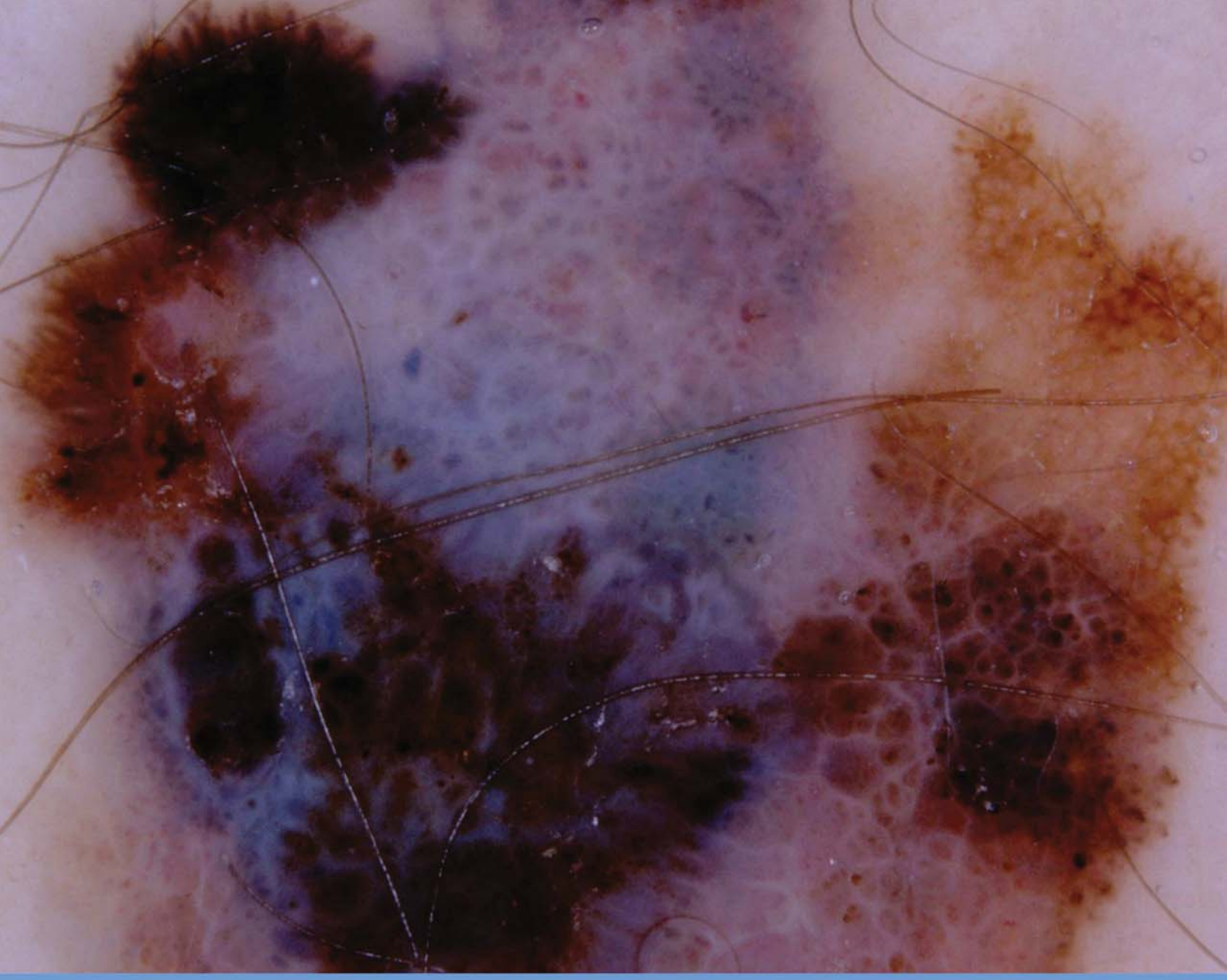

ROBERT H. JOHR • WILHELM STOLZ
ASSOCIATE EDITOR: JAMES IDA

DERMOSCOPY
Criteria Review

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Dermoscopy Criteria Review

Notice

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Dermoscopy Criteria Review

Robert H. Johr, MD, FAAD
Voluntary Professor Emeritus of Dermatology and
Voluntary Associate Professor Emeritus of Pediatrics
University of Miami Miller School of Medicine
Miami, Florida

Prof. Wilhelm Stolz, MD
Director, Clinic of Dermatology, Allergology and Environmental Medicine
Hospital München Thalkirchner Street and
Professor of Dermatology, Faculty of Medicine
Ludwig-Maximilians-Universität München
Munich, Germany

Associate Editor

James A. Ida, MD, MSPH
Private Practice
Affiliate Dermatologist
Department of Medicine
Northwestern Lake Forest Hospital
Lake Forest, Illinois

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Contributors

Aimilios Lallas, MD, MSc, PhD
Department of Dermatology
Aristotle University of Thessaloniki
Thessaloniki, Greece
Chapter 5

Antonella Tosti, MD
Professor
Department of Dermatology and Cutaneous Surgery
University of Miami Miller School of Medicine
Miami, Florida
Chapter 6

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Foreword

It has been a pleasure and an honor to be asked to review and write a foreword for this new publication. Drs. Johr and Stolz have once again advanced the field of dermoscopy by providing a step-by-step guide which can take the neophyte dermoscopist to the next level of expertise. They have added an associate editor Dr. James Ida and have chapters which relate to the use of dermoscopy in general/non-neoplastic skin disorders as well as hair disorders.

I have had the gift of learning from Dr. Johr, first in 1996 and frequently since then. Although primarily a pediatric dermatologist, I have always seen selected adults as well. With time I would feel disarmed if I somehow started a clinic without a dermatoscope available to me. Obviously, you do not expect to see a child with a melanoma frequently in a pediatric dermatology practice, yet I have seen more than twenty melanomas in children, many before I became proficient in dermoscopy. In children we frequently make use of dermoscopy in inflammatory and infections disorders as well as hair disorders. Having a long interest in scabies, for the past 15 years I have abandoned skin scrapings for diagnosis, and have relied on dermoscopy alone. I will occasionally do a scraping to prove to parents the diagnosis, as they have often been misdiagnosed by other doctors for weeks and months. Likewise, dermoscopy is essential in rheumatologic conditions (e.g., capillary nail fold visualization) and in hair shaft disorders.

This text is an extraordinary teaching instrument. It lays out with descriptions and dermoscopic figures, the basics of features which lead to the diagnosis or differential diagnosis. This is done in the chapter "Dermoscopy A to Z." What follows is the heart of the learning experience: 105 cases which are sequences of brief history, followed by clinical, then unlabeled dermoscopic photos, and then like peeling back the onion, labeled important dermoscopic features, then the diagnosis, as well as discussion of the important features of the case. An honest description of the limits of dermoscopy is given for many cases. These cases are brief, beautifully photographed, and packed with insight.

I truly wish I had this text available when I first learned dermoscopic analysis. A beginner could learn all of the essentials from this work alone, followed by years of practice. I find it inconceivable today that a trained dermatologist would diagnose and treat melanoma, and fail to use a dermoscopy. Drs. Johr, Stolz, and Ida are to be commended for producing a text which will jump-start those on their venture into dermoscopy!

