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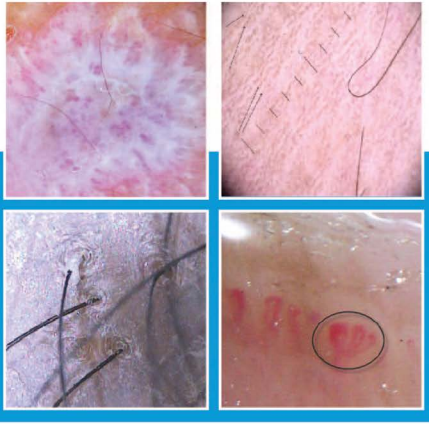
Dermoscopy Trichoscopy & Onychoscopy | In Diseases of the Pigmented Skin

An Atlas and Short Text



SECOND EDITION

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Contents

SECTION 1: BASICS OF DERMOSCOPY

1. **Principles and Techniques of Dermoscopy and Videodermoscopy** 1
   KC Nischal, Uday S Khopkar
2. **Dermoscopy: Terms, Definitions, and Patterns in Diseases of the Brown Skin** 10
   Omprakash HM
3. **Choice of Dermatoscope: An End-user Perspective** 23
   Nirmal B
4. **Smartphone Dermatoscopes** 40
   Nina Madnani, Khan Kaleem
5. **Dermatoscopy of Normal Skin and Appendages** 47
   Nirmal B
6. **Vascular Patterns** 59
   Anjali Pal, Purva Mehta, Subrata Malakar
7. **Applications of Dermatoscopy** 76
   Usha Khemani, Feroze Kaliyadan

SECTION 2: DISORDERS OF HYPERPIGMENTATION

8. **Disorders of Facial Hyperpigmentation** 95
   Ankit H Bharti, Uday S Khopkar

9. **Dermoscopy in Melasma** 122
Niti Khunger, Rashmi Sharma

10. **Importance of Dermatoscopy in Diagnosing Exogenous Ochronosis** 139
Sunil N Mishra, Rachita Dhurat

11. **Pigmented Purpuric Dermatoses** 146
Siddhi Chikhalkar, Monica Bambroo, Uday S Khopkar

12. **Becker's Nevus versus Café au lait Macules: A Dermoscopic Analysis** 156
Mary Thomas, Uday S Khopkar

SECTION 3: DISORDERS OF HYPOPIGMENTATION

13. **Dermoscopy in Vitiligo: Utility for Early Diagnosis, Assessing Stability and Monitoring Therapy** 166
Laxmisha Chandreshekhar

14. **Differential Diagnosis of Hypopigmented Lesions** 175
Ankit H Bharti, Uday S Khopkar

15. **Dermoscopy in the Differentiation of Idiopathic Guttate Hypomelanosis and Guttate Vitiligo** 197
Monica Bambroo, Sushil Pande, Uday S Khopkar

SECTION 4: PAPULOSQUAMOUS DISORDERS

16. **Dermoscopy in Lichen Planus and Differential Diagnosis** 204
Sunanda Mahajan

17. **Lichen Planus Pigmentosus versus Ashy Dermatosis: Through a Dermoscope** 246
Shekhar S Haldar, Uday S Khopkar

18. **Dermoscopy: Eczema versus Psoriasis** 259
Manas Chatterjee, Ruchi Hemdani

SECTION 5: NAIL DISORDERS

19. **Overview of Onychoscopy** 271
Archana Singal, Deepak Jakhar

20. **Neoplastic Nail Unit Disorders** 292
Ishmeet Kaur, Archana Singal

21. **Nail Psoriasis versus Onychomycosis** 313
Tulika Yadav, Uday S Khopkar

22. **Nailfold Capillaroscopy in Connective Tissue Diseases** 321
Pinanky Jadhav, Uday S Khopkar

