

DERMATOLOGICAL DIAGNOSIS

AN APPROACH TO DERMATOLOGICAL DIAGNOSIS

- Definitive diagnosis may require the information provided by a complete history, physical examination, laboratory tests, and histopathologic analysis.
- Here is an outline of a logical step-by-step approach to dermatologic diagnosis

Anamnesis

History of skin lesions. Seven key questions:

- When did it start?
- Does it itch, burn, or hurt?
- Where on the body did it start?
- How has it spread? (pattern of spread)
- How have individual lesions changed? (evolution)
- Provocative factors? (patient's occupation, immediate environment, seasonal variations, physiological states, foods, prescription or nonprescription drugs etc.)
- Previous treatment(s).

Anamnesis

General history of present illness as indicated by clinical situation, with particular attention to constitutional and prodromal symptoms:

1. Acute illness syndrome (fever, sweats, chills, headache, nausea, vomiting, etc.)?
2. Chronic illness syndrome (fatigue, anorexia, weight loss, malaise)?
3. *Review of systems.*
4. *Past medical history* (operations, illnesses, allergies, medications, habits, atopic history).
5. *Family medical history* (particularly of skin disorders and of atopy).
6. *Social history* (occupation, hobbies, exposure, travel).
7. *Sexual history.*

Physical Examination

General physical examination as indicated by clinical presentation and differential diagnosis, with particular attention to vital signs, lymphadenopathy, hepatomegaly, splenomegaly, joints.

Physical Examination

Dermatologic examination – detailed physical examination of skin, hair, and mucous membranes.

A. *Four cardinal features:*

1. *Distribution* (be sure to examine scalp, mouth, palms and soles):
 - a. *Extent or involvement:* circumscribed, regional, generalized, universal? What percentage of the body surface is involved (the palm is roughly equivalent to 1%)?
 - b. *Pattern:* symmetry, exposed areas, sites of pressure, intertriginous areas?
 - c. *Characteristic location:* flexural, extensor, intertriginous, glabrous, palms and soles, dermatomal, trunk, lower extremities, exposed areas, etc.?
2. *Type of lesion:* macule, papule, nodule, vesicle, etc.?
3. *Shape of individual lesions:* annular, iris, arciform, linear, round, oval, umbilicated, etc.?
4. *Arrangement of multiple lesions:* isolated, scattered, grouped, herpetiform, zosteriform, annular, arciform, linear, reticular, etc.?

Physical Examination

B. Three major characteristics:

1. *Color:*

- a. *If diffuse:* red, brown, gray-blue, orange-yellow, etc.; or *if circumscribed:* red, violaceous, orange, yellow, lilac, livid, brown, black, blue, gray, white, etc.?
- b. Does color blanch with pressure (diascopy test)?
- c. Wood's lamp examination of pigmentary alterations: Is contrast enhanced?

2. *Consistency and feel of lesion:* soft, doughy, firm, hard, "infiltrated", dry, moist, mobile, tender?

3. *Anatomic component(s) of skin primarily affected:* Is the process epidermal, dermal, subcutaneous, appendageal, or a combination of these?

Physical Examination

Special procedures for dermatologic diagnosis are:

- palpation of the lesion – reveals the consistence, texture, deepness, stratification, “infiltrated” character, mobility, temperature, fluctuation, etc.
- diascopy or vitropressure reveals dermal modifications (apple jelly sign – hyaline yellowish-brown color of papules and nodules), vascular changes (erythema, purpura, telangiectasia)
- instrumental dermatoscopy – important for pigmentary, vascular, neoplastic lesions, etc.
- raclage of lesions reveals hyperkeratotic scales (dermatomycosis) and parakeratotic scales (psoriasis), grattage triad in psoriasis (oil spot, terminal film, pinpoint dots of blood – bloody dew), Besnier’s sign in lupus erythematosus, latent desquamation in tinea versicolor
- dermatographism - white, red and mixed type, persistency, elevation level
- appreciation of pain, temperature, touch perception (an important sign in leprosy)
- appreciation of sebaceous and sweat glands function (for acne, ichthyoses, dishidrosis, etc.)

Physical Examination

Specific instrumental and laboratory investigations confirming dermatologic diagnosis:

- skin biopsy (histopathologic analysis)
- Gram's stain (microscopic examination),
- cytologic preparation,
- bacteriologic and fungal cultures
- confirming the diagnosis of scabies
- patch testing to confirm contact dermatitis, etc.

DERM ABC - SKIN LESIONS

Primary lesions		
Lesion	Description	Example
Macule	A flat, circumscribed area of altered skin color	Vitiligo, purpura HS pityriasis versicolor
Papule Plaque	A small circumscribed elevation of the skin (<0.5cm) Elevated solid confluence of papules (>0.5 cm)	Molluscum cont. Psoriasis
Nodule/ tubercle	A solid, circumscribed elevation whose greater part lies beneath the skin surface	Erythema nodosum, Tertiar syphilis, Lepra
Weal	A transient, slightly raised lesion, usually with a pale centre and a pink margin	Urticaria
Vesicle	A small, circumscribed, fluid-containing elevation (<0.5 cm)	Eczema, herpes simplex
Bulla	Similar to vesicle but larger (>0.5 cm)	Pemphigus, bullous pemphigoid
Pustule	A collection of pus	Acne, impetigo

DERM ABC - SKIN LESIONS

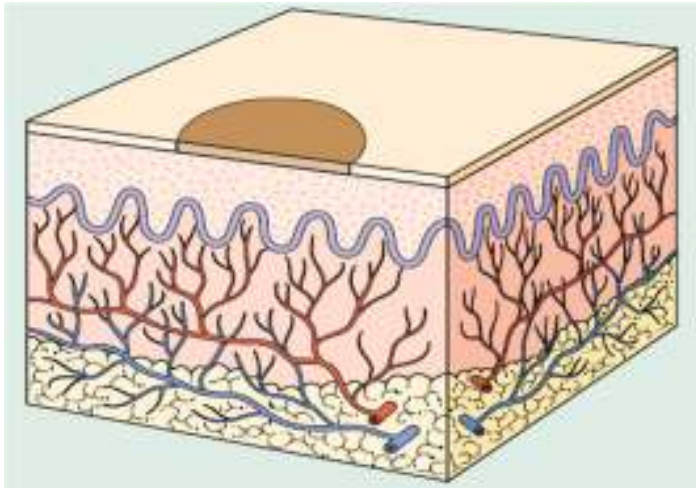
Secondary lesions		
Scale	Thickened, loose, readily detached fragments of stratum corneum	Psoriasis, ichthyosis, pityriasis versicolor
Crust	Dried exudate	Impetigo, eczema
Excoriation	A shallow abrasion often caused by scratching	Atopic dermatitis
Ulcer	An excavation due to loss of tissue exceeding the basement membrane and deeper	Venous stasis ulceration
Scar	A permanent lesion that results from the process of repair by replacement with connective tissue	CLE
Lichenification	Areas of increased epidermal thickness with accentuation of skin	Atopic dermatitis
Erosion	A moist, circumscribed, depressed lesion that results from loss of the viable epidermis	Pemphigus, eczema
Fissures	Linear cleavages or cracks in the skin and may be painful	Palmar/plantar psoriasis, tinea pedis
Vegetation		
Macule (sec.)	A flat, circumscribed area of altered skin color	After any primary lesion

Macula

A macule is a circumscribed, flat lesion that differs from surrounding skin because of its color. Macules may have any size or shape. They may be:

- **Dyschromic**
 - hyperpigmented (darker skin) – junctional nevi, café au lait (neurofibromatosis)
 - hypopigmented (lighter skin) – vitiligo, tuberous sclerosis
- **Vascular by capillary dilatation**
 - inflammatory – roseola (less than 1cm diameter) seen in secondary syphilis; erythema (greater than 1cm diameter) seen in eczema, drug-induced; erythroderma (involving all skin surface) seen in psoriasis, lichen planus, drug-induced, etc.;
 - non-inflammatory – telangiectasis (permanent dilatation of capillaries that may or may not disappear with application of pressure) seen in lupus erythematosus, dermatomyositis, rosacea, etc.
- **Vascular by red cell extravasation or purpuric macules** (don't disappear or blanch by pressure) – petechiae (less than 5 mm); purpura (greater than 5 mm); **ecchymoses** are larger, bruise-like purpuric lesions, all are seen in vasculitis

