SKIN PATHOLOGY

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Dermatologic history:
- details of onset
- evolution of symptoms
- previous diagnosis and treatment
- PMH of skin disease
- PMH of allergies
- PMH of chronic disease
- environmental/occupational history
- family history of skin disease (distinguish between inherited and acquired disease in the family)
- medications
- other medical problems
- sexual history

Manifestation of skin disorders
- Skin lesion
- Location of lesions
- Configurations
- Distribution of lesions

Topics
Normal Skin Structure
Pathological Skin Lesion
- Macroscopic
- Microscopic
Common Skin Disease
- Infection
- inflammation
- Neoplasm of the skin
- Pigmentary Disorders
- Disorders of Epidermal Maturation
- Disorders of Epidermal Appendages
Common oral lesions
Structure of Skin

1. Epidermis
   - stratified squamous epithelium
   - epidermal ridges

2. Dermis
   a. Papillary layer
      - small blood vessels, lymph & nerves
      - fine collagen & elastic fibers
   b. Reticular layer
      - vascular plexus, lymph, nerves & appendages
      - compact collagen fibers & thick elastic fibers

3. Hypodermis: Subcutaneous
4 distinct cell types:
1. Keratinocyte
2. Melanocyte
3. Langerhans cell
4. Merkel cell

Pathological Finding

Macroscopic finding
- Primary lesion
- Secondary lesion

Microscopic finding
- Epidermis
- Dermis
Configurations

- Nummular means round or coin-like.
- Annular means ring-like.
- Circinate means circular.
- Arcuate means curved.
- Discoid means disc-like.
- Gyrate means wave-like.
- Retiform and reticulate mean net-like.

Classification of skin lesions

- Primary lesions
- Secondary lesions
### Macroscopic Lesion

<table>
<thead>
<tr>
<th>Primary lesion</th>
<th>Secondary lesion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macule</td>
<td>Crust</td>
</tr>
<tr>
<td>Patch</td>
<td>Scale</td>
</tr>
<tr>
<td>Plaque</td>
<td>Erosion</td>
</tr>
<tr>
<td>Papule</td>
<td>Ulcer</td>
</tr>
<tr>
<td>Nodule</td>
<td>Scar</td>
</tr>
<tr>
<td>Vesicle</td>
<td>Atrophy</td>
</tr>
<tr>
<td>Bullae</td>
<td></td>
</tr>
<tr>
<td>Pustule</td>
<td></td>
</tr>
<tr>
<td>Wheal</td>
<td></td>
</tr>
<tr>
<td>Cyst</td>
<td></td>
</tr>
</tbody>
</table>

### Morphologic Lesions

<table>
<thead>
<tr>
<th>Raised</th>
<th>Depressed</th>
<th>Flat</th>
<th>Surface change</th>
<th>Fluid Filled</th>
<th>Vascular</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papule</td>
<td>Erosion</td>
<td>Macule</td>
<td>Scale</td>
<td>Vesicle</td>
<td>Purpura</td>
</tr>
<tr>
<td>Plaque</td>
<td>Ulcer</td>
<td>Patch</td>
<td>Crust</td>
<td>Bulla</td>
<td>Telangiectasia</td>
</tr>
<tr>
<td>Nodule</td>
<td>Atrophy</td>
<td>Erythema</td>
<td>Excoration</td>
<td>Pustule</td>
<td>Infarct</td>
</tr>
<tr>
<td>Cyst</td>
<td>Porphiderma</td>
<td>Erythroderma</td>
<td>Fissure</td>
<td>Furuncle</td>
<td></td>
</tr>
<tr>
<td>Wheal</td>
<td>Sinus</td>
<td></td>
<td></td>
<td></td>
<td>Lichenification</td>
</tr>
<tr>
<td>Scar</td>
<td>Striae</td>
<td></td>
<td></td>
<td></td>
<td>Keratoderma</td>
</tr>
<tr>
<td>Comedo</td>
<td>Burrow</td>
<td></td>
<td></td>
<td></td>
<td>Eschar</td>
</tr>
<tr>
<td>Horn</td>
<td>Sclerosis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcinosis</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### Macule

- Circumscribed color change
- No elevation or depress
- Macule: diameter < 0.5 cm
- Patch: > 0.5 cm

The colors of **macules**:
- **A** Brown: melanin pigmentation in the epidermis
- **B** Blue: melanin or particulates tattoo in the dermis as in Mongolian Spots
- **C** Red: vasodilatation in the dermis = erythema extravasated red blood cell = purpura
- **D** Red: inflammatory cells infiltration
Macule

- A macule is a circumscribed color change, flat lesion.
- Macules may have any size or shape.
- Some macular lesions are associated with fine scaling "Maculosquamous"

Patch

- "A small well-defined area of the skin distinct in color or appearance."
- Such as:
  - large macule,
  - thin and scaling plaque.

