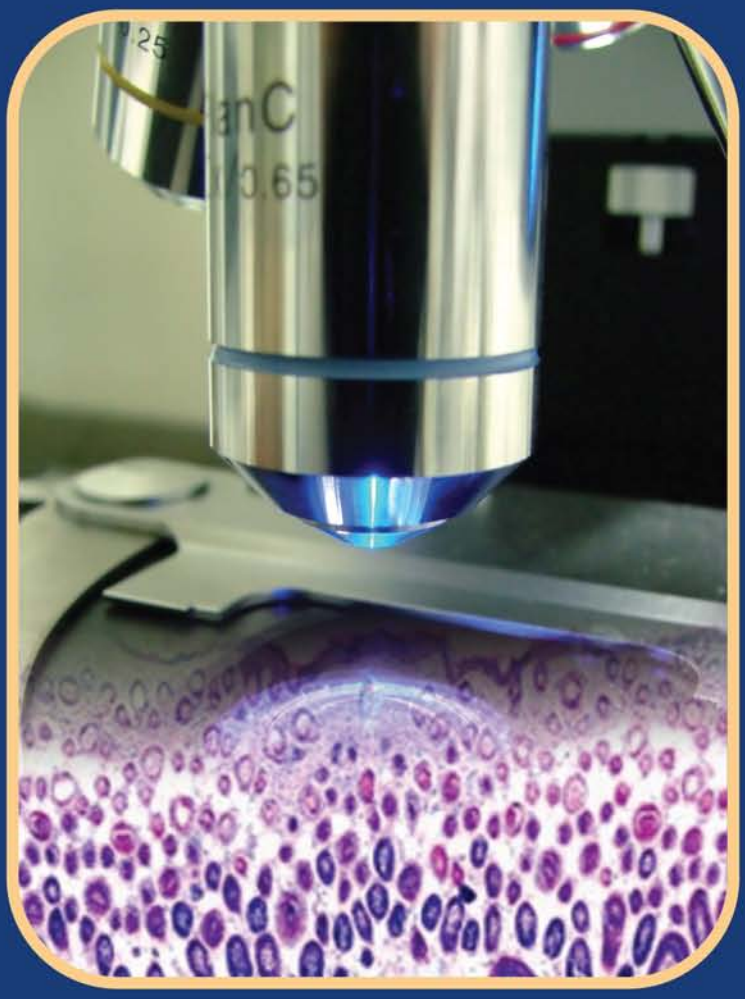
COLOR ATLAS OF DERMATOPATHOLOGY



Edited by

Jane M. Grant-Kels

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DERMATOLOGY: CLINICAL & BASIC SCIENCE SERIES

COLOR ATLAS OF DERMATOPATHOLOGY

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DERMATOLOGY: CLINICAL & BASIC SCIENCE SERIES

COLOR ATLAS OF DERMATOPATHOLOGY

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This book is dedicated to the memory of my Dad,
George H. Grant, D.D.S. who died on June 8, 2006 at noon
and to my husband, Barry D. Kels, M.D., J.D.
They are both gentle yet strong, demonstrate an absolute love of life and family,
and my greatest supporters. In their arms, I have learned what it means to feel safe and secure.
My Dad was the first man in my life that I loved with every ounce of my being
and my husband is my second and last.

I am also indebted to my loving Mother, Charlotte Grant,
who has been my role model for caring, grace and dignity
and to my adored children, Joanna Kels Albright and Captain Charles Grant Kels, USAF.
Their love has enveloped me and my love for them has given me great joy.