MACULA



Phototoxic drug eruption



Lentigo

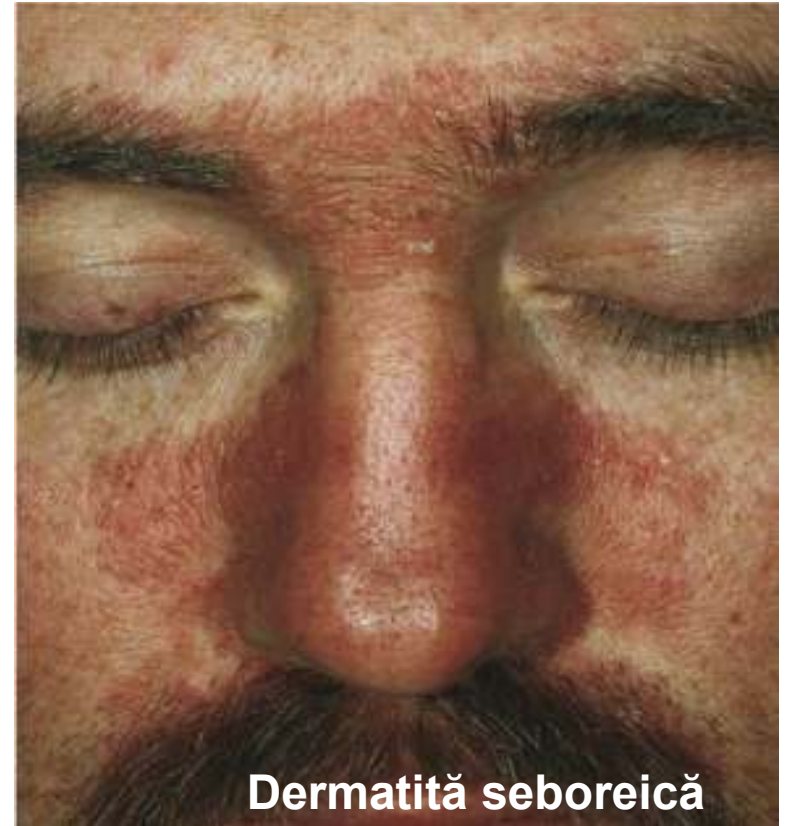


Tuberous sclerosis



Henoch-Schönlein purpura

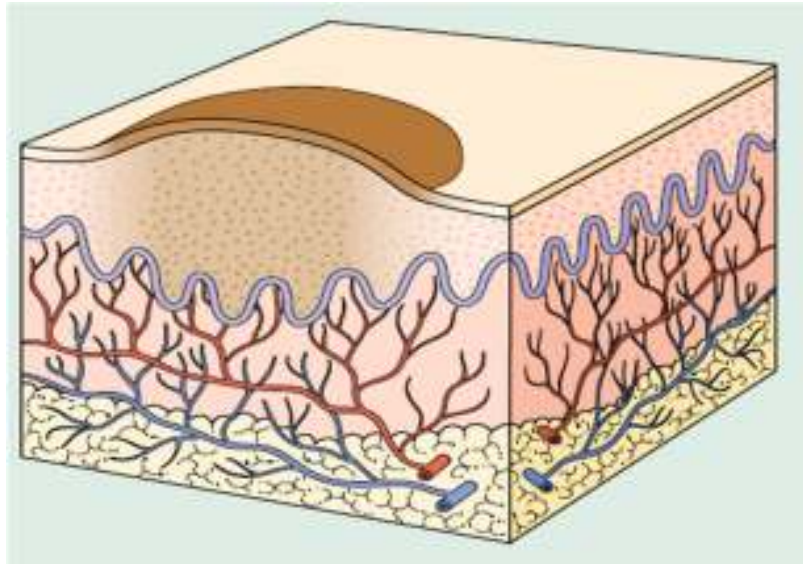
Macula



Papula

- A papule is a small solid, elevated lesion less than 0,5 cm in diameter. The elevation can be a result of metabolic deposits, localized hyperplasia of cellular components of the epidermis or dermis, or localized cellular infiltrates in the dermis.
- Papules may have a variety of shapes. They may be:
 - acuminate (miliaria rubra);
 - surmounted with scale of keratin (secondary syphilis);
 - dome-shaped (molluscum contagiosum);
 - flat-topped (lichen planus).
- Papules by color: red – psoriasis; copper – secondary syphilis; violet – lichen planus; yellow – xanthomatosis.
- Papules may be follicular and perifollicular – acne, folliculitis, Darier's disease.

PAPULA



Lichen planus



Wart (cylindrical projections)



Nevi (dermal)

Plaque

Is a mesa-like elevation that occupies a relatively large surface area (more than 0,5 cm in diameter) in comparison with its height above skin level. Plaques are often formed by a confluence of papules, as in psoriasis. The typical psoriatic lesion is a raised, erythematous plaque with layers of silvery scale.

PAPULES and PLAQUES



Syphilis (secondary)

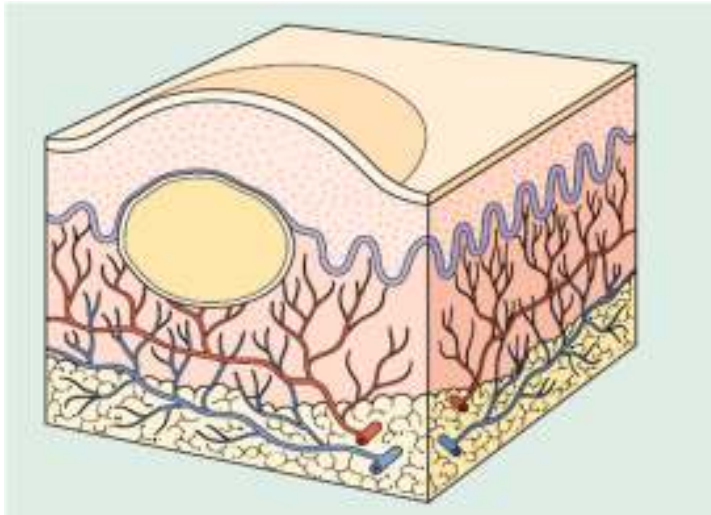


Psoriasis

Nodule

- Is a palpable, solid, round or ellipsoidal lesion. Depending upon the anatomic component(s) primarily involved, nodules are of five main types:
 1. **epidermal** (keratoacanthoma, verruca vulgaris, basal cell carcinoma);
 2. **epidermal-dermal** (nevi, malignant melanoma, invasive squamous cell carcinoma, mycosis fungoides);
 3. **dermal** (granuloma annulare, dermatofibromas);
 4. **dermal-subdermal** (erythema nodosum, superficial thrombophlebitis);
 5. **subcutaneous** (lipomas).
- **Nodules in the dermis and subcutis** may indicate systemic disease and result from inflammation, neoplasms, or metabolic deposits in the dermis or subcutaneous tissue. For example, late syphilis, tuberculosis, the deep mycosis, xanthomatosis, lymphoma, and metastatic neoplasms all can present as cutaneous nodules. A **gumma** is the granulomatous nodular lesion or tertiary syphilis and leproma is the same in leprosy

NODULE



Neurofibromatosis



Cutaneous T-cell lymphoma



Keratoacanthoma



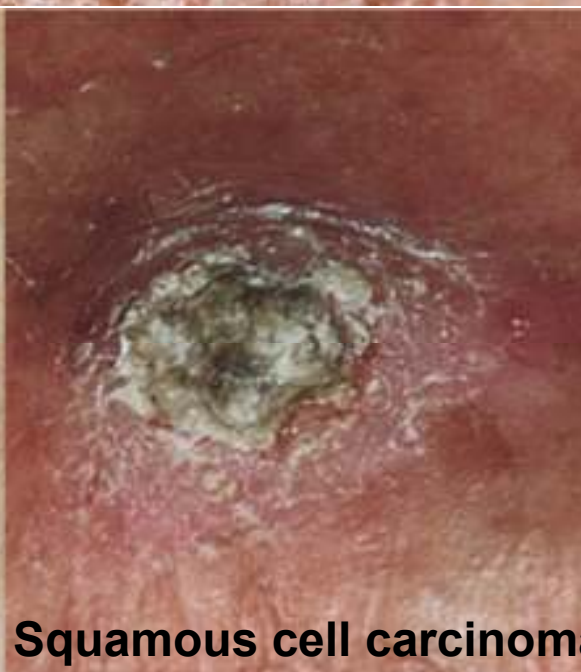
Basal cell carcinoma



Kaposi's sarcoma



Hemangioma



Squamous cell carcinoma

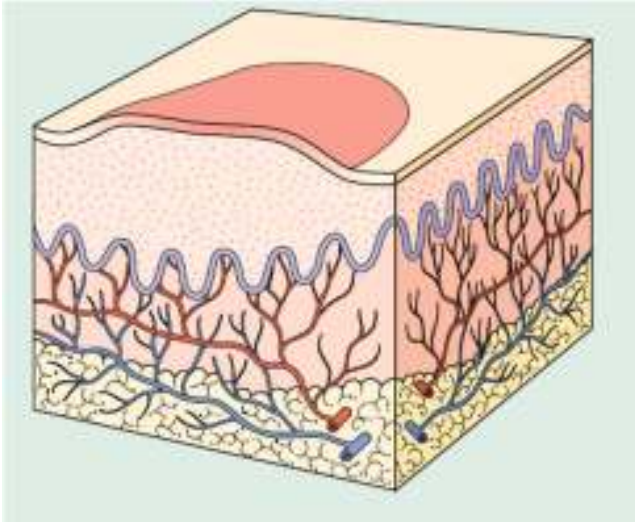


Melanoma

Wheals

- A wheal is rounded or flat-topped elevated lesion disappearing within hours.
- Wheals (hives or urticaria), are the result of edema in the upper portion of the dermis – edema of dermal papilla. Wheals may be tiny of 3-4 mm in diameter, as in cholinergic urticaria, or as giant urticaria of 10-12 cm caused by penicillin hypersensitivity.
- Stroking of the skin may produce wheals in some normal persons; this phenomenon is called dermographism and is one of the physical urticarias. When it is associated with significant itching, it is called symptomatic dermographism.
- Angioedema is a deep, edematous urticarial reaction that occurs in areas with very loose dermis and subcutaneous tissue, such as the lip.
- **Laryngeal edema !!!** which may cause airway obstruction.

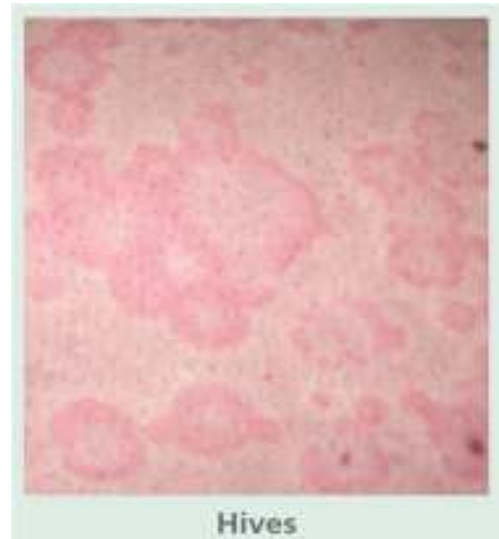
WHEEL



Dermographism



Urticaria pigmentosa

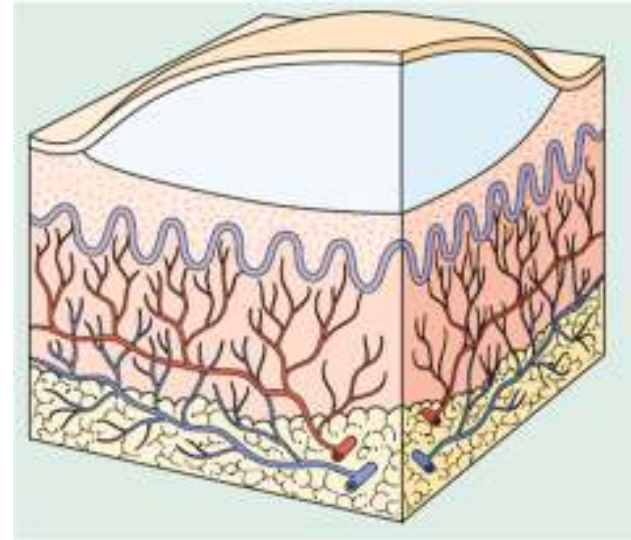
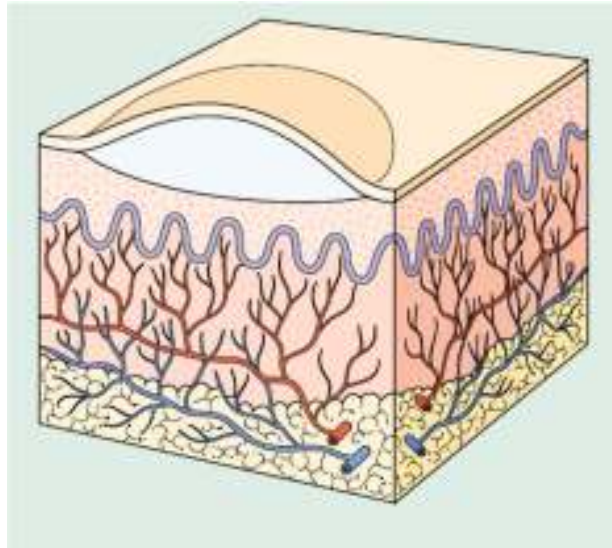