Papule

- A small, solid, elevated lesion
- Flat, pointed or round
- <0.5 cm in diameter
- Coalesce into Plaque

- The accumulated material may be a metabolic deposit, amyloid or mucin.
- A cellular infiltrate of inflammatory or neoplastic cells
- A proliferation of cells in the epidermis
- Papule tightly packed, the lesion is verrucous or warty
Papule

- Multiple, well-defined papules of varying sizes are seen
- Flat tops and glistening surface are characteristic of Lichen planus

Plaque

- Circumscribed
- Solid elevation
- Usually flat-topped
- It may be a confluence of papules over a surface

Plaque

- Well-demarcated pink plaques with a silvery scale representing psoriasis vulgaris

Nodule

- Palpable, variably shaped lesion
- Epidermal, Dermal, SC.
- Usually elevated, any size
- Tumor is term for any mass
**Nodule**

- A nodular basal cell carcinoma
- Well-defined, firm nodule with a smooth and glistening surface through which telangiectasia can be seen

**Wheals**

- Firm edematous plaque.
- Infiltrating fluid may cause blanching.
- Usually transient.

**Vesicles and Bullae**

- Circumscribed fluid-filled lesion
- Vesicle < 0.5 cm or less.
- Bulla >0.5 cm.

- A vesicle is a circumscribed, elevated lesion that contains fluid that they are translucent and the serum, lymph, blood, or extracellular fluid.
- A vesicle with a diameter greater than 0.5 cm is a bulla.
Erosion

- Focal loss of epidermis.
- Loss does not penetrate into dermis.
- Heal without scarring.

Ulcer

- Focal loss of epidermis and dermis.
- Loss does penetrate into at least upper dermis.
- Heals with scarring.

Scar

- An abnormal formation of connective tissue implying dermal damage; after injury or surgery.
- Scars are initially thick and pink but with time become white and atrophic.

Pustule

- A vesicle / bulla with pus exudate.
- May/may not be sterile.
- Vary in size & shape.
Pustules may present different levels:

- Epidermis: pustule
- Dermis: abscess
- Follicle: Folliculitis
- Deep follicle: Furuncle
- Several Furuncle: Carbuncle

Folliculitis

An inflamed follicular papule

Furuncle

An inflamed deep follicular-based nodule with a central necrotic plug crusting over the surface
Abscess

A tender red erythematous fluctuant abscess on the leg dermis

Cysts

- A circumscribed lesion
- With a wall and a lumen
- The lumen may contain fluid or solid matter

Atrophy

- Depression of the skin
- Results from thinning of the epidermis +/- dermis
- Potent topical steroid can cause

Scale

Abnormal shedding or accumulation of stratum corneum
Erythema craquele (crack dense scale)

Pityriasis rosea (collarette)

Psoriasis (silvery)

Tinea versicolor (fine)
### Ichthyosis

<table>
<thead>
<tr>
<th>Type of Scale</th>
<th>Description</th>
<th>Prototype Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crack like/craquelé</td>
<td>Desquamation giving the appearance of dried, cracked skin</td>
<td>Eczema craquelé</td>
</tr>
<tr>
<td>Exfoliative</td>
<td>Scales split of from the epidermis in finer scales or in sheets</td>
<td></td>
</tr>
<tr>
<td>Follicular</td>
<td>Scales appear as keratotic plugs, spines, or filaments</td>
<td>Keratosis pilaris</td>
</tr>
<tr>
<td>Gritty</td>
<td>Densely adherent scale with a sandpaper texture</td>
<td>Actinic keratosis</td>
</tr>
<tr>
<td>Ichthyosiform</td>
<td>Scales are regular polygonal plates arranged in parallel rows or diamond patterns (fish-like, tessellated)</td>
<td>Ichthyosis vulgaris</td>
</tr>
<tr>
<td>Keratotic</td>
<td>Scales appear as heaped up column of scale</td>
<td>Cutaneous horn</td>
</tr>
<tr>
<td>Lamellar</td>
<td>Scales are thin large plates or shields attached in the middle and loosen around the edges</td>
<td>Lamellar ichthyosis</td>
</tr>
<tr>
<td>Phytoliform</td>
<td>Scale is small and branny</td>
<td>Phytoliform</td>
</tr>
<tr>
<td>Psoriasiform micaceous and ostraceous</td>
<td>Scale is silvery and brittle and forms thin plaques in several loose sheets, like mica micaceous scale. Large scales may accumulate in heaps, giving the appearance of an oyster shell ostraceous scale</td>
<td>Psoriasis vulgaris</td>
</tr>
<tr>
<td>Seborrheic</td>
<td>Scales are thick, waxy or greasy, yellow-to-brown, flakes</td>
<td>Seborrheic dermatitis</td>
</tr>
<tr>
<td>Wickham striae</td>
<td>Scale appears as a lacy white pattern overlying violaceous flat topped papules</td>
<td>Lichen planus</td>
</tr>
</tbody>
</table>

### Crust

- A collection of dried serum and cellular debris
- a scab

### Impetigo

- Crusts
  - yellow – dried serum
  - green – purulent exudate
  - brown or dark red – blood.

