



Skin

Table of Content

| <u>Chapter Name</u> | <u>Page No.</u> |
|--|-----------------|
| 1. Dermatology Basics - 1 | 3 |
| 2. Dermatology Basics - 2 | 10 |
| 3. Disorders of Hair | 23 |
| 4. Disorders of Nail | 33 |
| 5. Disorders of Adnexa & Appendages | 39 |
| 6. Papulosquamous Disorders - 1 | 49 |
| 7. Papulosquamous Disorders - 2 | 61 |
| 8. Blistering (Vesiculobullous) Diseases - 1 | 67 |
| 9. Blistering (Vesiculobullous) Diseases - 2 | 73 |
| 10. Hansen's Disease - 1 | 80 |
| 11. Hansen's Disease - 2 | 84 |
| 12. Viral Infections | 90 |
| 13. Bacterial Infections | 99 |
| 14. Mycobacterial Infections | 111 |
| 15. Parasitic & Protozoal Infections | 120 |
| 16. Fungal Infections | 129 |
| 17. Sexually Transmitted Diseases - 1 | 142 |
| 18. Sexually Transmitted Diseases - 2 | 149 |
| 19. Sexually Transmitted Diseases - 3 | 156 |
| 20. Eczema & Histamine Related Diseases | 160 |
| 21. Disorders of Pigmentation | 172 |
| 22. Connective Tissue Disorders & Drug Eruptions | 181 |
| 23. Genodermatoses | 194 |
| 24. Systemic & Nutritional Dermatology | 202 |
| 25. Malignancies & Skin | 211 |
| 26. Important Short Topics in Dermatology | 220 |

1 Chapter

BASICS OF DERMATOLOGY PART-1

- Skin is the largest organ of the body.
- Weight of skin: 4-5 kgs(16-18% Total Body Weight)
- Total area covered by skin is 1.6-1.8 square meters

Layers of Skin (from above downwards):

1. Epidermis: composed of stratified squamous epithelium
2. Dermis
3. Hypodermis / Subcutis / Panniculus

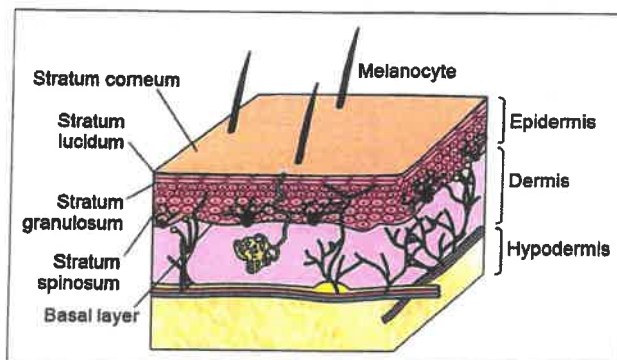


Fig. 1

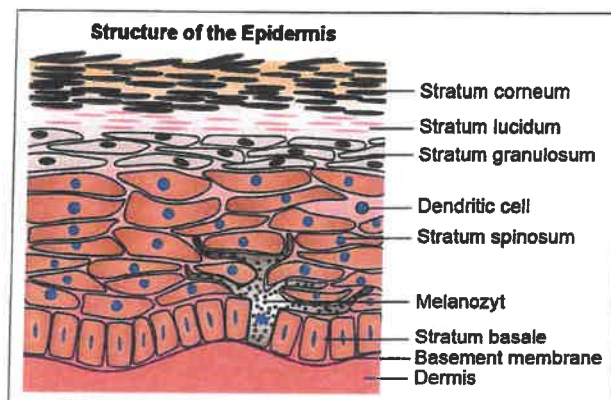


Fig.2

Layers of Epidermis (from above downwards): S-stratum

- S Corneum.
- S Lucidum.
- S Granulosum.
- S Spinosum.
- S Basale.

Stratum Basale aka Stratum Germinativum:

- Single cell layer
- Columnar cells with central nucleus

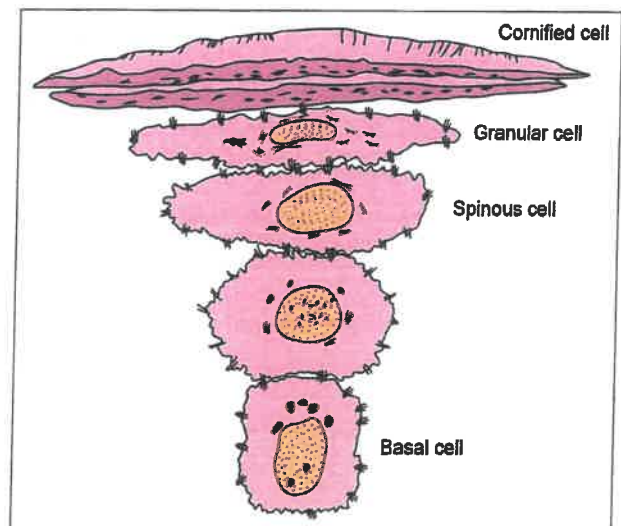


Fig. 3

Stratum Spinosum Aka Prickle Cell Layer:

- Polygonal keratinocytes connected by desmosomes
- Light microscopy: Spine-like appearance of desmosomes

Basics of Dermatology-Part-1

- **Desmosomes:** Intraepidermal intercellular connections between keratinocytes.
- **Antibodies against desmosomes:** pemphigus group of diseases

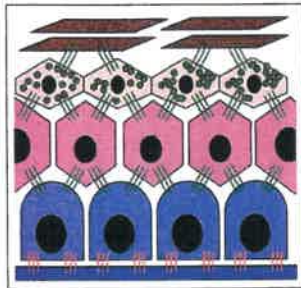


Fig. 4

Stratum Granulosum:

A. Keratohyaline Granules:

- Basophilic
- Profilaggrin protein → cleaved → Filaggrin (active form)
- Filament-aggregating protein

Applied Aspect:

- Atopic Dermatitis and ichthyosis vulgaris-filaggrin gene mutation.

B. Lamellar Granules/Oldland Bodies/ Membrane Coating Granules/ Cementosomes:

- Responsible for producing the lipid content of epidermis which contributes to the barrier function of skin
- Reduces Trans-epidermal water loss

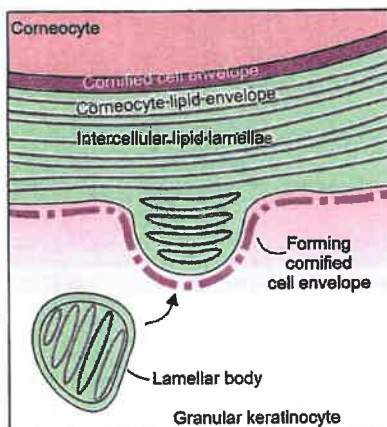


Fig. 5

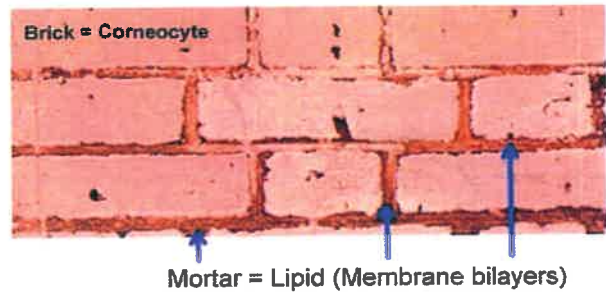


Fig. 6

Stratum lucidum:

- Lucidum refers to translucency
- Extra layer located over palms & soles
- **Eleidin granules** can be seen

Stratum Corneum:

- Outermost layer
- Anucleate (no nucleus: dead layer)
- Fully keratinised layer with flat cells.

