Musculoskeletal System

Sub-System	Pathology sheet 5 part 2
Lecture Title	Some skin conditions
Lecture Date	21-oct -2019
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2019-2020

Some skin conditions

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Macroscopic Lesions	Definition
Excoriation	Traumatic lesion breaking the epidermis and causing a raw linear area (i.e., deep scratch); often self-induced
Lichenification	Thickened, rough skin (similar to a lichen on a rock); usually the result of repeated rubbing
Macule, Patch	Circumscribed, flat lesion distinguished from surrounding skin by color. Macules are 5 mm in diameter or less, patches are greater than 5 mm.
Onycholysis	Separation of nail plate from nail bed
Papule, Nodule	Elevated dome-shaped or flat-topped lesion. Papules are 5 mm or less across, while nodules are greater than 5 mm in size.
Plaque	Elevated flat-topped lesion, usually greater than 5 mm across (may be caused by coalescent papules)
Pustule	Discrete, pus-filled, raised lesion
Scale	Dry, horny, platelike excrescence; usually the result of imperfect cornification
Vesicle, Bulla, Blister	Fluid-filled raised lesion 5 mm or less across (vesicle) or greater than 5 mm across (bulla). Blister is the common term for either.
Wheal	Itchy, transient, elevated lesion with variable blanching and erythema formed as the result of dermal edema

Microscopic Lesions	Definition
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

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This table is very important especially for clinical years and was explained in detail in lap,so plz don't forget to check it .

Some skin conditions

Acute Inflammatory Dermatoses

-Urticaria
-Acute eczematous(*_**aka: spongy**_) dermatitis
-Erythema multiforme

Chronic Inflammatory Dermatoses

-Lichen planus
-Psoriasis

Blistering (Bullous) Diseases

Inflammatory blistering diseases

-Pemphigus vulgaris
-Bullous pemphigoid

Panniculitis =* inflammation of subcutaneous fat

Disorders of Epidermal Appendages

Acne vulgaris

-**Blistering (Bullous) Diseases**: when antibodies attack the cell junctions leading to listers formation

- **Panniculitis** =* inflammation of subcutaneous fat

-Includes : * erythema nudism

*Bioderma ganglinosom

-both are extra-intestinal manifestations of IBD

* ***note*** : ~autoimmune rxn's that harm our bodies and causes a collateral damage to our systems are called ***hypersensitivity*** rxn's

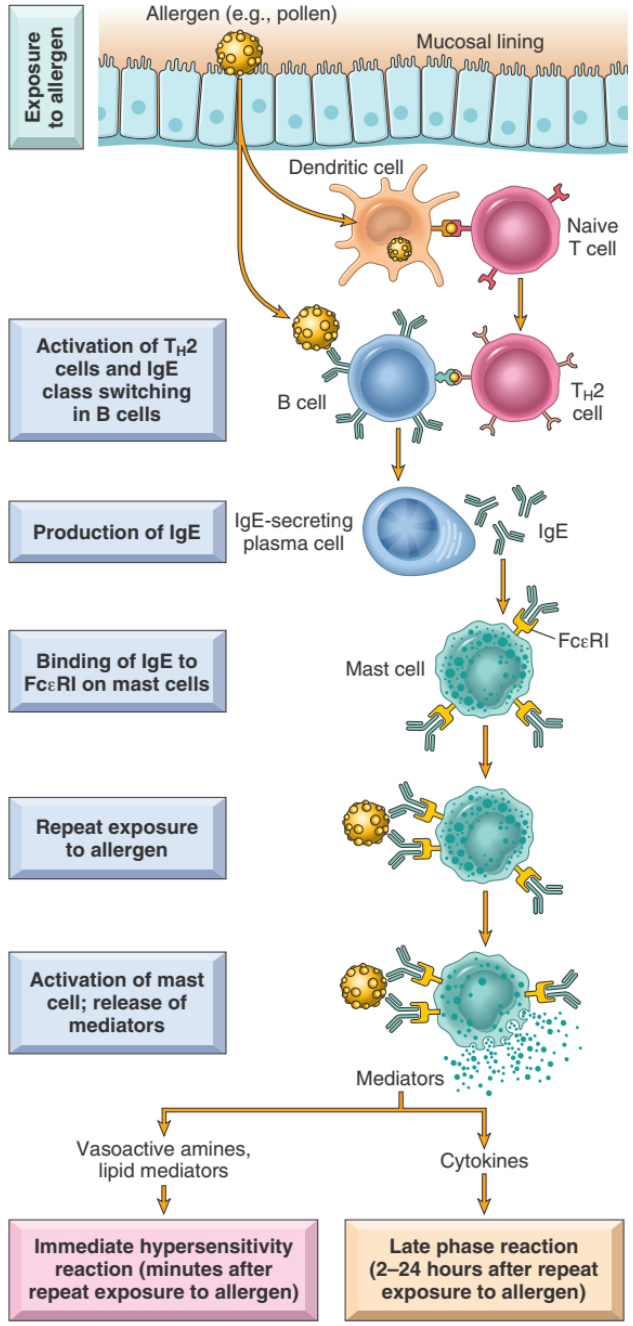
-And we have 4 types of them :

-type 1 immediate ***(-Mast cell-dependent, IgE-dependent)***

~eg: urticaria and allergies

~pathogenesis : when an allergen inters the body an immediate immune response is triggered to form IGE antibodies Against it (located on mast cells surfaces) , during first exposure to allergen ,all...

