DERMATOLOGY

1 BASICS OF DERMATOLOGY

Basics of Dermatology

Layers of Skin

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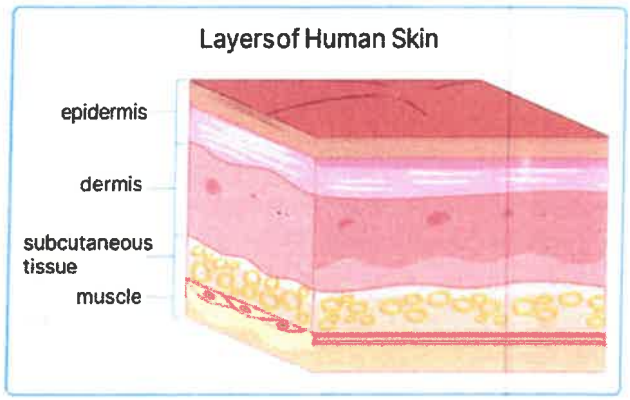
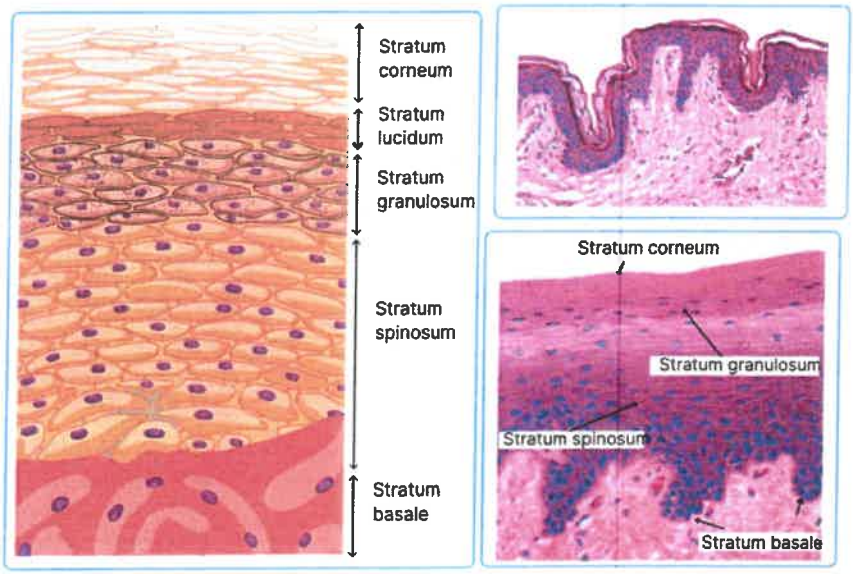


Epidermis

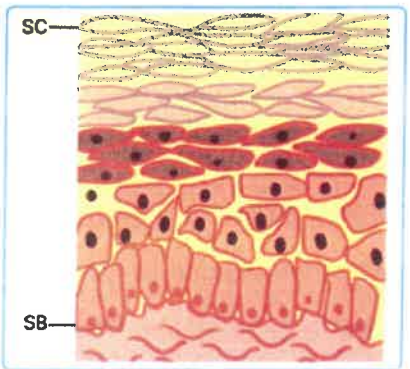
PYQ: AIIMS 2019 00:01:07

- Come Let's Get Sun Burnt: Stratum Corneum (come), Stratum Lucidum (let's), Stratum Granulosum (get), Stratum Spinosum (sun) and Stratum Basale (burn)

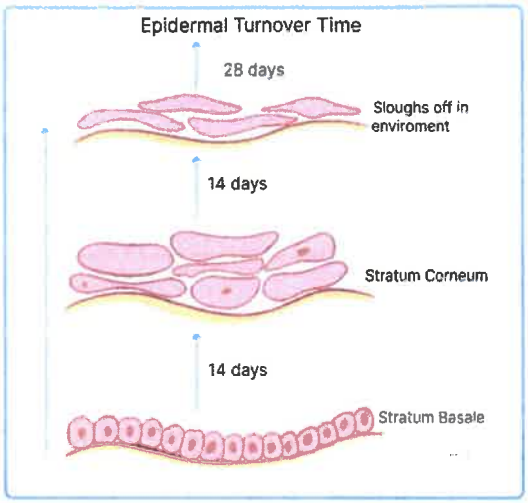


Cell Differentiation

- Happens from the basal layer to the corneal layer.
- As the cell Differentiate, it loses nuclei
- The cell becomes flattened
- This results in loss of mitosis and cells are dead
- The surface area increases
- Finally, cells become dehydrated.