Hives

Vesicles and bullae

- A vesicle is a circumscribed, elevated lesion that contains fluid. Often the vesicle walls are so thin that they are translucent and the serum, lymph, blood, or extracellular fluid is visible.
- A vesicle with a diameter greater than 0,5 cm is a bulla.
- Vesicles and bullae arise from cleavage at various levels of the skin; the cleavage may be within the epidermis (epidermal), or at or below the dermal-epidermal interface (subepidermal). Cleavage just beneath the stratum corneum produces a subcorneal vesicle or bulla, as in impetigo.
- Intraepidermal vesication may result from intercellular edema (spongiosis), as characteristically seen in delayed hypersensitivity reactions of the epidermis (contact eczematous dermatitis) and in dishidrotic eczema.
- *Spongiotic vesicles* may be detectable microscopically but may not be clinically apparent as vesicles.

VESICLE AND BULAE



Herpes zoster



Dermatitis herpetiformis



Bullous pemphigoid

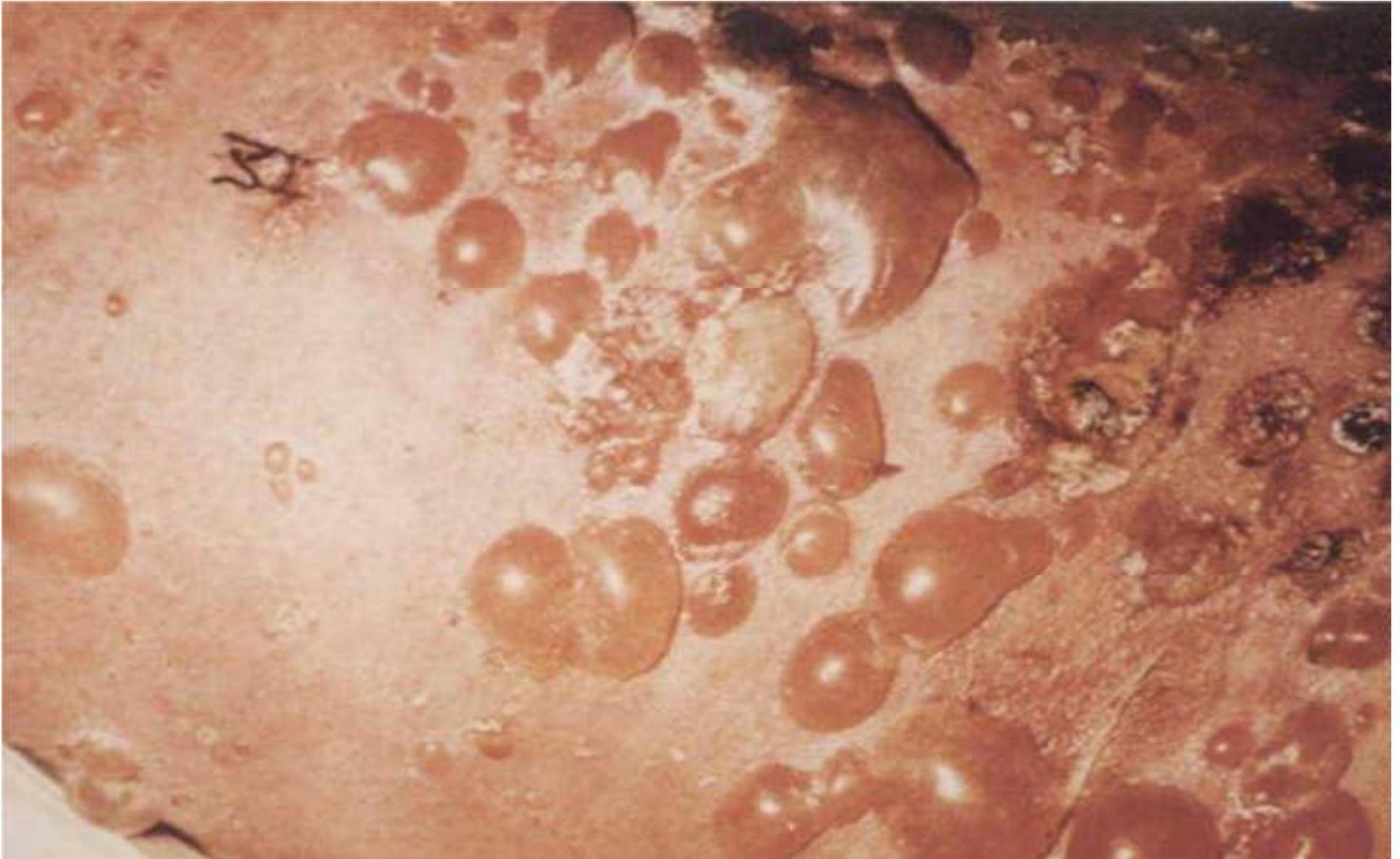
Eczema



Vesicles and bullae

- Loss of intercellular bridges, or desmosomes, is known as *acantholysis*, and this type of intraepidermal vesication is seen in pemphigus vulgaris, where the cleavage is usually just above the basal layer. In pemphigus foliaceus the cleavage occurs just below the sub-corneal layer.
- Viruses cause a curious “ballooning degeneration” of epidermal cells, as in herpes zoster, herpes simplex, variola, and varicella. Viral bullae often have a depressed (“umbilicated”) center.
- Pathologic changes at the dermal-epidermal junction may lead to subepidermal vesicles and bullae, as are seen in pemphigoid, bullous erythema multiforme, porphyria cutanea tarda, dermatitis herpetiformis, and some forms of epidermolysis bullosa.

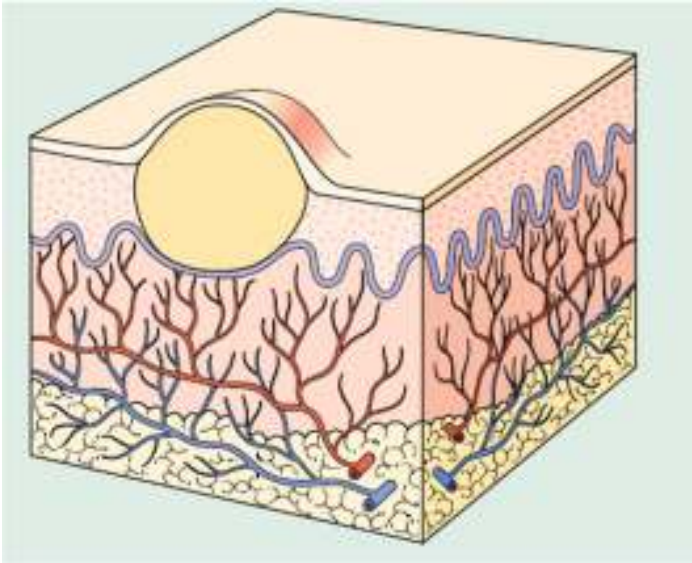
Bule – pemfigus vulgar



Pustule

- A pustule is a circumscribed, raised lesion that contains a purulent exudate (pus), can be sterile or non-sterile
- Pustules may vary in size and shape and, depending on the color of the exudate, may appear white, yellow, or greenish yellow.
- Can be follicular and non-follicular.
- Pustules are characteristic for rosacea, pustular psoriasis, Reiter's disease, and some drug eruptions, especially those due to bromide or iodide; Vesicular lesions of some viral diseases (varicella, variola, vaccinia, herpes simplex, and herpes zoster), as well as the lesions of dermatophytosis, may become pustular.
- A Gram's stain and culture of the exudate from pustules should always be performed.

