



中国科学院教材建设专家委员会规划教材
全国高等医药院校规划教材

DERMATOVENEREOLOGY

皮肤性病学

(英文版)

Chief Editor Song Zhiqi (宋智琦)



科学出版社

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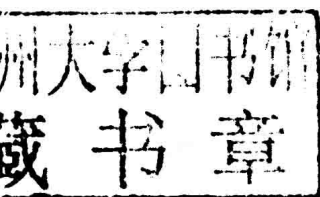
Chief Editor (主编): Song Zhiqi (宋智琦)

Associate Editors (副主编): Lin Jingrong (林景荣) Gao Mingyang (高明阳)

English Editor (英文主审): Molu Ozukum

Contributors (编委): Han Shixin (韩世新) Guo Wei (郭伟)

Piao Yongjun (朴永君) Yu Xiaohong (于晓虹)



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举报电话:010-64030229;010-64034315;13501151303(打假办)

Contents Abstract

This book is a textbook for foreign college students. The book comprises of two parts. The first part is composed of 4 chapters, including introduction of dermatology, structure of the skin, functions of the skin, clinical manifestation and diagnosis of skin diseases. The second part is composed of altogether 15 chapters, including the most common and some rare but important skin diseases and sexually transmitted diseases. The etiology, pathogenesis, clinical manifestations, diagnosis and differential diagnosis, and treatment of the diseases are introduced. The whole book includes 56 color pictures. All the pictures are original.

The book is not only applies to foreign college students, but also to post-graduates and students of English class.

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Preface

In recent years, education for foreign medical students is developing widespread. Dalian Medical University is one of the top universities enrolling foreign students in our country. As the first "overseas education demonstration base", we have provided dermatovenereology courses in English for years, and accumulated some experiences in foreign medical students education.

Although there are many English textbooks in dermatology, we still need a book at a comprehensible level of complexity, containing the most common skin diseases and sexually transmitted diseases. We have previously written some internal materials on dermatovenereology. Those materials were easily understood, and the contents were selected according to the need of college education. However, in order to adapt to the need of standardized education for foreign students, we need a more systemic English textbook with refined contents and moderate difficulty. For this reason, we invite seven professors to organize this textbook of dermatovenereology, and we invite Dr. Molu Ozukum to proofreading the English words and sentences. The book starts with an introduction to dermatology, focusing on the primary and secondary lesions of skin diseases, which are the most important basis for recognition of skin diseases. The chapters in the second part are organized according to disease category. The clinical pictures used in this book are all original. The pictures were taken from outpatients or inpatients of Department of Dermatology, the first Affiliated Hospital of Dalian Medical University.

Thanks for reading this book. If you have comments or questions, please feel free to email me at the address below. You are on your way to a successful practice in dermatovenereology.

Song Zhiqi

szqdalian@163.com

Contents

Preface

PART ONE

Chapter 1	INTRODUCTION OF DERMATOLOGY	1
Section 1	DEFINITION	1
Section 2	EVOLUTION OF DERMATOLGY	1
Chapter 2	STRUCTURE OF THE SKIN	2
Section 1	EPIDERMIS	2
Section 2	DERMIS	2
Section 3	SUBCUTANEOUS TISSUE	2
Section 4	CUTANEOUS APPENDAGES	2
Section 5	NERVES, VESSELS AND MUSCLES OF THE SKIN	3
Chapter 3	FUNCTIONS OF THE SKIN	5
Section 1	BARRIER FUNCTION	5
Section 2	ABSORPTION FUNCTION	5
Section 3	SENSORY FUNCTION	5
Section 4	SECRETION AND EXCRETION FUNCTION	5
Section 5	TEMPERATURE REGULATION	6
Section 6	METABOLIC FUNCTION	6
Section 7	IMMUNOLOGICAL FUNCTION	6
Chapter 4	CLINICAL MANIFESTATION AND DIAGNOSIS OF SKIN DISEASES	7
Section 1	CLINICAL MANIFESTATION OF SKIN DISEASES	7
Section 2	DIAGNOSIS OF SKIN DISEASES	11
Section 3	HISTOPATHOLOGY OF THE SKIN	12