Preface

Why one more book on dermatopathology? Certainly there are many outstanding encyclopedic textbooks already written and even recently updated. Why one more atlas? Hopefully you will agree that this book is different. We have tried to pair clinical and histologic photographs to enhance the reader's appreciation for clinical-pathological correlation. In addition, this text is meant to be user friendly whether you are approaching dermatopathology from a background of dermatology or pathology. Herein we hope to share with you our enthusiasm as well as the helpfulness of clinical-pathological as well as pathological-clinical correlation. Ideally after reading through some of our examples, the next time you look through the microscopic oculars at a skin slide, you will ask yourself "how would this lesion look clinically?" Conversely, when you examine a skin lesion or rash in vivo, you will ask yourself "how would this look under the microscope?" Once you ask yourself these questions enough times, it will become automatic and so helpful to you in developing your differential lists, you will be incredulous that you did not always approach dermatopathology and dermatology in this manner.

This book is not meant to be a complete review of all skin diseases. It is meant to try to teach you a different approach to the patient and to the biopsy obtained from a patient's skin. One should always be mindful of the clinical-pathologic corollaries that will help improve your diagnostic acumen. I personally hope that in addition to finding this book educational, you will also have some fun. In the words of A. Bernard Ackerman, dermatopathology is "art in vivo"!

The many authors who have contributed to this volume are the thought leaders in our field. They are scattered geographically but share their continued enjoyment in becoming better dermatopathologists. Some of the authors have been my friends, "classmates," colleagues, and teachers since I began my journey in dermatopathology in 1978! Others are younger and compose the next generation of leaders in dermatopathology. All have brought their enthusiasm to this project for which I am grateful.

I now invite you to "see" skin disease through new oculars! Not only will the journey be fun, but it will make you a better diagnostician whether you treat patients in an office or study slides in a lab.

Jane M. Grant-Kels

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1

A Philosophy of an Approach to a Slide

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By way of introduction, I would like to review with you my personal approach to a slide. None of the ideas presented herewith are original; they represent a compendium of ideas that have been borrowed from my teachers, especially my first mentor in dermatopathology, Dr. A. Bernard Ackerman, and all of my friends and colleagues I had taken training with and have collaborated with over the years, many of whom are authors of chapters in this book.

Remember, how well you perform as a dermatopathologist is directly correlated to the development of the proper philosophical and intellectual approach to our specialty and each individual slide that crosses the stage of your microscope.

Philosophically:

1. It is important to approach the pathology you see under the microscope from the clinician's point of view. Clinical–pathological correlation is essential. When you gaze on the histologic changes you should be able to imagine how the lesion looked clinically.
2. Know normal anatomy at various anatomic sites and learn to recognize changes that may be normal due to age or exposure to the elements. Once you know normal histology and its variants you will be able to recognize what is abnormal on the slide.
3. Learn to recognize common artifacts of either processing or biopsy technique.
4. The criteria applied to each case must be repeatable and well established.
5. The language of your report must be precise.
6. Be willing to admit when you do not know the diagnosis and appropriately seek the opinion of others.
7. Diseases are dynamic and demonstrate changes that correspond to their chronology or "lives." Learn to recognize the changing histologic features of an acute, fully developed, and resolving lesion.
8. Our knowledge of diseases is also dynamic. Therefore, keep an open mind. Criteria for diagnoses may evolve over the years with increased experience and new staining techniques. Be willing to learn and be open to new ideas.
9. Finally, there is much that is subjective in dermatopathology; mistakes are inevitable. Learn from errors rather than hide from them. Mistakes and malpractice are not synonymous.

Your practical approach to the slide should demonstrate a methodical approach following a checklist of sequential steps (algorithmic method) utilizing pattern analysis. Sign out of slides should be done in a quiet place without distractions. All slides should be initially examined without knowledge of the clinical history. Prior to reviewing the slide under the microscope, examine the slide with the naked eye: make note of how the specimen was grossed and how many pieces of tissue are present to be examined on each slide. Establish the kind of biopsy technique used, that is, shave, punch, curette, or excision. If there are multiple small fragments, circle them to ensure that all pieces of tissue are reviewed.

