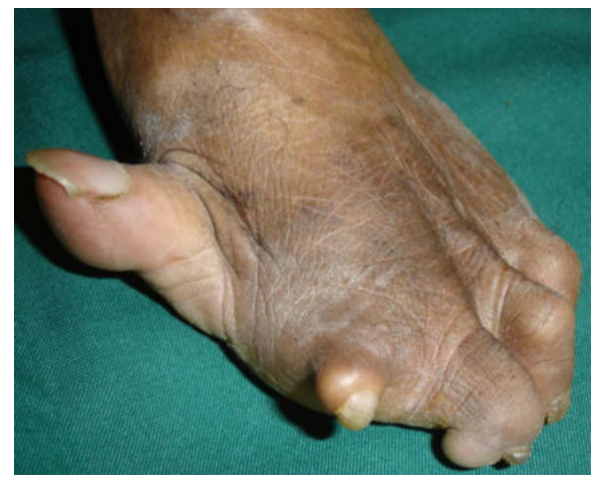
- **Sensory distribution of HANDS by various nerves**

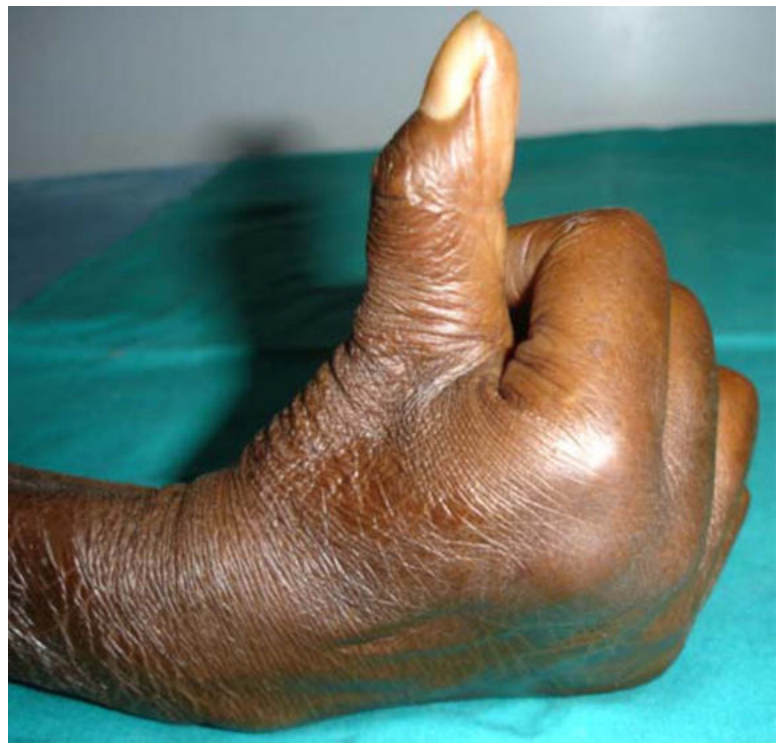


- **Terminal branches of facial nerve**

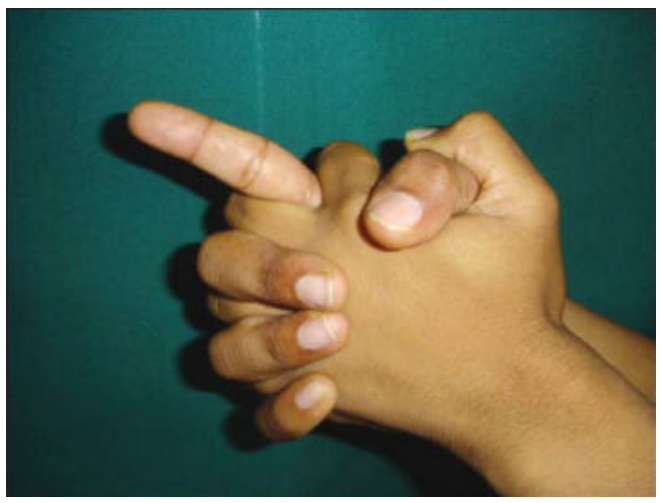
MUSKULOSKELETAL SYSTEM EXAMINATION



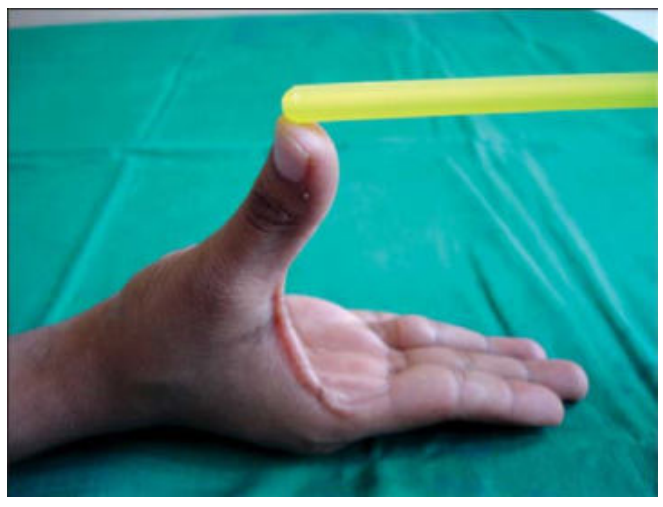




- Z THUMB DEFORMITY

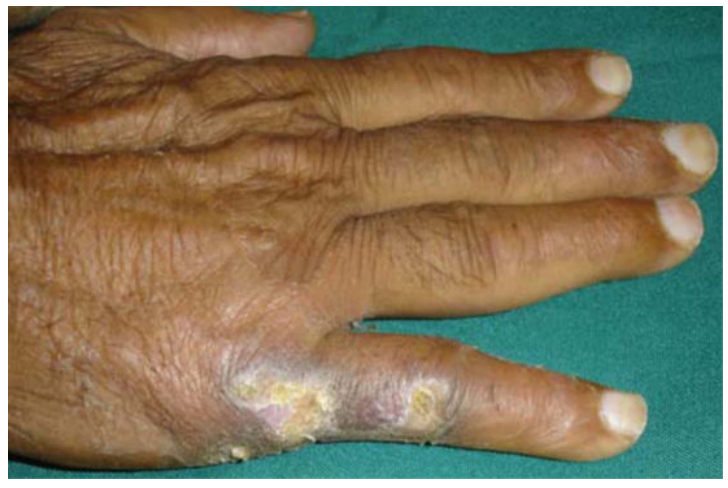


- **Ochsner’s clasping test with pointing index.**



- **Pen test.**

- **Book test with positive Froment’s sign (right side**



- **Positive Wartberg’s sign: earliest evidence of ulnar nerve palsy**

Examination of External Genitalia

- genitalia of both male and female patients should be inspected for presence of skin lesions

- in male patients, testicles should be palpated gently to see for:
- • **Size and consistency:**
- Whether the testicles are firm, resilient and of appropriate size or small and soft (sequel of advanced disease and / or repeated type 2 reaction).
- • **Testicular sensation:**
- If absent, indicates fibrosis resulting from repeated episodes of epididymo-orchitis (type2 reaction).
- • **Tenderness:**
- Acute testicular pain indicates epididymo-orchitis, a part of type2 reaction and this may be the presenting feature of type2 reaction.

OTHER SYSTEM EXAMINATION

- Upper respiratory tract is the most common site of involvement. Though several other organs are involved in lepromatous leprosy and also during type 2 reaction, clinical manifestations of such involvement are unusual

- A hoarse voice, dry, hacking cough and occasional breathlessness are indicative of laryngeal involvement and or uvular dysfunction

LEPROSY (QUICK FACTS)

Pole	Tuberculoid		Lepromatous
Skin	Localized lesion, hypopigmented, raised erythematous margins		Symmetric diffuse lesions, papules/macules/nodules, massive tissue destruction
Nerves	Epitheloid granulomas		Poorly organised granulomas, vacuolated MΦ, few T cells
M.Leprae	Rare		Abundant
Classification			
WHO	Paucibacillary		Multibacillary
RIDLEY-JOPLING	TT	BT	Borderline	BL	LL
Immunology			
Adaptive	Th1, cell mediated, IL-2, IFN-γ		TH2, Humoral mediated, IL-4, IL-10
Innate	?		?

Thank you!