Dermatoscopy: Alternative uses in daily clinical practice

Giuseppe Micali, MD,[a] Francesco Lacarrubba, MD,[a] Doriana Massimino, MD,[a] and Robert A. Schwartz, MD, MPH[b]
Catania, Italy, and Newark, New Jersey

Dermatoscopy, also known as dermoscopy, epiluminescence microscopy, or surface microscopy, is a noninvasive technique allowing rapid and magnified (×10) in vivo observation of the skin with the visualization of morphologic features often imperceptible to the naked eye. Videodermatoscopy (VD) represents the evolution of dermatoscopy and is performed with a video camera equipped with lenses providing higher magnification (×10 to ×1000). Over the past few years, both dermatoscopy and VD have been demonstrated to be useful in a wide variety of cutaneous disorders, including ectoparasitic infestations, cutaneous/mucosal infections, hair and nail abnormalities, psoriasis, and other dermatologic as well as cosmetologic conditions. Depending on the skin disorder, both dermatoscopy and VD may be useful for differential diagnosis, prognostic evaluation, and monitoring response to treatment. Nowadays, it represents an important and relatively simple aid in daily clinical practice. (J Am Acad Dermatol 2011;64:1135-46.)

Key words: dermatoscopy; ectoparasitoses; epiluminescence microscopy; hair disorders; nail diseases; psoriasis; videodermatoscopy.

INTRODUCTION

Dermatoscopy, also known as dermoscopy, epiluminescence microscopy, or surface microscopy, is a noninvasive technique allowing rapid and magnified in vivo observation of the skin with the visualization of morphologic features often imperceptible to the naked eye. It is performed with manual devices which do not require any computer "assistance" and generally employs ×10 magnifications (Table I). Videodermatoscopy (VD) represents the evolution of dermatoscopy and is performed with a video-camera equipped with lenses providing magnification ranging from ×10 to ×1000.[1,2] The images obtained are visualized on a monitor and stored on a personal computer in order to process them and compare any possible changes over time (Table II).

Both dermatoscopy and VD have greatly improved the diagnostic accuracy of pigmented skin lesions and, more recently, the evaluation of nonpigmented skin disorders. They are usually performed according to an epiluminescence microscopy technique facilitated by the application of a liquid (oil, alcohol, or water) to the skin to eliminate light reflection. However, this method has been recently replaced by new systems involving polarized light instead of liquids, with comparable results.[2,3] Over the past few years, both dermatoscopy and VD have been demonstrated to be useful in a wide variety of cutaneous disorders, including ectoparasitic infestations, cutaneous/mucosal infections, hair and nail abnormalities, psoriasis, and other dermatological as well as cosmetologic conditions.

Abbreviations used:

AGA: androgenetic alopecia
HDD: hair diameter diversity
PPD: pigmented purpuric dermatoses
VD: videodermatoscopy

ECTOPARASITOSES

Scabies

Both dermatoscopy and VD represent promising and useful diagnostic tools for scabies. Their effectiveness has been confirmed by numerous studies.[1,4-13] In particular, the accuracy of VD has been demonstrated to be comparable to that of scraping.[11]

Dermatoscopic examination of active lesions shows, at low magnifications (up to ×40), the presence of a small dark brown triangular structure, corresponding to the pigmented anterior part of the

From the Dermatology Clinic, University of Catania,[a] and the Department of Dermatology, New Jersey Medical School.[b]
Funding sources: None.
Conflicts of interest: None declared.
Reprint requests: Giuseppe Micali, MD, Dermatology Clinic, University of Catania, A.O.U. Policlinico-Vittorio Emanuele, Via Santa Sofia, 78-95123, Catania, Italy. E-mail: cldermct@nti.it.
Published online February 4, 2011.
0190-9622/$36.00

doi:10.1016/j.jaad.2010.03.010

mite, located at the end of a subtle linear segment, the burrow[4,14]; together, both structures resembled a jet with contrail. At higher magnifications (×100 to ×600), VD allows more detailed identification; the oval translucent body of the mite is clearly visible (Fig 1). One can also visualize other anatomic structures, such as the anterior and posterior legs and rostrum. In most cases, it is possible to detect the mite moving inside the burrows.[10,11] Moreover, higher magnifications allow visualization of other diagnostic features, such as eggs and feces.[10,11]