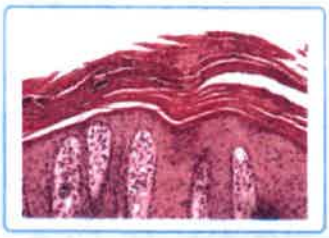
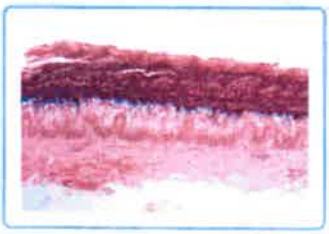
Q. If a child is born preterm, which layer of skin is absent from the body?
Ans. Since the child is born preterm, his/her cell cannot differentiate; hence the Stratum Corneum will be absent.



- **Epidermal Turnover time** is 52- 75 days (56 days)
- Psoriasis: In psoriasis, the epidermal turnover time reduces to 4 days or 36 hours.

Stratum Corneum

- Its major importance is that it acts as a barrier.
- It has dead keratinocytes.

Histopathology Findings	Reasons	Physiological findings	Pathological Findings (PEAS2)
Parakeratosis 	Retention of Nuclei in Stratum Corneum	Mouth and Vagina	Psoriasis, Eczema, Squamous Cell Carcinoma, Actinic Keratosis, Seborrheic Dermatitis, SCC
Hyperkeratosis 	Increased thickness of Stratum Corneum	NA	Lichen Planus, Psoriasis

Stratum Lucidum

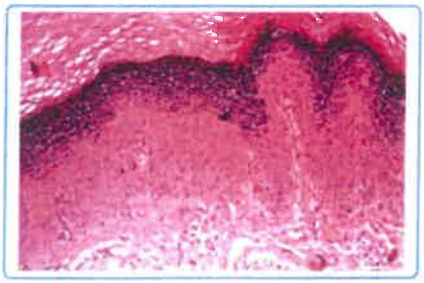
- Stratum lucidum is found in Palms and Soles only, skin is thick on these parts.
- The stratum lucidum layer is also called as clear cell layer
- The reason for being called a clear cell layer is due to the presence of Refractile Granules of Eleidin.

Stratum Granulosum

- According to the name, this layer is majorly made up of granules. The two most important granules of this layer are:

Types of Granules present in Stratum Granulosum	
Keratohyalin Granules	**Lipid Coating Granules**
• Responsible for forming Profilaggrin • Profilaggrin forms Filaggrin	• Responsible for providing moisture. • Odland bodies/ Lamellar Bodies

- Profilaggrin is a Filament Aggregating Protein
- Filaggrin form KIF in stratum corneum, defect in this will cause Icthyosis Vulgaris
- It has an important role in Barrier Functioning
- Defects in Odland bodies will cause Asteatotic Eczema
- The thickness of the granular layer is 1-2 cell layer
- **Hypergranulosis:** Increase thickness of the Granular Layer
  - Found in Lichen Planus (disease)
- **Agranulosis:** Absence of Granular layer
  - Ex: Psoriasis
- **Dyskeratosis:** Abnormal keratinization in the granular layer
  - Benign: Hailey Hailey, Darier's disease
  - Malignant: BCC, SCC, Paget's disease



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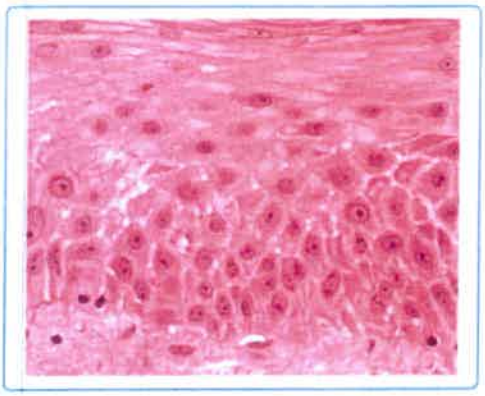
Stratum Spinosum

- This layer A.K.A Prickle cell layers- is boldly visible
- Keratinocytes present in this layer, are connected through Desmosomes.
- The thickest layer of the Epidermis
- Looks like spines assembled architecturally.