SECTION 6: TRICHOSCOPY

23. **An Overview of Trichoscopy** 332
Vidya Kharkar, Bhagyashri Abak

24. **Trichoscopy of Patchy Alopecia** 369
Viral Thakkar, Shekhar S Haldar

25. **Phototrichogram and TrichoScan®** 386
Punit Saraogi, Rachita Dhurat

SECTION 7: MISCELLANEOUS DERMOSCOPY APPLICATION

26. Dermoscopy of Granulomatous Skin Diseases **396**
Shubhangi Mahajan, Uday S Khopkar

27. Dermoscopy of Benign Skin Tumors **410**
Manas Chatterjee, Ruchi Hemdani

28. Dermoscopy of Malignant Cutaneous Tumors **434**
Laxmisha Chandrashekar

29. Dermoscopy in Keratosis Pilaris **448**
Mary Thomas, Uday S Khopkar

30. Porokeratosis **457**
Sarvesh S Thatte, Uday S Khopkar

31. Genodermatoses **466**
Atul M Dongre, Uday S Khopkar

32. Dermoscopy: Infections and Infestations **473**
Manas Chatterjee, Gopalsing Rajput

Index *491*

CHAPTER

4

Smartphone Dermatoscopes

Nina Madnani, Khan Kaleem

Traditional dermatoscopes were usually "stand-alone", relatively bulky, with no facility for photographing, storing or emailing images. Also, many required a contact medium for improved clarity. For a dermatoscope to be of significant benefit over a magnifying device, it should provide polarized light capabilities necessary for visualizing the dermis. This facility was often missing in the older models.

Modern day dermatoscopes have evolved to support the ever-growing need of a clinician. Good clinical practice requires maintaining a data base of clinical images of suspect lesions for review on subsequent follow-up, for publication/presentation in journals and discussion at various forums. Since smartphones are an integral part of our lives today, it would seem logical to incorporate the necessary optics

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of a dermatoscope with the camera/imaging power of the smartphone and hand us "smartphone dermoscopy". These newer devices are efficient and portable enough to fit in a pocket or ladies purse for easy availability.

The smartphone dermatoscopes usually attach to the smartphone with the help of a template, which aligns the optics with the phone camera. The template may enclose the entire phone, or more likely serve as a back-plate to mount the device. These templates are designed to be easy-to-use and are usually "slip-on" or "clip-on" types and can be formatted for any smartphone.

All dermatoscopes, which attach on to a smartphone, have these basic features:

- Optics and light source
- Battery to power the light source
- A software optimized for the specific hardware.

The major players for these smartphone devices are as follows:

- Canfield VEOS DS3
- DermLite 3Gen DL1
- HEINE iC1
- FotoFinder Handyscope
- MoleScope 1 and 2.

These devices vary in their external esthetics, mode of connecting, magnification, facility of polarizing/nonpolarizing, and option of use of a contact medium.

All smartphone dermatoscope devices are recommended to be used along with the software provided by the manufacturer. These are available as free download apps from the app store.

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The software shares similar functionality in that they are able to log images into a patient's profile and maintain a reference (Fig. 1). It also allows for rapid review of the lesion in question on subsequent follow-ups. The images are stored locally on the phone, can be downloaded to a computer, or can be emailed to any specified person. The applications are renewed on a regular basis to increase functionality thus making them future proof.

The Canfield VEOS DS3 (Fig. 2) is designed for use with the iPod touch (which is included in the cost of the device). Its unique touch screen has a zoom option and a millimeter scale for measuring the size of the lesion. It offers up to 10× magnification with both polarized and nonpolarized options achieved with a tap on the screen. A removable magnetic cap, protects the delicate optics, and can be sterilized/cleaned after every use. The battery pack provides 3.5 hours and is rechargeable with a

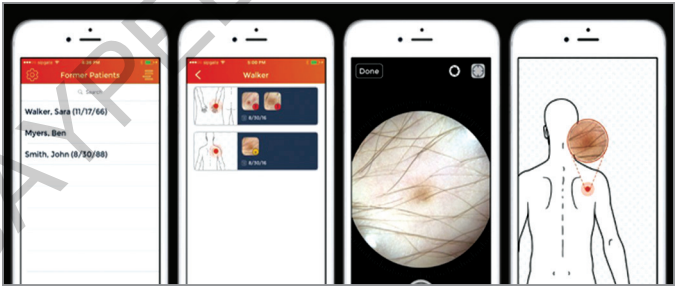

Fig. 1: App-based software allows for storing and cataloging dermoscopy images.

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Fig. 2: Canfield VEOS DS3.

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standard USB (universal serial bus) mini charger. A moveable lens design allows for taking standard photograph of the area of interest. It is also available as an attachment to an iPhone or Intelli Studio, or android smartphone by means of a clip and plate. When used with the Canfield Dermagraphic body mapping software and the Canfield Intelli Studio, images are wirelessly captured and rapidly mapped to body sites on the computer screen.