PUSTULE



Folliculitis



Impetigo

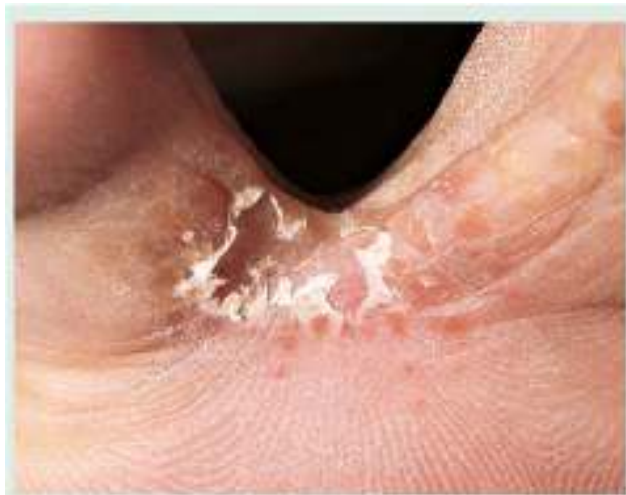
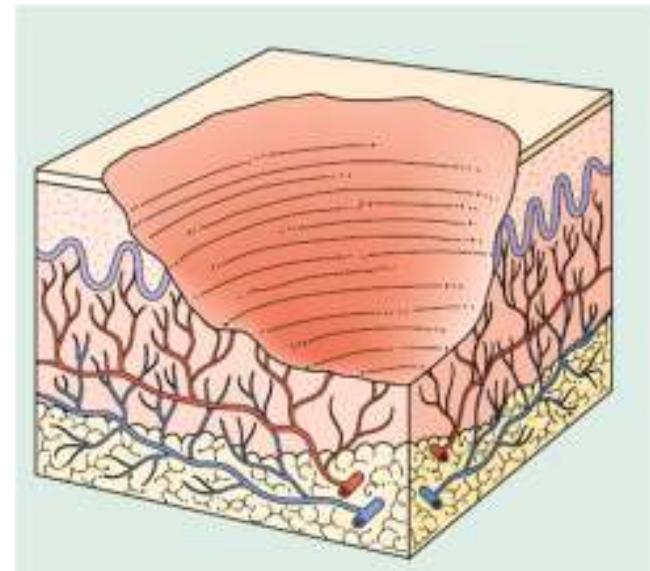
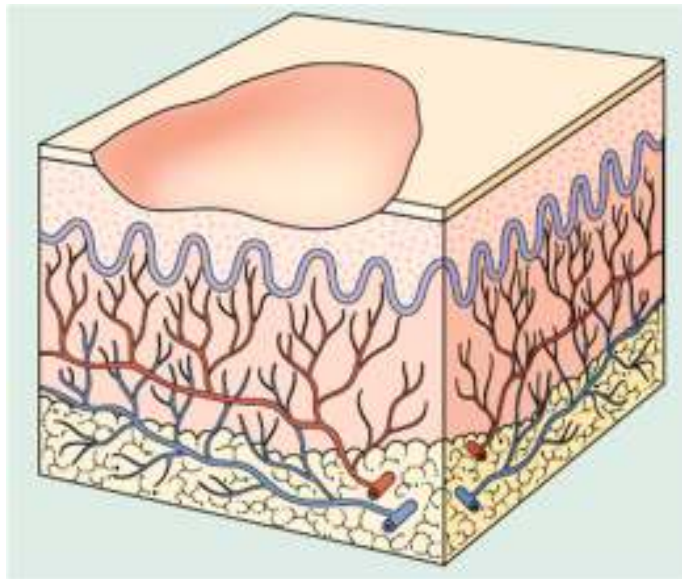


Acne

Erosions

- An erosion is a moist, circumscribed, usually depressed lesion that results from loss of all or a portion of the viable epidermis.
- After the rupture of vesicles or bullae, the moist areas remaining at the base are called erosions. Extensive areas of denudation due to erosions may be seen in bullous diseases such as pemphigus.
- Unless they become secondarily infected, erosions usually do not scar.
- If inflammation extends into the papillary dermis, an ulcer is present and scarring results, as in vaccinia and variola, and less often in herpes zoster and varicella.

EROSION AND ULCER



Tinea pedis



Ulcer

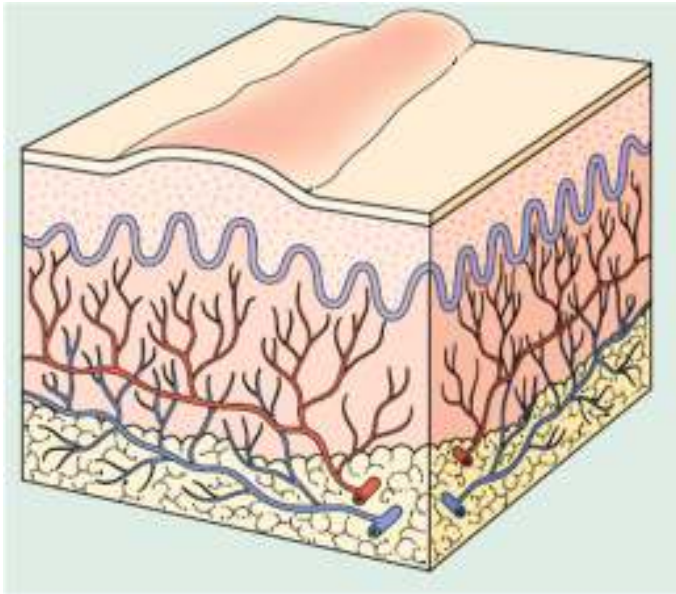
Ulcers

- An ulcer is a lesion in which there has been destruction of the epidermis and at least the upper (papillary) dermis involved.
- Ulcers are healing through scarring.
- Certain features that are helpful in determining the cause of ulcers and that must be considered in describing them include location, borders, base, discharge, and any associated topographic features of the lesion or surrounding skin such as nodules, excoriations, varicosities, hair distribution, presence or absence of sweating, and adjacent pulses. Stasis ulcers are accompanied by pigmentation and, occasionally, by edema or sclerosis.
- Ulceration occurs in granulomatous nodules of various types due to deep fungi, tuberculosis, syphilis, and yaws, as well as in a variety of parasitic and bacteriologic disorders. Nodules adjacent to ulcerations suggest granulomatous or neoplastic disease.

Scar

- A scar occurs wherever ulceration has taken place and reflects the pattern of healing in those areas.
- Scars may be hypertrophic or atrophic.
- They may be sclerotic, or hard, as a consequence of collagen proliferation.
- The scarred epidermis is thin, generally without normal skin lines and without appendages. A depressed scar may resemble the primary atrophy.
- Scars may occur in the course of acne, some porphyrias, herpes zoster, and varicella. Raynaud's disease, syphilis, tuberculosis (especially on the face), leprosy, or carcinoma may produce mutilations, or a loss of tissue that alters major anatomic structures.

SCARS

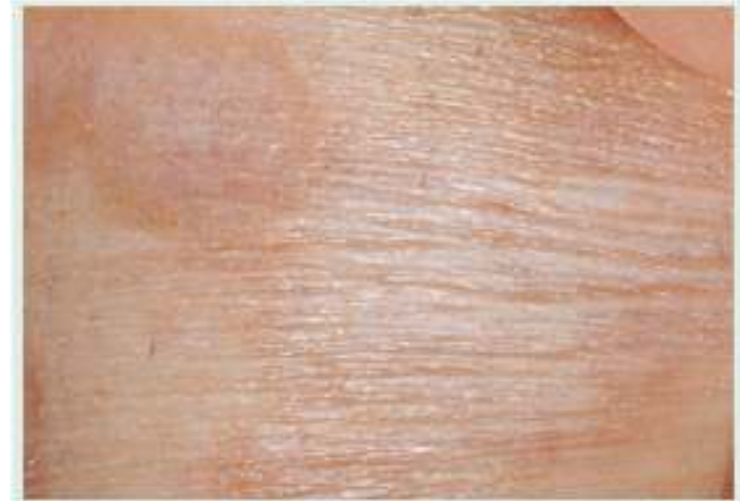
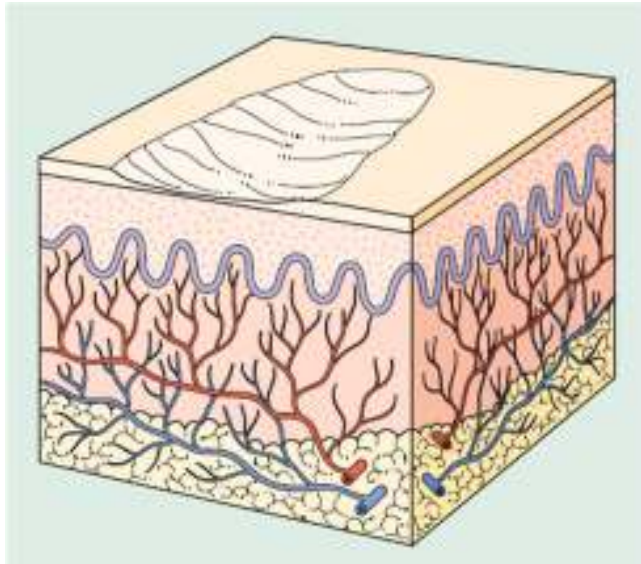


Herpes zoster



Porphyria

ATROPHY



Lichen sclerosus



Topical and intralesional steroids

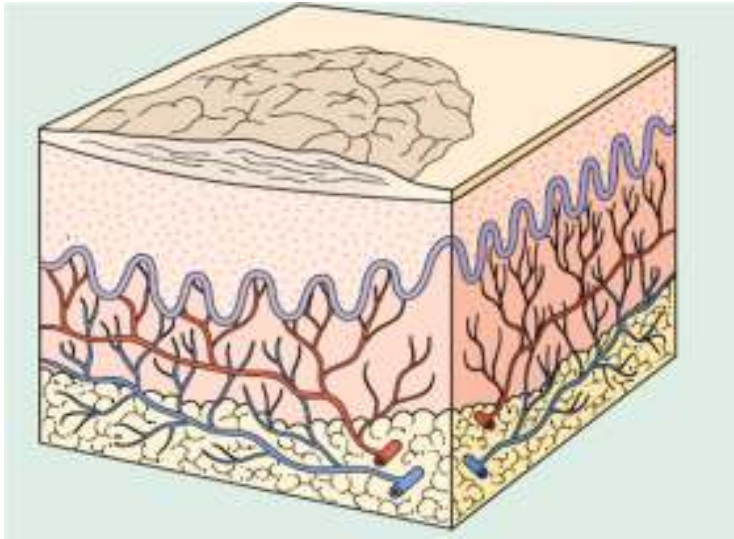


Morphea

Scaling (desquamation)

- Abnormal shedding or accumulation of stratum corneum in perceptible flakes is called scaling.
- Under normal circumstances the epidermis is completely replaced every 27 days. The cornified cell is packed with filamentous proteins, normally does not contain a nucleus and is usually lost imperceptible.
- When keratinocytes production occurs at an increased rate, as in psoriasis, immature keratinocytes that retain nuclei reach the skin surface – this is called parakeratosis.
- Parakeratotic scales - in psoriasis, scales may appear in thin sheets or accumulate massively, suggesting the appearance of an oyster shell.
- Orthokeratotic scales - densely adherent scales that have a gritty feel like sandpaper are typically seen in solar keratosis; fishlike scale occurs in a group of disorders known as ichthyoses, other - dermatophyte infections, pityriasis rosea, secondary and tertiary syphilis.