Pathological Findings

- Cells have interlinking fluid:
  - **Spongiosis:** Intercellular Edema - it occurs between the cells.
  - **Ballooning:** Intracellular Edema - occurs inside the cell.
  - Intercellular and intracellular are both seen in acute eczema.
  - **Acanthosis:** Occurs when Stratum Spinosum thickens - Chronic Eczema
  - Malpighian Layer:
    - → Mitotically active layer of Epidermis
    - → It is composed of Stratum Basale and Stratum Spinosum



Stratum Basale

- Single-cell layer thick
- Provides one extra layer of thickness
- The mitotically Active layer / germinative layer

Pathological Findings

- **Acantholysis**
  - Separation of keratinocytes
  - Pemphigus group, Herpes
- **Basal cell degeneration**
  - Inflammation infiltrate
  - Lichen planus, LE

Important Information

Microabscess: Collection of inflammatory cells in different cell layers

Types of Microabscess

- **Munro's:** Seen in Psoriasis at stratum corneum
- **Kogoj's Spongiform Pustules:** Seen in Psoriasis at Stratum Spinosum
- **Papillary (IgA + neutrophils):** Seen in Dermatitis Herpetiformis at Dermal papilla
- **Eosinophilic (Eosinophils):** Seen in Bullous Pemphigoid at Dermo-Epidermal junction
- **Pautrier's:** Seen in Mycosis Fungoides at stratum corneum.

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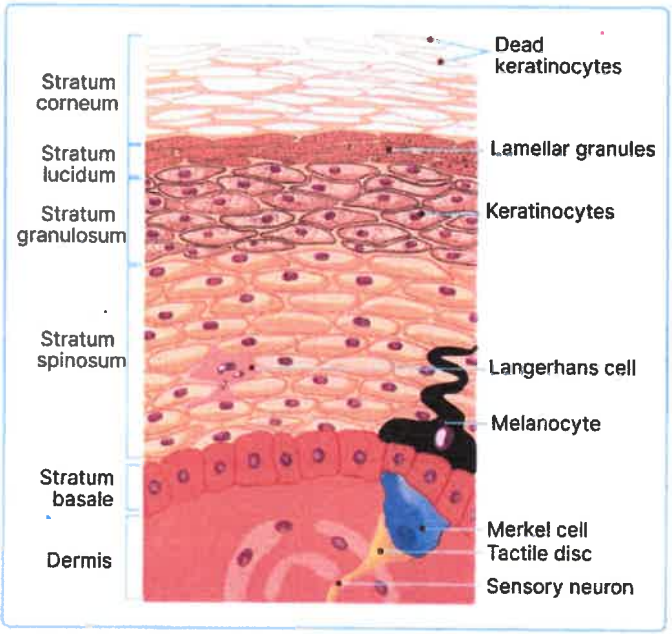


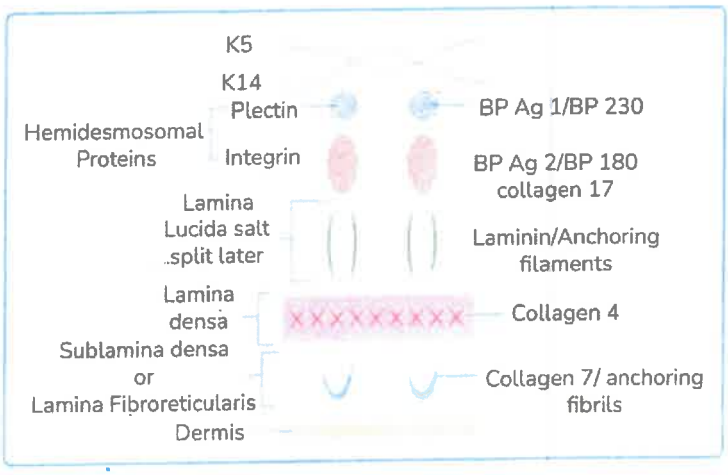
Layers of Epidermis are made up of four types of cells

	Keratinocyte	Langerhan's cell	Melanocyte	Markel cell
Layer of skin	All layers	Stratum spinousum	Stratum Basale	Stratum Basale
Derived from	Ectoderm	Mesenchyme	Neural crest	Ectoderm > Neural crest
Major Function	Epidermis structure formation by Keratin intermediate filament	Antigen presenting cells.	Pigment forming	Slow adaptive type 1 touch receptor
Special feature		Birbeck granules CD1A, CD207, S100		

- **Keratinocytes:** Present in 90% of Epidermis, present in all layers
  - Derived from ectoderm.
- **Langerhan Cells: Present in Stratum Spinosum**
  - It is an Antigen Presenting cells
  - Derived From mesenchyme
  - Shape: Birbeck Granules /Racquet Shaped
  - + Ve CDIA, CD207, Si00