Ronald C. Hansen MD
Professor (Emeritus) Dermatology and Pediatrics,
University College of Medicine, Tucson, Arizona
Affiliate and Founding Chief of Dermatology,
Phoenix Children's Hospital, Arizona

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Preface

The term *dermoscopy* derives from two basic Greek words: *dermà*, meaning "skin," and *skopéō*, meaning "to look or see." As you are likely already aware, however, the *science and practice of dermoscopy* involve so much more than simply "looking at skin." Indeed dermoscopy, which is also called dermatoscopy, has evolved a sort of language all its own. As you will soon learn in the coming chapters, there is a wealth of terms, each important to the practice of dermoscopy, with their own specific meanings and even subtle connotations depending on a given lesion. As with any language, a fluent understanding of the meaning of these terms is essential to becoming a proper speaker. To this end, Chapter 1, "Dermoscopy from A to Z," will be your starting point for a comprehensive overview of the basic terminology and concepts of dermoscopy. For example, it is here where you will be introduced to the essential principles of pattern analysis and the "two-step algorithm." This will serve as your basic approach when analyzing a lesion, such as differentiating melanocytic from nonmelanocytic. Next, and arguably the most critical part of the book, is Chapter 2, "Comprehensive Dermoscopy Criteria Review." In this chapter, representative images and detailed explanations will guide you as you learn the language of dermoscopy. Although the task may be initially daunting, through study, practice, and dedication you will overcome a steep learning curve to master the techniques and language of dermoscopy.

Our goal in writing this book has been to teach you the language and key principles of dermoscopy. Through the use of extensive clinical and dermoscopic images along with detailed explanations and diagnostic clues, you will have the opportunity to self-assess your knowledge and skills as you study. In our era of information overload, we have endeavored to design this book to be short, sweet, and to the point. We hope that you will find it to be an easy, enjoyable, and practical read. Important principles are often repeated in an effort to make them familiar and more easily remembered.

We have included 105 cases that are likely to be seen on a regular basis in a general dermatology practice. For each case, you will find a short history along with a clinical image and an unmarked dermoscopic image. Study the unmarked image and attempt to identify the global and local dermoscopic features. Next, make your diagnosis after identifying as much detail as you can. Then, turn the page and the dermoscopic image will be presented again, this time marked with circles, boxes, arrows, and/or stars to highlight the important dermoscopic features of each case. On the same page you will find the diagnosis along with a detailed discussion and a few pearls, or key take-away points, for your review. Our goal is to fully demonstrate the global features and local criteria of each lesion. The concept of dermoscopic differential diagnosis is critical and is emphasized throughout the book.

Each case has a discussion of all of its salient features. We achieve this not in long, verbose paragraphs, but rather in outline form to make the information easier to digest. We realize that your time is valuable and want to make the learning and recall process as easy and effective as possible.

Case series are organized into groups, depending on particular common dermoscopic features. For example, there are lesions in which the major feature may be pigment network; dots and globules; regression; pink, blue or black color; or vascular structures. There are similar clinical and/or dermoscopic images grouped together in specific body locations, such as brownish spots on the face or black lesions on the trunk. We have done this to better simulate real-life clinical encounters. One case often flows into the next, and concepts learned in a previous case may inform the analysis of a subsequent case. Finally, each case ends with a series of dermoscopic and/or clinical pearls based on our combined years of experience treating patients in outpatient clinical settings.

We present the many faces of melanoma from head to toe, whether easily diagnosed with well-developed criteria or challenging to the most astute dermoscopist. We include more than 100 clinical and dermoscopic images of melanoma to help you improve your diagnostic skills. In addition, we are especially delighted to include subspecialty expertise in the fields of hair and nail dermoscopy. You will find nail cases as well as chapters on trichoscopy and on dermoscopy in general dermatology. At the end of the book, you will also find a succinct glossary of specific terms and general principles to review at a glance.

In conclusion, we strongly believe in the importance of using dermoscopy routinely in the practice of dermatology. As a cutting-edge, noninvasive technique, dermoscopy

uniquely allows us insights into the diagnosis of numerous dermatologic conditions and indeed may be a potentially lifesaving tool to care for our patients. Our book is sprinkled with general principles and specific points that may at times be controversial but are strongly embedded in our core beliefs. Each of us has a profound responsibility for the well-being of every patient who walks through the door. We applaud you as you embark on your journey to learn the techniques and language of dermoscopy!

Dr. Robert H. Johr
Chapel Hill, North Carolina

Dr. Wilhelm Stolz
Munich, Germany

Acknowledgments

My journey continues! I would like to take a moment to express my gratitude to those who have meant so much in putting together this book.

To Professor Wilhelm Stolz, a pioneer in the field of dermoscopy and a loyal friend and colleague for more than 25 years. This book would not have been possible without your contribution of such superb and varied cases.

To Dr. James Ida, our copy editor and all-around language aficionado. Your gift for the written word has been indispensable for the writing of a clear, concise, and readable book. I appreciate your many "posthaste" edits of each case, pithy comments, eye to detail, and overall positive attitude.

To Dr. Antonella Tosti and Dr. Aimilios Lallas for their generous time and contribution of truly fantastic cases without which our text would not be complete.

To Robert Pancotti, Senior Development Editor at McGraw-Hill Medical, for his editorial oversight and meticulous attention to detail throughout the publishing process, and Revathi Viswanathan, Senior Project Manager at Cenveo Publisher Services for transforming our written material into the actual book.

Allow me to also thank Karen Edmonson, Senior Content Acquisitions Editor at McGraw-Hill Medical, for her unwavering support and belief in us. It has truly been a delightful experience to work with Karen on the present book as well as on all of our projects over the years.

Finally, to my wife Irma to whom I owe infinite gratitude. You are my life's best friend. I thank you for your continual sage advice, encouragement, and support.

Dr. Robert H. Johr

I am deeply grateful to my friend and highly esteemed colleague Dr. Robert Johr for the wonderful cooperation and his extremely passionate work on the case presentations that are the core of this book.

Without the very valuable contributions of Dr. James Ida, Dr. Antonella Tosti, Dr. Aimilios Lallas, Robert Pancotti, Revathi Viswanathan, and, especially, Karen Edmonson, writing this book would not have been possible.

For her enthusiasm and skill regarding the beautiful color images, a cornerstone of our text, I would like to thank our nurses in the outpatient clinic: Mss. Carolin Mertens, Delia Nagy, Antje Seehuber, and Vesna Davidovic.

To the many physicians in our clinic who assisted me with my dermoscopy clinic and with the case preparations, most of all Dr. Brigitte Coras-Stepanek, Dr. Stefanie Guther and Dr. Ulrike Weigert, I wish to extend my sincerest thanks.

Special thanks also go to my assistant in our office, Mrs. Leonie Rieger, for her continuous, very helpful support in the management of both patients and staff.

However, first and foremost I would like to express my deepest gratitude to my wife, Karola, who has lovingly shared my many dermoscopic and academic pursuits over the past three decades.

Dr. Wilhelm Stolz

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CHAPTER 1

Dermoscopy From A to Z

SYNONYMS

- Dermatoscopy.
- Skin surface microscopy.
- Epiluminescence microscopy (ELM).
- Digital dermoscopy/digital ELM.
- *Auflichtmikroscopie* (German).
- *Dermoscopia/dermatoscopia* (Spanish).
- *Dermoscopy* and *dermatoscopy* are used interchangeably by experienced dermoscopists and in the literature.