Once you have placed the slide on your microscope stage (Table 1):

1. Employ scanning magnification. Try to establish the pattern of the infiltrate of cells. Is this an inflammatory or neoplastic infiltrate? Higher magnification should be used later to review cytologic changes.
2. Try to determine the anatomic site of the biopsy. Various anatomic locations have key distinguishing features. Certain diseases favor certain anatomic sites and, therefore, this information will help in clinical–pathological correlation. In addition, some locations may alter the appearance of the pathology. For example, overlapping stasis changes often alters a lesion on the leg of an older adult.
3. Try to determine the approximate age of the patient. Is there solar elastosis suggesting a sun-damaged adult? Are there effete sebaceous glands as would be seen in a young child? Many diseases have a tendency to occur in certain age groups as well as locations.
4. Confirm your impression regarding how the biopsy was obtained.
5. Look at all the sections on the slide.
6. Learn to recognize artifacts so that you do not assign inappropriate import to these changes.
7. Develop a systematic approach to looking at the sections of skin. Some dermatopathologists study the biopsy from top to bottom (stratum corneum → rest of epidermis → dermis → subcutaneous tissue). Others prefer to first determine the pattern of changes in the dermis and then proceed to the epidermis and subsequently to the changes in the subcutis. Although I prefer the latter style, it is irrelevant which technique you use as long as you are methodical, consistent, and systematic in your approach.
8. Apply pattern analysis to help you determine whether a lesion is inflammatory, malformation, deposition, or neoplastic. This seemingly simple step is not always easy. It is not uncommon for neoplasms to be associated with significant inflammation and for inflammatory conditions to mimic a neoplastic process. Therefore, a specific diagnosis cannot always be achieved. However, the system works in most cases and one's

Table 1 Algorithmic Approach to a Slide

Scanning magnification:

1. look at all the sections and pieces of skin present on the slide
2. assess how specimen was obtained—punch, shave, etc.
3. determine anatomic site
4. determine approximate age of patient
5. imagine the clinical appearance of the lesion (CPC)
6. Is the lesion:

Inflammatory	or	Neoplastic
↓		↓
Which of 9 major patterns?		Benign vs. malignant
↓		↓
What is the epidermal pattern?		Epithelial or nonepithelial?
↓		↓
Are there changes in the subcutaneous tissue?		Specific type of cell? or
↓		↓
What types of cells are present in the infiltrate?		Specific type of differentiation?
↓		↓
Obtain clinical information: clinical–pathological correlation		Obtain clinical information: CPC
↓		↓
Specific diagnosis or differential		Specific diagnosis or differential

Table 2 Neoplasms: Benign vs. Malignant

Benign	Malignant
Small	Large
Symmetric	Asymmetric
Well circumscribed	Poorly circumscribed
Smooth margins	Irregular, jagged margins
V-shaped lesions	Not V-shaped lesions
Superficial	Deep
Not usually ulcerated	Tends to ulcerate
Neoplastic cells discretely arranged	Neoplastic cells in sheets
Aggregations uniform in size and shape	Aggregations vary in size and shape
Cells well differentiated	Cells poorly differentiated
Adnexal structures usually preserved	Adnexal structures often absent
Maturation: nuclei of cells at base of lesion smaller than those near the surface	No maturation
No necrosis or necrosis only of single cells	Necrotic cells in aggregate
No neoplastic cells in perineural locations	Neoplastic cells in perineural locations
No neoplastic cells in vessels	Neoplastic cells in vessels
Epithelial cells not in single file between collagen bundles	Epithelial cells in single file between collagen bundles
Peripheral fibrous tissue well-packed	Peripheral fibrous tissue not well-packed
Clefts between well-packed fibrous tissue and normal fibrous tissue	Clefts between neoplastic cells and altered stroma

Source: From Ref. 1.