Rete ridges Vs Dermal papilla:

- Rete ridge is projection of epidermis into dermis
- Dermal papilla is projection of dermis into epidermis

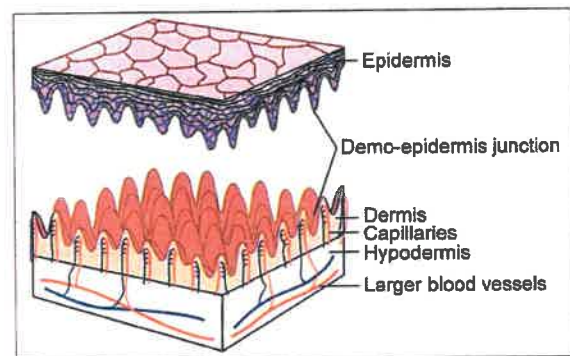


Fig. 7

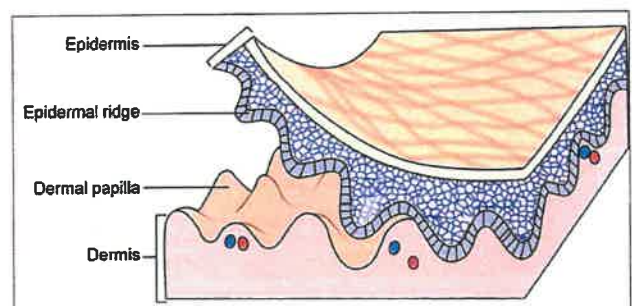


Fig. 8

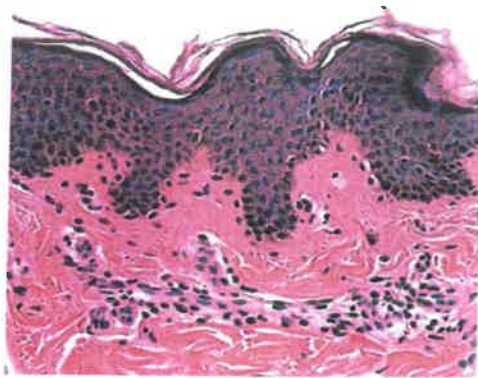


Fig. 9

Journey of A Keratinocyte from Stratum Basale to Stratum Corneum:

1. Cells flatten.
2. Keratin content increases.
3. Loss of Nucleus.
4. Dehydration.
5. Metabolism absent

Epidermal Transit Time/Doubling Time/Turnover Time:

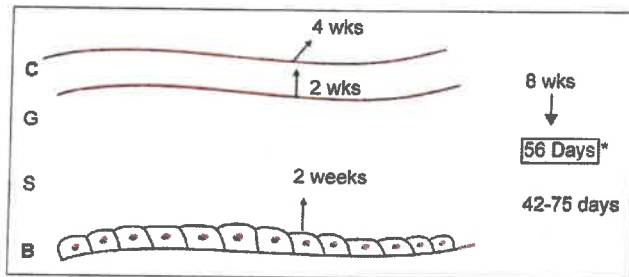


Fig. 10

Cells of Epidermis: Keratinocytes:

- Ectodermal in origin.
- Keratin intermediate filaments.

Non-Keratinocytes:

- Langerhans cells.
- Melanocytes.
- Merkel cells.

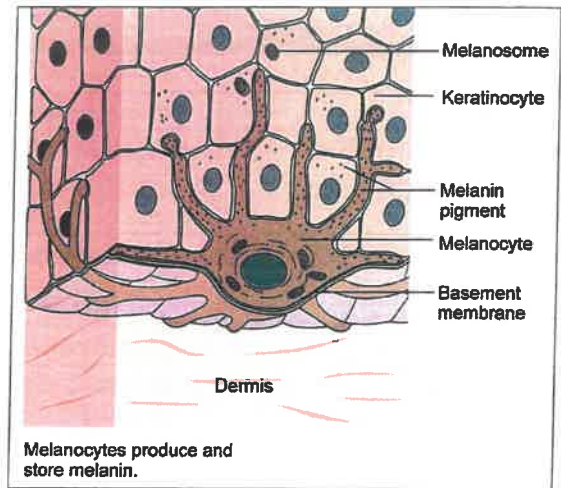


Fig. 11

Epidermal Melanin Unit-

Ratio of Melanocytes to Keratinocytes is 1:36

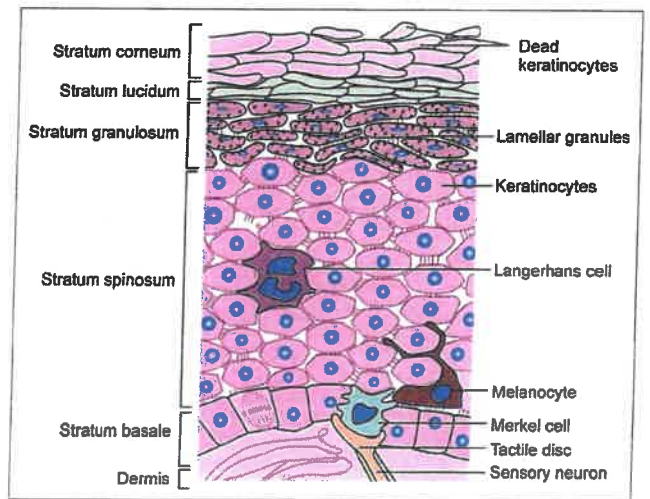


Fig. 12

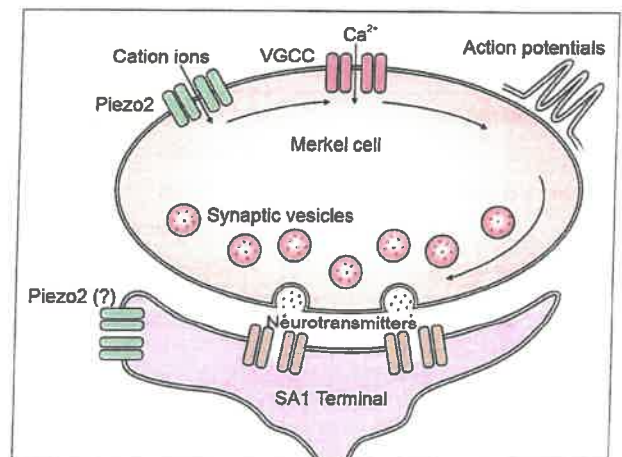


Fig. 13

| | Keratinocytes | Non-Keratinocytes | | |
|-----------------|---------------|---|--------------------------------|--|
| Nature of cells | Keratinocytes | Langerhans cells | Melanocytes | Merkel cells |
| Location | | S spinosum | S Basale | S Basale |
| Origin | Ectoderm | Bone marrow (macrophages) | Neural crest | Ectoderm |
| Components | KIF | Birbeck granules tennis racquet appearance on electron microscopy | Melanosomes | Neurosecretory granules |
| Function | | Antigen Presenting Cells | Melanin pigment producing cell | Mechanoreceptors (Touch): Slow adapting low threshold receptors (SALT) |
| Example | | Langerhans Cell Histiocytosis | Melanoma | Merkel Cell Carcinoma |
| Markers | | S100, CD1a, CD-207 (Langerin) Most specific marker | S100, HMB45 Melan-A | CytoKeratin -20 |