- Acute eczematous dermatitis and impetigo
  - honey-colored, glistening crusts
Excoriations

- Superficial excavations of epidermis result from scratching
- Linear loss of epidermis and punctate excoriations

Fissure

A linear loss of epidermis and dermis with sharply defined, nearly vertical walls

Fissures

- Linear cleavages or cracks in the skin
  - in palmar/plantar psoriasis
  - in chronic eczematous dermatitis of the hands and feet

Poikiloderma

- Refers to the combination of
  - Atrophy
  - Telangiectasia
  - Pigmentary changes (hyper- and hypo-).

- Poikilodermatous lesions can be seen in
  - Radiodermatitis
  - Dermatomyositis
  - mycosis fungoides
  - lupus erythematosus
Microscopic Lesion

**Microscopic finding**

<table>
<thead>
<tr>
<th>Response</th>
<th>Terminology</th>
<th>Clinical Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidermal atrophy</td>
<td>Atrophy</td>
<td>Thinning of skin</td>
</tr>
<tr>
<td>Degeneration of basal layer</td>
<td>. . .</td>
<td>Subepidermal vesicle</td>
</tr>
<tr>
<td>Separation of epidermal cells</td>
<td>Acantholysis</td>
<td>Intraepidermal vesicle</td>
</tr>
<tr>
<td>Hyperplasia of keratinocytes</td>
<td>Acanthosis</td>
<td>Diffuse thickening or localized elevated plaque (papule)</td>
</tr>
<tr>
<td>Increased rate of maturation of keratinocytes</td>
<td>Hyperkeratosis</td>
<td>Silvery surface scales</td>
</tr>
<tr>
<td>Increased rate of maturation of keratinocytes with premature shedding of nucleated cells in stratum corneum</td>
<td>Parakeratosis</td>
<td>None</td>
</tr>
<tr>
<td>Abnormal keratinization</td>
<td>Dyskeratosis</td>
<td>None</td>
</tr>
</tbody>
</table>

**Microscopic finding**

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<tr>
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<th>Clinical Appearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Epidermal edema</td>
<td>Spongiosis</td>
<td>Intraepidermal vesicle 1</td>
</tr>
<tr>
<td>Dysplasia of keratinocytes</td>
<td>Dysplasia</td>
<td>Papule 2</td>
</tr>
<tr>
<td>Inflammatory cells in epidermis</td>
<td>Exocytosis</td>
<td>None</td>
</tr>
<tr>
<td>Epidermal abscess formation</td>
<td>Pustule</td>
<td>Pus-filled vesicle 3</td>
</tr>
<tr>
<td>Dermal inflammation, edema</td>
<td>. . .</td>
<td>Macule; 2 wheal</td>
</tr>
<tr>
<td>Dermal hemorrhage</td>
<td>. . .</td>
<td>Petechiae, purpura</td>
</tr>
</tbody>
</table>

Anaplasia = Dedifferentiation
Hyperplasia = Physiological proli.
Neoplasia = Abn. proliferation
Dysplasia = Abn. maturation
Metaplasia = cell type conversion
Dyskeratosis = Abn. keratinization
Acantholysis - Loss of intercellular cohesion between keratinocytes
Acanthosis - Diffuse epidermal hyperplasia
Dyskeratosis - Abnormal, premature keratinization within cells below the stratum granulosum
Erosion - Discontinuity of the skin showing incomplete loss of the epidermis
Exocytosis - Infiltration of the epidermis by inflammatory cells
Hydropic swelling (ballooning) - Intracellular edema of keratinocytes, often seen in viral infections
Hypergranulosis - Hyperplasia of the stratum granulosum, often due to intense rubbing
Hyperkeratosis - Thickening of the stratum corneum, often associated with a qualitative abnormality of the keratin
Lentiginous - A linear pattern of melanocyte proliferation within the epidermal basal cell layer
Papillomatosis - Surface elevation caused by hyperplasia and enlargement of contiguous dermal papillae
Parakeratosis - Keratinization with retained nuclei in the stratum corneum; On mucous membranes, parakeratosis is normal
Spongiosis - Intercellular edema of the epidermis
Ulceration - Discontinuity of the skin showing complete loss of the epidermis revealing dermis or subcutis
Vacuolization - Formation of vacuoles within or adjacent to cells; often refers to basal cell-basement membrane zone area