DEFINITION

- Dermoscopy is an in vivo, noninvasive technique in which oil or fluid (eg, mineral oil, gel, alcohol, water) is placed on the lesion.
  - Fluid eliminates reflection of light from the surface of the skin, allowing visualization of color and structure in the epidermis, dermoepidermal junction, and papillary dermis.
  - The color and structure visualized cannot be seen with the naked eye or with typical magnification that clinicians use.
  - Polarizing light and digital instrumentation do not require fluid.
- When using polarized light dermoscopy:
  - Light from a polarized light source penetrates the stratum corneum with less scatter.
  - A second polarizer screens out scattered surface light, resulting in the physician seeing primarily light from the deeper structures.
  - This removes the need for contact with the skin and the need for immersion fluids, resulting in faster examination times.
- There is noncontact and contact polarized dermoscopy.
  - Gels can be used with contact polarized dermoscopy to enhance the appearance of vessels or eliminate the negative effects of dry skin.
- There is contact nonpolarized dermoscopy.
  - Some criteria can be better visualized with polarized dermoscopy, such as small vessels and blue-white color.
  - Some criteria can be better visualized with nonpolarized contact dermoscopy, such as milia-like cysts seen in seborrheic keratosis and melanocytic lesions.
  - Crystalline structures (aka shiny white structures) can only be seen with polarized dermoscopy.
  - All the criteria needed to make a dermoscopic diagnosis can be made using any form of the technique.

BENEFITS OF DERMOSCOPY

- Helps to differentiate melanocytic from nonmelanocytic skin lesions.
- Helps to differentiate benign from malignant skin lesions.

- With dermoscopy, the sensitivity to diagnose melanoma is 85% and better compared with 65% to 80% when the technique is not used.
- Increases the diagnosis of early melanoma.
- Increases the diagnosis of amelanotic and hypomelanotic melanoma.
- Increases the diagnosis of melanoma incognito (clinically false-negative melanoma).
- Increases the diagnosis of inflammatory lesions (ie, lichen planus, psoriasis, seborrheic dermatitis, rosacea, discoid lupus erythematosus, granulomatous diseases).
- Increases the diagnosis of infestations (eg, scabies, head lice, crab lice).
- Increases the diagnosis of alopecia (eg. androgenic alopecia, alopecia areata) and hair shaft pathology (eg, monilethrix, trichorrhexis invaginata).
- Helps to avoid unnecessary surgery.
- Helps to plan surgery.
- Helps to work better with a pathologist (asymmetrical high-risk criteria, collision tumors, dermoscopic-pathologic correlation).
- Patient reassurance.
- Allows for follow-up of patients with a single nevus or multiple nevi digitally to find changes over time.

DERMOSCOPIC DIGITAL MONITORING

- There are pigmented skin lesions that are not high-risk enough to warrant immediate histopathologic diagnosis, yet not so banal that there is no concern at all.
- There are melanomas that do not appear to be high-risk clinically or with dermoscopy.
- They are only diagnosed after monitoring for dermoscopic changes over time when comparing baseline with subsequent digital images.
- Short-term monitoring is performed every 3 or 4 months.
  - Any change over time could be a melanoma.
- Long-term monitoring is done at 6-month to yearly intervals.
  - Important changes include asymmetrical enlargement, the appearance of high-risk criteria, new colors, or regression.
- Single or multiple suspicious pigmented skin lesions can be chosen for digital monitoring.

THE 2-STEP ALGORITHM

- The analysis of a suspicious skin lesion is a 2-step process:
  - Step 1: Determine if it is melanocytic or nonmelanocytic.
  - Step 2: If it has the criteria for a melanocytic lesion, the second step is to determine if it is low, intermediate, or high risk using the melanocytic algorithm of your choice.

TABLE 1-1 • ABCD Rule of Dermatoscopy: Identify Criteria and Assign Points to Determine Total Dermatoscopy Score (TDS)

Dermoscopic Criterion	Definition	Score Weight Factor
*A*symmetry	In 0, 1, or 2 perpendicular axes; assess contour, colors, and structures	0-2
*B*order	Abrupt ending of pigment pattern at periphery in segments	0-8
*C*olor	Presence of up to 6 colors (white, red, light brown, dark brown, blue-gray, and black)	1-6
*D*ermoscopic structures	Presence of network, structureless (homogeneous) areas, branched streaks, dots, and globules	1-5

Formula for calculating TDS: (A score × 1.3) + (B score × 0.1) + (C score × 0.5) + (D score × 0.5) = TDS. Interpretation of total score: <4.75. Benign melanocytic lesion 4.75-5.45; suspect lesion (close follow-up or excision recommended); >5.45, lesion highly suspect for melanoma

- Pattern analysis was the first melanocytic algorithm developed for this purpose and is most often used by experienced dermoscopists. Variations of pattern analysis have also been developed, including
  - The ABCD rule of dermatoscopy (Table 1-1).
  - The 11-point checklist (Table 1-2).
  - The 7-point checklist (Table 1-3).
  - The 3-point checklist (Table 1-4).

Step 1: Identification of Criteria

Look for the criteria associated with a melanocytic lesion. If one does not find them, the search is on for the criteria associated with seborrheic keratosis, basal cell carcinoma, dermatofibromas, vascular lesions, and others (Table 1-5).

- Not all of the possible criteria are needed to make a diagnosis.
- When there is absence of criteria for a melanocytic lesion, seborrheic keratosis, basal cell carcinoma, dermatofibroma, or vascular lesion, you are now dealing with a melanocytic lesion by default.
- The "default category" is the last criterion used to diagnose a melanocytic lesion (Fig. 1-1).

TABLE 1-2 • 11-Point Checklist

Dermoscopic Criteria	
1.	Symmetry of pattern (negative feature)
2.	Presence of single color (negative feature)
Positive Features	
3.	Blue-white veil (color)
4.	Multiple brown dots
5.	Pseudopods (streaks)
6.	Radial streaming (streaks)
7.	Scar-like depigmentation (bony-white color)
8.	Peripheral black dots/globules
9.	Multiple (5 or 6) colors
10.	Multiple blue/gray dots
11.	Broadened network (irregular pigment network)

For melanoma to be diagnosed, both negative features must be absent and 1 or more of the 9 positive features must be present.

TABLE 1-3 • 7-Point Checklist

Dermoscopic Criteria	Scores
1. Irregular pigment network (**major criteria**)	2
2. Bluish-white veil (any blue and/or white color)	2
3. Polymorphous vascular pattern	2
4. Irregular streaks (**minor criteria**)	1
5. Irregular dots/globules	1
6. Irregular blotches	1
7. Regression	1

By simple addition of the individual scores, a minimum total score of 3 is required for the diagnosis of melanoma, whereas a total score of less than 3 is indicative of nonmelanoma.

TABLE 1-4 • 3-Point Checklist to Diagnose High-Risk Lesions (Melanoma, Basal Cells)

Asymmetry of color and/or structure
Irregular pigment network
Blue and/or white color
2 out 3, 3 out 3 → Excise

The 3-point checklist is based on simplified pattern analysis and is intended to be used by nonexpert dermoscopists as a screening technique. Its aim is to diagnose melanocytic and nonmelanocytic potentially-malignant pathology.