…antigens are used in forming ABs so no hypersensitivity rxn is seen clinically , but with repetitive exposure these IGe ABs are going to bind the new allergen's antigens then they will cross link together .remember that cross linking will stimulate mast cell degranulation ,this releases histamine which will lead to severe clinical symptoms like bronco constriction (asthma),vasodilatation —>oedema (urticaria).see the extra photo —>



-type 2

-type 3 (immune complex mediated) — —>eg:SLE

-type 4(delayed type)

~hyper sensitivity rxn's are either caused by increased response of certain antibody or autoimmune attacks for self cells antigens,(ex:autoimmune diseases , allergies ,urticaria)

-***now lets start with***

*Acute inflammatory dermatosis —->

A)Urticaria = “Hives”

-most common type is considered hyper sensitivity rxn type 1(immediate) .

*I. Acute inflammatory dermatosis —->Urticaria = "Hives"

Urticaria types:

-Mast cell-dependent, IgE-dependent

*-Mast cell-dependent, IgE-independent —->*not type 1 hyper sensitivity bcz IGe antibodies are not produced here .*

-Mast cell-independent, IgE-independent

*Individual lesions develop and fade within hours (usually less than 24 hours), and episodes may last for days or persist for months.

…any area exposed to pressure, such as the trunk, distal extremities, and ears

***Pruritic(*well surcumscribed +itchy) oedematous plaques called *wheals*.**

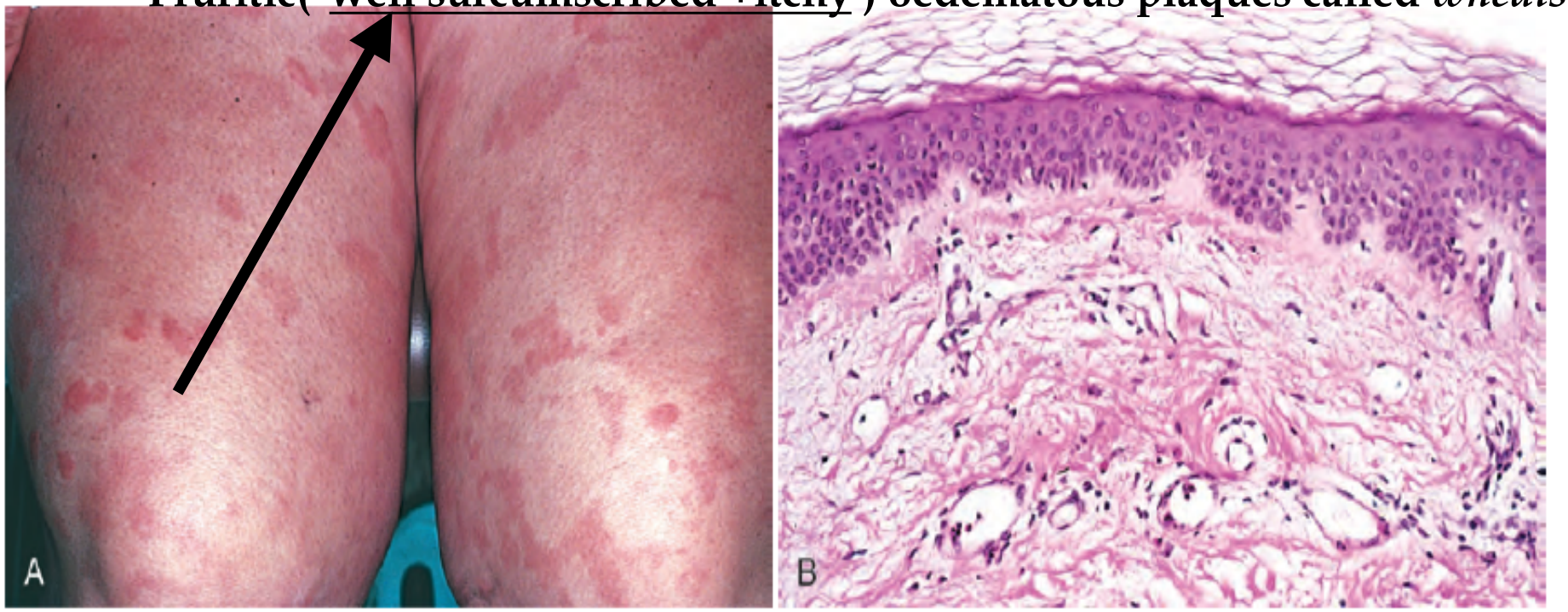


Figure 25-21 Urticaria. **A,** Erythematous, edematous, often circular plaques are characteristic. **B,** Histologically, there is superficial dermal edema, manifested by spaces between collagen bundles, and dilated lymphatic and blood-filled vascular spaces; the epithelium is normal.

Read these carefully*

And remember there is no epidermal changes

*edited paragraph from slide :

If it was Persistent we need to make sure that the patient doesn't have a more complicated condition like : Collagen vascular diseases, Hodgkin…etc.
If not , the diagnosis will be idiopathic persistent urticaria

Urticaria, cont'd

*__Mast cell-dependent, IgE-dependent__
-caused by many antigen types (pollens, foods, drugs* ,insect venom...etc.)
-an example of a localized immediate hypersensitivity (type I) reaction

*__Mast cell-dependent, IgE-independent__
-substances that directly incite the degranulation of mast cells
...such as opiates(**eg:morphine), certain antibiotics, curare***, and radiographic contrast media(صبغات)