DEFINITIONS OF MICROSCOPIC TERMS

Epidermal atrophy

- Reduction of keratinocytes leads to:
  - thinning of the epidermis
  - the papillary processes are diminished or lost
- It is often found in:
  - senile skin,
  - actinic keratosis

Acanthosis

- Acanthosis is diffuse epidermal hyperplasia implies increased thickness of stratum spinosum
- It is classified into:
  - flat: the entire site thickens moderately chronic eczema
  - psoriasiform: epidermal protrusions/elongated rete ridge psoriasis
  - papillomatous: the epidermis projects upwards e.g. warts or seborrheic keratosis
  - pseudocarcinomatous: irregularly downward project e.g. chronic ulcer margin, deep mycoses

Acanthosis Atrophy
Hyperkeratosis
- Thickening of the stratum corneum
- Associated with a qualitative abnormality of the keratin
  - Parakeratosis:
    - Retained nuclei
  - Orthohyperkeratosis
    - Without retained nuclei

Parakeratosis
- Caused by incomplete keratinization
  - Nuclei remain in the cells of the horny cell layer
  - Such as psoriasis vulgaris
- Column parakeratosis, "cornoid lamellae."
  - Porokeratosis

Hypergranulosis
- A thickening of the granular cell layers to > 4 layers (normal 1-3)
- It is often found in
  - Lichen planus
  - Warts
  - Congenital ichthyosis

Granular degeneration
- In the granular cell layer
  - Vacuolated cells containing large keratohyaline granules appear
- It is characteristic of
  - Vörner palmoplantar keratosis
  - Ichthyosiform erythroderma (bullous congenital)
Spongiosis

- Separation of spinous layer because of increased fluid in epidermis secondary to inflammation
- Excessive spongiosis can lead to intraepidermal vesicles
- It is found in
  - Atopic dermatitis
  - Acute eczema

Intracellular edema

- Ballooning degeneration
  - Intracellular swelling
  - The cells become spherical
  - such as herpes simplex

Acantholysis

- Loss of intercellular bridges of keratinocyte (desmosomes)
- resulting in
  - The dispersion of keratinocytes call Acantholytic cell
  - Form Intercellular spaces and blisters
  - Acantholytic cells have a tendency to become dyskeratotic

Dyskeratosis

- Abnormal keratinization occurring prematurely within individual cells below the stratum corneum
- The phenomenon is found in
  - Pemphigus
  - Hailey-Hailey disease
  - Darier’s disease

Dyskeratosis, acantholysis and the intraepidermal cleft formation Darier's disease
Blister

- Intraepidermal and subepidermal separation resulting in blister formation
- Blister contents are cytoplasm and infiltrating cells

Pemphigus vulgaris.

The epidermal separation occurs low in the epidermis (Suprabasal blister)

Bullous pemphigoid.

A subepidermal blister contains numerous eosinophils

| Table 61–3. Common Causes of Blisters (Bullae) in the Skin. 1 |
|------------------|-----------------|------------------|
| Site of Blister  | Disease         | Pathogenesis     |
| Upper epidermal (subcorneal) | Impetigo (pustules) | Infection |
| Burns, friction blisters | Viral infection | Physical injury |
| Intraepidermal | Acute dermatitis | Immunologic mechanism |
| Suprabasal | Pemphigus vulgaris | Immunologic mechanism |
| Dyer’s disease | Benign familial pemphigus | Inherited |
| Subepidermal | Bullous pemphigoid | Immunologic mechanism |
| | Dermatitis herpetiformis | Immunologic mechanism |
| | Epidermolysis bullosa | Inherited |
| | Erythema multiforme | Immunologic mechanism |
| | Lichen planus | Uncertain |
Exocytosis

- The infiltration of inflammatory cells and erythrocytes into the dermis
- It is mostly found in spongiotic space

Pautrier’s microabscess

- Infiltration of tumorous lymphocytes
- Cutaneous Tcell lymphoma (CTCL)

Munro’s microabscess

- A blister containing purulent (mainly neutrophils)
- A small pustule below the horny cell layer

Inflammatory Infiltration

Table 2.2 Diseases with inflammatory infiltration into the skin.