SCALE



Ichthyosis—sex-linked
(quadrangular)



Psoriasis (silvery)

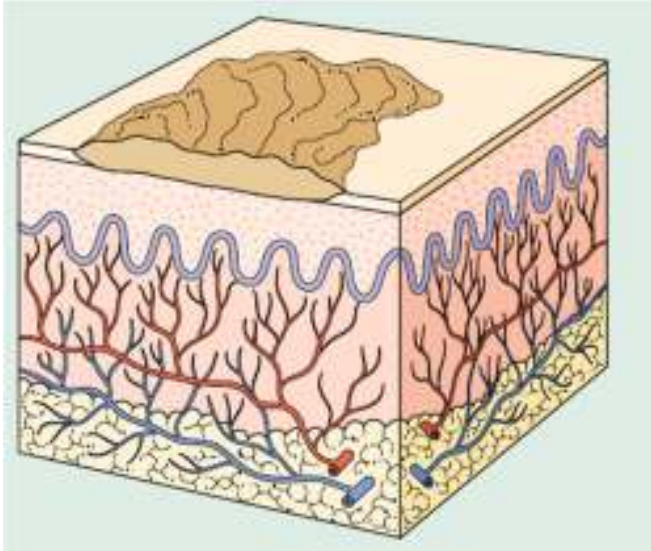


Tinea versicolor
(fine)

Crusts (encrusted exudates)

- Crusts result when serum, blood, or purulent exudate dries on the skin surface, and are characteristic of pyogenic infections.
- Crusts may be thin, delicate, and friable, or thick and adherent.
- Crusts are yellow when formed from dried serum, green or yellow-green when formed from purulent exudate, or brown or dark red when formed from blood.
- Crusts may be present in acute eczematous dermatitis and impetigo (honey-colored, glistening crusts).
- When the exudate or crust involves the entire epidermis, the crusts may be thick and adherent: this condition is known as ecthyma. A scutula is a small, yellowish, cupshaped crust especially characteristic of superficial fungal infection of the scalp caused by *Trichophyton schoenleinii*.

CRUST



Impetigo (honey colored)



Pemphigus foliaceus

Excoriations

- Excoriations are superficial excavations of epidermis that may be linear or punctate and result from scratching.
- They are findings in all types of pruritus and are concomitants of pruritic skin disease, such as atopic eczema, dermatitis herpetiformis, or infestations.

Lichenification

- Repeated rubbing, especially in people with chronic eczema, leads to areas of lichenification.
- Proliferation of keratinocytes and stratum corneum, in combination with changes in the collagen of the underlying dermis, causes lichenified areas of skin to appear as thickened plaques with accentuated skin markings.
- The lesions may resemble tree bark.
- They are findings in atopic dermatitis, chronic eczema, neurodermitis, etc.

EXCORIATION



Excoriation

LICHENIFICATION

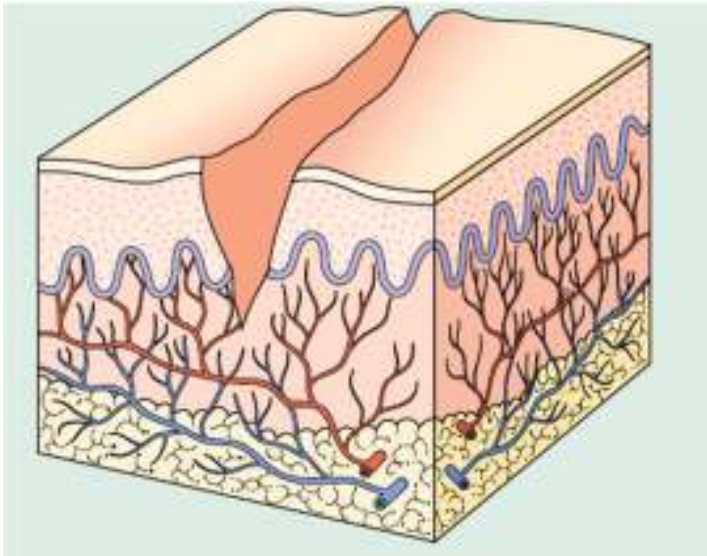


Lichenification

Fissures

- Fissures are linear cleavages or cracks in the skin and may be painful.
- They occur particularly in palmar/plantar psoriasis and in chronic eczematous dermatitis of the hands and feet, especially after therapy that has caused excessive drying of the skin.
- Fissures are frequently noted in perianal psoriasis or at the angles of the mouth (perleche). Perleche may be caused by avitaminosis, moniliasis, ill-fitting dentures, or unknown factors.