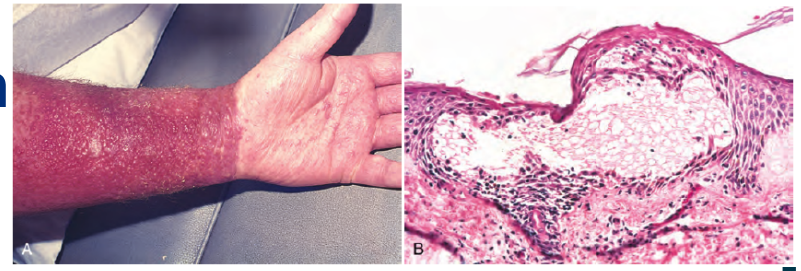
*__Mast cell-independent, IgE-independent__
-local factors that increase vascular permeability
...aspirin-induced urticaria → Works on PGs
...hereditary angioedema (see next note*)

*all drugs represent rash as a side effect this might be due either type 1 hyper sensitivity or even type 4
***curare is previously mentioned in pharma as an ancient musculorelaxant drug
-mast cell independent IGe independent response is when the allergen directly increases vascular permeability

hereditary angioedema, caused by an inherited deficiency of C1 inhibitor that results in excessive activation of the early components of the complement system(c2,c3) and production of vasoactive mediators.

-eczema:

A)**acute** : characterised by spongiosis sign



B)**chronic** : characterised by hyperkeratosis and acanthuses).

~sense were talking about acute inflammatory dermatosis we will only mention the acute eczema

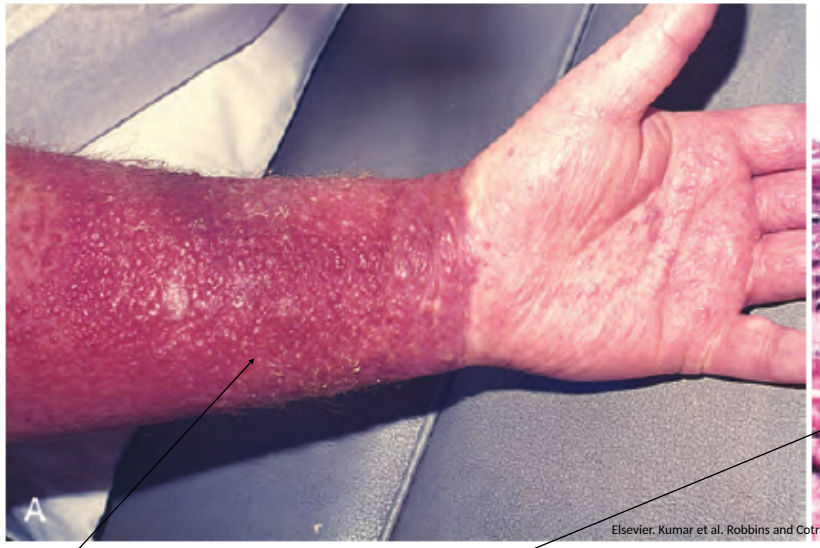
A)**<u>Acute Eczematous Dermatitis</u>** • Based on initiating factors, eczematous
dermatitis can be subdivided into the following categories:

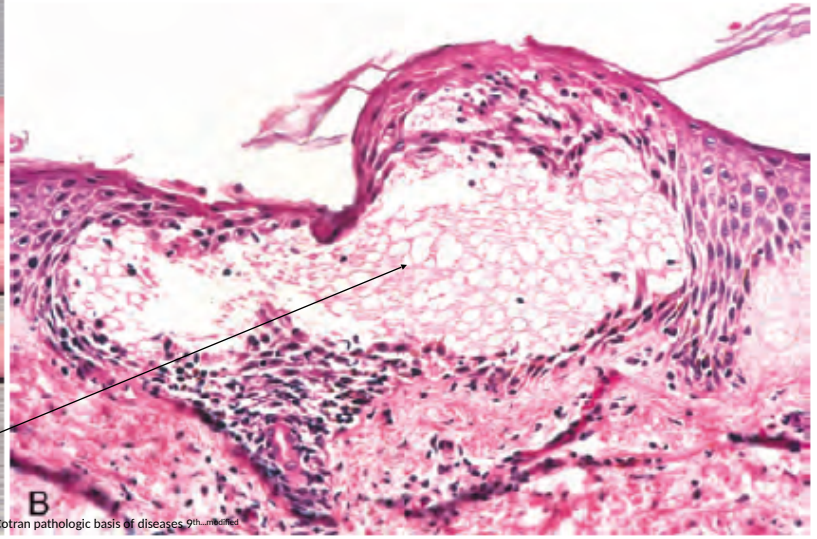
(1) allergic contact dermatitis (type 4 hyper sensitivity)—->most common related to poison ivy
(2) atopic dermatitis
(3) drug-related eczematous dermatitis,
(4) photo-eczematous dermatitis (caused by sun exposure)
(5) primary irritant dermatitis.

- its main feature is ***<u>spongiosis</u>*** : edema btw epidermis cells might lead to fluid filled vesicles (vesicular rash

Eczema = Spongiotic dermatitis (acute*)

(1) allergic contact dermatitis
(2) atopic dermatitis
(3) drug-related eczematous dermatitis
(4) photoeczematous dermatitis
(5) primary irritant dermatitis





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...in this case, laundry detergent in clothing

Edema within the epidermis (spongiosis) creates small fluid-filled intraepidermal vesicles

Acutely: erythematous vesicular rash

...with chronicity:
Parakeratosis, hyperkeratosis & acanthosis...scales

T cell-mediated inflammatory reactions (type IV hypersensitivity)

Erythema multiforme.