<table>
<thead>
<tr>
<th>Infiltrated cells</th>
<th>Disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neutrophils</td>
<td>early-stage inflammation, irritant contact dermatitis, erythema nodosum, etc.</td>
</tr>
<tr>
<td></td>
<td>infections, impetigo, candidiasis, etc.</td>
</tr>
<tr>
<td></td>
<td>disorders associated with reactions of immuno complexes and complements, cutaneous small-vessel vasculitis, Sweet’s disease, Behçet’s disease.</td>
</tr>
<tr>
<td>Eosinophils</td>
<td>autoimmune diseases, pemphigus, bullous pemphigoid, etc.</td>
</tr>
<tr>
<td></td>
<td>type I allergy</td>
</tr>
<tr>
<td></td>
<td>malignant diseases: mycosis fungoides, Langerhans cell histiocytoses</td>
</tr>
<tr>
<td>Lymphocytes</td>
<td>inflammations; allergic diseases, etc.</td>
</tr>
<tr>
<td>Plasma cells</td>
<td>infections; syphilis, lymphogranuloma venereum deep fungal infection</td>
</tr>
<tr>
<td></td>
<td>actinic keratosis, syringocystadenoma papilliferum, etc.</td>
</tr>
<tr>
<td>Histiocytes</td>
<td>granulomatous diseases; sarcoidosis, granuloma annulare, etc.</td>
</tr>
<tr>
<td>Mast cells</td>
<td>inflammations; atopic dermatitis, chronic eczema, lichen planus, etc.</td>
</tr>
<tr>
<td></td>
<td>other; wounds (especially during healing), neurofibroma, etc.</td>
</tr>
</tbody>
</table>

Dermal Infiltration

- There are several infiltration patterns
  - Perivascular infiltration: Inflammatory cells infiltrate around the blood vessels
  - Lichenoid infiltration: the cells infiltrate in a band resembling that in lichen planus
  - Vasculitis: the cells cause fibrinoid degeneration, blood clots, or bleeding in the blood vessels
  - Nodular infiltration

Giant cell

- Giant cell is the general term for cells that contain a characteristically large nucleus
- Most giant cells derive from the fusion of macrophages or repeated nuclear division

Subcutaneous fat tissue

- Macrophages grow large by phagocytosing foreign substances
- The nuclei are irregularly arranged
- Syncytial macrophages with regularly arranged nuclei in a circular or horseshoe-shaped arrangement.
- Found in tuberculosis, sarcoidosis, and lichen nitidus.
- Touton giant cell: These macrophages phagocytose fat tissue. The eosinophilic cytoplasm at the center of the cell is surrounded by a nucleus that is further surrounded by foamy light cytoplasm.
- Found in juvenile xanthogranuloma and xanthoma.
Septal Panniculitis

Common Skin Disease

- INFECTION DISEASE OF THE SKIN
  - BACTERIAL
  - VIRAL
  - FUNGAL
- INFLAMMATORY DISEASE OF THE SKIN
  - ATOPIC DERMATITIS
  - PSORIASIS
  - LICHEN PLANUS
  - BULLOUS DISEASE
- NEOPLASM OF THE SKIN
  - BENIGN LESION : ACTINIC KERATOSIS, BOWEN
  - MALIGNANT LESION : SCC BCC
- Pigmentary Disorders
  - NEVUS
  - MELANOMA
- Disorders of Epidermal Maturation
  - ICHTHYOSIS
- Disorders of Epidermal Appendages
  - ACNE VULGARIS

Infection

- Verrucae (Warts)
- Molluscum Contagiosum
- Impetigo
- Superficial Fungal Infections
Verrucae (Warts)

- Verrucae are common lesions of children and adolescents
- Caused: human papillomaviruses
- Transmission of disease: direct contact between individuals or auto-inoculation
- Verrucae are generally self-limited, regressing spontaneously within 6 months to 2 years

Molluscum contagiosum

- Molluscum contagiosum is a common, self-limited viral disease of the skin
- Caused by a poxvirus
- Transmission: direct contact, particularly among children and young adults
- Multiple lesion, predilection for the trunk and anogenital area
Impetigo

- Impetigo is a common superficial bacterial infection of skin
- It is highly contagious
  - Healthy children as well as occasionally in adults in poor health
- Ethiology: *Staphylococcus aureus* & mixed Group A beta hemolytic streptococcal infection
- Two forms
  - **Impetigo contagiosa**
    - Transient sup. Vesicle/Pustule rupture
    - -> shallow erosions->drying serum *(honey-colored crust)*
    - -> ulceration with thick crust -> **Ecthyma**
  - **Impetigo bullosa** *(80% *S. aureus* producing exfoliative toxin)*
    - Thin walled flaccid bullae with no surrounding erythema.
    - Bullae of 1 to 2 cm persist for 2 to 3 days and then rupture.
    - Generalized form is SSSS (Staphylococcal Scalded-Skin Syndrome)

Impetigo contagiosum

- Honey-colored, glistening crusts

Impetigo Bullosa

- Source: Weedon: Skin Pathology 2nd edition
- Intraepidermal Vesicle
- Subcorneal pustule with Neutrophil infiltration
- Special stains: bacteria foci