TABLE 1-5 • Criteria for Various Lesions

Criteria for a Melanocytic Lesion
Pigment network (trunk and extremities)
Aggregated brown globules.
Homogeneous blue color (blue nevus).
Parallel patterns on acral sites.
By default (when there is an absence of criteria for a melanocytic lesion, seborrheic keratosis, basal cell carcinoma, hemangioma, or dermatofibroma, the lesion should be considered melanocytic by default).
Criteria for a Seborrheic Keratosis
Milia-like cysts
Pseudofollicular/comedo-like openings
Fissures/furrows and ridges/fat fingers
Hairpin vessels
Sharp border demarcation
Criteria for a Basal Cell Carcinoma
Absence of pigment network
Arborizing blood vessels/serpentine vessels
Pigmentation
Ulceration
Spoke-wheel structures
Criteria for a Dermatofibroma
Central white patch
Peripheral pigment network
Criterion for a Vascular Lesion
Vascular spaces called lacunae Fibrous septae

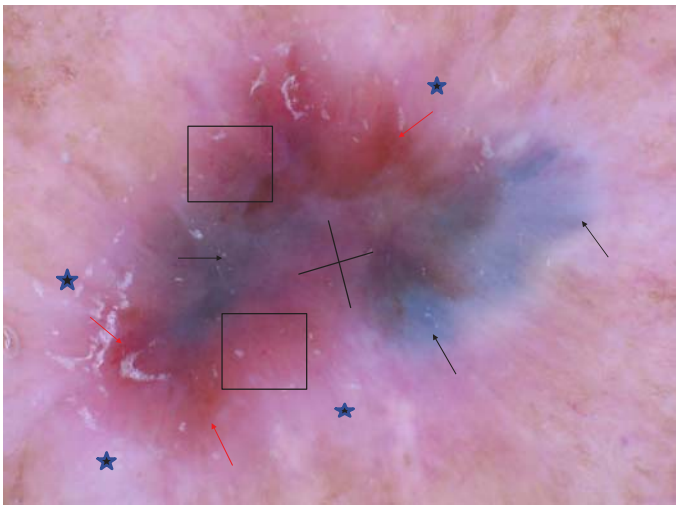

FIGURE 1-1. Invasive melanoma. A melanocytic lesion by default, because there is an absence of criteria for a melanocytic lesion, seborrheic keratosis, basal cell carcinoma, dermatofibroma, or hemangioma. There is asymmetry of color and structure (+), bluish-white color (black arrows), milky-red color (red arrows) with polymorphous vessels (boxes). The vessels are dotted, linear and comma shaped. The bony-white color of regression (stars) surround the lesion.

Criteria Defined

Melanocytic lesion

PIGMENT NETWORK/NETWORK

- On the trunk and extremities.
- Shades of black or brown.
- Honeycomb-like, reticular, web-like line segments (elongated and hyperpigmented rete ridges) with hypopigmented holes (dermal papilla).

WHITE/NEGATIVE NETWORK

- Bony-white network-like structures.
- Not a primary criterion used to diagnose melanocytic lesions.
- Can be seen in pink/pigmented nevi, Spitz nevi, melanoma, and dermatofibromas.

PSEUDONETWORK/PSEUDOPIGMENT NETWORK

- Because the skin of the head and neck is thin and does not have well-developed rete ridges, one sees:
  - Appendageal openings/adnexal structures (sebaceous glands, hair follicles).
  - Uniform, round white or yellowish structures.
- When they penetrate areas of diffuse pigmentation, reticular-like structures are formed that are referred to as the *pseudonetwork*.
- Monomorphous appendageal openings can often be seen on the skin of the face without any pigmentation.
- They should not be confused with the milia-like cysts seen in seborrheic keratosis.
- It is not always possible to make the differentiation.
- Consequences could be misdiagnosing lentigo maligna for a seborrheic keratosis.

- This criterion can be seen with nonmelanocytic lesions (ie, actinic keratosis, solar lentigo, lichen planus–like keratosis).
- It is not diagnostic of a melanocytic lesion.

DOTS AND GLOBULES

- Roundish structures distinguished only by their relative sizes.
- Dots (0.1 mm) are smaller than globules (>0.1 mm).
- Black, brown, gray, or red.
  - When black, they can represent atypical melanocytes in the epidermis or transepidermal elimination of pigment.
  - Regular brown dots and globules (brown is the main color to diagnose a melanocytic lesion) represent nests of melanocytes at the dermoepidermal junction.
  - Irregular brown dots and globules represent nests of atypical melanocytes at the dermoepidermal junction.
  - Grayish dots ("peppering") represent free melanin and/or melanophages in the papillary dermis, which can be seen in regression, alone, or in benign pathology such as lichen planus–like keratosis or posttraumatically.
  - Reddish globules (milky-red globules) can be seen in melanoma (neovascularization).
  - It is written and taught that aggregated brown globules identify a melanocytic lesion with no mention of the smaller dots. The reality is that both dots and globules define a melanocytic lesion (Fig. 1-2).

HOMOGENEOUS BLUE PIGMENTATION

- Structureless blue color in the absence of local criteria such as pigment network, dots, or globules (Fig. 1-3).

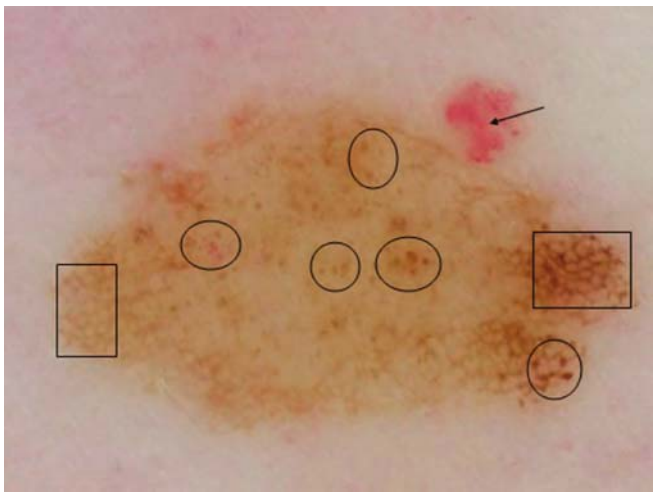

FIGURE 1-2. Acquired nevus. A melanocytic lesion, because it has pigment network (black boxes) and aggregated brown globules (circles). There is a small hemangioma adjacent to the nevus (arrow). (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

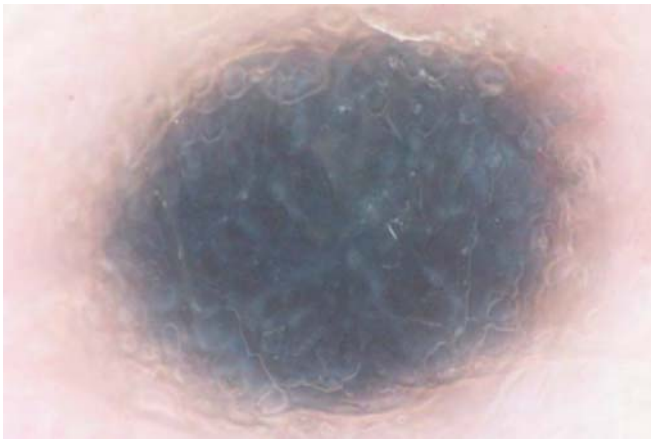

FIGURE 1-3. Blue nevus. The classic homogenous blue color of a blue nevus. (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

- Different shades of homogeneous blue color usually represents a blue nevus.
- The history is important, because there is a differential diagnosis which could include a lesion as banal as a radiation tattoo to one more ominous such as nodular or cutaneous metastatic melanoma.