Table 3 Patterns of Inflammatory Diseases

Ackerman's Original Nine Basic Patterns of Inflammatory Diseases Circa 1978

1. Superficial perivascular dermatitis
2. Superficial and deep perivascular dermatitis
3. Vasculitis
4. Nodular and diffuse dermatitis
5. Intraepidermal vesicular and pustular dermatitis
6. Subepidermal vesicular dermatitis
7. Folliculitis and perifolliculitis
8. Fibrosing dermatitis
9. Panniculitis

Ackerman's New Schema of Eight Basic Patterns of Inflammatory Diseases Circa 2005

1. Perivascular dermatitis (superficial as well as superficial and deep perivascular)
2. Nodular and diffuse dermatitis
3. Vasculitis
4. Vesicular dermatitis (intraepidermal vesicular and/or subepidermal vesicular dermatitis)
5. Pustular dermatitis (intraepidermal and infundibular epidermal pustular dermatitis)
6. Peri-infundibulitis and perifolliculitis
7. Fibrosing dermatitis
8. Panniculitis (predominantly septal or predominantly lobular)

ability to apply the pattern analysis approach improves with experience.

9. If the lesion is neoplastic:
   - The next critical question is whether the lesion is benign or malignant? Architectural pattern is extremely important in making this important distinction. Size, symmetry, and circumscription patterns outweigh cytology. Table 2 presents an overview of features useful in distinguishing benign versus malignant neoplasms (1).
   - Is the lesion epithelial or nonepithelial?
   - What cells are proliferating? Keratinocytes, melanocytes, fibroblasts, muscle cells, nerve cells, sebocytes, ductal cells, lymphocytes, histiocytes, mast cells, and so on.
10. If the lesion is inflammatory, determine the pattern of the inflammatory cells in the dermis and subcutaneous tissue.
   - There are nine major patterns of inflammatory infiltrates (Table 3). Although many more patterns and variations have been described, it is still worthwhile to go back to simple basics and start with the original nine described many years ago.
   - What pattern of change is noted in the epidermis? (spongiosis, interface, psoriasiform hyperplasia, etc.)
   - What types of cells predominate in the infiltrate? (lymphocytes, histiocytes, neutrophils, eosinophils, etc.)

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2

Perivascular Dermatitis

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CONTENTS

This chapter covers diseases that consist of perivascular (and interstitial) infiltrates of inflammatory cells devoid of marked changes in the epidermis. Clinically, these diseases usually present with smooth surfaced macules, patches, papules, and plaques without either the crust, scale, or both. Some of the diseases in this chapter are characterized by infiltrates that include neutrophils (urticaria, erysipelas), others by infiltrates that typically show numerous eosinophils (pruritic urticarial papules and plaques of pregnancy), or plasma cells (erythema migrans), or by infiltrates that are virtually monopolized by lymphocytes (persistent pigmented purpuric dermatitis, viral exanthems, polymorphous light eruption, tumid lupus erythematosus, pernio, erythema figuratum); still others are typified by sparse infiltrates of inflammatory cells accompanied by very subtle, but highly characteristic changes in epidermis or dermis (postinflammatory pigmentary alteration, vitiligo, tinea versicolor, erythrasma).

It should be mentioned that many diseases dealt with in separate chapters of this book may present themselves also as perivascular dermatitis devoid of marked changes in the epidermis at an early or resolving stage. Among those are bullous diseases (e.g., bullous pemphigoid) and vasculitides (e.g., leukocytoclastic vasculitis).

URTICARIA

Synonyms: Nettle rash; hives; wheals.

Clinical Presentation (Fig. 1A):

- Edematous papules and plaques, discrete or confluent
- Localized, regional, or widespread
- Individual lesions disappear in hours
- Lesions are intensely pruritic

Histopathology (Figs. 1B and C):

- Perivascular infiltrate of neutrophils and eosinophils early
- Lymphocytes perivascular, neutrophils, and eosinophils interstitial later
- Sparse perivascular infiltrate of lymphocytes and a few eosinophils in a resolving lesion

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Edematous papules and plaques	Edema located mostly in the reticular dermis (not visualizable in H+E)
Erythema	Dilated vessels

Differential Diagnosis:

Insect Bites	Urticarial Lesions of Bullous Pemphigoid or Pemphigus Vulgaris	Urticarial Lesions of Prurigo Pigmentosa
Wedge-shaped infiltrate of lymphocytes and eosinophils	Bandlike infiltrate housing numerous eosinophils	Superficial perivascular infiltrate of neutrophils mostly
Spongiosis, a spongiotic vesicle sometimes	Eosinophilic spongiosis sometimes	Scattered neutrophils in the epidermis

Pathophysiology:
- Different causes lead to degranulation of mast cells, which attract inflammatory cells and cause vasodilation and edema in the dermis.