Superficial Fungal Infections

- **Tinea**
- **Dermatophyte 3 organism**
  - Trichophyton
  - Epidermphyton
  - Microsporum
- Various forms: location
  - Scalp: Tinea Capitis
  - Face: Tinea Faciei
  - Body: Tinea Corporis
  - Inguinal: Tinea Crus
  - Hand: Tinea Manuum
  - Foot: Tinea Pedis
  - Nail: Tinea Ungium
- **Tinea versicolor** *(Pityriasis versicolor)*
- **Malassezia furfur, a yeast**
- Condition:
  - Humidity area
  - Seborrheic area
- Location:
  - Upper chest
  - Upper back
- Lesion:
  - Hypo-hyperpigment macule
  - With fine scale
Tinea Corporis

A: well circumscribed erythematous macule, papule to plaque with active border and central regression
B: mild spongiosis and focal neutrophilic abscesses with fungal hyphae
C: Periodic Acid–Schiff stain (PAS): hyphae within the S.corneum.

Inflammatory Dermatoses

Acute
- Acute Eczematous Dermatitis
- divided into
  - Endogenous cause
    - Atopic dermatitis
  - Exogenous cause
    - Allergic contact dermatitis
    - Irritant contact dermatitis
    - Photo allergic contact dermatitis

Chronic
- Psoriasis
- Seborrheic Dermatitis
- Lichen Planus

Acute Eczematous Dermatitis

Acute eczematous

A: Numerous vesicles on erythematous skin
B: Histologically: intercellular edema & intraepidermal vesicles

Characterized:
- Acute => red, papulovesicular, oozing, and crusted lesions
- Chronic => scaling plaques acanthosis and hyperkeratosis
Psoriasis

- Psoriasis is a common chronic inflammatory dermatosis
- The pathogenesis:
  - multifactorial => genetic & environmental factors
- The defect in the epidermis is
  - an increase epidermal turnover rate 14 days => 4 days
  - เกิดการหนาตัวของชั้นหนังก้าน้า ทำให้เกิดเป็นปื้นนูนแดง ปกคลุมด้วยสะเก็ดสีเทาเงิน
- Location: elbows, knees, scalp, lumbosacral areas, glans penis
- The typical lesion:
  - A well-demarcated, pink to salmon-colored plaque
  - Covered silvery - white scale

Lichen Planus

- A chronic inflammatory skin/mucous membrane
- characterized => 6P disease
  - Pruritic, purple, polygonal, planar papules, and plaques
- Mostly idiopathic but the possibility of a cell mediated immunologic mechanism
- Microscopic examination shows
  - Irregular acanthosis, hyperkeratosis,
  - Hypergranular cell layer,
  - Vacuolar degeneration of basal cells, and a bandlike lymphocytic infiltrate in the upper dermis.

Psoriasis

A: erythema plaque with silvery-white scale
B: Histologically:
  - hyperkeratosis with parakeratosis
  - regular acanthosis with clubbing
  - an absent granular layer
  - neutrophils infiltration in the stratum corneum (Munro microabscesses)
  - subcorneal layer (Kojog spongiform pustules)

Lichen planus

A: This flat–topped pink–purple, polygonal papule
a white lacelike pattern that is referred to as Wickham stria
B: A bandlike infiltrate of lymphocytes at the dermoeipidermal junction
hyperkeratosis
hypergranulosis
pointed rete ridges (saw toothing)
Blistering (Bullous) Diseases

Inflammatory Blistering Disorders
- Pemphigus
- Bullous Pemphigoid

Noninflammatory Blistering Disorders (genetic)
- Epidermolysis Bullosa
- Porphyria

Histologic levels of blister formation
A: Subcorneal blister the stratum corneum forms the roof of the bulla (as in pemphigus foliaceus)
B: Suprabasal blister a portion of the epidermis, including the stratum corneum, forms the roof (as in pemphigus vulgaris)
C: Subepidermal blister the entire epidermis separates from the dermis (as in bullous pemphigoid)

Pemphigus
- A blistering disorder
- Caused: autoantibodies (IgG) => loss of intercellular keratinocyte adhesion of the epidermis and mucosal epithelium
- Rare, but may be life-threatening
- The majority: in the <60 yrs of life
- There are multiple variants
  - pemphigus vulgaris
  - pemphigus vegetans: granulomatous vegetating plaque
  - pemphigus foliaceus: superficial form of PV
  - pemphigus erythematosus: SLE
**Pemphigus foliaceus.**