The DermLite DL1 (Fig. 3) on the other hand can be used with iPhones, iPads, and even Samsung Galaxy phones when used with a compatible adaptor. The device itself is very compact and can also be used as a "stand-alone" dermatoscope. It too offers up to 10× magnification with both polarized and nonpolarized options. This device can be used by patients



Fig. 3: DermLite DL1.

at home to track their moles and upload the images for the physician to see. The DermLite series have been upgraded to more sophisticated versions, which do not require smartphones for their use.

The HEINE iC1 (Fig. 4) has an edge over the others as it offers up to 40× magnification with up to 12 MP image quality. It has optics for both, polarized and nonpolarized light but can only be used as a contact dermatoscope. It is compatible with recently released iPhones using suitable templates.

The FotoFinder Handyscope (Fig. 5) is another dermatoscope, which is available for use with the iPhone and iPod touch. It uses a slide-in design for ease of use. The advantage it offers over other smartphone dermatoscopes is its long battery life (8 hours), reducing the need to charge the device often.

MoleScope (Fig. 6) is a smartphone dermatoscope attachment for capturing and storing images. It is compatible with both IOS and android devices providing both polarizing/

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Fig. 4: HEINE iC1.



Fig. 5: FotoFinder Handyscope.

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Fig. 6: MoleScope.

nonpolarizing options (depending on the model) with a rechargeable lithium battery (only in MoleScope II).

Over the last decade, a dermatoscope has become an essential diagnostic tool in clinical dermatology akin to a stethoscope for medical personnel. The ease of use and the significant impact a dermatoscope with imaging capabilities can make to one's clinic practice includes it in "must have" for every clinician. The choice of model purchased is regulated mostly with the convenience of use and the cost of the device.

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An Atlas and Short Text

Dermoscopy is a rapidly expanding imaging technique that has caught the fancy of clinicians and patients alike. New observations are still being made to open exciting opportunities for clinical research.

The book begins with a section on Basics of Principles and Techniques of Dermoscopy giving a sense of evolution of dermoscopy instrument over the last century. This is followed by a compilation of terminologies, the pros and cons of various available dermoscopy equipment. A new addition is devoted chapter on regional variation in dermoscopy of normal skin, which has never been described yet. A separate section is devoted to Disorders of Hyperpigmentation like melasma, exogenous ochronosis, Schamberg's disease, etc. This is followed by a section on Disorders of Hypopigmentation like leprosy, vitiligo, and idiopathic guttate hypomelanosis and then a section of inflammatory papulosquamous disorders.

Another novel addition to this book is a devoted section on onychoscopy. A focused chapter on onychoscopy of nail psoriasis and onychomycosis and neoplastic nail disorders is added. The section on Trichoscopy is also updated. The last section describes some unique disorders such as granulomas, benign and malignant neoplasms of skin and dermoscopy of vascular lesions of skin, and dermoscopy of infections and infestations. A chapter on unconventional practices in dermoscopy using a mobile phone or self-illumination lenses is best for those inclined toward adapting new technology.

Uday S Khopkar MD FIDP is an accomplished Consultant Dermatologist and Dermatopathologist, a pioneer in the field of dermoscopy in India. He headed the Department of Dermatology, Seth Gordhandas Sunderdas Medical College (GSMC) and King Edward Memorial (KEM) Hospital, Mumbai, Maharashtra, India, for 16 years during which he undertook many projects with the help of his postgraduates and brought many novel observations in dermoscopy. The First edition of this book was brought out by Dr Uday S Khopkar, is an effort to document his vast observations on the occasion of the first ever national CME on Dermoscopy (2008) held at KEM Hospital, Mumbai. This book guided and inspired many young dermatology colleagues to take up dermoscopy in a big way. He had initiated a Fellowship in Diagnostic Dermatology where he has enriched and trained talented young dermatologists in dermatopathology and dermoscopy.

Ankit H Bharti MD FIDD is working as Consultant Dermatologist and Dermatopathologist, Department of Skin and Dermatopathology Referral Center, General Hospital, Vyara, Gujarat, India. He has authored chapters Disorders of Facial Hyperpigmentation and Differential Diagnosis of Hypopigmented Lesions in this book and has undertaken original research on the subject of pigmented contact dermatitis and has special interests in cutaneous lymphomas. He is a recent Fellow in Diagnostic Dermatology and has impressed colleagues with his understanding of skin diseases as also his teaching skills.

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