FISSURE



Perlèche

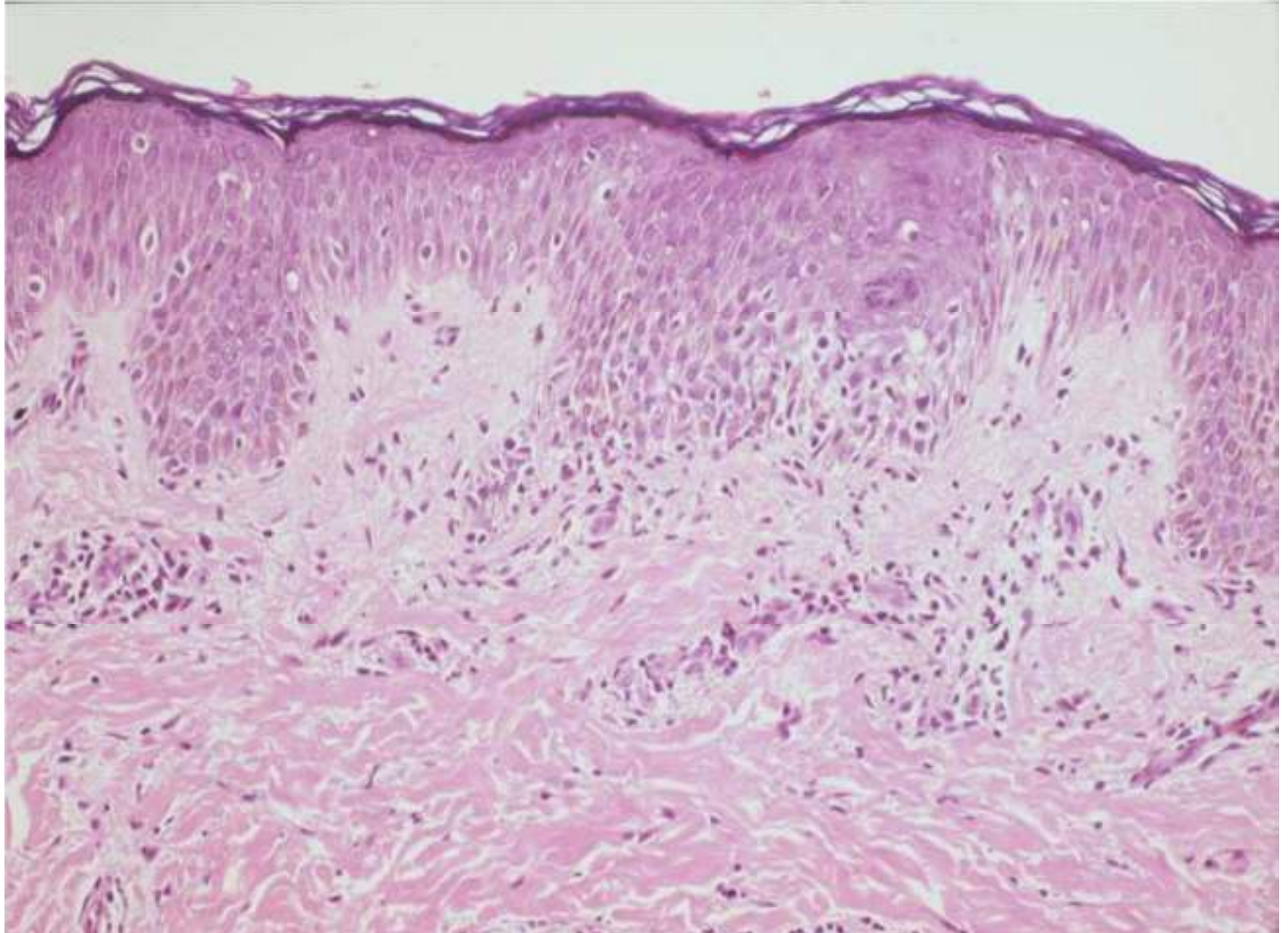


Eczema

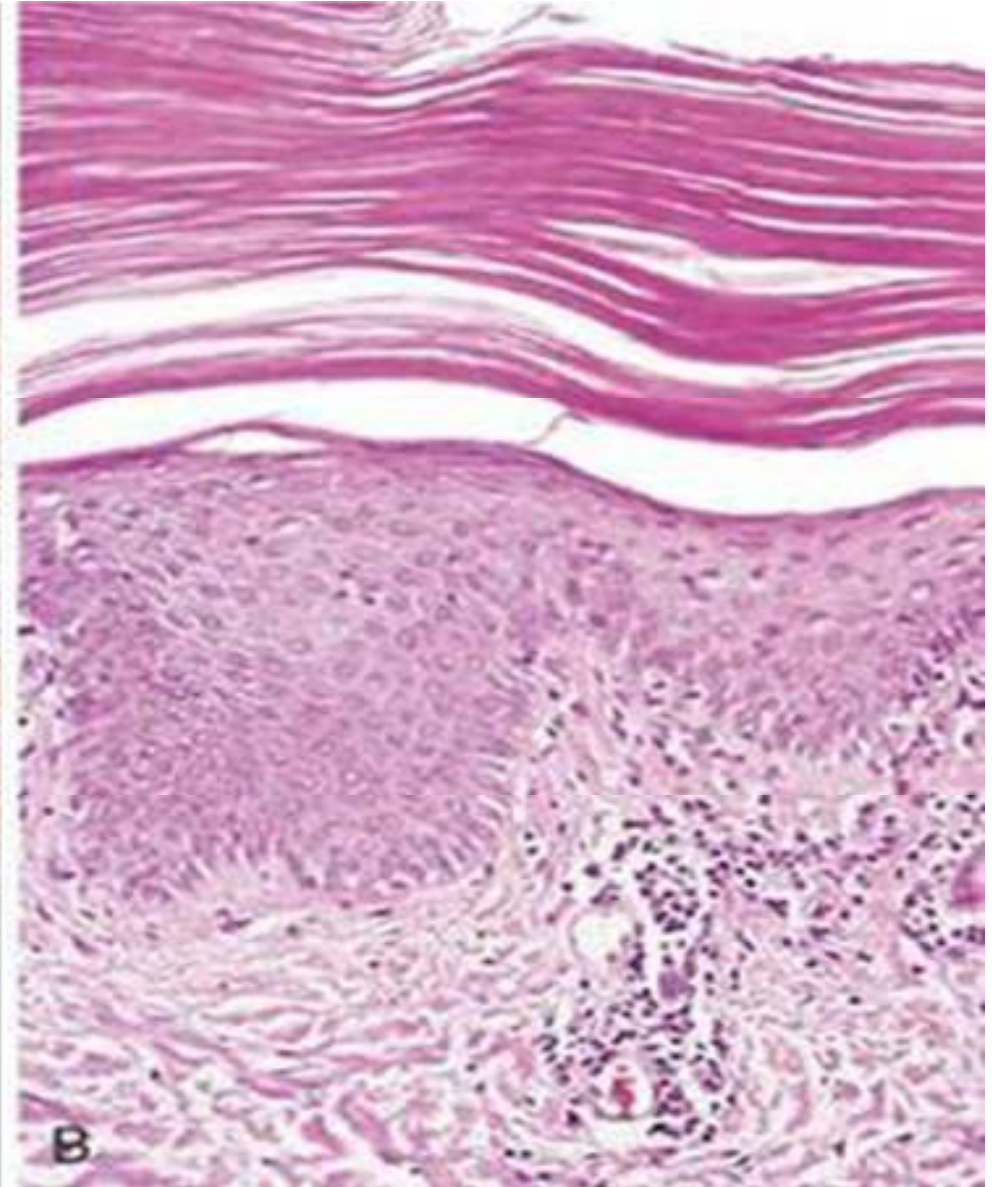


Intertrigo

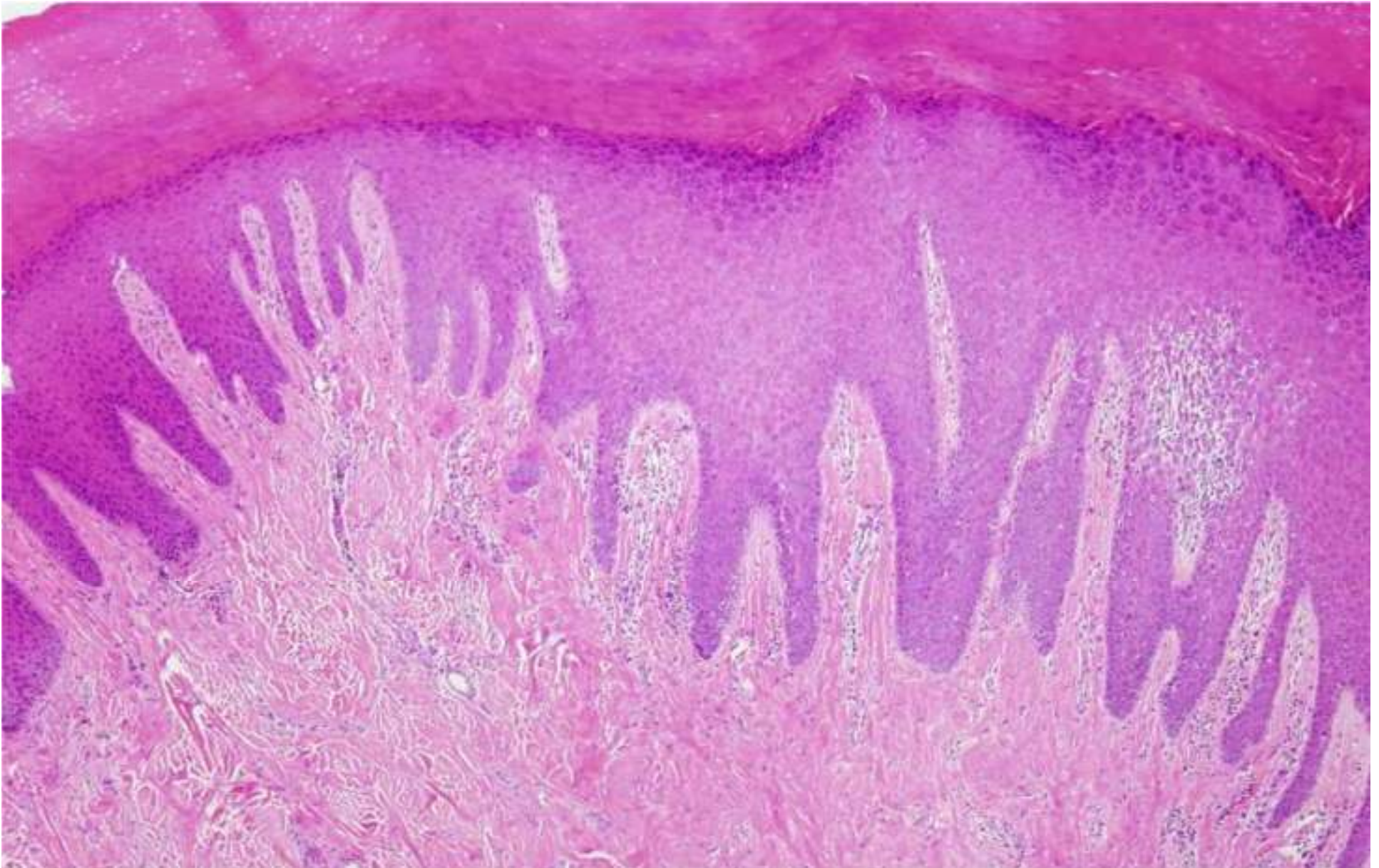
Spongiosis



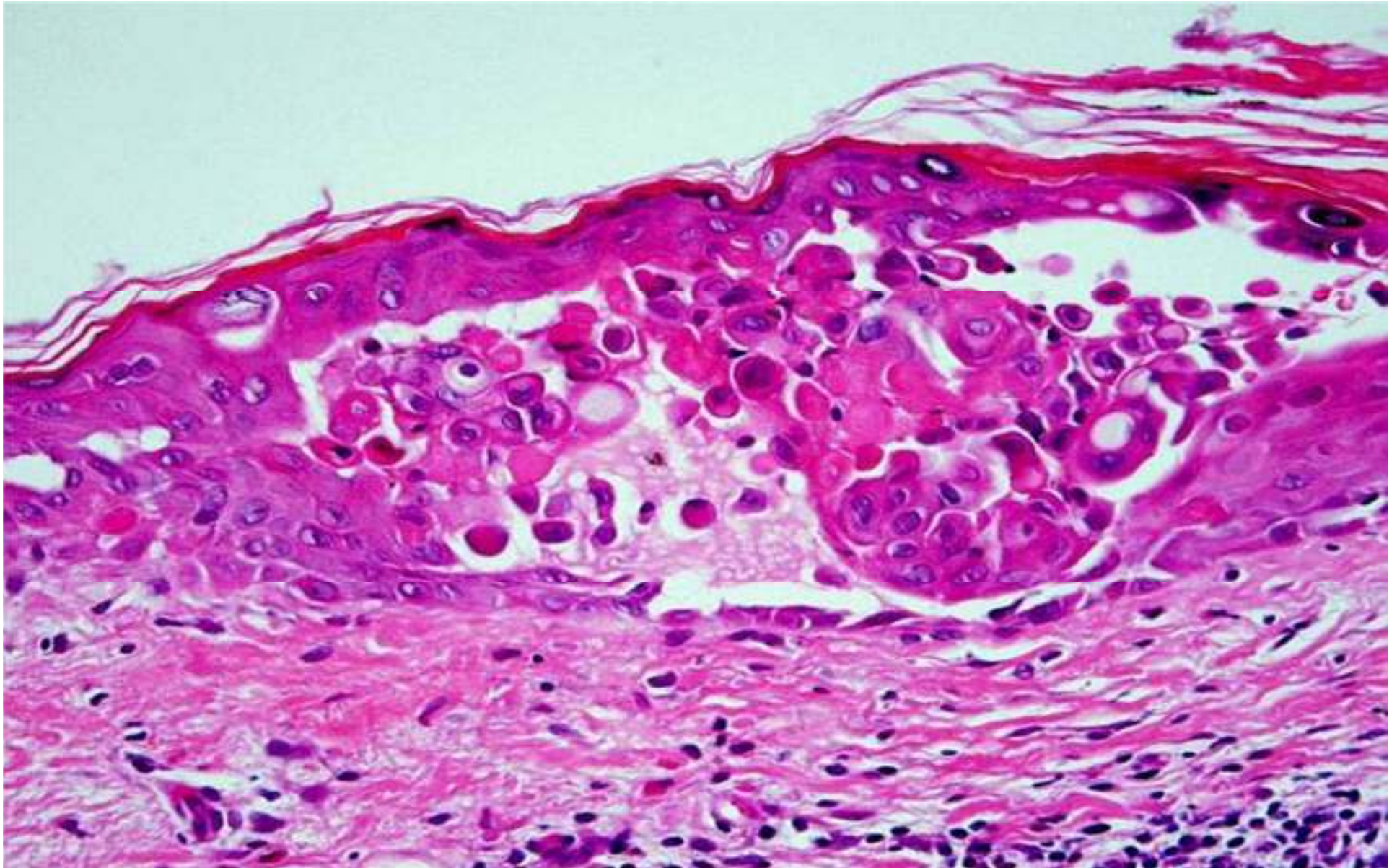
Hyperkeratosis (ihtiozis lamelaris)