BMZ / DEJ:

Specialized junction connecting the epidermis to the underlying Dermis

"Glue" holding epidermis to dermis

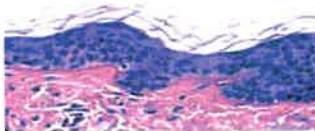


Fig. 14

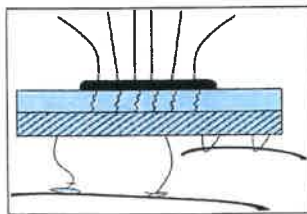


Fig. 15

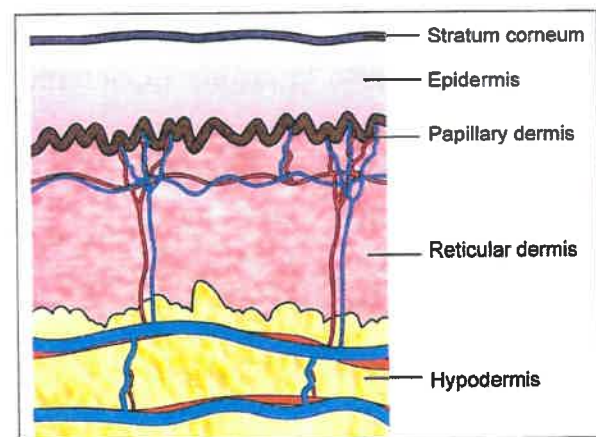


Fig. 16

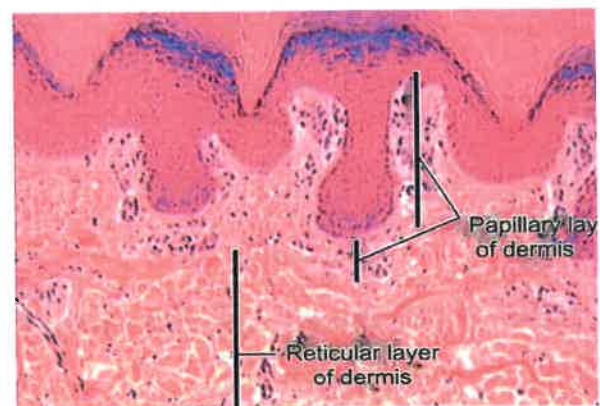


Fig. 17

Extra Edge

| Zones | Components |
|-------------------------------|-----------------------------------|
| Keratin intermediate filament | Keratin 5/14 |
| Hemidesmosome complex | BPAG 2 & 1 |
| Lamina lucida | BPAG 2 Laminin |
| Lamina densa | Laminin Collagen 4 |
| SubLamina densa | Collagen 7 (Anchoring fibrils) |

Dermis:

Superficial 1/10th Papillary dermis

Deep 9/10th Reticular dermis, made of Dense Irregular connective tissue

Contents of Dermis:

- Connective tissue
- Cells:
 - Fibroblasts: produce connective tissue
 - Macrophages
 - Lymphocytes
 - Ground substance Glycosaminoglycans (GAG)

- Blood vessels
- Nerve receptors

Appendages of Skin:

- Hair follicle
- Sweat glands
- Sebaceous glands
- Nail

Connective Tissue:

1. Collagen fibers:

- 70% dermis
- Responsible for tensile strength
- Most common type of collagen in skin: type 1 > type 3
- Collagen: 1:3:: 8:1

2. Elastic fibers:

- Elastin
- Elastin associated microfibrils (Fibrillin/Fibulin)
- Fibrillin gene involved in Marfan syndrome

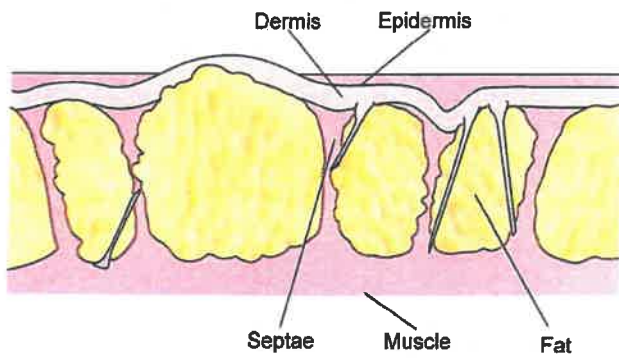


Fig. 18

Stratum Corneum

Hyperkeratosis: pathological thickening

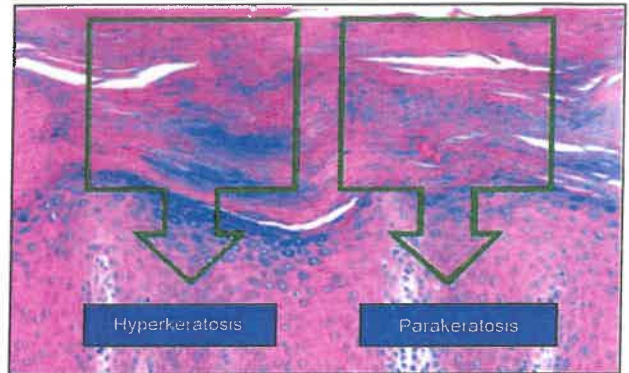


Fig. 19

Para keratosis: retention of nucleus

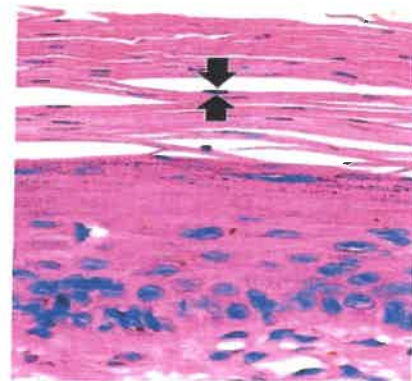


Fig. 20

Stratum Granulosum:

Absent / decreased granular layer: psoriasis vulgaris, ichthyosis vulgaris

Wedge-shaped Hypergranulosis: lichen planus

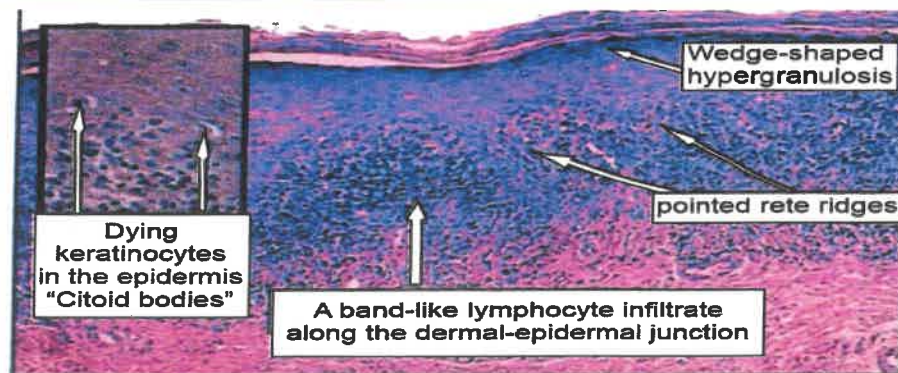


Fig. 21

Stratum Spinosum:

Balloon degeneration (intracellular oedema): Herpes Simplex Virus

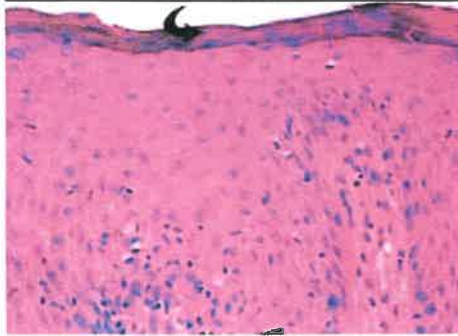


Fig. 22: Histopathology image of Normal skin

Spongiosis, intercellular oedema between cells: Acute eczema

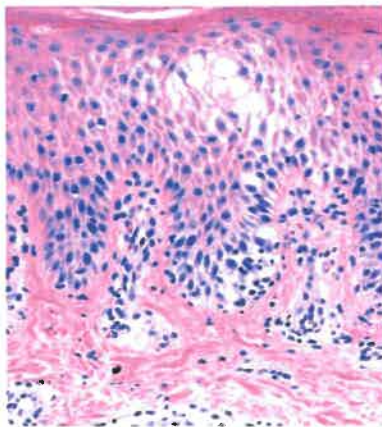


Fig. 23

- Histopathology image of Acute Eczema
- Patient showing Spongiosis
- Acanthosis: thickening of stratum spinosum
- Acantholysis: loss of attachment between keratinocytes

Acantholysis:

Causes:

1. Autoimmune: pemphigus group
2. Infection: bacterial-bullous impetigo, Staphylococcal scalded skin syndrome (SSSS) / viral-hsv infection.
3. Genetic: Hailey Hailey disease, Darier disease

Extra Edge

Dyskeratosis: Premature keratinization of individual keratinocytes

- Benign: Inherited acantholytic disorders
- Pre-malignant: Bowens SCC in situ, Actinic keratosis
- Malignant: Squamous Cell Carcinoma

| Micro abscess | Cells | Disease |
|------------------------------|------------------------------------|--------------------------|
| Munroe's microabscess | Neutrophils in stratum corneum | Psoriasis |
| Spongiform pustules of Kogoj | Neutrophils in stratum spinosum | Psoriasis |
| Papillary tip microabscess | Neutrophils in dermal papilla | Dermatitis herpetiformis |
| Pautrier microabscess | Malignant lymphocytes in epidermis | Mycosis fungoides (CTCL) |

Psoriasis:

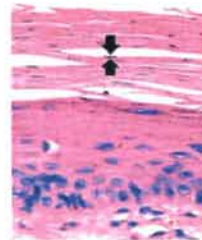


Fig. 24

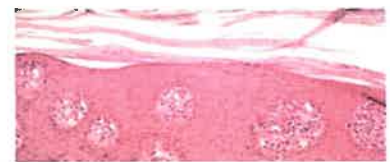


Fig. 25

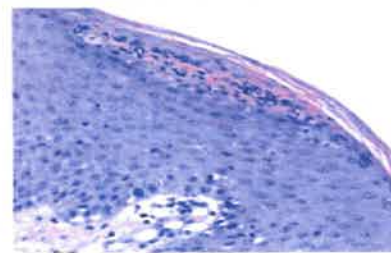


Fig. 26

Dermatitis Herpetiformis aka Duhring Disease:

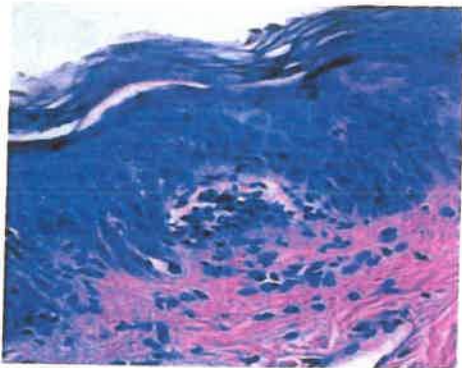


Fig. 27

- Subepidermal split with Papillary tip microabscess: neutrophils

Extra Edge

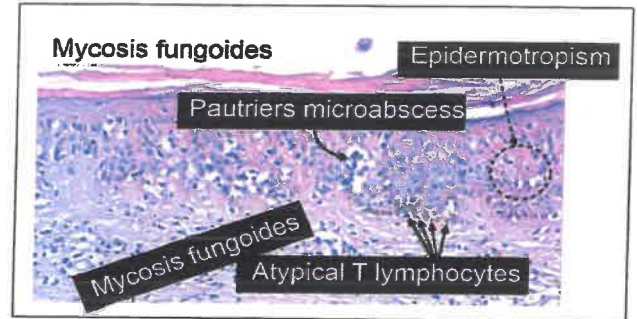


Fig. 28

Eosinophilic microabscesses: Pemphigus vegetans

2 Chapter

BASICS OF DERMATOLOGY PART-2

Clinical Diagnosis of a Disease:

1. Morphology of the lesion
2. Configuration of lesion
3. Distribution of lesion

1. Morphology of the Lesion:

- Primary lesions: Lesions which patient notices initially or initial skin lesions to develop
- Flat Lesions (Neither raised nor depressed)
- Both hypo / hyperpigmentation