A. The delicate, superficial (subcorneal) blisters are much less erosive than seen in pemphigus vulgaris.

B. Subcorneal separation of the epithelium is seen.

**Pemphigus vulgaris**

A: Flaccid bullae and thin-roofed => Eroded plaques

B: Suprabasal acantholysis => intraepidermal blister

C: Ulcerated blisters in the oral mucosa are also common

**Bullous Pemphigoid**

- An autoimmune disorder generally affecting elderly > 60 yrs
- It may involve only the skin or the skin and mucosal surfaces
- Clinical
  - **Tense bullae**, not easily rupture as do pemphigus, heal without scarring
- Morphology
  - The basal cell layer vacuolar degeneration => a subepidermal blister
  - no acantholytic cell in blisters
  - superficial & deep perivascular infiltrate
    - lymphocytes
    - +/- eosinophils or neutrophils
- Pathogenesis
  - Linear deposition of IgG and complement in the basement membrane zone
  - Reactivity to the bullous pemphigoid antigen (BPAG)
Bullous pemphigoid.
A: Tense bullae, filled with clear fluid, on normal or erythematous skin
B: Histopathology shows
  • Basal cell layer vacuolization, producing tense, intact subepidermal blisters
  • With eosinophils, as well as lymphocytes or neutrophils

Suprabasal separation

Neoplasm of the skin
### Benign Epithelial Tumors

- **Seborrheic Keratoses**
- **Acanthosis Nigricans**
- **Fibroepithelial Polyp**
- **Epithelial Cyst (Wen)**
- **Adnexal (Appendage) Tumors**

### Seborrheic Keratosis

- Common benign tumor
- Usually in elderly persons
- This lesion occurring on
  - the face, trunk and extremities
- The lesions are flat, raised, soft, sharply demarcated, and brown

Seborrheic keratosis

- A well-demarcated coin like pigmented lesion with warty surface
- Stuck on appearance
- Histologically of benign basaloid cells proliferation interspersed with keratin filled horny cysts

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**Cell of Origin**

<table>
<thead>
<tr>
<th>Cell of Origin</th>
<th>Benign</th>
<th>Malignant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keratinocyte</td>
<td>Verruca vulgaris</td>
<td>Carcinoma in situ (Bowen's disease)</td>
</tr>
<tr>
<td></td>
<td>Condyloma acuminatum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Molluscum contagiosum</td>
<td>Squamous carcinoma</td>
</tr>
<tr>
<td></td>
<td>Keratoacanthoma</td>
<td>Basal cell carcinoma</td>
</tr>
<tr>
<td>Skin adnexal cells</td>
<td>See Table 61-5</td>
<td></td>
</tr>
<tr>
<td>Melanocyte</td>
<td>Nevocellular nevus</td>
<td>Lentigo maligna</td>
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<tr>
<td></td>
<td>Blue nevus</td>
<td>Superficial spreading malignant melanoma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nodular malignant melanoma</td>
</tr>
<tr>
<td>Merkel cell</td>
<td></td>
<td>Merkel cell carcinoma</td>
</tr>
<tr>
<td>Dermal mesenchymal cells</td>
<td>Dermatofibroma</td>
<td>Dermatofibrosarcoma protuberans</td>
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<tr>
<td></td>
<td>Fibrosarcoma</td>
<td>Angiosarcoma</td>
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<td>Hemangiosarcoma</td>
<td>Malignant schwannoma</td>
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<td></td>
<td>Neurofibroma</td>
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<tr>
<td>Lymphocyte</td>
<td>Urticaria pigmentosa</td>
<td>Mycosis fungoides</td>
</tr>
<tr>
<td>Mast cell</td>
<td>Solitary mastocytoma</td>
<td>Sézary's syndrome</td>
</tr>
</tbody>
</table>

**Benign Epithelial Tumors**

- **Seborrheic Keratoses**
- **Acanthosis Nigricans**
- **Fibroepithelial Polyp**
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- **Adnexal (Appendage) Tumors**
Premalignant and Malignant Epidermal Tumors

- Actinic Keratosis
- Squamous Cell Carcinoma
- Basal Cell Carcinoma

**Actinic Keratosis (Solar keratosis)**

- Actinic keratosis is a premalignant lesion
- A single/multiple dry rough adherent scaly lesion on sun exposed skin
- the risk of carcinoma ~ the degree of epithelial dysplasia
- Histology:
  - epidermal dysplasia
  - degeneration of dermal collagen called solar elastosis

**Squamous carcinoma**

- Second most common malignant skin tumor
- It is a locally aggressive neoplasm
  - that rarely metastasizes (1% of cases).
- Clinical: shallow ulcer with a raised, everted, firm border
- Histology:
  - KC: cellular atypia, pleomorphism, and mitotic activity
  - invasion of the basement membrane
  - Keratin-containing epithelial pearls are prominent in well differentiated tumors
- Treatment:
  - Wide surgical excision is usually curative
  - Metastasis: Radical lymph node dissection and adjuvant therapy
Bowen's Disease
(Carcinoma in Situ)

- Bowen's disease may occur either on the vulva, oral mucosa, and glans penis or on sun-exposed skin.
- It is associated with visceral malignant disease.
- Clinical: as a slowly enlarging erythematous patch.
- Histologic examination:
  - extreme dysplastic change but basement membrane intact.