PART TWO

Chapter 5	ANAPHYLACTIC SKIN DISEASES	13
Section 1	DRUG REACTIONS	13
Section 2	URTICARIA	19
Section 3	ECZEMA	21
Section 4	CONTACT DERMATITIS	26
Chapter 6	ERYTHEMATOUS AND ERYTHROSQUAMOUS DERMATOSES	29
Section 1	PSORIASIS	29
Section 2	LICHEN PLANUS	34
Chapter 7	CONNECTIVE TISSUE DISEASE	40

Section 1	LUPUS ERYTHEMATOSUS (LE)	40
Section 2	DERMATOMYOSITIS	46
Chapter 8	NON-INHERITED BULLOUS DERMATOSES	51
Section 1	PEMPHIGUS	51
Section 2	BULLOUS PEMPFIGOID	54
Chapter 9	SUPERFICIAL FUNGAL DISEASES	56
Section 1	TINEA CAPITIS	56
Section 2	TINEA CORPORIS AND TINEA CRURIS	58
Section 3	TINEA MANUS AND TINEA PEDIS	60
Section 4	TINEA UNGUIUM (ONYCHOMYCHSIS)	62
Chapter 10	DERMATOSES DUE TO VIRAL INFECTION	64
	HERPES ZOSTER	64
Chapter 11	CUTANEOUS VASCULAR DISEASES	69
	VASCULITIS	69
Chapter 12	SEXUALLY TRANSMITTED DISEASE	71
Section 1	SYPHILIS	71
Section 2	GONORRHEA	79

PART ONE

Chapter 1 INTRODUCTION OF DERMATOLOGY

Section 1 DEFINITION

Dermatology is defined in The New Oxford Dictionary of English as 'The branch of medicine concerned with the diagnosis and treatment of skin disorders'. However, dermatologists don't confine themselves merely to a study of intrinsic disorders of the skin, but must also study internal medicine and the many environmental and occupational factors that so frequently cause skin problems.

Dermatology: aesthetic dermatology, skin surgery, dermal pathology, dermal immunology and dermal mycology.

Venereology: sexually transmitted disease.

Section 2 EVOLUTION OF DERMATOLGY

Dermatology evolved as a branch of internal medicine during the 19th century. During the last decades of the 18th century, however, many of the great physicians began to record their observations on the diseases of the skin, and this continued throughout the 19th century. Towards the end of that century, skin diseases, particularly the chronic infections such as syphilis and tuberculosis, formed a significant part of the general physician's practice.

In the first half of the 20th century, dermatology was slow to develop along scientific lines. Dermatology lagged behind some of the other medical specialties in its understanding of basic disease processes.

In the second half of the 20th century, there was an explosion of dermatological knowledge, mainly as a result of the introduction of sophisticated research techniques. More recently, the techniques of molecular biology have also been applied. As a result, increasing numbers of non-medical scientists are studying the skin, is very helpful to the research worker.

Chapter 2 STRUCTURE OF THE SKIN

Skin is the largest organ in the body. The total weight of the skin takes accounted for 16% of an individual. In an adult, the skin covers a surface area approaching 1.5-2 m².

There are two main kinds of human skin: hairless thick skin and hairy thin skin. The former is found on the palms and soles and has a grooved surface with alternating ridges and sulci giving rise to the dermatoglyphics (fingerprints). However, the structure of the dermal-epidermal junction does not belong to any of the two types. The color of the skin varies depending on age, gender, race, nutrition and the location.

Section 1 EPIDERMIS

The normal epidermis is a terminally differentiated, stratified, squamous epithelium. The major cell, making up more than 80% of the total is the keratinocyte, which moves progressively from attachment to the epidermal basement membrane towards the skin surface, forming several well-defined layers during its transit. The epidermis can be divided into five distinct layers: stratum basale, stratum spinosum, stratum granulosum, stratum lucidum and stratum corneum. Other cells within the epidermis include melanocytes, Langerhans cells and Merkel cells. Melanocytes are located in the basal layer and produce melanin. Langerhans cells are antigen presenting cells. Merkel cells may have non nerve ending mediated sensory function.