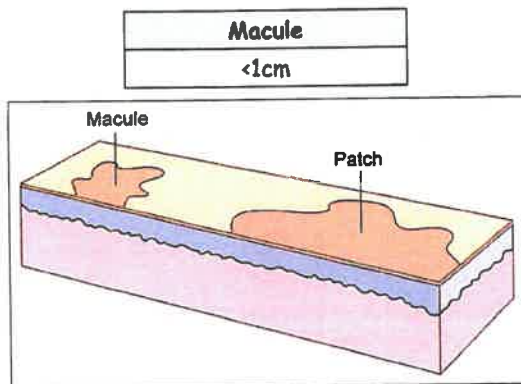


Fig. 1

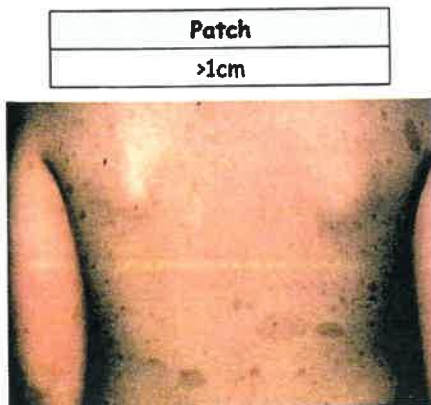
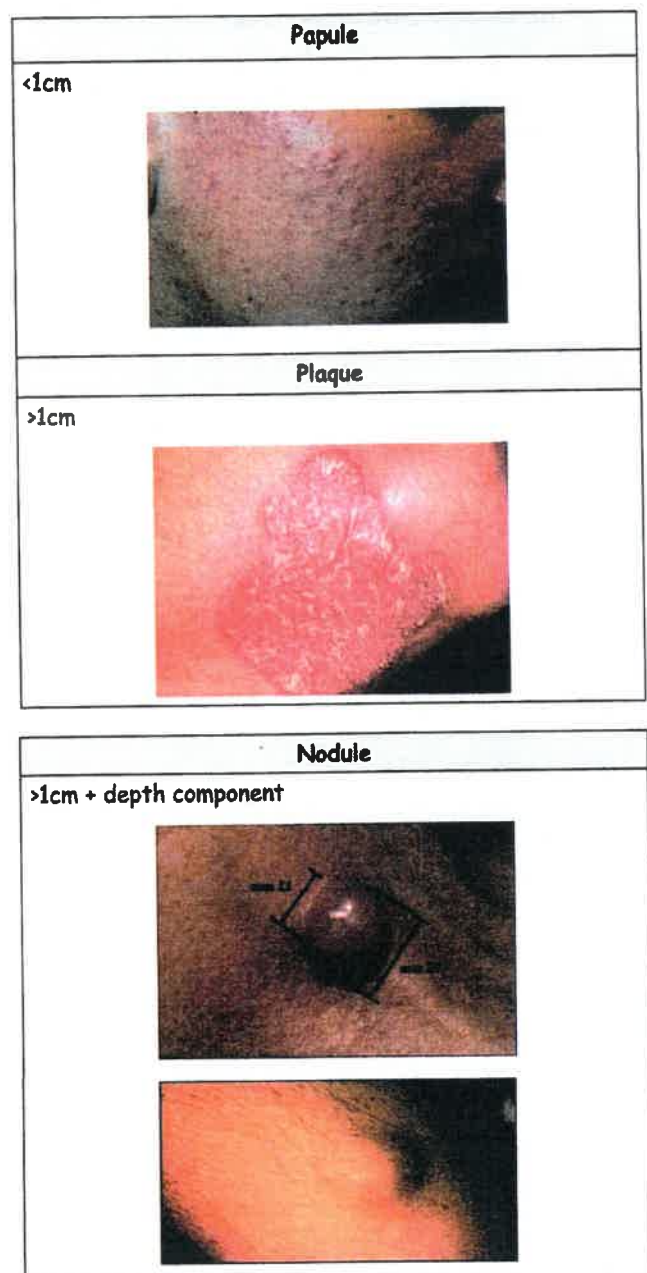


Fig. 2

2. Circumscribed Solid Raised Lesions:



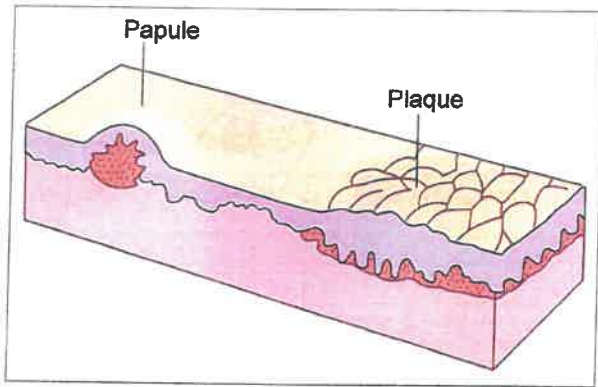


Fig. 3

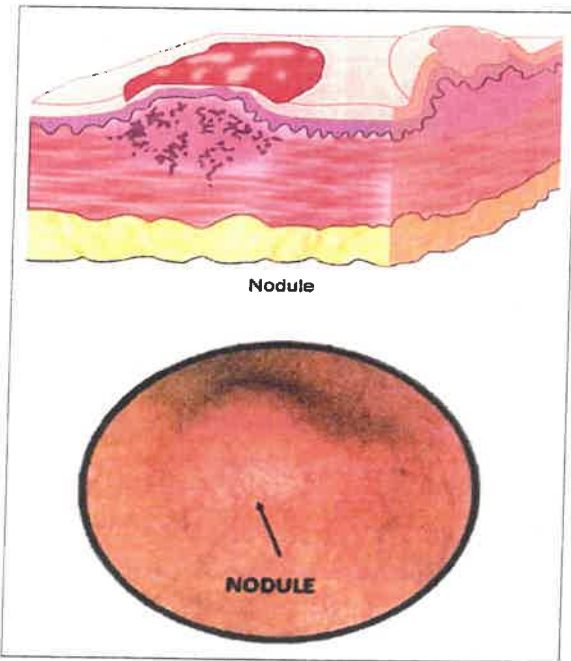
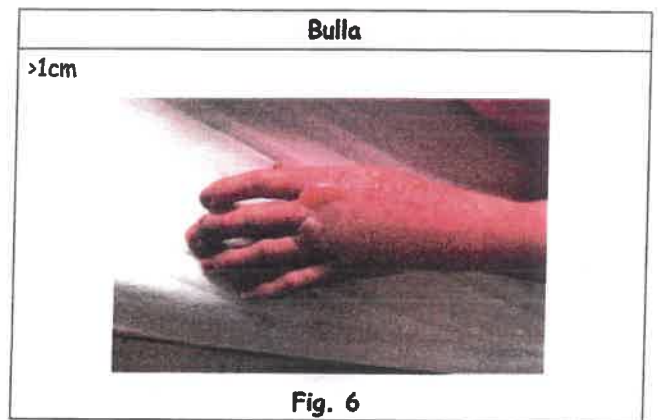
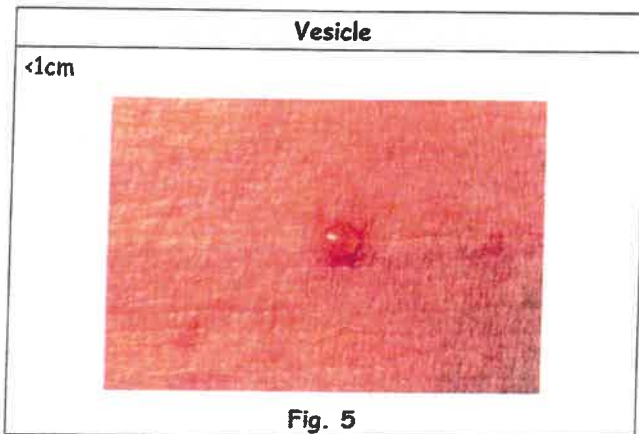
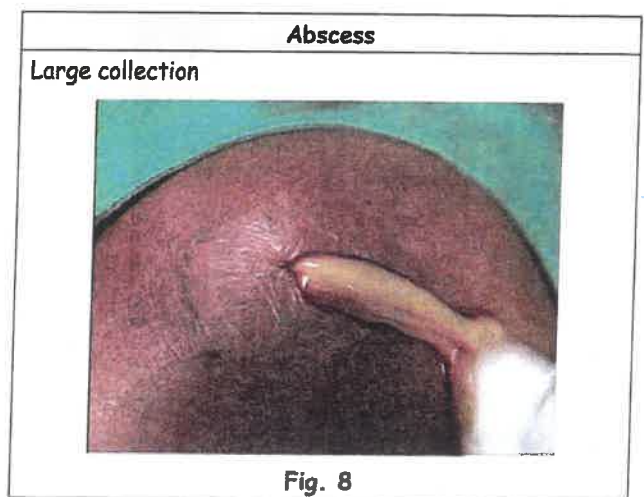
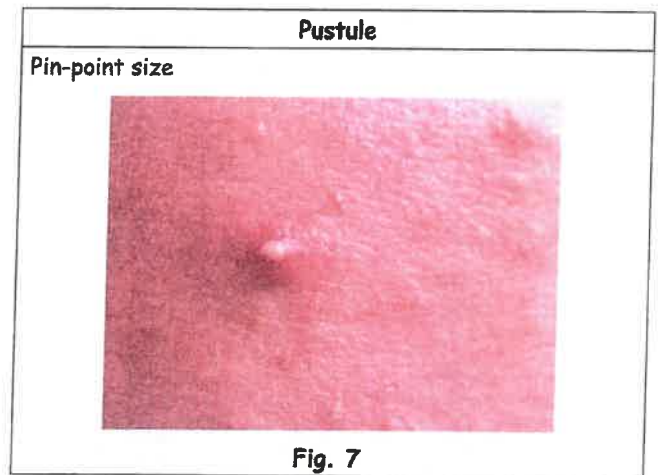