PARALLEL PATTERNS/ACRAL PATTERNS/PALMS AND SOLES

- Fissures/furrows and ridges on the skin of the palms and soles (dermoglyphics).
- Can create parallel patterns.
  - Parallel lines can also be seen on all nonglabrous skin/mucosal surfaces (ie, lips, genitalia).

PARALLEL-FURROW PATTERN (BENIGN PATTERN)

- Thin brown parallel lines in the furrows of the skin (crista superficialis limitans).
- Variations include 2 thin lines with or without dots and globules (Fig. 1-4).

LATTICE-LIKE PATTERN (BENIGN PATTERN)

- Thin brown parallel lines in the furrows.
- Thin brown parallel lines running perpendicular to the furrows forming a ladder-like picture (Fig. 1-5).

FIBRILLAR PATTERN (BENIGN PATTERN)

- Fine brown lines.
- Run in an oblique (/////) direction.
- Pressure can change the lattice-like pattern into a fibrillar pattern.

GLOBULAR PATTERN (BENIGN)

- Brown globules without a parallel component.

RETICULAR PATTERN (BENIGN)

- A lesion with only pigment network.

HOMOGENEOUS PATTERN (BENIGN)

- Brown homogeneous color.

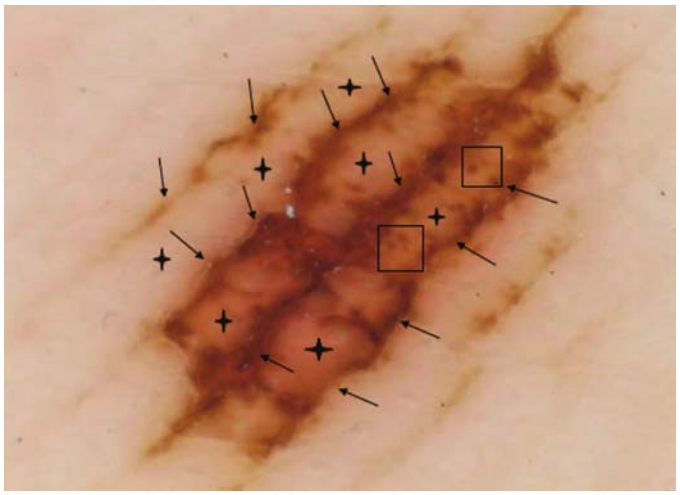

FIGURE 1-4. Acral nevus. A melanocytic lesion on acral skin with the benign parallel furrow pattern. Pigmentation is in the thin furrows (arrows) with globules (boxes) in the ridges (stars). (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

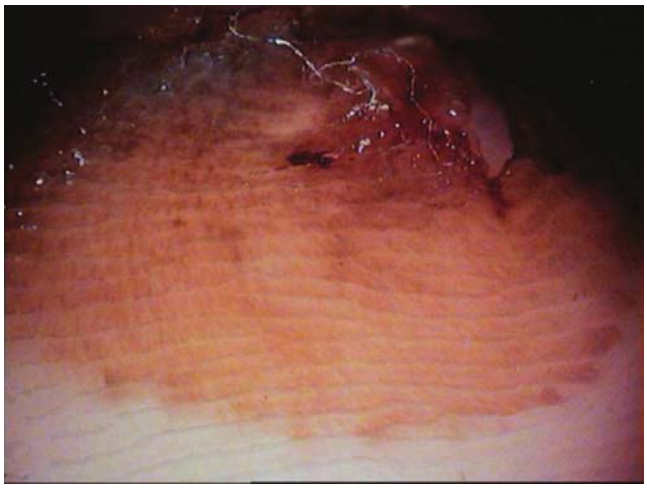

FIGURE 1-6. Acral melanoma. The parallel-ridge pattern diagnoses this acral melanoma with pigmentation in the thicker light brown ridges. The thin white lines are the furrows. (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

PARALLEL-RIDGE PATTERN (THIN/EARLY MELANOMA)

- Pigmentation is in the thicker ridges of the skin (crista profunda intermedia) (Fig. 1-6).
- Sometimes there are monomorphous round white structures in the ridges that represent the acrosyringia of the sweat ducts ("string of pearls").
- The acrosyringia are always in the ridges.
- An important landmark when one has to determine if pigmentation is in the furrows or ridges. Benign (furrows) vs malignant (ridges) pathology.
- Foci of the parallel-ridge pattern can be seen in more advanced acral melanomas with a multicomponent global pattern and melanoma-specific criteria (ie, regression, irregular blotches, blue color, polymorphous vessels).
- Parallel-ridge pattern created by blood (talon noir, black heel) (Fig. 1-7).
- Parallel-ridge pattern in darker-skinned persons (Fig. 1-8).
- Macules seen in the Peutz-Jeghers syndrome.
- This pattern is not 100% diagnostic of melanoma.

DIFFUSE VARIEGATE PATTERN (MELANOMA)

- Irregular pigmented dark blotches.
- Black, brown, or gray.

MULTICOMPONENT PATTERN (MELANOMA)

- Filled with regular and irregular criteria.
- Multiple colors plus areas with acral benign patterns (fibrillar, parallel furrow).

NONSPECIFIC PATTERN (MELANOMA)

- If one cannot determine any of the above benign or malignant patterns, this represents a red flag of concern.

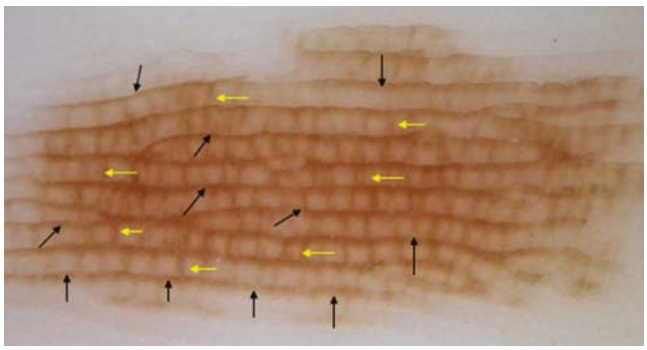

FIGURE 1-5. Acral nevus. Brown lines in the furrows (black arrows) and perpendicular to the furrows (yellow arrows) characterize the lattice-like pattern. Pressure on the foot can change this into the fibrillar pattern with fine oblique (/////) lines. (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

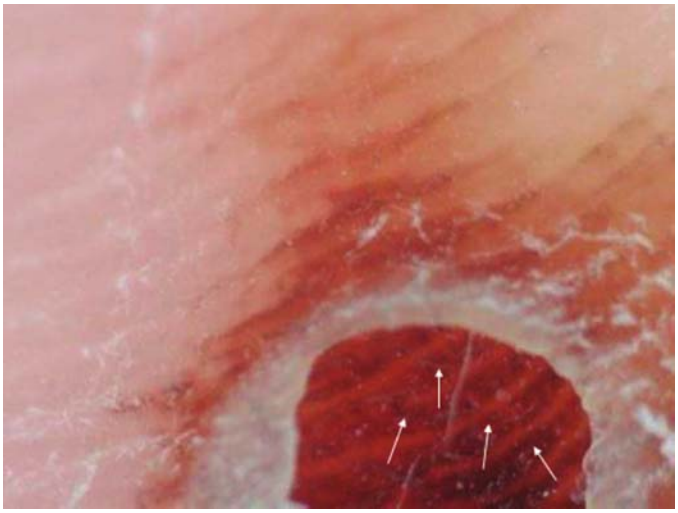

FIGURE 1-7. Acral hemorrhage. The parallel-ridge pattern created by blood (white arrows). (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