Epidermis

Turnover time is 28 days. Duration of migration from the basal cell layer to the granular layer is 14 days. Similarly migration from the granular layer to the surface of the stratum corneum and shedding takes 14 days.

Section 2 DERMIS

Dermis consists of collagen fibers, elastic fibers, reticular fibers, matrix (proteoglycan in the majority) and cells (such as fibroblasts, mast cells, macrophage, etc.).

Section 3 SUBCUTANEOUS TISSUE

Subcutaneous tissue includes areolar connective tissue and adipose connective tissue. The strands of collagen divide the population of fat cells into lobules. These fibrous septae accommodate the major blood vessels, lymphatics and nerves.

Section 4 CUTANEOUS APPENDAGES

1. Hair There are four classes of pilosebaceous unit: terminal on the scalp and beard;

apopilo sebaceous in axilla and groin; vellus on the majority of skin; and sebaceous on the chest, back and face.

There are three phases of cyclical hair growth: anagen, when growth occurs; catagen, a regressing phase; and telogen, a resting phase. The follicle re-enters anagen, and the old hair is replaced by a new one.

The hair cycle. There are three components to the hair cycle: anagen (where new hair forms and grows), followed by catagen (regressing phase) and telogen (resting phase), and then loss of old hair. The hair cycle is associated with discrete changes in hair follicle anatomy, both in the shape of the follicle and in the subjacent dermal papilla. IRS, inner root sheath; ORS, outer root sheath.

2. Sebaceous glands Some sebaceous glands open directly on the surface of mucosa, the remaining open into the hair follicles. Through a system of ducts.

3. Eccrine and apocrine glands Human sweat glands are generally divided into two types: apocrine and eccrine. The eccrine gland is the primary gland responsible for thermoregulatory sweating in humans. Eccrine sweat glands are distributed over nearly the entire body surface.

Apocrine glands are located only in genital, axillary and mammary areas, where they are always connected to a hair follicle. Apocrine glands have a low secretory output, and hence no significant role in thermoregulation.

4. Nail The nail matrix forms the nail plate and is divided into three regions: the dorsal section of the matrix contributes to the most superficial layers of the nail plate whereas the intermediate region of the matrix forms the deeper layers. The ventral subdivision is the most distal part of the nail matrix. The nail bed is the area underneath the nail plate (between the lunula and the hyponychium). It has a role in forming the deeper layers of the nail plate, as its thin epidermal layer represents the ventral portion of the nail matrix. The hyponychium is located underneath the free edge of the nail plate and denotes the transition of the nail bed to the normal epidermis of the fingers and toes.

Section 5 NERVES, VESSELS AND MUSCLES OF THE SKIN

1. Nerves The nerves can be divided into sensory nerve and motor nerve. Tactile corpuscle, Meissner's corpuscles, Krause bulb, Merkel corpuscles disks and root hair plexus are associated with tactile sense. Ruffini corpuscle and Pacinian corpuscle are associated with pressure sense. Free nerve ending is associated with pain and thermic sense.

2. Blood vessels The arteries entering the skin form a deep plexus, the 'fascial' network, from which individual vessels rise to the border between the subcutaneous adipose tissue and the dermis to form a 'cutaneous' vessel network. These vessels then branch out towards various cutaneous appendages and provide ascending arterioles to generate a subpapillary plexus, which forms capillary loops entering the papillary dermis between the rete ridges. From these capillaries the blood is drained by venules which form intermediate plexuses. Thus, the cutaneous vasculature is rather elaborate and limited to the dermis, while the epidermis has no blood vessels.

In addition to providing nutrients and oxygen to the skin, the vasculature plays a major role

in regulating the body temperature.

