# Dermatoscopy of Parasitic and Infectious Disorders

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**KEYWORDS**

• Dermatoscopy • Dermoscopy • Entomodermoscopy • Videodermatoscopy • Skin infection • Skin infestation • Ectoparasites

**KEY POINTS**

- The increasing reports of several diverse dermatoscopic patterns confirm the important role of dermatoscopy in many dermatologic fields.
- Dermatoscopy has proved to be a helpful auxiliary tool in the diagnosis of parasitic and infectious disorders.
- Among different skin infestations and infections, characteristic dermoscopic patterns have been described for scabies, pediculosis, tungiasis, leishmaniasis, larva migrans, trombiculiasis, viral warts, molluscum contagiosum, tinea capitis, and tinea nigra.

## INTRODUCTION

Dermatoscopy is traditionally used for the evaluation of pigmented skin lesions, improving the diagnostic accuracy of malignant lesions significantly above that of a naked eye examination. In the past years, its use has been extended to other dermatology fields, including parasitic and infectious disorders; the term entodermoscopy has been introduced.[1] Several studies have reported the usefulness of dermatoscopy in assisting the clinical diagnosis of these conditions and in reducing the need of semi-invasive or invasive procedures, such as skin scrapings and/or biopsies. This article provides a review of the main dermatoscopic patterns seen in selected parasitic, viral, and fungal skin disorders.

## PARASITIC DISORDERS

### *Scabies*

Scabies is caused by infestation by the host-specific mite *Sarcoptes scabiei var hominis*, which lives its entire life within the epidermis. It is a worldwide problem that may involve all ages, races, and socioeconomic groups, although higher incidences occur in overcrowded environments, including schools, hospitals, prisons, and refugee camps. Scabies may be transmitted directly by close contact or indirectly via fomites. Clinical diagnosis is based on the presence of intense itching accentuated at nighttime, typical distribution (wrists, axillae, waist, umbilicus, ankles, buttocks, genitalia, areolae, and nipples), and types of lesions (small erythematous papules, excoriations, secondary bacterial infections) along with a positive history for similar symptoms in household members or close personal contacts. The pathognomonic sign is the burrow, appearing as a small (3–10 mm long), wavy, thread-like, grayish-whitish trait. However, at clinical observation intact burrows may be hard to detect because of intense scratching. Confirmation of the diagnosis can be achieved by light microscopic examination of skin scrapings that reveals the presence of adult mites, eggs, and/or fecal pellets. However, the results of this method are limited to the tested areas and false-negative results are common.

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Dermatoscopy has been proved to be an effective tool for the diagnosis of scabies, allowing a rapid, noninvasive, in vivo examination of the entire skin surface in a few minutes.[2–6]

At low magnifications (×10), dermatoscopy enables the visualization of a small, dark-brown triangular structure "circumflex accent" located at the end of a subtle linear segment (**Fig. 1**A); both structures resemble a jet with contrail whereby the triangular structure corresponds to the pigmented anterior part of the mite (mouth and 2 anterior pairs of legs), whereas the contrail-shaped segment correlates with the burrow.[1,2] The use of low magnification, however, requires good experience, as these features may be confused with excoriations and/or splinters that may frequently occur because of repeated scratching. Higher magnifications (up to ×600) reveal unequivocal images of burrows and mites; they also allow the recognition of eggs or feces (invisible at low magnifications) that also represent diagnostic signs[7,8] (**Fig. 1**B). Using higher magnifications, anatomic details of *Sarcoptes scabiei* may be revealed, including the roundish translucent body, the head, the anterior and posterior legs, and the dorsal spiculae. In some cases, the mite moving inside the burrows may be highlighted.[9] A double-blinded study has demonstrated that high-magnification dermatoscopy is equivalent to scraping in terms of diagnostic accuracy.[7] Another study in children has confirmed a better acceptance in the pediatric population, as it is not painful and does not require blades for skin scraping.[8] Dermatoscopy is also particularly useful to screen asymptomatic contacts and family members and for post-therapeutic follow-up, ruling out the persistence of viable mites, thus, reducing the risk of infestation spread.[9–13] Recently, low-cost videomicroscopes (about $30), which permit high magnifications (up to ×500) and are available for nonmedical use in entomology, botany, and/or microelectronics, have been demonstrated to be able to allow for a definitive scabies diagnosis, showing the typical signs of the infestation as did the medically marketed videodermatoscope.[14] The impact of these inexpensive videomicroscopes, whose usefulness has not been confirmed in other dermatologic conditions,[15] seems to be significant and cost-effective in scabies, both in institutional settings (hospitals, nursing homes, long-term care facilities, and prisons) as well as in underdeveloped countries experiencing endemic outbreaks, where the availability of affordable, noninvasive techniques is crucial.[14]

## *Pediculosis*

Dermatoscopy has demonstrated to be useful for the diagnosis and therapeutic monitoring of 2 common, highly contagious, cutaneous infestations due to human obligate, blood-sucking arthropods: pediculosis capitis and phthiriasis pubis.[16]

Pediculosis capitis is caused by *Pediculus humanus var capitis* (head louse). It is dorsoventrally elongated (2–3 mm), flattened, and wingless, with 3 pairs of clawed legs. The oval eggs (nits) are cemented to hair shafts close to the scalp with a chitinous material secreted by the female louse. Pediculosis capitis is worldwide and usually occurs in school-aged children causing small epidemics in classmates and in members of the same household. Girls seem to be more frequently affected, probably because of long hair and common sharing of brushes and hair accessories. Patients typically complain of intense pruritus of the scalp, mainly involving the occipital and retroauricular regions. The itching induces scratching, which can lead to excoriations, secondary bacterial infection, and lymphadenopathy.

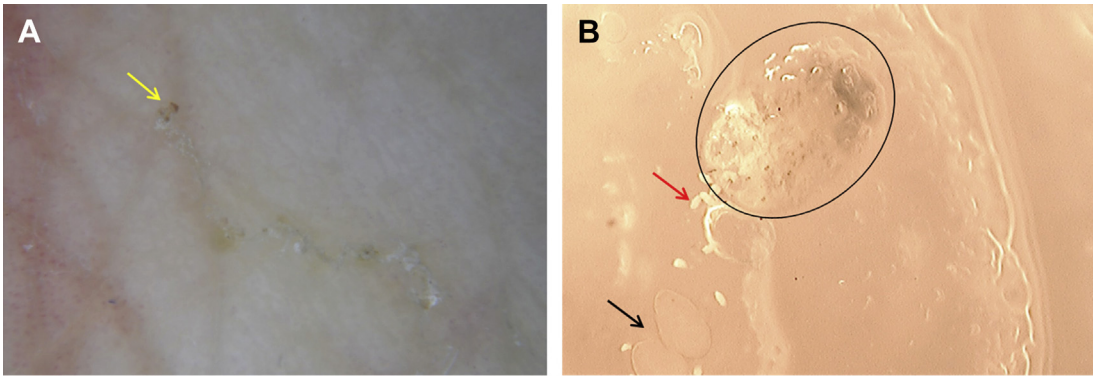


**Fig. 1.** Scabies. (*A*) Low-magnification dermatoscopy of a burrow shows a small dark brown triangular structure (*yellow arrow*) located at the end of a wavy, whitish segment (original magnification ×10). (*B*) High-magnification videodermatoscopy reveals unequivocal images of *Sarcoptes scabiei* body (*circle*) along with eggs (*black arrow*) and feces (*red arrow*) (original magnification ×400).