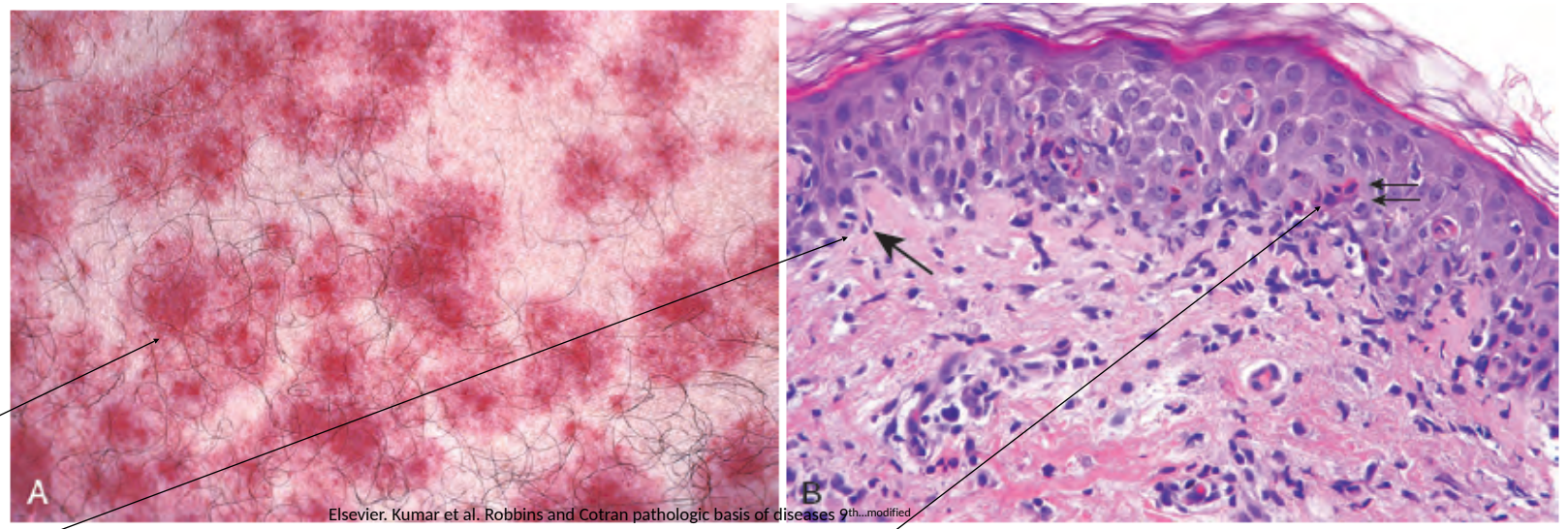
-an eg. Of interface dermatitis : when inflammatory cells attack the interface btw dermis and epidermis

-most of damage appear morphologically at the basal layer as apoptotic and necrotic keratinocytes ,vacuolar degeneration of basal cell layer

-Clinically appears as target lesions on skin —>central epidermal necrosis/ plaster surrounded by macular erythema “macular means at the same level with skin “

Erythema multiforme

…an example of “interface dermatitis”



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…target-like lesions consist of a central blister or zone of epidermal necrosis surrounded by macular erythema

…lymphocytes accumulating along the dermoepidermal junction where basal keratinocytes have begun to become vacuolated (arrow)

Self-limited hypersensitivity reaction to certain infections and drugs

-herpes simplex…etc.
-sulfonamides…etc.
-cancer
-Collagen vascular diseases

…necrotic/apoptotic keratinocytes appear in the overlying epithelium (double arrow)

II.Chronic Inflammatory Dermatoses:

Koebner phenomenon is present here

A)Lichen planus

Oral lichen is risky for oral squamous cell carcinoma

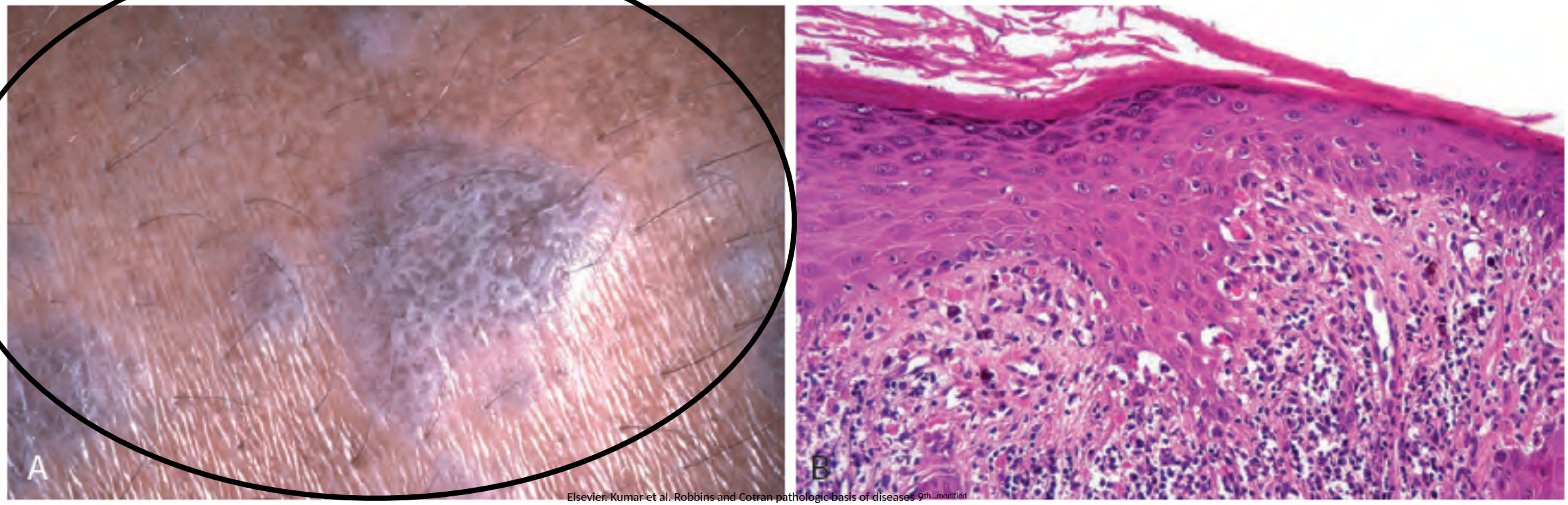

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Figure 25-26 Lichen planus. **A,** This flat-topped pink-purple, polygonal papule has a white lacelike pattern of lines that are referred to as Wickham stria. **B,** There is a bandlike infiltrate of lymphocytes at the dermoepidermal junction, hyperkeratosis, and pointed rete ridges (sawtoothing), the latter as a result of chronic basal cell layer injury.

Chronic Inflammatory Dermatoses:

-Lichen Planus: you need to remember the mnemonic F3P

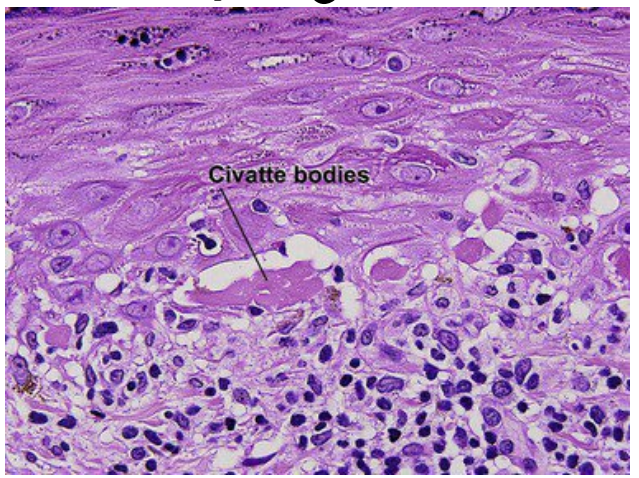
Flat topped **p**olygonal **p**urple **p**apules

-Wickham stria are lace like white lines on papules top

-**morphology** :1-civatte bodies /colloid bodies apoptotic slash necrotic keratenocyts in lower layer of epidermis (eosinophilic)

2- saw toothing :epidermis is worn out inferiorly ممزق

-a characteristic feature of both psoriasis and lichen planus is kobnarization: none infectious lesions results from rapid itching