3. Lymphatic vessels The lymphatic network in the skin serves to transport particulate and liquid materials, such as proteins, from the extravascular compartment of the dermis. Interconnecting lymphatic spaces arise from terminal bulbs in the papillary layer and ultimately form the system that drains into the lymph nodes. The vessels have a broad lumen surrounded by a single endothelial layer, which is discontinuous in the terminal components and rests on an often discontinuous basal lamina.

4. Muscles Arrectores pilorum is the most common type of muscle in the skin.

Chapter 3 FUNCTIONS OF THE SKIN

Section 1 BARRIER FUNCTION

- 1. Protection of physical injury** An intact stratum corneum protects from physical injury.
- 2. Protection of chemical stimulation** The stratum corneum is the main structure to protecting from chemical stimulation.
- 3. Defensive role of microorganisms** An intact stratum corneum prevents invasion of the skin by normal skin flora or pathogenic microorganisms.
- 4. To prevent the loss of nutrients** The stratum corneum and the sebum membrane can prevent the loss of nutrients, electrolyte and water.

Section 2 ABSORPTION FUNCTION

- 1. The structure and the site of skin** The efficiency of the barrier differs between body sites. The scrotum is particularly permeable and the face, forehead and dorsa of the hands may be more permeable to water than the trunk, arms and legs. The palms are particularly impermeable to nearly all molecules except water.
- 2. The hydration level of stratum corneum** The higher hydration level of stratum corneum is, the stronger absorption function of skin is.
- 3. The physicochemical properties of absorbed substance** Most covalent substances in aqueous solution, such as glucose, urea and the macromolecular human serum albumin, have very low permeability constants in human skin. Others, such as certain aliphatic alcohols, have high constants. Solutes in organic liquids generally show permeability similar to the solvents themselves. In addition, vapours and permanent gases can penetrate skin.
- 4. The external environmental factors** Increase in environmental temperature and humidity enhances the skin absorption capacity.
- 5. The pathological condition** Percutaneous absorption is affected by skin hyperemia, physicochemical injury and disorders of skin.

Section 3 SENSORY FUNCTION

The skin also contains sensory and autonomic nerves and several types of sensory receptor, which detect the incoming stimuli of touch, vibration, pressure, change in temperature (warmth and cold), pain (including heat pain) and itch.

Section 4 SECRETION AND EXCRETION FUNCTION

Secretion and excretion is done through the sweat glands and sebaceous gland.

Section 5 TEMPERATURE REGULATION

The essential point about its function, however, is that a system of arteriovenous shunts, which are plentiful in the feet, hands, lips, nose and ears, enables the blood flow to an extensive and more superficial venous plexus to be considerably varied. In high environmental temperatures, the process of evaporation is considerably enhanced by eccrine sweating.

Section 6 METABOLIC FUNCTION

1. Glucose metabolism Sugar facilitates fungal and bacterial growth, so the high glucose content in the skin of diabetic patients could promote fungal and bacterial infection.

2. Protein metabolism The skin proteins are generally divided into two types: fibrous and non-fibrous protein. The former includes keratin, collagen and elastin. The later includes nucleoprotein in the cell and various enzymes regulating cell metabolism.

3. Lipid metabolism Hyperlipidemia can make localized lipid deposition in the dermis, leading the formation of cutaneous xanthoma.

4. Water and electrolyte metabolism The water in the skin is mainly in the dermis. When the body is dehydrated, the skin can provide 5% -7% of its water content to maintain the stability of circulating blood volume.

Section 7 IMMUNOLOGICAL FUNCTION

1. Cellular components of the skin immune system(Table 3-1).

Table 3-1 Cellular components of the skin immune system

Cell type	Distribution	Function
keratinocyte	epidermis	synthesize and secrete cytokines; participate in antigen presentation
Langerhans cell	epidermis	antigen presentation; synthesize and secrete cytokines; immunologic surveillance; etc
lymphocyte	dermis	mediate immune response
endothelial cell	dermal vascular	secrete cytokines; participate in inflammatory reaction; tissue repair; etc
mast cell	the surrounding dermal papillary vascular	type I hypersensitivity
macrophage	the superficial layer of dermis	repair in trauma; prevent the invasion of microorganisms
fibroblast	dermis	involved in the maintenance of the skin immune system self-stabilization
dendritic cell	dermis	maybe precursor cells of Langerhans' cells in the epidermis

2. Molecular components of the skin immune system

(1) Cytokines: influence cell differentiation, proliferation and activation.