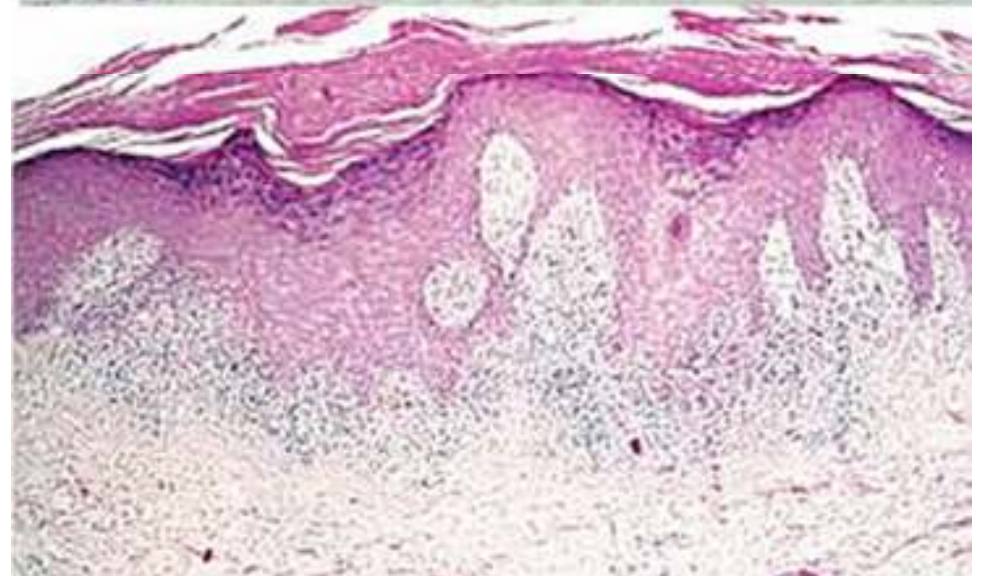
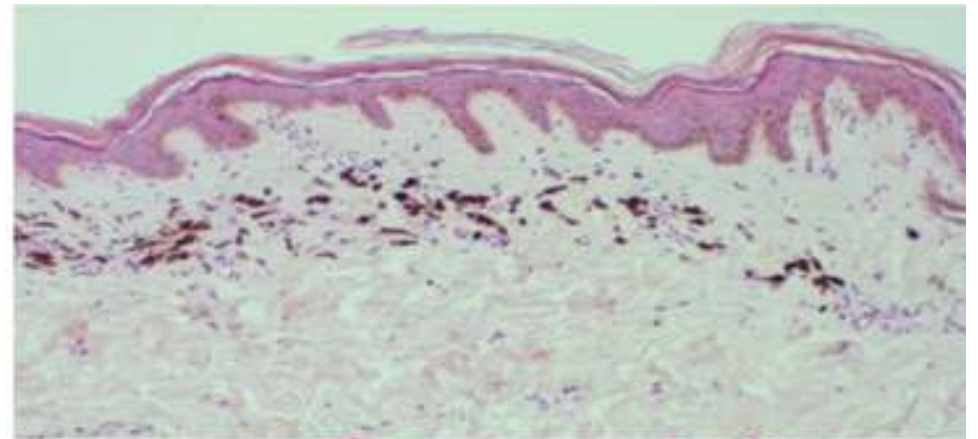
Parakeratosis, acantosis, papilomatosis



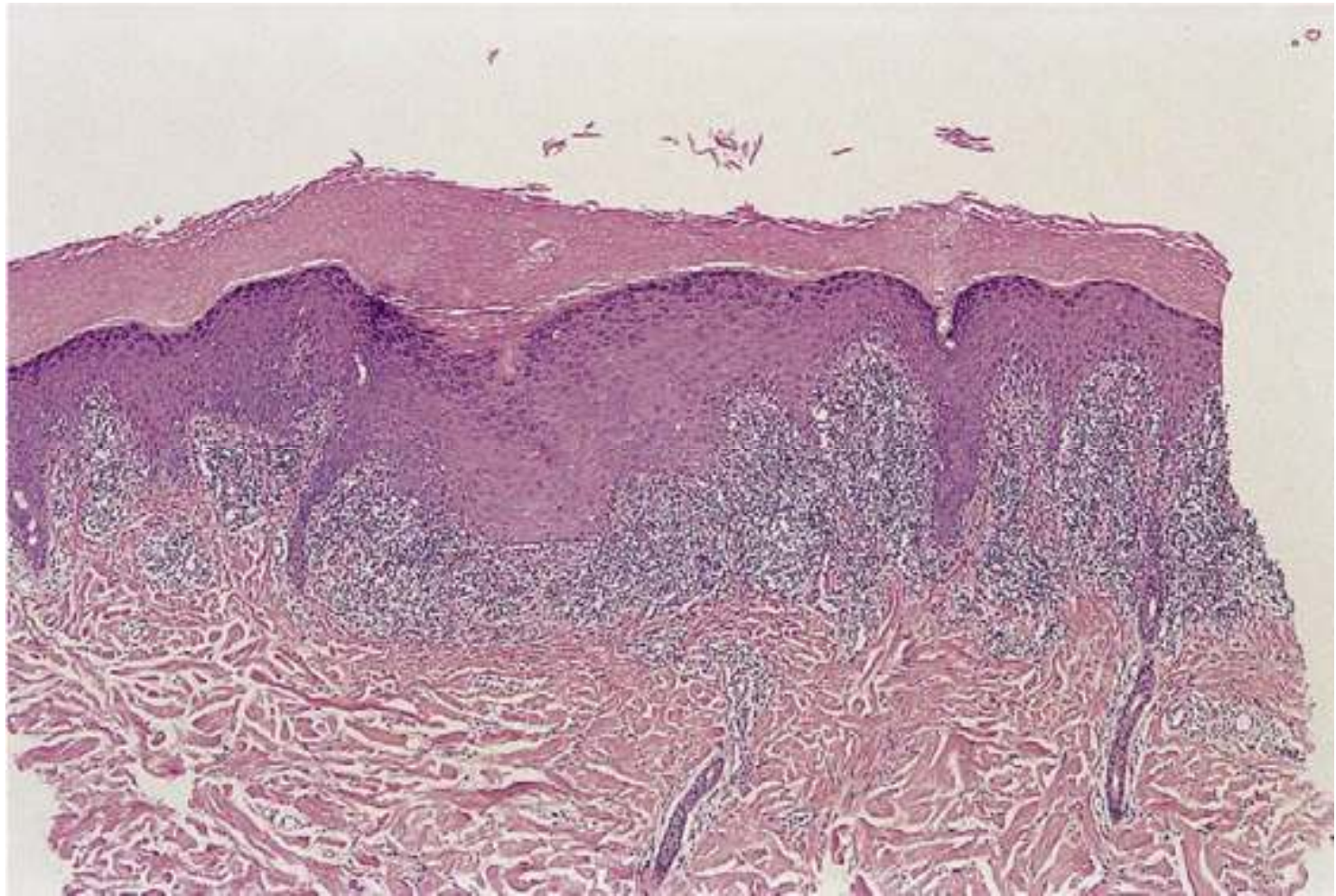
Acantholysis – pemfigus vulgaris



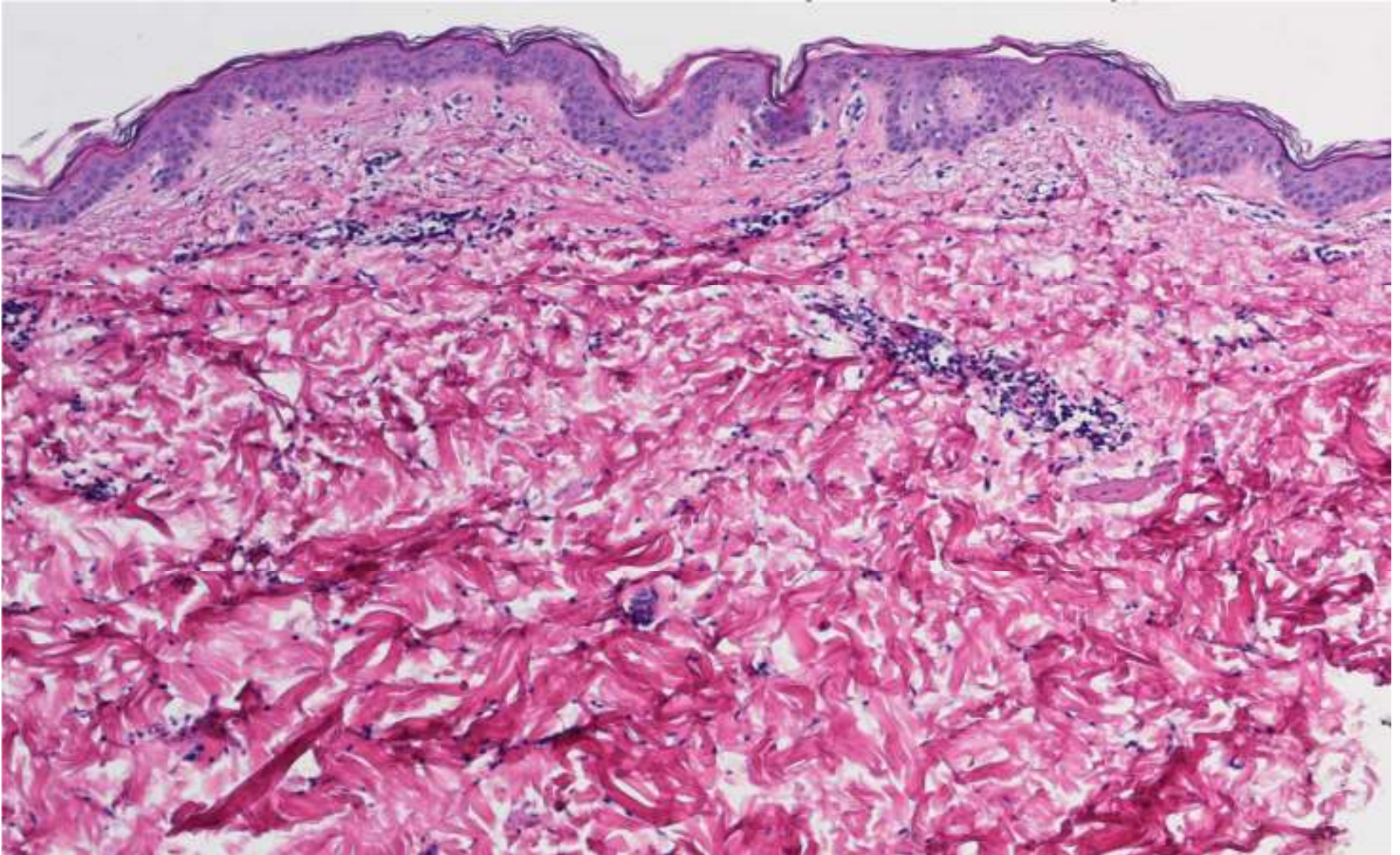
Hydropic degeneration, hypergranulosis lichen planus