- **Melanocytes – present in Stratum Basale**
  - Melanocytes are Pigment forming cell
  - Dendritic cell
  - One melanocyte will transfer melanosomes to 36 Keratinocytes known as Epidermal Melanin Unit
  - Melanocytes are responsible for forming uniform skin color.
- **Merkel Cells – present Stratum Basale**
  - Derived from Ectoderm > Neural Crest
  - Touch receptors
  - Slow adapting type I touch receptors

Dermo Epidermal Junction 00:27:28



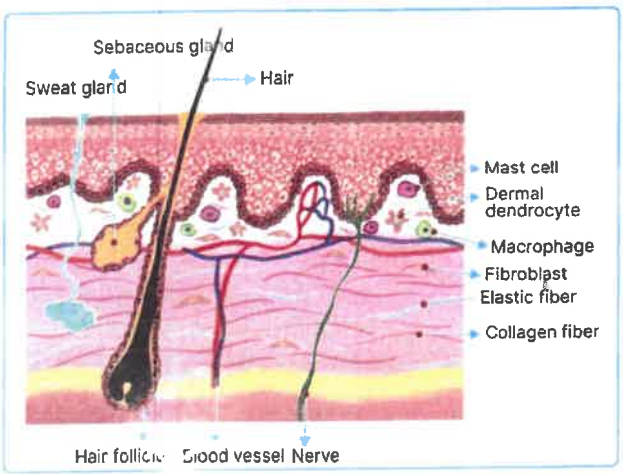
- Rete ridges are a part of the epidermis that invaginates into the dermis
- Dermal papillae is the part of the Dermis that invaginates into the epidermis.
- Dermo-epidermal junction: The junction between the Epidermis and Dermis, is a complex structure, It is known as the Basement Membrane Zone.
- The basement membrane consists of Type IV collagen.
- The main function of BMZ is to provide adhesion and signaling.

Dermis

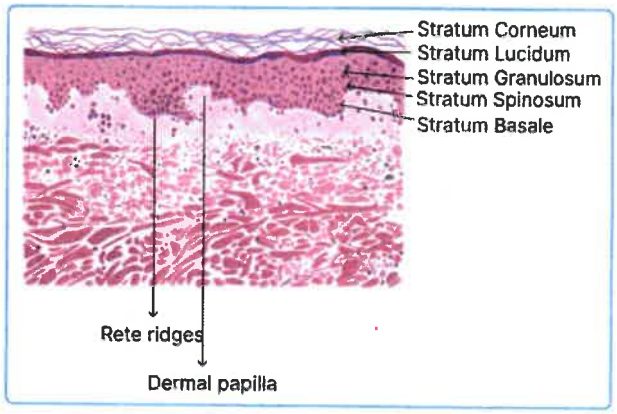
- The dermis is the layer next to the epidermis. It consists of various cells, Nerve Endings, fibers, Blood vessels, hair follicles and a lot of ground substances.

Dermis has two parts

- Papillary Dermis
- Reticular Dermis
- The Ground Substance present here is:
  - Hyaluronic Acid
- The most abundant Fiber present here is:
  - Collagen
- The most abundant cells present here are:
  - Fibroblasts
- Meisner's corpuscle:
  - A type of touch receptor present in dermis



Histopathological image



Types of Skin Lesion

PYQ: NEET PG 2018
PYQ: AIIMS 2020

- **Primary lesion**: They appear first in the disease.
- **Secondary lesions**: Secondary lesions are changes that develop over the primary lesions.
- **Special lesion**: This type of lesion is characteristic of a particular disease. (Specific to certain dermatological disorders)

Macule and Patch

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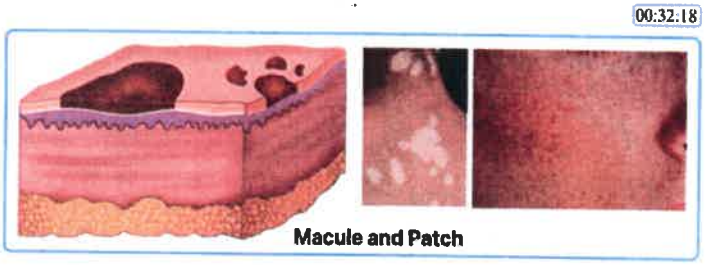
- Macules and patches are changes in skin color.
- These cannot be felt.
- Better seen than felt.
- These lesions are neither raised nor depressed
  - If lesion < 0.5 cm = Macule
  - If lesion > 0.5 cm = Patch