(2) Adhesion molecules: consist of integrin family, immunoglobulin superfamily, selectin family and cadherin family.

(3) Other molecules: secretory IgA, complement, CGRP, SP, etc.

Chapter 4 CLINICAL MANIFESTATION AND DIAGNOSIS OF SKIN DISEASES

Section 1 CLINICAL MANIFESTATION OF SKIN DISEASES

4.1.1 SYMPTOMS

Itch is the prime dermatological symptom, but may be variously described by different patients; there are individual differences in threshold and perception. Intense itch is typical in scabies, atopic dermatitis and lichen planus, whereas psoriasis and pityriasis versicolor usually cause less severe itch for the same degree of body surface involvement. Indeed, the degree of itch (as judged by the amount of scratching, and the general affect, and even without any other history), is potentially useful in distinguishing between atopic versus seborrhoeic dermatitis in infants.

Other symptoms include various qualities of pain, such as sharp pain (e. g. chondrodermatitis of the ear), burning (e. g. chilblains) or tenderness (e. g. erythema nodosum). The site may influence symptoms, for example, urticaria causes itch, but the same pathology affecting the palms often causes pain (because the oedema is deeper and the firmer tissues of the palm cannot distend easily). Both the quality and intensity of symptoms should therefore be recorded.

4.1.2 SIGNS

The common descriptive terms applied to cutaneous lesions are listed below. However, a particular problem is the dynamic aspects of skin disease.

1. Primary lesions The skin lesions directly produced by pathological changes.



Figure 4-1 Erythema on the back

more than 2 mm in diameter.

(2) Plaque: A papule is an elevated area of skin, usually defined as 2 cm or more in diameter. It may be formed by the extension or coalescence of either papules or nodules as in psoriasis and granuloma annulare, respectively. Small plaque is sometimes used for such lesions 0.5-2 cm in diameter (Figure 4-2).

(1) Macule: A macule is a circumscribed, flat lesion that differs from surrounding skin because of its color. Macules are usually smaller than 1 cm in diameter, including pigmentation, hypopigmentation, inflammatory hyperemia, and so on (Figure 4-1).

patch—a macule more than 2 mm in diameter.

petechia—a punctate haemorrhagic spot, approximately 1-2 mm in diameter.

ecchymosis—a macular area of haemorrhage

(3) **Papule:** A papule is a small, solid, elevated lesion. Papules are usually smaller than 1 cm in diameter (Figure 4-3).



Figure 4-2 Plaques on the leg



Figure 4-3 Papules on the leg



Figure 4-4 Nodules on the nose

maculopapular-rash consisting of both macules and papules.

(4) **Nodule:** A nodule is a palpable, solid, round or ellipsoidal lesion. It may involve epidermis and dermis, dermis and subcutis, or subcutis alone. It may consist of fluid, other extracellular material (e. g. amyloid), inflammatory or neoplastic cells. Depth of involvement and/or substantive palpability rather than diameter help to differentiate a nodule from a papule (Figure 4-4).

(5) **Wheal:** A wheal, or hive is a round or flat-topped papule or plaque that is characteristically evanescent, disappearing within 24 hours. It is a transient edema of the superficial layer of dermis. It is white, compressible and usually evanescent. It is the characteristic lesion of urticaria. It is often surrounded by a red, axon-mediated flare (Figure 4-5).



Figure 4-5 Wheal on the leg

(6) **Vesicle and bullae:** They are visible accumulations of fluid within or beneath the epidermis. A vesicle is a circumscribed, elevated lesion that contains fluid. Vesicles are small (less than 0.5 cm in diameter) and often grouped (Figure 4-6). Bullae, which may be of any size over 0.5 cm, should be subdivided as multilocular (due to coalesced vesicles, typically in eczema) or unilocular (Figure 4-7).