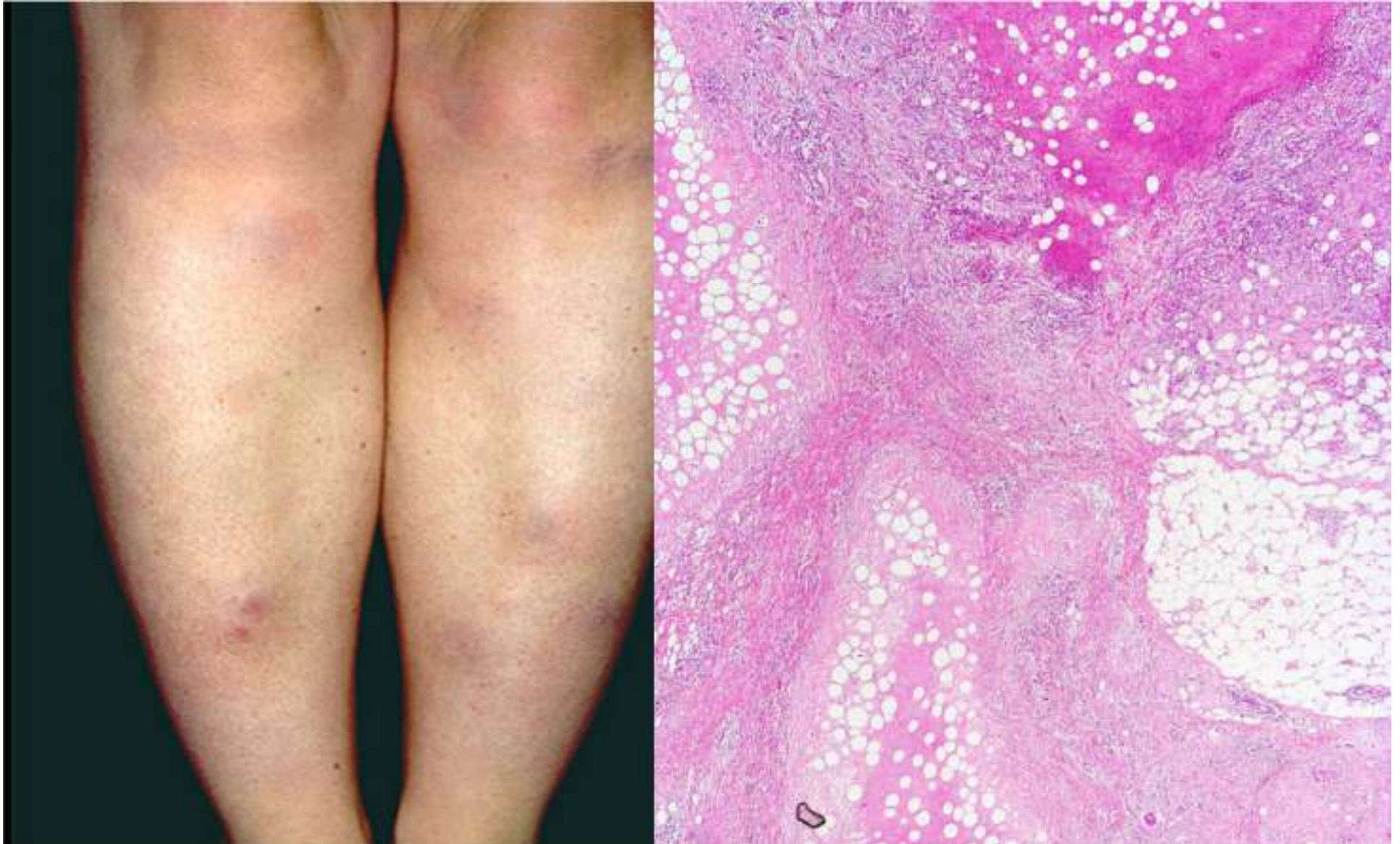
Band-like infiltrate in dermis – lichen planus



Dermal edema (urticaria)



Septal panniculitis – erythema nodosum



The treatment of skin disease

- topical,
- systemic,
- intralesional,
- radiation
- surgical modalities

Topical treatment: vehicles+/-active ingredients

- **Lotion.** A liquid vehicle, often aqueous or alcohol-based, which may contain a salt in solution. A *shake lotion* contains an *insoluble* powder (e.g. calamine lotion).
- **Cream.** A semi-solid emulsion of oil-in-water; contains an emulsifier for stability, and a preservative to prevent overgrowth of microorganisms.
- **Gel.** A transparent semi-solid, nongreasy emulsion.
- **Ointment.** A semi-solid grease or oil, containing little or no water but sometimes with added powder; no preservative is usually needed; the active ingredient is suspended rather than dissolved.
- **Paste.** An *ointment base* with a high proportion of powder 50% (starch or zinc oxide) producing a stiff consistency.

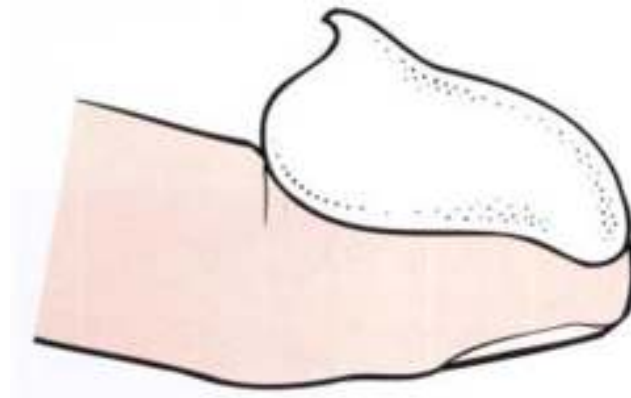


Fig. 1 The fingertip unit (FTU) = $\frac{1}{2}$ g.

Fingertip unit – FTU:

the amount of cream or ointment that can be applied to the terminal phalanx of the index finger - one FTU equals 0,5 g.

Table 1 An overview of topical medicaments

Drug	Indications	Pharmacology
Corticosteroids	Eczemas, psoriasis, lichen planus, discoid lupus erythematosus, sunburn, pityriasis rosea, mycosis fungoides, photodermatoses, lichen sclerosus	Mode of action is through vasoconstrictive, anti-inflammatory and anti-proliferative effects; medication is available in different strengths; side-effects need to be considered
Antiseptics	Skin sepsis, leg ulcers, infected eczema	Chlorhexidine, benzalkonium chloride, silver nitrate and potassium permanganate are used
Antibiotics	Acne, rosacea, folliculitis, impetigo, infected eczema	Chlortetracycline, neomycin, bacitracin, gramicidin, polymixin, sodium fusidate, and mupirocin are available; resistance and sensitization are potential problems. Metronidazole is used for rosacea
Antifungals	Fungal infections of the skin, <i>Candida albicans</i> infections	Nystatin, clotrimazole, miconazole, econazole, terbinafine, ketoconazole, sulconazole and amorolfine are available
Antiviral agents	Herpes simplex, herpes zoster	Aciclovir, penciclovir
Parasiticidals	Scabies, lice	Benzyl benzoate, permethrin and malathion for scabies; malathion, permethrin and carbaryl for lice – applied as lotion or shampoo
Coal tar	Psoriasis, eczema	Presumed anti-inflammatory and anti-proliferative effects; available as creams, shampoos and in paste bandages
Dithranol	Psoriasis	Anti-proliferative effects; available as creams, pastes and ointments
Vitamin D analogues	Psoriasis	Calcipotriol and tacalcitol inhibit keratinocyte proliferation and promote differentiation; creams and ointments available
Keratolytics	Acne, scaly eczemas	Salicylic acid, benzoyl peroxide and tretinoin
Retinoids	Acne, psoriasis	Isotretinoin (acne), tazarotene (psoriasis)

Table 2 Relative potencies of topical steroids

Potency	Example (Generic name)	Proprietary name (UK)
Mild	Hydrocortisone 1% and 2.5%	Efcortelan, Mildison,
Moderately potent	Clobetasone butyrate 0.05%	Eumovate
	Desoximethasone 0.05%	Stiedex LP
	Flurandrenolone 0.0125%	Haelan
	Alclometasone dipropionate 0.05%	Modrasone
Potent	Betamethasone valerate 0.1%	Betnovate (Valisone USA)
	Beclomethasone dipropionate 0.025%	Propaderm
	Betamethasone dipropionate 0.05%	Diprosone (UK and USA)
	Fluocinolone acetonide 0.025%	Synalar (UK and USA)
	Fluocinonide 0.05%	Metosyn (Lidex USA)
	Fluticasone propionate 0.05%	Cutivate (UK and USA)
	Hydrocortisone 17-butyrate 0.1%	Locoid (UK and USA)
	Mometasone furoate 0.1%	Elocon
	Triamcinolone acetonide 0.1%	Adcortyl (Aristocort, Kenalog USA)
Very potent	Clobetasol propionate 0.05%	Dermovate (Temovate USA)
	Diflucortolone valerate 0.3%	Nerisone Forte

Table 3 An overview of systemic therapy

Group	Drug	Indications
Corticosteroids	Prednisolone usually	Bullous disorders, connective tissue disease, vasculitis
Cytotoxics	Methotrexate	Psoriasis, sarcoidosis
	Hydroxyurea	Psoriasis
	Azathioprine	Bullous disorders, chronic actinic dermatitis, atopic eczema
Immunosuppressants	Ciclosporin	Psoriasis, atopic eczema, pyoderma gangrenosum
	Gold	Bullous disorders, lupus erythematosus
Immunomodulators	Inosine pranobex	Viral warts (genital), herpes simplex (genital)
Retinoids	Acitretin	Psoriasis, other keratinization disorders
	Isotretinoin	Acne
Antifungals	Griseofulvin, terbinafine	Fungal infection
	Ketoconazole	Fungal infection (<i>C. albicans</i> too)
	Itraconazole, fluconazole	Fungal infection, candidiasis
Antibiotics	Various	Skin sepsis, acne, rosacea
Antivirals	Aciclovir, valaciclovir	Herpes simplex, herpes zoster
	Famciclovir	Herpes zoster, genital herpes simplex
Antihistamines	H 1 blockers	Urticaria, eczema
Antiandrogens	Cyproterone	Acne (females only)
Antimalarials	Hydroxychloroquine	Lupus erythematosus, porphyria cutanea tarda
Antileprotic	Dapsone	Dermatitis herpetiformis, leprosy, vasculitis