Fig. 4:

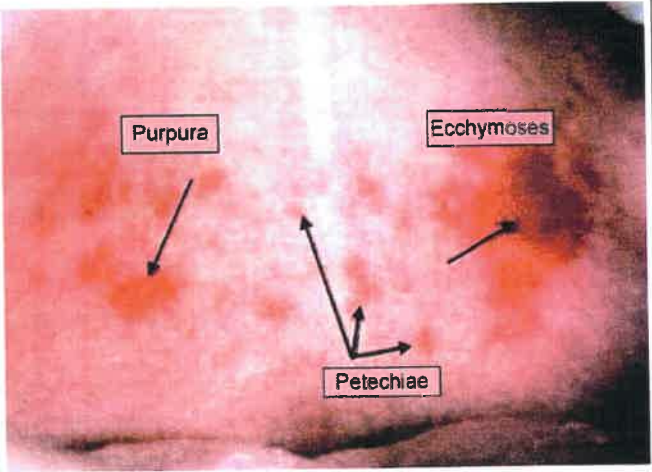
3. Clear Fluid-Filled Lesions: 4. Pus-filled lesions:



4. Pus-filled lesions:



5. Extravasation of RBC: Skin / Mucosa

| Petechiae | Purpura | Ecchymosis |
|--|---------|------------|
| 1-2 mm | >3mm | >1cm |
|  <p style="text-align: center;">Fig. 9</p> | | |

6. Wheal:



Fig. 10

- Pruritic transient plaque with central pallor and peripheral erythema.
- found in urticaria.

Secondary Skin Lesions:

Modified skin lesions due to itching or treatment received.

1. Scale: Visible Exfoliation of Stratum Corneum

| | |
|---------------------|---------------------------------------|
| Silvery / Mica-like | Psoriasis |
| Yellow greasy | Seborrheic Dermatitis |
| Branny powdery | Pityriasis versicolor |
| Collarette | Pityriasis Rosea |
| Fish-like | Ichthyosis Vulgaris |
| Leaf-like | Pemphigus Foliaceus |
| Mica | Pityriasis lichenoides chronica (PLC) |