(7) **Pustule:** A pustule is a circumscribed, raised lesion that contains a purulent exudate. It is a visible accumulation of free pus. It may occur within a pilosebaceous follicle or a sweat duct or, less often, on glabrous skin. Most commonly due to infections, but some eruptions typically cause sterile pustules (Figure 4-8).



Figure 4-6 Vesicles on the back



Figure 4-7 Bulla on an arm

(8) **Cyst:** A cyst is a closed cavity or sac that contains liquid or semisolid material (fluid, cells, and cell products), on palpation, it is resilient (Figure 4-9).



Figure 4-8 Pustules on an arm



Figure 4-9 Cyst under the eyebrow

2. Secondary lesions Changes from the primary lesions, or caused by treatment, scratching and so on.

(1) **Erosion:** An erosion is a moist, circumscribed, usually depressed lesion that results from loss of all or a portion of the viable epidermis, which heals without scarring. It commonly follows a blister (Figure 4-10).

(2) **Ulcer:** An ulcer is a depressed lesion in which the epidermis and at least the upper dermis have been destroyed, often with loss of the underlying tissues (Figure 4-11).



Figure 4-10 Erosions on the face



Figure 4-11 Ulcer on the leg

(3) **Scale, desquamation:** Abnormal shedding or accumulation of stratum corneum in perceptible flakes is called scaling. Scale is a flat plate or flake of stratum corneum (Figure 4-12). A collarette scale is a fine, peripherally attached and centrally detached scale at the edge of an inflammatory lesion. Annular scaling is also seen in porokeratosis. Furfuraceous or pityriasiform scales are fine and loose. Ichthyotic scales are large and polygonal. Scaling may

accompany or follow many inflammatory disorders. Silvery scales are characteristic of processes involving parakeratosis, especially psoriasis. The silvery colour is due to reflection of light at the many air - keratin interfaces and can be altered by wetting the skin.

(4) **Maceration**: Water absorbed by skin stratum corneum makes the epidermis more soft and white. The erosive surface is easily exposed by excoriation after friction (Figure 4-13).

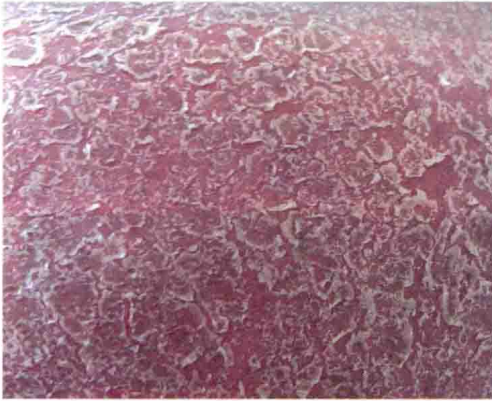


Figure 4-12 Scales on the trunk



Figure 4-13 Maceration between the toes

(5) **Fissure**: Any linear gap or slit on the skin surface.

(6) **Scar**: Scar refers to replacement of normal tissue that has been destroyed due to injury or disease by new connective tissue. An atrophic scar is thin and wrinkled. A hypertrophic scar is elevated, with excessive growth of fibrous tissue, also called keloid (Figure 4-14).

(7) **Atrophy**: Atrophy refers to a loss of tissue from one or more of the epidermis, dermis or subcutaneous tissues. There may be fine wrinkling and increased translucency if the process is superficial.

(8) **Crusts**: Crusts are hardened deposits that result when serum, blood, or purulent exudate dries on the skin surface, and they are characteristic of pyogenic infections (Figure 4-15).



Figure 4-14 Keloid on the scalp



Figure 4-15 Crusts on the foot

(9) **Excoriation**: Loss of skin substance, specifically produced by scratching (Figure 4-16).

(10) **Lichenification**: Thickening of the epidermis (and to some extent also of the dermis) in response to prolonged rubbing (Figure 4-17).