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ERYSIPELAS

Synonyms: St. Anthony's fire; *ignis sacer.*

Clinical Presentation (Fig. 2A):
- Sharply demarkated erythematous or purpuric patch or plaque, sometimes covered by vesicles and/or bullae
- Often accompanied by edema, lymphangitis, lymphadenitis, and fever
- Face and lower extremities involved commonly, usually unilateral
- Lesion is painful

Histopathology (Figs. 2B and C):
- Sparse to moderately dense perivascular and interstitial mixed-cell infiltrate of lymphocytes, neutrophils, and few eosinophils
- Erythrocytes extravasated in number
- Widely dilated venules and lymphatics
- Edema of the papillary dermis
- Spongiosis and ballooning of the epidermis sometimes

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Erythema	Dilated vessels
Purpuric color	Extravasated erythrocytes
Vesicles and bullae	Extensive edema of the papillary dermis, and/or spongiosis, and ballooning

Differential Diagnosis:

Urticaria	Zoster Early in the Course of an Eruption
Perivascular and interstitial infiltrate of lymphocytes, neutrophils, and eosinophils	Superficial and deep infiltrate of lymphocytes mostly
No changes in surface epidermis	Ballooning of the epidermis, acantholysis, multinucleated epithelial cells

Pathophysiology:
- Beta-hemolytic streptococcus is responsible most commonly, *Staphylococcus aureus* less commonly.

References:

1. Chartier C, Grosshans E. Erysipelas. Int J Dermatol 1990; 29: 459–467.
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PRURITIC URTICARIAL PAPULES AND PLAQUES OF PREGNANCY

Synonyms: Pruritic urticarial papules and plaques of pregnancy (PUPPP), polymorphic eruption of pregnancy, Bourne's toxemic rash of pregnancy, toxic erythema of pregnancy, nurse's late onset prurigo of pregnancy.

Clinical Presentation (Fig. 3A):
- Urticarial papules and plaques
- Abdomen, buttocks, and thighs especially, often beginning in abdominal striae
- Lesions usually disappear shortly after term
- Lesions are itchy
- Primigravidas late in the third trimester

Histopathology (Figs. 3B–D):
- Superficial perivascular infiltrate of lymphocytes (Fig. 3C)
- Eosinophils scattered interstitially (Fig. 3D)
- Focal spongiosis and parakeratosis sometimes

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Papules and plaques	Sparse perivascular and interstitial infiltrates of inflammatory cells and slight edema in the upper part of the dermis
Erythema	Dilated blood vessels
Subtle scale	Parakeratosis

Differential Diagnosis:

Urticaria	Insect Bites
Perivascular and interstitial infiltrate	Dense, wedge-shaped infiltrates, perivascular and interstitial
Neutrophils and eosinophils	Lymphocytes and eosinophils
No changes in the epidermis	Spongiosis in the center of the lesion

Pathophysiology:
- Unknown

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ERYTHEMA MIGRANS

Synonyms: None.

Clinical Presentation (Fig. 4A):
- Macules, patches, or plaques
- Centrifugal extension with healing in the center leads to formation of annular shapes
- Hemorrhagic or scaly lesions sometimes

Histopathology (Figs. 4B and C):
- Perivascular and sometimes interstitial infiltrate of lymphocytes and plasma cells
- Eosinophils in the vicinity of the "bite" of the tick in an early lesion
- Spongiosis and parakeratosis rarely

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Annular plaque	Perivascular and sometimes interstitial infiltrate
Scale	Parakeratosis

Differential Diagnosis:

Insect Bites	Erythema Figuratum/ Deep Gyrate Erythema	Tumid Lupus Erythematosus
Wedge-shaped infiltrate	Perivascular infiltrate, no involvement of the interstitium	Perivascular and interstitial infiltrate
Numerous eosinophils	Lymphocytes monopolize	Lymphocytes monopolize
Interstitial mucin sometimes	No mucin	Interstitial mucin always

Pathophysiology:
- Erythema migrans is caused by species of *Borrelia burgdorferi* (*Borrelia burgdorferi sensu stricto, Borrelia garinii*, and *Borrelia afzelii*)

References:

1. Afzelius A. Erythema chronicum migrans. Act Derm Venereol 1921; 2:120–125.
2. Berger BW, Clemmensen OJ, Gottlieb GJ. Spirochetes in lesions of erythema chronicum migrans. Am J Dermatopathol 1982; 4: 555–556.

PERSISTENT PIGMENTED PURPURIC DERMATITIS

Synonyms: Pigmented purpuric dermatitis; progressive pigmented prupura.

Clinical Presentation (Fig. 5A):
- Purpuric macules and papules, sometimes scaly
- Symmetrically involving legs and thighs, rarely the trunk and the upper extremities
- Variations include Schamberg's disease (purpuric and pigmented macules), lichenoid purpura of Gougerot-Blum (lichenoid papules), lichen aureus (yellow or brown patches), purpura of Doucas and Kapetanakis (scaly papules), and purpura annularis telangiectodes of Majocchi (annular purpuric macules)

Histopathology (Figs. 5B–E):
- Superficial perivascular and interstitial, sometimes lichenoid, infiltrate of lymphocytes
- Dermoepidermal junction often spared but sometimes lymphocytes scattered in the epidermis accompanied by slight spongiosis and parakeratosis
- Extravasated erythrocytes and/or siderophages in the upper part of the dermis
- Wiry bundles of collagen in the upper part of the dermis, sometimes

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Purpuric macules	Extravasated erythrocytes in the dermis
Yellow or brown macules	Multiple siderophages in the dermis
Lichenoid papules	Bandlike infiltrates of lymphocytes
Scale	Parakeratosis

Differential Diagnosis:

Drug Eruption	Mycosis Fungoides
Perivascular or lichenoid infiltrate	Lichenoid or psoriasiform-lichenoid infiltrate
Eosinophils in the infiltrate	Lymphocytes monopolize
Vacuolar alteration, necrotic keratinocytes	Lymphocytes in the epidermis accompanied by subtle spongiosis
No changes of collagen	Wiry bundles of collagen
Focal parakeratosis	Elongated mounds of parakeratosis

Pathophysiology:
- Unknown, but drugs as well as infectious foci have been claimed to induce the eruption.

Reference:

1. Ackerman AB, Böer A, Bennin B, Gottlieb GJ. Histologic Diagnosis of Inflammatory Skin Diseases. 3rd ed. New York: Ardor Scribendi, 2005.

VIRAL EXANTHEMS

Synonyms: None.

Clinical Presentation (Fig. 6A):
- Exanthem of macules and/or papules
- Sometimes morbilliform (measles), and rubeoliform, (German measles)
- Children, especially
- Variations include erythema infectiosum (appearance of cheeks that have been slapped), roseola/exanthema subitum (discrete, small macules and papules similar to those of rubella)

Histopathology (Figs. 6B and C):
- Sparse perivascular infiltrate of lymphocytes
- Few eosinophils, sometimes
- Extravasate erythrocytes, sometimes

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Red macules and papules	Sparse superficial perivascular infiltrate and vasodilation

Differential Diagnosis:

Drug Eruption	Persistent Pigmented Purpuric Dermatitis
Perivascular or lichenoid infiltrate	Perivascular and interstitial, sometimes lichenoid, infiltrate
Eosinophils in the infiltrate	Lymphocytes, erythrocytes, and siderophages
Vacuolar alteration and necrotic keratinocytes often	No changes in the epidermis or slight spongiosis
No changes of collagen	Wiry bundles of collagen

Pathophysiology:
- Erythema infectiosum is caused by parvovirus B19, roseola is caused by human herpesvirus 6, and other exanthems are caused by other specific viruses.