Papule

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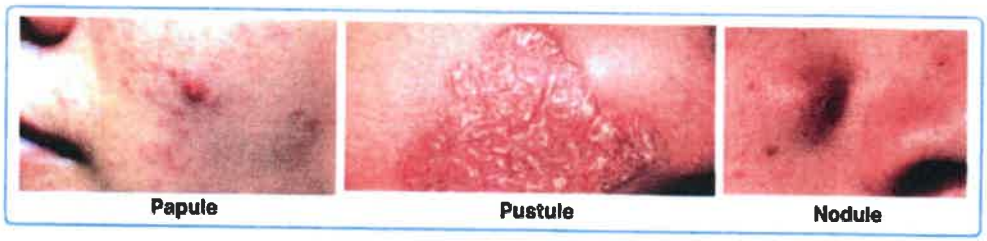

- A papule is a circumscribed solid elevated lesion.
- Three types:
  - If they are < 0.5 cm = papule
  - If they are > 0.5 cm = plaque (there is a change in texture)
  - If they are > 0.5 cm & more depth than height = Nodule (better felt than seen)

Vesicle and Bullae

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- Vesicles and bullae are Fluid-filled lesions: Vesicle: < 0.5 cm fluid-filled lesion and Bullae: > 0.5cm fluid-filled lesion

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Pustule and Abscess

- Pustule: It is a pus-filled lesion: it can be primary or secondary
  - Primary pustular lesion: It can be a primary lesion.
  - Secondary pustular lesion: Sometimes vesicles get infected.
- Abscess: It is a collection of pus

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Petechia, Purpura and Ecchymosis

- Due to any reason or clotting disorder, RBCs settle down on the skin.
- These are non-Blanche.
  - If these lesions are 1-2 mm = Petechiae.
  - If > 3 mm = Purpura
  - If it is 1-2 cm = Ecchymosis

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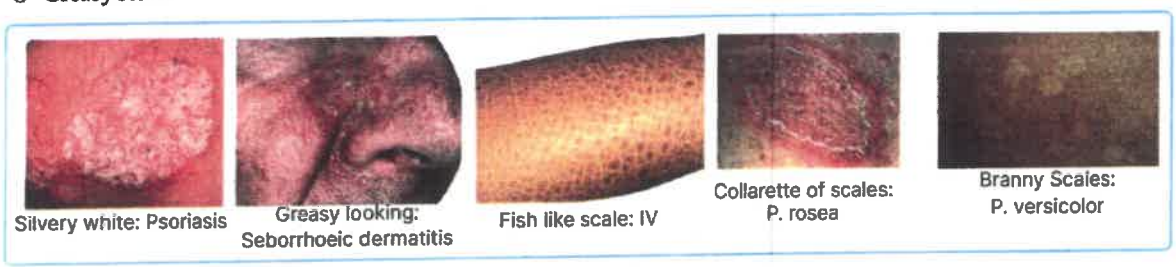
Secondary Skin Lesions

Scale

- These are visible exfoliation of the stratum corneum.
- Examples:
  - Silvery white scale
  - Fish-like scale
  - Greasy scales



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PYQ: FMGE 2021

Crust

- Crusts are Dried-up exudates.
- Exudate can be pus, serum & blood.
- A honey-colored crust is seen in non-bullous impetigo.

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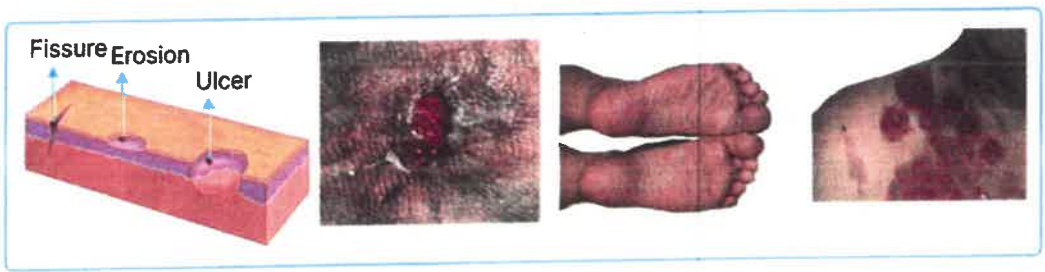
Erosion, Ulcers and Fissures



- Erosions: Breach in Epidermis and superficial dermis.
- An ulcer: Breach in Epidermis along with deep dermis.
- They can even go up to subcutaneous tissue.
- Ulcers have a base and margin.
- A fissure is a linear crack in the skin.