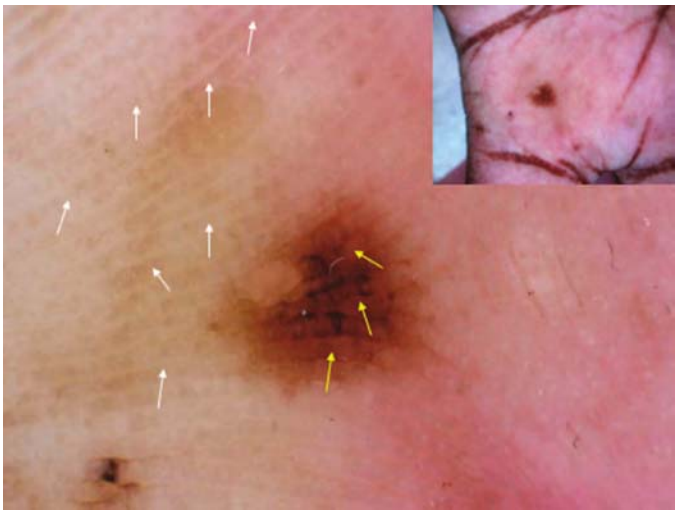

FIGURE 1-8. Acquired nevus. There is an increased incidence of acral melanoma in darker-skinned persons. This nevus on the palm of an African American patient was without change and demonstrates the benign parallel-ridge pattern. Pigmentation is seen in the ridges of the nevus (yellow arrows) and in the ridges of the entire palm (white arrows). (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

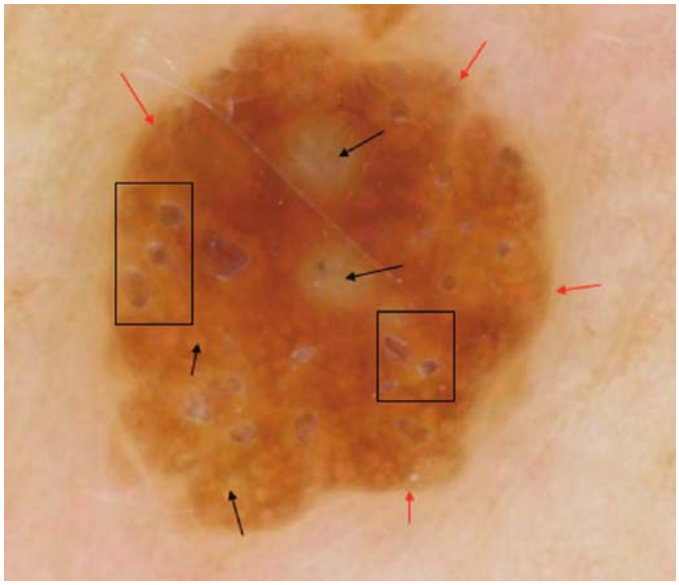

FIGURE 1-9. Seborrheic keratosis. Sharp borders (red arrows), milia-like cysts (black arrows), and pigmented pseudofollicular openings (boxes) characterize this seborrheic keratosis. (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

PEARLS

- There can be exceptions to every dermoscopic rule.
- The history and clinical appearance of a lesion are important and should not be ignored.
- Negative "gut" feelings should not be ignored.
- If an acral lesion is rapidly changing yet has a benign appearance, it still could be melanoma.
- A supposedly benign acral pattern with irregularity of some components could be high-risk.
- The presence of blood at acral sites (palms, soles, nails) can be associated with melanoma.
- Look carefully for other high-risk criteria when blood is seen.
- If in doubt, cut it out!

Seborrheic keratosis

MILIA-LIKE CYSTS

- Variously sized white or yellow structures.
- Small or large, single or multiple.
- They can appear opaque or bright—like "stars in the sky" (epidermal horn cysts).

PSEUDOFOLLICULAR OPENINGS/COMEDO-LIKE OPENINGS

- Sharply demarcated roundish structures.
- Pigmented or nonpigmented.
- Shapes can vary, not only within a single lesion but from lesion to lesion in an individual patient.
- When pigmented, they can be brownish-yellow or even dark brown and black (oxidized keratin-filled invaginations of the epidermis).
- Pigmented pseudofollicular openings can be hard to differentiate from the pigmented dots and globules of a melanocytic lesion (Fig. 1-9).

FISSURES/FURROWS AND RIDGES

- Fissures/furrows (sulci) and ridges (gyri) seen in seborrheic keratosis can create several patterns.
- Large irregularly shaped keratin-filled fissures are called *crypts*.
  - Fissures/furrows and ridges can also be seen in papillomatous melanocytic lesions.
  - Cerebriform or brain-like in which they resemble a sagittal section through the cerebral cortex.
  - Mountain-like with variously sized or uniformly roundish structures representing mountains (ridges) and fine pigmented lines representing valleys (fissures).
    - Possible to confuse the mountain-and-valley pattern with the globular or cobblestone pattern of a melanocytic lesion.
  - Pigmented lines should not be confused with an irregular pigment network.
  - Hypo- and hyperpigmented ridges can be digit-like (straight, kinked, circular, or branched) and are referred to as "fat fingers."
  - "Fat fingers" might be the only clue that a lesion could be a seborrheic keratosis.
- All these patterns are commonly seen in this ubiquitous most commonly encountered benign skin lesion (Fig. 1-10).

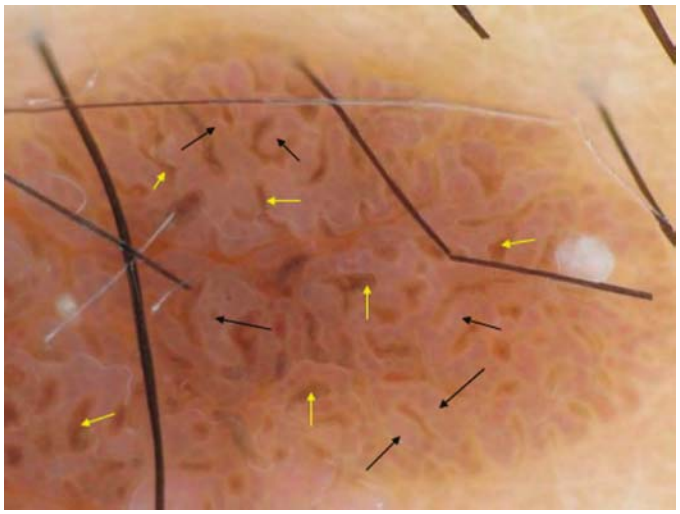

FIGURE 1-10. Seborrheic keratosis. A striking brain-like pattern created by pigmented fissures (yellow arrows) and light ridges (black arrows). Many of the ridges look like "fat fingers." (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