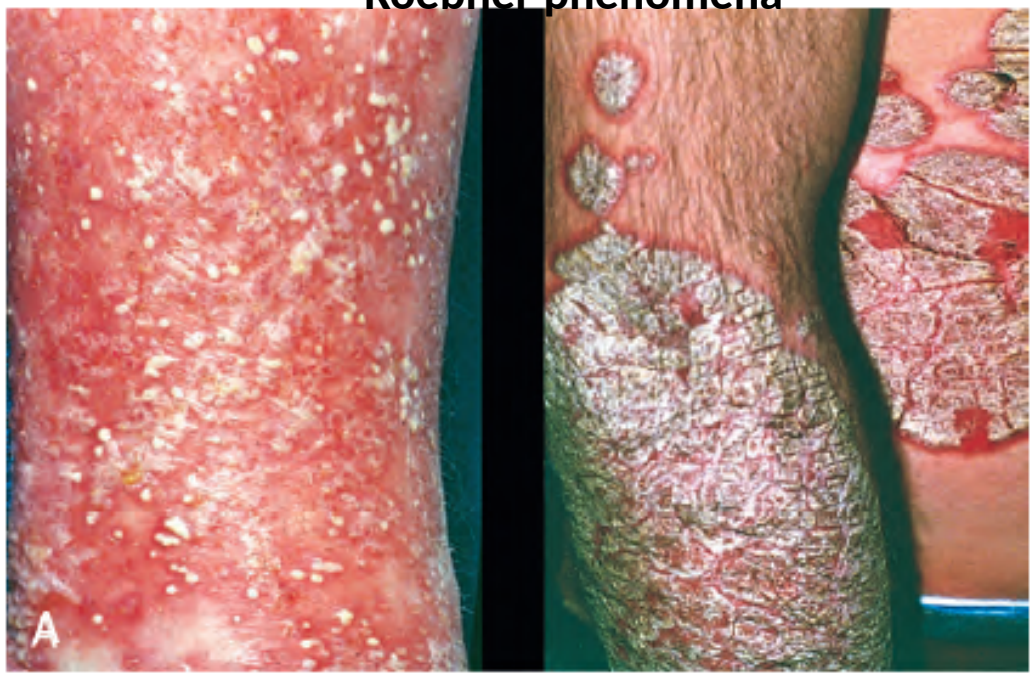


B)Psoriasis

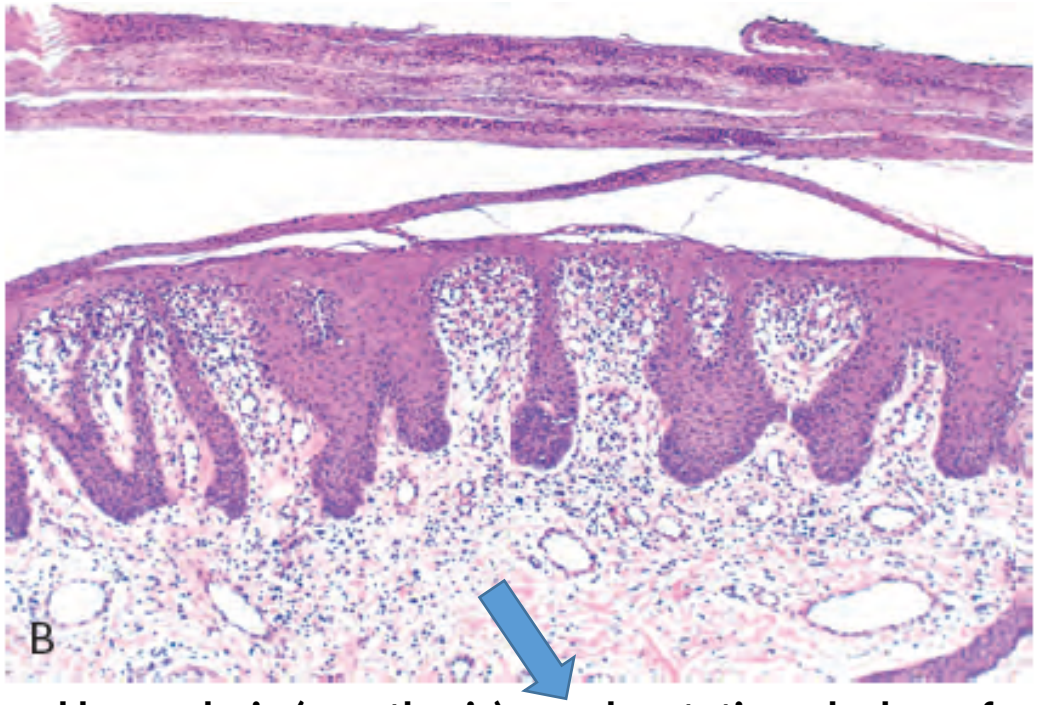
*Types :
-**plaque** psoriasis (most common

-Any age, more in hormonal changes (puberty & menopause, but improves in pregnancy)
-Autoimmune, multifactorial (genetic & environmental)
-Associated with other autoimmune diseases like DM 1
-Associated with psychiatric problems
-Association with metabolic syndrome, hyperlipidemia, obesity & DM 2
-Of the factors: trauma, drugs, infection (e.g., pharyngeal streptococcal infection & guttate psoriasis), strong sunlight, stress, smoking and alcohol consumption
-Koebner phenomena

Auspitz sign??



Salmon-colored lesions covered by silver-white scales



...epidermal hyperplasia (acanthosis), parakeratotic scale, loss of granular cell layer and accumulation of neutrophils within the superficial epidermis (Munro micro abscesses)+*elongated retredges test tube appearance

Psoriasis may be associated with AIDS

Auspitz sign?

-as we can see the epidermis is thinned at the top of the tube like papilla that formed from dermis layer forming skin scales ,since dermis is vascularised ,when the patient tries to remove these scales this will lead to bleeding and that what we call auspitz sign

Cont. psoriasis types

-Guttate psoriasis : manifested as small drop like lesions

Occurs mainly in children after 2weeks of pharyngeal strip infection

****Some important things to know :**

1- langerhans cells :skin dendritic cells

2- langhans cells multi-nucleated giant cells in TB with horse shoe shaped nucleus.

3- ilets of langerhans :in Pancras

Psoriasis

Pathogenesis:

...role of TNF-alpha, induces proliferation of keratinocytes (acanthosis)...rapid migration of keratinocytes into stratum corneum (abnormal cornification)...parakeratosis (scales clinically)

...dendritic cells including Langerhans cells and T cells...activated T cells produce cytokines such as TNF-alpha

Clinical variants

1- Plaque-type psoriasis (= psoriasis vulgaris)...most common...previously described lesions with Auspitz sign

...most commonly elbows & knees...severe itching

2- Inverse psoriasis...no scales, skin folds (under breasts, armpits and near genitals...etc.)...may be induced by sweat & fungal growth

3- Acute guttate psoriasis...children, adolescents and young adults...around 2 weeks after beta-hemolytic streptococcal infection (tonsillitis/pharyngitis) or viral infection

...diffuse erythematous small drop-like lesions with fine scales

...usually self-limited in 3-4 months

4- Pustular psoriasis

...uncommon

...pustules (fluid-filled lesions)*filled with neutrophils

...may be acute emergency requiring systemic therapy

5- Erythrodermic psoriasis...large area covered by erythema

...may also threaten life (anemia, heart failure...etc.)

6- Psoriatic diaper rash

...the most common type of psoriasis in children < 2 years

...not only diaper area

Psoriasis

Psoriatic arthritis

-10-30% of psoriasis patients
-10-15% of psoriatic patients with arthritis, joint symptoms precede skin involvement
-Rarely, may occur without skin disease

Psoriatic arthritis usually occurs in distal interphalingial joints like ostioarthrites

Nail involvement

-Pitting: the most common…punched-out depressions انبعاج الظفرللداخل
-Oil spots: fluid collections with yellow-brown discoloration
-Onycholysis (nail separation)
-Thickening and deformity