Silvery / Mica-Like: Psoriasis



Fig. 11

Yellow greasy: Seborrheic Dermatitis

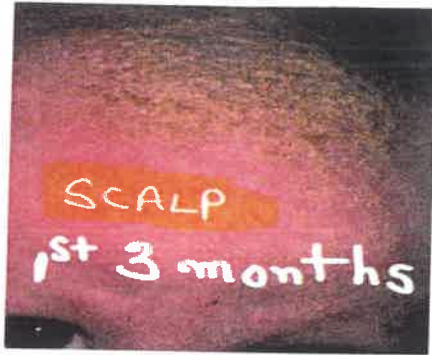


Fig. 12

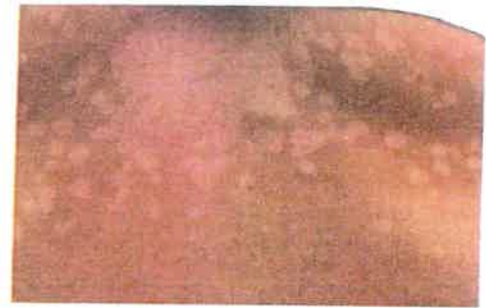


Fig. 16

Branny Powdery: Pityriasis Versicolor

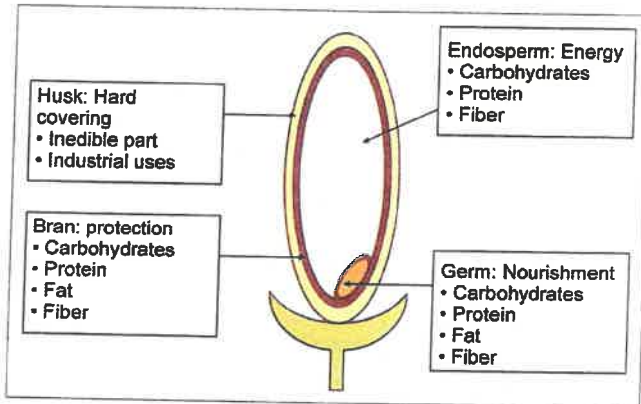


Fig. 13



Fig. 17

Collarette Of Scales: Classical Pityriasis Rosea



Fig. 14



Fig. 18

Fish-Like: Ichthyosis Vulgaris



Fig. 15

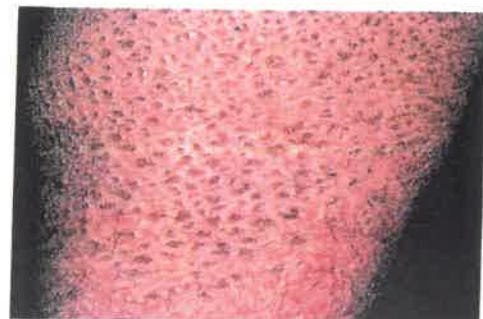


Fig. 19

Leaf-like: Pemphigus Foliaceus

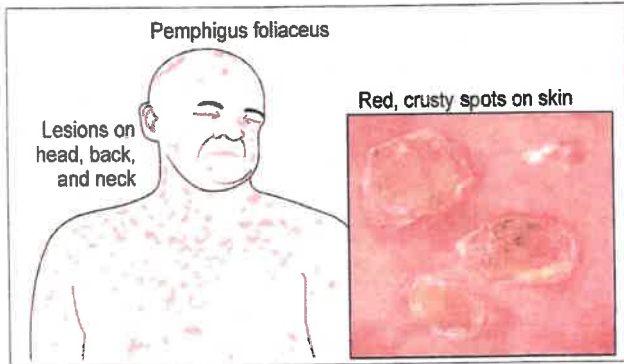


Fig. 20

Mica: Pityriasis Lichenoides Chronica



Fig. 21

1. Crust:



Fig. 22

Serum/pus/blood when dried on the skin surface form hard exudate

Ex: Non-bullous impetigo: honey-coloured crust

3. Erosion

Focal/total loss of epidermis

Pemphigus vulgaris

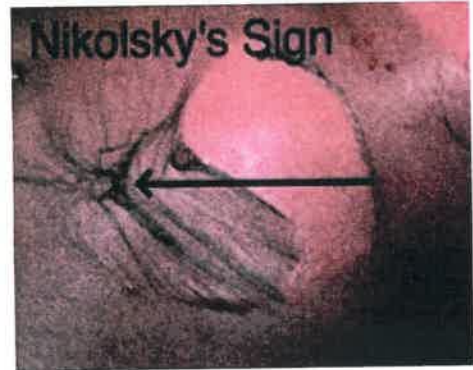


Fig. 23

4. Ulcer

Loss of epidermis + partial/total loss of dermis (scar present)



Fig. 24

5. Fissure:



Fig. 25

- Linear deep cleft in the skin (cracks)
- Dryness, eczema in winter

6.Excoriation: Scratch Marks



Fig. 26

- Linear or punctate abrasion of the skin due to scratching

7.Lichenification:



Fig. 27

Due to continuous chronic itching:

- Hyperpigmentation
- Thick skin
- Exaggerated skin markings

8.Atrophy:



Fig. 28



Fig. 29

- Decreased / loss of structural components of the skin
- Clinically: wrinkled appearance of skin
- Quacks/self-medication with Topical steroid

9.Special Lesions:

- Lesions which are specific to a particular disease

a.Burrows:

- Scabies produces a wavy greyish white tunnel in the skin (stratum corneum)

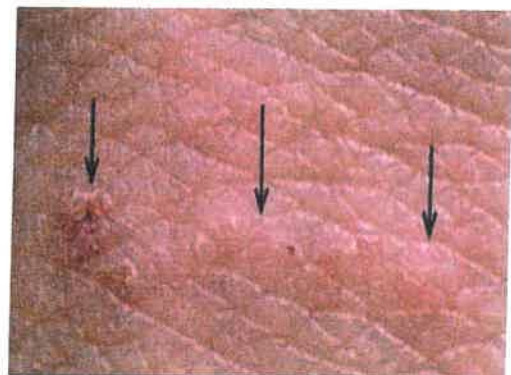


Fig. 30

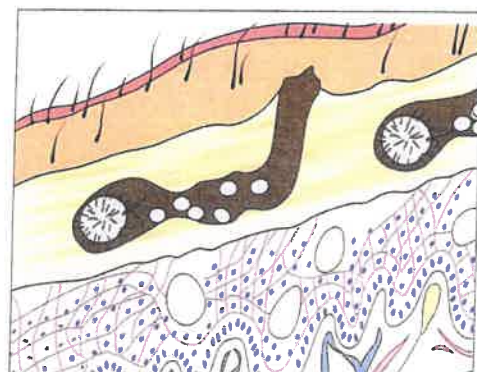


Fig. 31

b. Comedones:

- Follicular-oriented lesions plugged by sebum+keratin
- **Types** -Open (black) or closed (white) comedones
- **Ex:** pilosebaceous disorder, acne vulgaris

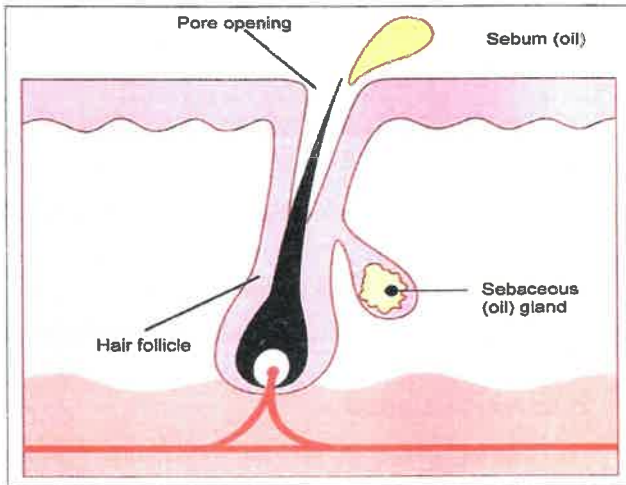


Fig. 32



Fig. 33



Fig. 34

Target / Bull's Eye / Iris Lesion With 3 Zones:

- **Distribution:** Distal extremities (like palms & soles)
- Erythema Multiforme (EMF)

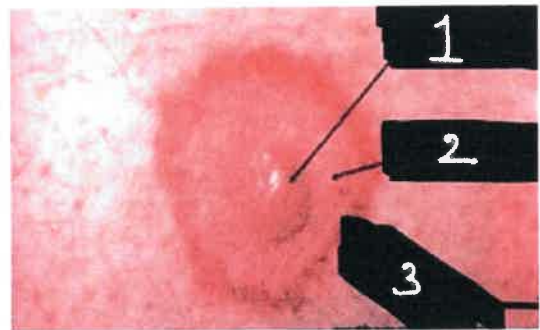


Fig. 35


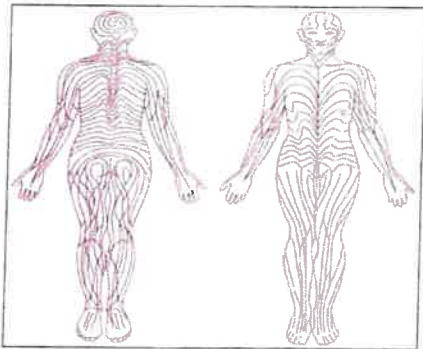


1. Central zone: vesicle/bulla having dusky red hue
2. Intermediate zone: pale edema
3. Peripheral zone: erythema

Configuration/ Pattern/ Arrangement of Skin Lesions:

| Configuration | Arrangement of lesion | Example |
|---------------|------------------------------|-----------------|
| Grouped | Vesicles arranged in cluster | Herpes labialis |



Fig. 36

| | | |
|----------------------------------|--|--|
| <p>Dermatomal pattern</p> | <p>Vesicles in an area supplied by a single nerve</p>  <p>Fig. 37</p> | <p>Herpes zoster</p> |
| <p>Blaschkoid</p> | <p>Whorled/ wavy Along the Blaschko lines</p>  <p>Fig. 38</p> | <p>Incontinentia pigmenti</p> |
| <p>Annular</p> | <p>Ring-shaped lesions Centre: inactive/clear Periphery: active</p>  <p>Fig. 39</p> | <p>Tinea corporis (Dermatophyte)</p> |
| <p>Discoïd / Nummular lesion</p> | <p>Disc-like lesion Centre + periphery active</p>  <p>Fig. 40</p> | <p>Discoïd / Nummular eczema</p> |

Pellagra:

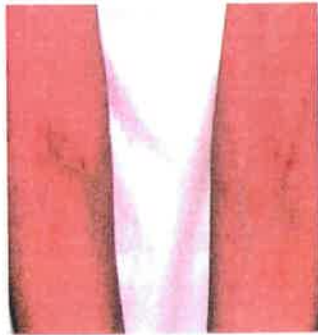


Fig. 41: Flexural: Atopic dermatitis



Fig. 42: Sun exposed Pellagra



Fig. 43: Extensors: Psoriasis

Lines in Dermatology: Langer Lines: RSTL

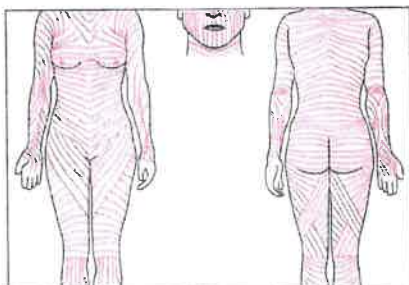


Fig. 44

- Collagen fiber orientation in the dermis corresponds to them
- Applied aspect for a surgeon - incisions are put along or parallel to these lines: healing better without scarring.