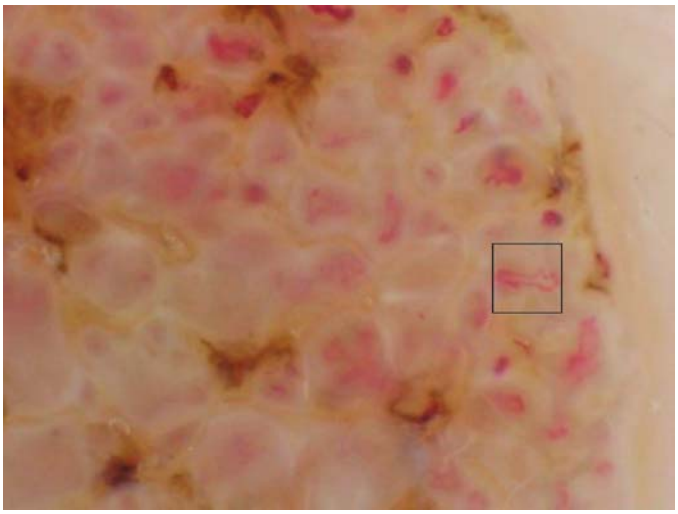

FIGURE 1-11. Seborrheic keratosis. An especially well-formed hairpin vessel in a seborrheic keratosis (black box). (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

FINGERPRINT PATTERN

- Brown fine/thin parallel line segments that resemble fingerprints.
  - The lines can be arched, swirled, or look like branched fungal hyphae.
  - The lines can fill the lesion or be broken up.
- Differ from the pigment network where the line segments are honeycomb-like or reticular.
  - Network-like structures/pseudonetwork can be seen in seborrheic keratosis created by fissures/furrows and ridges not elongated and hyperpigmented rete ridges of the true pigment network.
- Fingerprint pattern can be seen in flat seborrheic keratosis or in solar lentigines.
- Some authors believe that solar lentigines are flat seborrheic keratosis (see below and Fig. 1-23).

HAIRPIN VESSELS

- Elongated vessels (capillary loops) resembling hairpins (Fig. 1-11).
- May or may not be surrounded by hypopigmented halos.
- Light halo indicates a keratinizing tumor and may be found in keratoacanthomas.
- Irregular and thick hairpin vessels can be seen in melanoma.

MOTH-EATEN BORDERS

- Flat or slightly raised brown seborrheic keratoses and solar lentigines.
- Well-demarcated, concave borders that are felt to resemble a moth-eaten garment.

SHARP DEMARCATION

- The majority of seborrheic keratoses have sharp, well-demarcated borders.
- Not always indicative of melanoma in a pigmented lesion (see Fig. 1-9).

Basal cell carcinoma

ABSENCE OF A PIGMENT NETWORK

Arborizing Vessels

- One of the most sensitive and specific vascular structures seen with dermoscopy.
- Not all basal cell carcinomas contain arborizing vessels.
  - Red tree-like branching telangiectatic blood vessels.
  - Can be thick or thin lines that are in focus because of their superficial location.
- Out-of-focus arborizing vessels are a clue that the lesion might be a melanoma.
  - Most often there are different-caliber vessels in a single lesion.
- Can also be found with:
  - Benign nevi
  - Sebaceous gland hyperplasia
  - Scars
  - Sun-damaged skin
  - Melanoma
  - Desmoplastic melanoma
  - Merkel cell carcinoma
- Serpentine Vessels
  - May be very fine/thin or thick
  - Irregular linear red lines
  - A variation of linear vessels
  - Typically found in flat lesions without arborizing vessels
  - Might be the only clue to suggest the diagnosis

PIGMENTATION

- Basal cell carcinoma may or may not contain pigment (pigmented nests or island of basal cell carcinoma in the dermis) that can range from:
  - Fine dots to large leaf-like structures (bulbous extensions forming a leaf-like pattern).
  - Blue-gray ovoid nets.
  - Multiple blue-gray dots and globules.
  - Colors that can be seen
    - Black
    - Brown
    - Gray
    - Blue
    - Red
    - White
- Not necessary to try to determine if leaf-like structures (maple-leaf–like areas) are present, because in reality this is a difficult task (Fig. 1-12).

ULCERATION

- Single or multiple areas where there is loss of epidermis with oozing blood or congealed blood and crusts (Fig. 1-13).
- Multifocal ulceration is associated with superficial basal cell carcinomas.
- There should be no recent history of trauma.

SPOKE-WHEEL STRUCTURES

- Can be found in up to 10% of basal cell carcinomas.
- Diagnostic of basal cell carcinoma.
  - May or may not be associated with the other criteria used to make the diagnosis.
- Well-defined pigmented radial projections meeting at a darker central globule/central axle/hub.

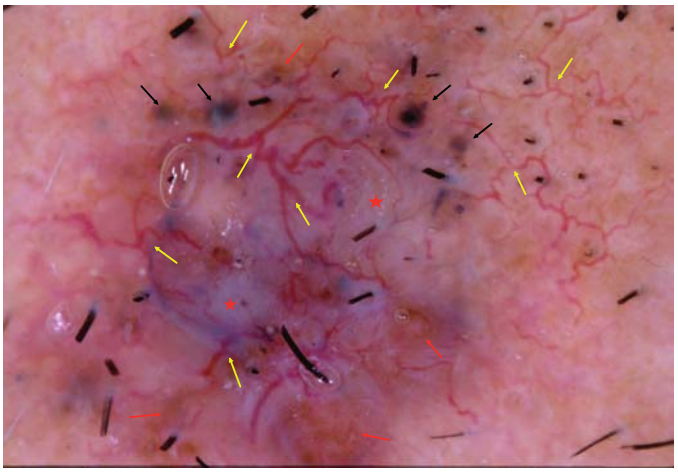

FIGURE 1-12. Basal cell carcinoma. This is a classic pigmented basal cell carcinoma with thick and thin walled branching/arborizing vessels (yellow arrows), bluish-white (red stars), blackish-white, black (black arrows) and brown pigmentation (red arrows).

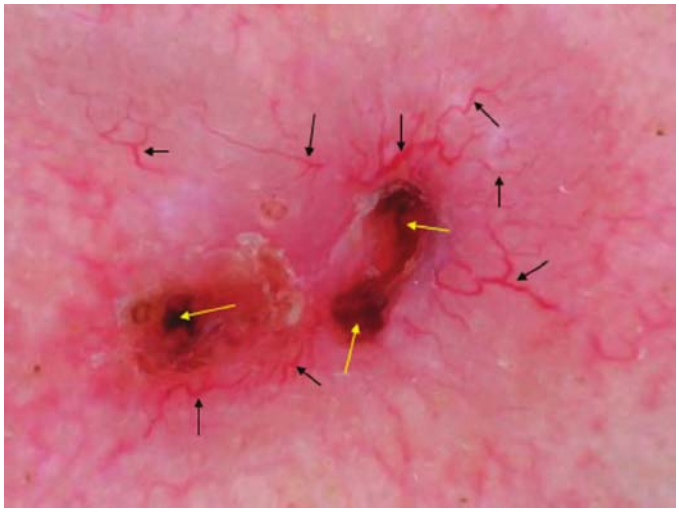

FIGURE 1-13. Basal cell carcinoma. Arborizing vessels (black arrows) and ulcerations (yellow arrows) characterize this nonpigmented basal cell carcinoma. (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide*. 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

- Complete or incomplete variations of this structure can be seen, and one often has to use one's imagination to make the identification.
- Streak-like structures referred to as *pseudostreaks* represent incomplete spoke-wheel structures and could be confused with true steaks of a melanocytic lesion.
- Finding spoke-wheel structures might be the only clue to the correct diagnosis.