*III.Blistering (Bullous) Diseases—->inflammatory

1-Pemphigus vulgaris

Suprabasal separation resulting in **intraepidermal** blister

Fishnet appearance on immunofluorescence due to deposition of antibodies

Tombstone appearance of basal cells

…autoantibodies against desmoglein in desmosome

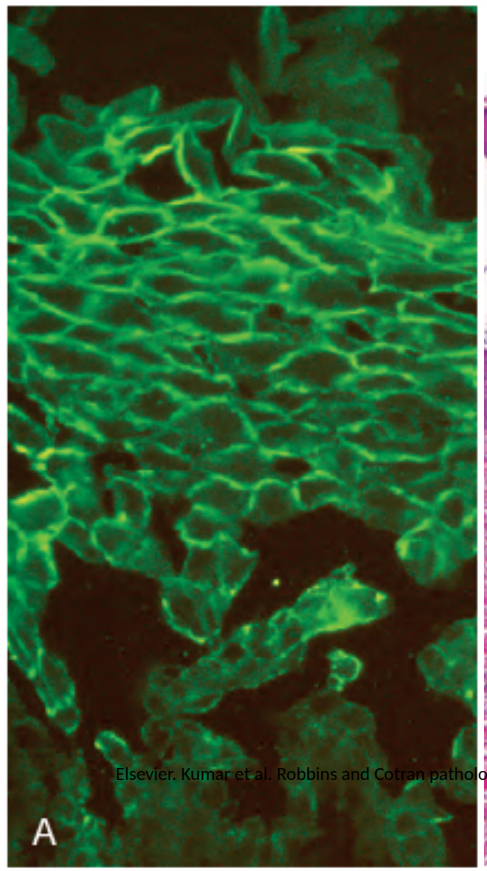
Mucosal epithelium is also involved

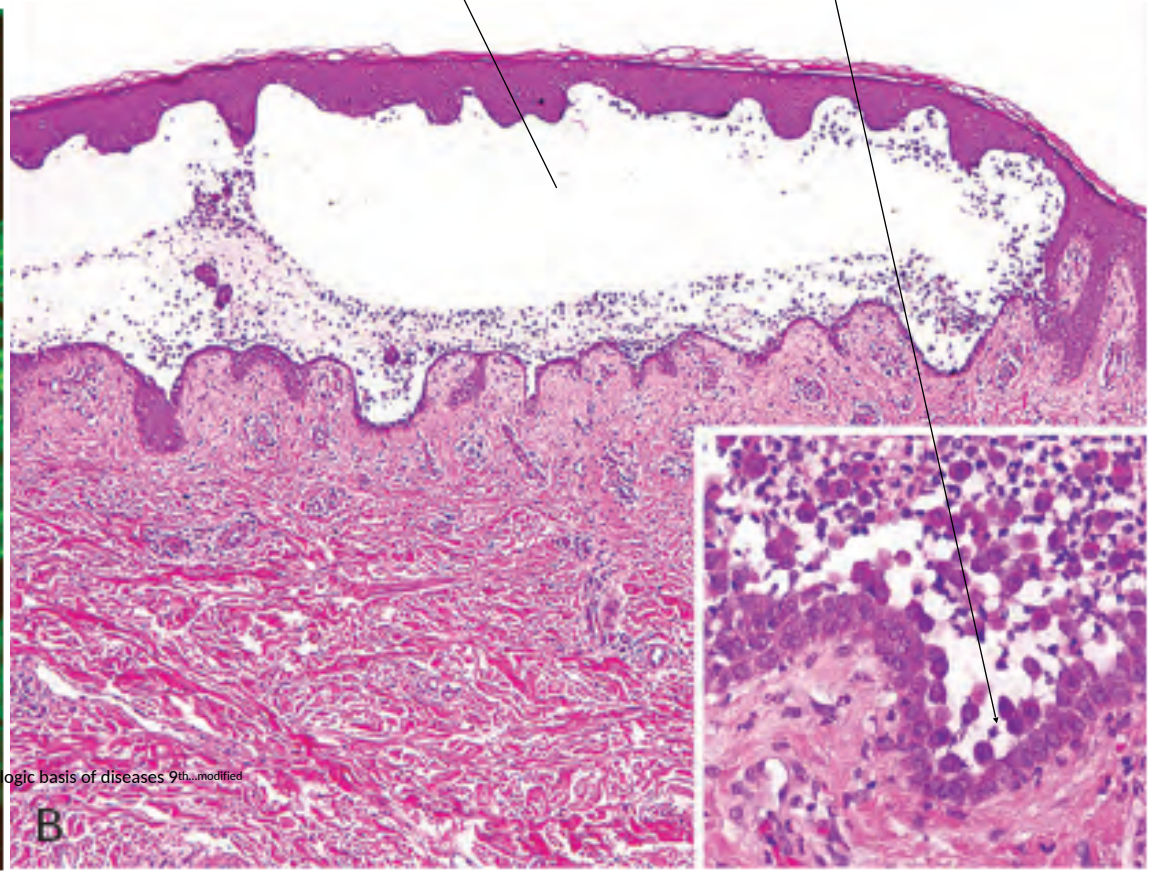
4th-6th decade

…**scalp, face**, axilla, groin, trunk, and points of pressure

…may present as oral ulcers that may persist for months before skin involvement appears

…bullae can rupture easily





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2-Bullous pemphigoid

…all the epidermis is separated from the dermis

*Bcz antibodies will attack hemi dismosoms btw basal layer and basement membrane

Tense bullae *hardly ruptured

Elderly patients

…the inner aspects of the thighs, flexor surfaces of the forearms, axillae, groin, and lower abdomen