Squamous Cell Carcinoma

- A: Lesions are often nodular and ulcerated as seen in this scalp tumor.
- B: Atypical squamous epithelium invading BM into the dermis.
- C: A magnified image: invasive tumor cells showing enlarged nuclei with angulated contours and prominent nucleoli.

Basal Cell Carcinoma
(Basal Cell Epithelioma)

- Basal cell carcinoma is a most common skin neoplasm.
  - in sun-exposed areas, face is the most common site, white skin.
- Clinical:
  - early stage: a shiny papule with small telangiectatic vessels.
  - Late stage: Central necrosis (a punched-out ulcer) with pearly rolled edges called rodent ulcer.
- Histology:
  - The neoplastic cells, forming a palisade at the periphery of the tumor nests invades the dermis.
  - as nests and cords of cells.
- Basal cell carcinoma is locally aggressive => bone and muscle.
- Treatment: Wide surgical excision & margins free of tumor requires.
Disorders of Epidermal Maturation

• Ichthyosis

Ichthyosis

- Ichthy- (Greek) mean “fishy”
- Group of genetically inherited disorders
- Ichthyosis exists in several forms with different inheritance patterns (dominant, recessive, X-linked)
- Pathogenesis.
  - defective desquamation => formed scale
  - Severe congenital forms => early death

Disorders of Epidermal Appendages

• Acne Vulgaris
• Rosacea
Acne
- Divided into 2 types
  - Non inflammatory types
    - Open comedones: black keratin plug
    - Closed comedones: the keratin plug is trapped beneath the epidermal surface
  - Inflammatory types
    - erythematous papules, nodules, and pustules
    - Severe: acne conglobata => sinus tract formation & physical scarring

Four key components
Contribute to the development of acne:
1. Changes in keratinization of the lower portion of the follicular infundibulum => a keratin plug blocking outflow of sebum to the skin surface
2. Hypertrophy of sebaceous glands
   puberty / hormonal stimulation => increased activity Sebaceous gland
3. Lipase-synthesizing bacteria (Propionibacterium acnes)
   lipids in sebum => to pro-inflammatory fatty acids
4. Inflammation of the follicle
   release of cytotoxic and chemotactic factors

Pigmentary Disorder
- NEVUS
- MELANOMA
Melanoma

Disease-free 5-year survival

Nodal metastasis

Melanocytic nevus: junctional type

A small, relatively flat, symmetric, and uniform.

B On histologic examination, junctional nevi are characterized by rounded nests of nevus cells originating at the tips of rete ridges along DEJ.
Melanocytic nevus, compound type

(A) the compound nevus is more raised and dome-shaped.
   - The symmetry and uniform pigment distribution suggest a benign process.

(B) Histologically: combine the features of
   - junctional nevi (intraepidermal nevus cell nests) with nests
   - cords of nevus cells in the underlying dermis

Malignant melanoma

- occurs most often in skin
- clinical:
  - an elevated pigmented nodule
  - grows rapidly and tends to bleed and ulcerate
  - Metastasis is common via the lymphatics and bloodstream

- Histology
  - The melanocyte: cytologic atypia, pleomorphism, nuclear hyperchromatism, and increased mitotic activity.
    - Nuclei are large, with prominent nucleoli
  - The cytoplasm is abundant and usually contains melanin pigment.
  - The dermis: lymphocytic infiltrate around the invading melanocytes

Common oral lesions

- Aphthous ulcer
- Lichen planus
- Leuko plakia
- Fordyce granules
- Common wart
- Herpes labialis
- Impetigo
- Candidiasis
- Pyogenic granuloma
- Hemangioma
Wart

Herpes labialis

Impetigo

Candidiasis
Pyogenic granuloma

Hemangioma

Reference

2. Fitzpatrick's Dermatology in General Medicine, 7e
   Klaus Wolff, Lowell A Goldsmith, Stephen I Katz, Barbara A Gilchrest, Amy S Paller, David J Leffell
3. Concise Pathology, 3rd ed. Chapter 61, Diseases of the Skin, Copyright © The McGraw-Hill Companies. All rights reserved.
4. Weedon Skin Pathology 2nd edition
   http://www.accessmedicine.com/content.aspx?aID-5185601

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