PEARL

- At times, one cannot differentiate melanoma from basal cell carcinoma. If there is pigment network in any form, then it cannot be a basal cell carcinoma.

Dermatofibroma

CENTRAL WHITE PATCH

- Most typical presentation of this criterion is:
  - Centrally located
  - Scar-like
  - Bony or milky-white
  - Homogeneous area (scarring in this fibrohistiocytic tumor)
- Several variations such as white network-like structures (white/negative network), which can also be seen in Spitz nevi and melanoma.
- Telangiectatic vessels (ie, pinpoint vessels) with different shapes can also be found anywhere in the lesion.
- Not all dermatofibromas have a central white patch.
- The clinically firm feel should be used to help make the diagnosis.

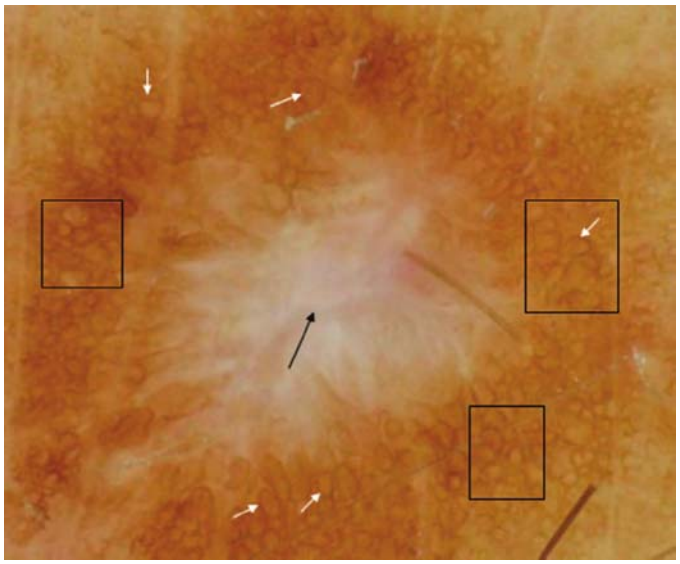

FIGURE 1-14. Dermatofibroma. A classic central white patch (black arrow) and pigment network (black boxes) characterize this dermatofibroma. In this instance, ring-like structures (white arrows) make up the pigment network. Ring-like structures can also be seen in flat seborrheic keratosis. (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

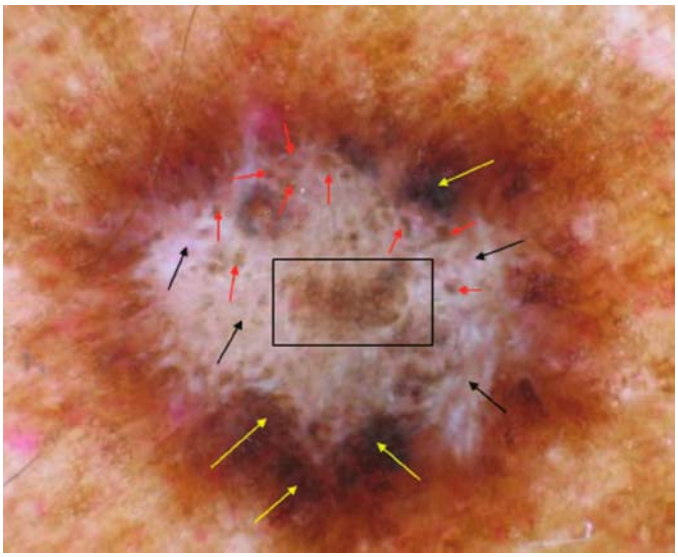

FIGURE 1-15. Atypical dermatofibroma. Regressive melanoma is in the dermoscopic differential diagnoses of this atypical dermatofibroma. There is asymmetry of color and structure, the multicomponent global pattern, irregular pigment network (box), irregular globules (red arrows), and irregular blotches (yellow arrows), multiple colors. This presentation warrants a histopathologic diagnosis. (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)

PIGMENT NETWORK

- Dermatofibromas are one of the types of nonmelanocytic lesions that can have a pigment network; solar lentigines are another.
  - In most cases, a fine peripheral pigment network with thin brown lines is seen.
  - Ring-like structures, which are a variation of a pigment network (Fig. 1-14).
  - Not all dermatofibromas have a pigment network.
- Atypical dermatofibromas with the following features are melanoma simulators that warrant a histopathologic diagnosis:
  - Irregular pigment network
  - Irregular dots/globules/dark blotches
  - Pink color
  - Irregular regression-like white color
  - High-risk vascular structures/polymorphous vessels with different shapes (Fig. 1-15)

Vascular lesions

LACUNAE

- Sharply demarcated bright red to bluish round or oval structures (dilated vascular spaces in the dermis) (Fig. 1-16).
  - Different colors can be seen in a single hemangioma.
  - The deeper the vessels, the darker the color (dark blue).
  - Lacunae should not be mistaken for the milky-red globules seen in pigmented and amelanotic melanoma, which can have out-of-focus reddish globular-like structures.
  - Black homogeneous structureless areas represent thrombosis.
  - Significant scale or dryness (hyperkeratosis) can be seen in angiokeratomas.
- Patchy white color or blue-white veil (blue and/or white color) can be seen in hemangiomas.
- Linear white lines can fill the lesion and represent fibrous septae.

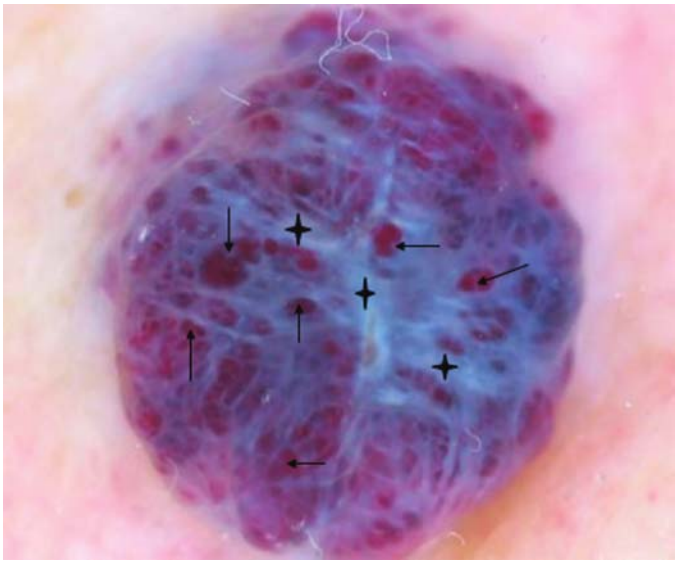

FIGURE 1-16. Hemangioma. Well-demarcated dark red lacunae (arrows) and blue-white color (stars) characterize this classic hemangioma. The linear blue-white color represents fibrous septae. (Reproduced with permission from Johr RH and Stolz W. *Dermoscopy: An Illustrated Self-Assessment Guide.* 2nd ed. New York, NY: McGraw-Hill Education; 2015.)