Reference:
1. Ackerman AB, Böer A, Bennin B, Gottlieb GJ. Histologic Diagnosis of Inflammatory Skin Diseases. 3rd ed. New York: Ardor Scribendi, 2005.

POLYMORPHOUS LIGHT ERUPTION

Synonyms: Polymorphic light eruption; summer prurigo, summer eruption; prurigo aestivalis.

Clinical Presentation (Fig. 7A):
- Scattered edematous papules and plaques
- Sites exposed to sunlight, mostly the face, chest, and arms
- Young women especially
- Variations include actinic prurigo (occurs in Indians of North and South America) and spring eruption of juveniles (vesicles on helices of boys)

Histopathology (Figs. 7B and C):
- Sparse to moderately dense infiltrate of lymphocytes
- Extravasated erythrocytes often
- Marked edema of the papillary dermis
- Spongiosis of variable extent sometimes

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Papules	Perivascular infiltrates of lymphocytes and edema in the papillary dermis
Scale-crust	Parakeratosis above spongiosis

Differential Diagnosis:

Tumid Lupus Erythematosus	Hydroa Vacciniforme
Superficial and deep infiltrate of lymphocytes	Superficial and deep infiltrate of lymphocytes
Abundant mucin in the reticular dermis	No mucin
No edema in the papillary dermis or changes in the epidermis	Edema of the papillary dermis, ballooning and reticular alteration of the epidermis

Pathophysiology:
- Ultraviolet light is the causative agent but the mechanism is not known precisely.

References:
1. Boonstra HE, van Weelden H, Toonstra J, van Vloten WA. Polymorphous light eruption: a clinical, photobiologic, and follow-up study of 110 patients. J Am Acad Dermatol 2000; 42(2 Pt 1):199–207.
2. Mikhail M, Ackerman AB. Actinic prurigo; Hutchinson's summer prurigo, prurigo solare, and hereditary polymorphic light eruption of the American Indians. Dermatopathol Pract 10(3):3, available at www.derm101.com.
3. Stratigos AJ, Antoniou C, Papadakis P, et al. Juvenile spring eruption: clinicopathologic features and phototesting results in 4 cases. J Am Acad Dermatol 2004; 50:S57–S60.

TUMID LUPUS ERYTHEMATOSUS

Synonyms: Lymphocytic infiltration of Jessner and Kanof most likely is tumidus lupus erythematosus.

Clinical Presentation (Fig. 8A):
- Smooth surfaced red macules, papules, and plaques
- Often localized on sun-exposed sites such as the face, chest, and arms

Histopathology (Figs. 8B and C):
- Perivascular and periadnexal infiltrate of lymphocytes, superficial and deep
- Mucin in abundance in the reticular dermis

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Papules and plaques	Superficial and deep infiltrate of lymphocytes and deposits of mucin
Erythema	Dilation of vessels in the dermis
Smooth surface	No changes in the epidermis

Differential Diagnosis:

Polymorphous Light Eruption	Erythema Figuratum/ Deep Gyrate Erythema	Chronic Lymphocytic Leukemia
Infiltrate of normal lymphocytes	Infiltrate of normal lymphocytes, no involvement of the interstitium	Infiltrate of lymphocytes that may have abnormal nuclei
Edema of the papillary dermis	No edema of the papillary dermis	No edema of the papillary dermis
Spongiosis	No changes in the epidermis	No changes in the epidermis

Pathophysiology:
- Lupus erythematosus is considered to be an autoimmune disease but the mechanism precisely is not known; genetic factors, estrogens, and deficiency of complement also seem to play a role in the pathogenesis.
- ANA and anti-ds DNA antibodies are variably present in the serum of patients with tumid lupus erythematosus, and direct immunofluorescence is usually negative.