VD is an easy, noninvasive, and relatively rapid technique, which allows the inspection of the entire skin surface, particularly with the use of a zoom-system instrument, which requires neither an additional magnifying lens nor the application of any liquid. False-negative results are not common and depend on the lack of operator experience or on the presence of a superficial secondary bacterial infection. Moreover, the use of VD, especially at high magnifications (> ×100), has been regarded as highly specific with no false-positive results[10,11] and as better accepted compared to scraping, especially in the case of children and highly emotional patients.[10,14] In addition, VD is comfortable, not painful, and has a low risk of related infections, especially in those cases requiring repeated tests to make a final diagnosis. Finally, it may also be used both for the screening of family members and post-therapeutic follow-up.[10,11] The use of dermatoscopy at low-magnifications (×10 to ×40) has some limitations, as it does not always allow, especially to non-experienced operators, a clear differentiation between the "jet-shaped" structure and minor excoriations and/or splinters that may frequently occur in scabies due to repeated scratching. Another deficit is that mite viability cannot be assessed at these magnifications, so that post-therapeutic monitoring cannot be performed.

CAPSULE SUMMARY

- Dermatoscopy and videodermatoscopy are noninvasive techniques allowing magnified in vivo skin observation, which have demonstrated to be useful in a wide variety of cutaneous disorders (including ectoparasitic infestations, cutaneous/mucosal infections, hair and nail abnormalities, psoriasis and other dermatological as well as some cosmetological conditions) beyond the traditional indication for pigmented lesions of the skin.
- Dermatoscopy and videodermatoscopy may be useful for differential diagnosis, prognostic evaluation, and monitoring response to treatment.
- The aim of this article is to advance knowledge about and update the alternative uses of dermatoscopy and videodermatoscopy by reviewing existing papers and presenting our experience.

Head and pubic lice

The diagnosis of pediculosis capitis (head lice) and phthiriasis pubis (crab lice) is generally based on the clinical identification of either adult lice (*Pediculus humanus* and *Phthirus pubis*, respectively) or of viable nits through close-up examination. Louse combs and the magnifying lens represent additional diagnostic tools which increase the possibility to identify live lice.[15-18] In pediculosis capitis, dermatoscopy ensures a more detailed evaluation of both mites and eggs, particularly in the presence of post-treatment residual eggs.[19,20] Dermatoscopy unequivocally shows the presence of the nits fixed to the hair shaft, allowing a rapid differentiation from empty nits, the latter appearing as translucent structures with a plane and fissured free ending[14,20] or scales of different origin or pseudo-nits (hair casts, debris of hair spray or gel, or seborrheic scales),[14,20] with subsequent remarkable effects on the therapeutic management. Furthermore, dermatoscopy does not require hair pulling, so that a large scalp area can be investigated with minimal discomfort to the patient. Finally, a close and accurate VD examination may disclose the morphology and physiology of the lice themselves, together with proving the pediculocidal activity of topical agents.[21,22]

The diagnostic effectiveness of dermatoscopy may be extended to phthiriasis pubis.[1,17] Dermatoscopy can be of particular importance in children, where eyelashes are the most common site of infestation. Phthiriasis palpebrarum is often misdiagnosed as atopic dermatitis or allergic conjunctivitis because of the semitransparent and deep burrowing aspect of the parasite at the lid margins.[23] In these cases, dermatoscopy can rapidly clarify any doubt by revealing the presence of lice and/or nits.

Finally, VD examination may enhance patient compliance to therapy for both head and crab lice, showing the presence, persistence, or resolution of the infestation on a VD monitor.[17]

Tungiasis

The dermatoscopic aspect of tungiasis, an ectoparasitosis caused by the flea *Tunga penetrans*, has been described as a brown to black ring with a