Blaschko Lines:

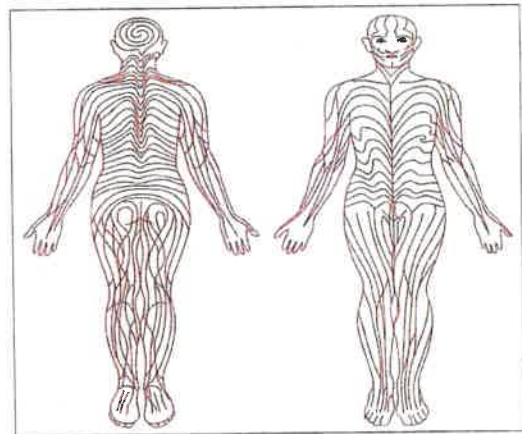


Fig. 45

- Pathways of epidermal cell migration during embryonic development
 - Do not correspond to arteries/veins/nerves/ Lymphatics
 - V-shaped on upper spine
 - S-shaped on abdomen
 - Spiral on scalp
 - Linear on lower extremities.
- Ex: Incontinentia pigmenti (XLD)

Dermatological Diagnosis: Nikolsky Sign:

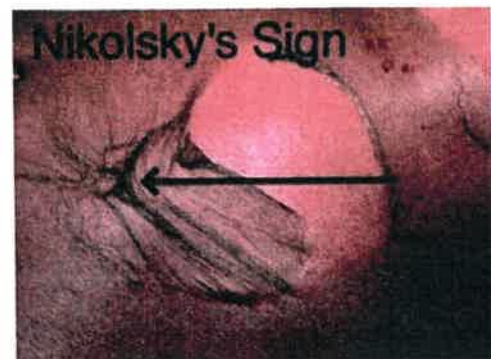


Fig. 46

- On application of tangential pressure over skin → upper layers of epidermis separate from the

lower layers → skin peels off → Erosion formed → Nikolsky's sign.

| | | |
|-----------|--|---|
| Types | True Nikolsky sign | Pseudo Nikolsky sign |
| Mechanism | Acantholysis | Necrosis of keratinocytes |
| Examples | Pemphigus foliaceus Pemphigus vulgaris Staphylococcal scalded skin syndrome (SSSS) | Stevens Johnson Syndrome (SJS) & Toxic Epidermal Necrolysis (TEN) |

Wood's Lamp Examination:



Fig. 49

- Wavelength: 360-365 nm
- Made of filter: 9% nickel oxide+ barium silicate

Diascopy: Vitro Pression Test



Fig. 47

- Glass slide → press the lesion
- Uses: Distinguish between erythema & purpura

| Erythema | Purpura |
|--|--|
| Redness disappears: blanching response | RBCs degenerate along with staining of blood vessel wall Redness persists: non-blanching response |

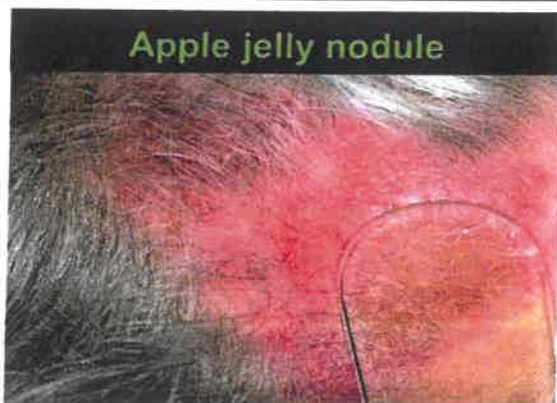


Fig. 48

- Erythema disappears, granulomas become prominent: apple jelly nodules

| Microsporum | Blue green (Fig. 50) |
|------------------------------|----------------------------------|
| Trichophyton Schonleinii | Dull blue |
| Pityriasis versicolor | Yellow |
| Corynebacterium Minutissimum | Coral red fluorescence (Fig. 51) |



Tinea capitis caused by microsporum: bright-green fluorescence

Fig. 50



Fig. 51



Fig. 52

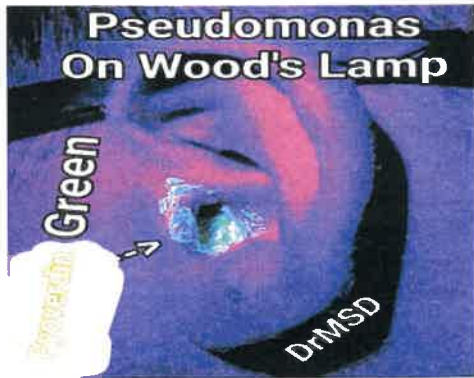
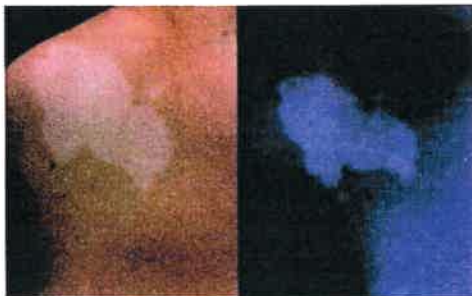


Fig. 53



Vitiligo: bright bluish-white fluorescence in Wood's light

Fig. 54

Melasma:



Fig. 55

Wood's lamp: Epidermal melasma gets enhanced on woods lamp



Fig. 56

An 'ash-leaf' macule easily detected with the Wood's lamp

Skin Biopsy: Punches:

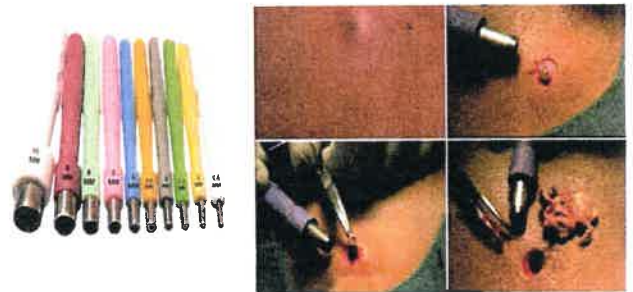


Fig. 57: Used to send samples for HPE

Potassium Hydroxide Mount:



Fig. 58

Scraping of skin / nail - 10% KOH mount - keratin dissolved.