References:

1. Kuhn A, Sonntag M, Ruzicka T, et al. Histopathologic findings in lupus erythematosus tumidus: review of 80 patients. J Am Acad Dermatol 2003; 48:901–908.
2. Lee SS, Ackerman AB. Lupus dermatitis is an expression of systemic lupus erythematosus. Dermatopathol: Prac & Conc 1997; 3:346–347.

PERNIO

Synonyms: Dermatitis congelationis; chilblains; perniosis; erythema pernio.

Clinical Presentation (Fig. 9A):
- Papules, papulovesicles, nodules, and ulcerations
- Fingers, toes, nose, and ears
- Young persons usually

Histopathology (Figs. 9B and C):
- Superficial and deep perivascular infiltrate of lymphocytes
- Extravasated erythrocytes
- Edema of the papillary dermis
- Lymphocytes at the dermoepidermal junction often
- Thrombi in the lumen and/or fibrin in the wall of vessels sometimes
- Mucin in the reticular dermis

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Edematous papules and nodules	Perivascular infiltrate of lymphocytes, deposits of mucin in the reticular dermis, and edema of the papillary dermis
Papulovesicles	Extensive subepidermal edema

Differential Diagnosis:

Erythema Multiforme	Hydroa Vacciniforme	Polymorphous Light Eruption
Lichenoid infiltrate of lymphocytes	Superficial and deep perivascular infiltrate of lymphocytes	Superficial and deep perivascular infiltrate of lymphocytes
No deposits of mucin in the dermis	No deposits of mucin in the dermis	No deposits of mucin in the dermis
Numerous individual necrotic keratinocytes	Ballooning and reticular alteration	Spongiosis

Pathophysiology:
- Caused by continued exposure to cold, the exact mechanism being opaque
- Sometimes presenting as a variant of lupus erythematosus (i.e., Chilblain lupus)

Reference:

1. Ackerman AB, Böer A, Bennin B, Gottlieb GJ. Histologic Diagnosis of Inflammatory Skin Diseases. 3rd ed. New York: Ardor Scribendi, 2005.

ERYTHEMA FIGURATUM

Synonyms: Deep gyrate erythema; "deep type" of erythema annulare centrifugum of Darier; palpable migratory and arciform erythema; erythema figuratum perstans; figurate erythema.

Clinical Presentation (Fig. 10A):
- Annular, arcuate, polycyclic, and serpentine papules and plaques devoid of scale
- Localized or widespread, trunk and proximal extremities especially
- Adults

Histopathology (Figs. 10B and C):
- Superficial and deep perivascular infiltrate of lymphocytes, the interstitium of the reticular dermis usually being spared
- No increase in mucin in the reticular dermis
- No edema of the papillary dermis
- No changes in the epidermis

Clinicopathologic Correlation:

Clinical Feature	Pathologic Feature
Red papules and plaques	Moderately dense infiltrates of lymphocytes around dilated venules

Differential Diagnosis:

Erythema Migrans	Chronic Lymphocytic Leukemia	Tumid Lupus Erythematosus
Perivascular and sometimes interstitial infiltrate	Dense perivascular infiltrate	Perivascular and interstitial infiltrate
Normal lymphocytes and plasma cells	Lymphocytes may have abnormal nuclei	Normal lymphocytes monopolize
No increase in mucin	No increase in mucin	Abundant mucin in the reticular dermis

Pathophysiology:
- Unknown, but figurate erythema may represent a pattern encountered in a variety of conditions rather than being a distinctive disease.

References:

1. Ackerman AB, Böer A, Bennin B, Gottlieb GJ. Histologic Diagnosis of Inflammatory Skin Diseases. 3rd ed. New York: Ardor Scribendi, 2005.
2. Clark WH, Mihm MC, Reed RJ, Ainsworth AM. The lymphocytic infiltrates of the skin. The lymphocytic infiltrates of the skin. Hum Pathol 1974; 5:25.
3. White JW Jr. Gyrate erythema. Dermatol Clin 1985; 3(1): 129–139.