Lichenification

- They happen due to chronic itching.
- Acanthosis will be seen here.
- They involve certain features, such as:
  - Hyperpigmentation
  - Increase in skin markings
  - Thickening of skin

Special Lesions

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Burrow

- They are mostly seen in Scabies.

Comedones

- They can be seen as Acne.

Target lesion

- They are seen in Erythema multiforme.

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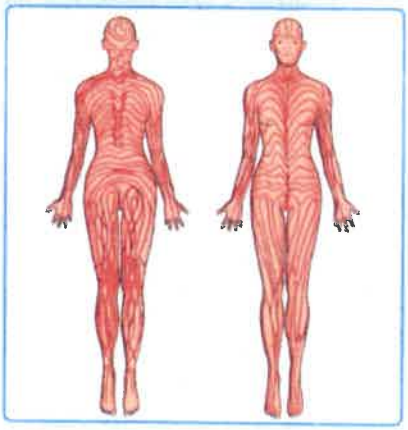
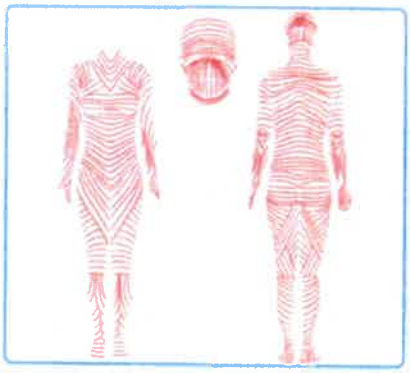
Blaschko's Lines PYQ: NEET PG 2022

- They are the lines of embryonic development.
- They are the lines along which keratinocytes migrate.
- These lines are constant.
- They have a strict midline demarcation.



Langer's Lines PYQ: INICET 2023

- They are the lines of the orientation of collagen and muscle fibers in our body.
- Not constant
- No midline demarcation
- Help in giving surgical incision
- They are relaxed skin tension lines

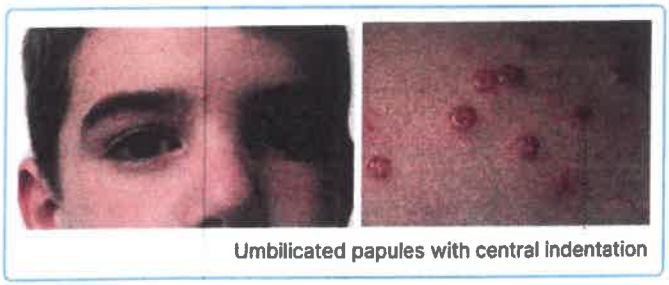


2 VIRAL INFECTIONS OF SKIN

PYQ: AIIMS 2018 PYQ: FMGE 2019 00:00:26

Molluscum Contagiosum

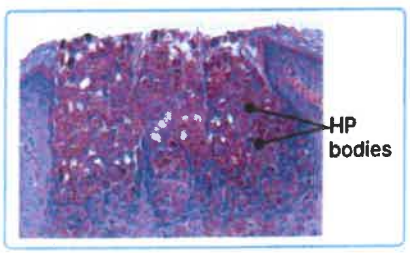
- Molluscum contagiosum is caused by **MCV**: Molluscipox virus
- Family: **Poxvirus**
  - Largest known DNA viruses
- **Types**
  - **MCV 1**: Seen in children
  - **MCV 2**: Seen in adults
- **Characteristic features:**
  - Asymptomatic umbilicated papule
  - Can be present anywhere on the body, most commonly present on the face.
  - Pseudo-Koebner's phenomena is positive: When a molluscum micro-organism gets seeded along the line of trauma due to scratching, it leads to the development of molluscum lesion along the line of trauma, this is known as pseudo-Koebner's phenomena
  - Family history may also be present.



Umbilicated papules with central indentation

Histopathology: Molluscum Contagiosum

- Intracytoplasmic eosinophilic inclusion bodies are present known as - Henderson Patterson Bodies
- **Treatment**
  - Self-resolution
  - Chemical /physical method
  - Systemic: Levamisole, cemetidine



Chemical method	Physical method
• Trichloroacetic acid: TCA • KOH	• Needle extirpation • Electrocautery • Radiofrequency • Cryotherapy

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Other Poxvirus Infections

Ecthyma contagiosum

- Zoonotic infections - Transferred by animals.
- Parapoxvirus / ORF virus
- Sheep

Ecthyma Contagiosum