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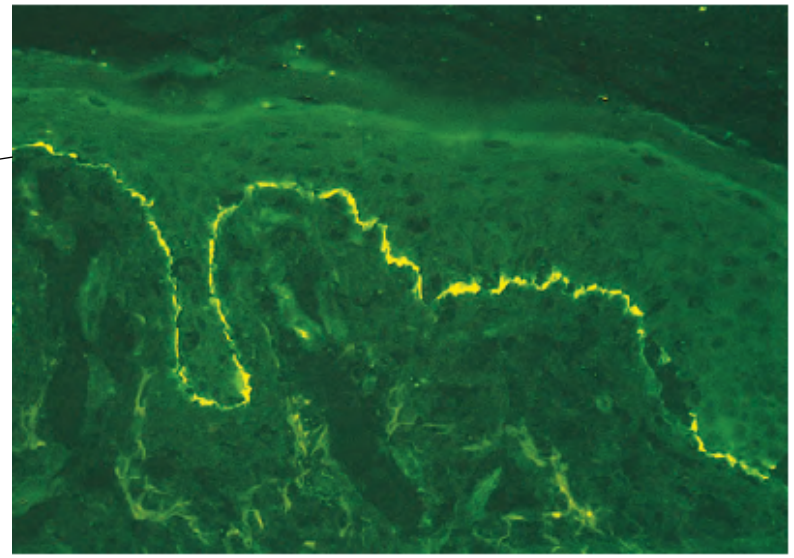
Oral lesions are present in 10% to 15%

Immunofluorescence showing continuous linear pattern at the dermoepidermal junction due to deposition of the antibodies that attack hemidesmosomal components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IV.Panniculitis

- Inflammatory reaction in the subcutaneous adipose tissue
    - *__subcutaneous fat appears like lobules located in septa__

…may preferentially affect

(1) the lobules of fat (erythema induratum)*its **rare**

or

(2) the connective tissue that separates fat into lobules (erythema nodosum)

…often involves the lower legs

- Erythema nodosum is the most common form

Panniculitis, erythema nodosum

- Tender papules (*مؤلمه عند الضغط عليها)
- Caused by:

-Infections (β-hemolytic streptococcal infection, tuberculosis and, less commonly, coccidioidomycosis, histoplasmosis, and leprosy)

-Drugs (sulfonamides, oral contraceptives)

-Sarcoidosis(***none caziating granulumatus inflammation -hypercalcimia causes metastatic calcifications**)

-Inflammatory bowel disease

-Certain malignant neoplasms

-Many times a cause cannot be identified

- Delayed hypersensitivity reaction to microbial or drug related antigens, may also immune complexes

Panniculitis, erythema induratum…uncommon

- Primarily adolescents and menopausal women
- Vasculitis of deep vessels supplying the fat lobules of the subcutaneous
- Originally considered a hypersensitivity response to tuberculosis, but today most commonly occurs without an associated underlying disease

***V.Disorders of Epidermal Appendages:**

Acne vulgaris

- Middle to late teenage years

- Both males and females are equal in "***prevalence** " …but males are more severe
- Usually milder in people of Asian descent

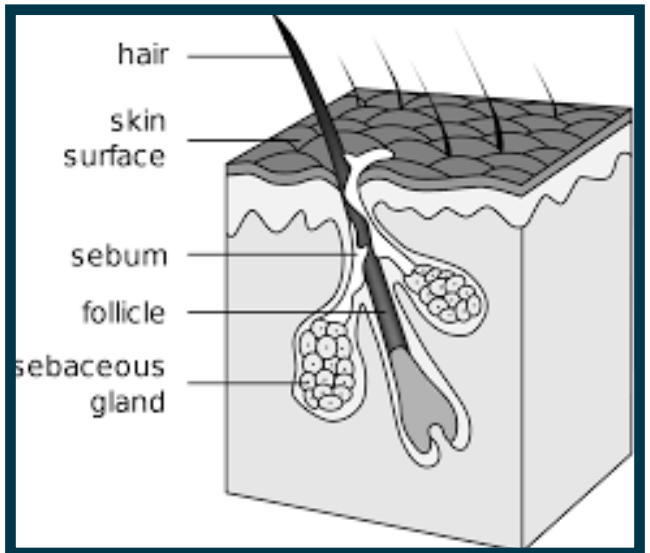
…Risk factors:

***Drugs**: corticosteroids, adrenocorticotropic **hormone**, testosterone, gonadotropins, contraceptives, trimethadione, iodides, and bromides

*Occupational exposures (cutting oils, chlorinated hydrocarbons, and coal tars)

*Occlusion of sebaceous glands: heavy clothing, cosmetics, and tropical climates

*In some families



Acne vulgaris, cont'd

- 2 types: Noninflammatory & inflammatory

- Noninflammatory: Open & closed comedones "*AKA:black and white heads separately "

- Open comedone: small follicular papule containing a central black keratin plug

- Closed comedone: follicular papule without a visible central plug

…the keratin plug is trapped beneath the epidermal surface

…potential sources of follicular rupture and inflammation

- Inflammatory type: erythematous papules, nodules, and pustules

…Severe variants (e.g., **acne conglobata**) result in sinus tract formation and dermal scarring

Acne vulgaris, pathogenesis

1-Formation of keratin plug that blocks outflow of sebum to the skin surface

2-hypertrophy of sebaceous glands during puberty under the influence of androgens

3-lipase-synthesizing bacteria *(Propionibacterium acnes)* colonizing the upper and midportion of the hair follicle, converting lipids within sebum to proinflammatory fatty acids

4-Secondary inflammation of the involved follicle

*Elimination of *P. acnes* is the rationale for administration of antibiotics to individuals with inflammatory acne.

*The synthetic vitamin A derivative13-*cis*-retinoic acid (isotretinoin) brings about remarkable improvement in some cases of severe acne through its strong antisebaceous action

End of the sheet

Thank You <3