Trichoscopy Tips
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INTRODUCTION
Dermoscopy has only recently been introduced in the assessment of hair and scalp disorders. However, in the past few years, much attention has been given to the method, with many studies focusing on its applications in the field being published; to the point that many hair specialists now consider dermoscopy as an essential part of their dermatologic consultation. Dermoscopy allows visualization of morphologic structures that are not readily visible by the naked eye, including peri-follicular and interfollicular features, as well as changes to hair shaft thickness and shape. In 2006, the name trichoscopy was first proposed for the use of dermoscopy in the diagnosis of hair and scalp disorders and is now widely adopted. The aim of this article was not to make an extensive and overdetailed review of all trichoscopic signs, but rather to discuss topics that may be a source of doubt and to give tips that will help clinicians to better perform trichoscopy.

PERFORMING TRICHOLOGY: THE BASICS

How to Evaluate My Patient
First, it is important to determine in which general group of hair loss your patient best fits: diffuse, patchy, or marginal alopecia. Examination of the scalp will depend on the type of hair loss presented by the patient. In addition, examination of hair shafts and eyebrows may be decisive in some individuals.

Diffuse alopecia
In patients with diffuse hair loss, it is important to part the hair in the midline and to examine at least 3 sites: frontal and middle scalp and vertex. We recommend evaluating each one of the sites with at least 2 magnifications: first with a lower one (10–20) and then with a higher magnification (40–50). Hair diameter variability, a hallmark of androgenetic alopecia (AGA), may be better appreciated at higher magnifications (Fig. 1). Because the occipital scalp is commonly spared in patients with AGA, control pictures can be taken from this site for comparison.

Patchy alopecia
When patients present with patchy alopecia, both the center and the periphery of the alopecic patch should be checked. When examining the center of the lesion, it is important to establish whether hair follicle openings are present or not. Loss of follicular openings will guide the diagnosis toward a scarring...
condition. Signs of disease activity may be present either at the center or at the periphery of lesions, depending on the etiology. So, the latter should always be examined, as well. In addition, it is important to evaluate apparently normal scalp surrounding alopecic patches because early signs of disease activity may already be present in trichoscopy, even before hair loss becomes clinically evident.

Marginal alopecia
An important tip when evaluating a patient with marginal alopecia is to check if vellus hairs are present. Loss of vellus hairs in the hairline is a typical sign of frontal fibrosing alopecia (FFA) (Fig. 2).

“My hair does not grow”
This is a common complaint of patients with either congenital or acquired hair shaft disorders. In these cases, shafts should be directly examined and trichoscopy has satisfactorily replaced optical microscopy in most scenarios. For hair shafts, it’s interesting to use polarized light, and higher magnifications are needed (at least $\times 70$). Clinicians should look for causes of hair breakage, such as trichorrhexis nodosa (Fig. 3), commonly seen in hair weathering; or hair shaft defects that may signal a congenital condition, such as the typical constrictions of monilethrix (Fig. 4).

Eyebrows
Hair disorders, such as alopecia areata (AA) and FFA, may also affect the eyebrows (Fig. 5). Trichoscopy may be quite useful, particularly in cases of atypical presentation or when the disease is limited to this area. Of note, disorders or hair shaft formation, such as trichorrhexis invaginata, might be detectable only in the eyebrows.

Immersion Fluid: When to Use It
A few variables will determine whether immersion fluid should be used or not, when performing trichoscopy. A few simple points should be taken into account:

1. Contact dermoscopy always will be necessary if an immersion fluid is being used.
2. Devices with nonpolarized light will require the use of an immersion fluid to cancel out reflections from the stratum corneum.
3. Immersion fluids may hamper evaluation of scaling conditions and visualization of vellus and white hairs (as they “disappear” when a fluid is used).
4. “Elimination” of scaling with immersion fluid is sometimes desirable, as excessive scaling may interfere with visualization of underlying trichoscopic features.

As a general rule, we start the examination with dry dermoscopy and then use an immersion fluid if we judge necessary. The choice of the immersion fluid (eg, water, gel, alcohol) is a matter of personal choice.
Which Dermoscope Should I Use?

Each device has its advantages and drawbacks, and the clinician should opt for the one that will best fit his or her practice profile. Handheld portable dermoscopes usually allow a 10-fold magnification; which is quite satisfactory in daily practice. In addition, lower magnifications provide a better overview of a large scalp area. Such dermoscopes are generally considered to be reasonably cost-effective. On the other hand, higher magnifications (20-fold to 100-fold and higher) provided by digital dermoscopes allow better visualization of fine details, specially hair shaft defects and changes in scalp vessels. Another advantage of this more expensive group of devices is that they are usually equipped with photo storage software, allowing comparison of “before and after” pictures, among other resources. Personally, we feel that showing patients their trichoscopic pictures helps them to understand their condition and to better appreciate the results of the treatment being used. A somewhat in-between and practical option are the mobile-connected dermoscopes, which allow photography usually at a magnification of ×10 to ×20. Recently, cheaper videodermoscopes that can be connected to any computer via USB also became available. According to some investigators, these cheaper devices may have image quality drawbacks, when compared with the more expensive digital dermoscopes.

IDENTIFYING BASIC STRUCTURES IN TRICHOLOGY

A didactic way to learn the trichoscopic structures is to organize them in groups, according to their distribution on the scalp. In this regard, trichoscopic features could be divided into (1) follicular, (2) perifollicular and interfollicular; (3) vascular, and (4) hair shaft. The following examples are not a comprehensive review of all trichoscopic structures, but illustrative of this classification. Hair shafts are discussed in the article by Lidia Rudnicka and colleagues, “Trichoscopy in Hair Shaft Disorders,” elsewhere in this issue.

Follicular Structures

Because in trichoscopy we observe a 3-dimensional structure such as the skin as a 2-dimensional image, follicular structures will be seen as dots by the observer. A few examples include yellow, black, red, and white dots.

In case shafts break before scalp emergence, they will be perceived as black dots (Fig. 6). This may be due to weakening of shafts secondary to inflammation, such as seen in AA, or to mechanical trauma, as provoked by patients with trichotillomania.

If a hair follicle loses its shaft, it becomes filled with sebum and keratin debris. This material gives a yellow hue to hair follicle openings and can be observed as a yellow dot (Fig. 7) under trichoscopy of patients with AGA or long-standing AA, for example.

Follicular red dots (FRD) were described in active discoid lupus (DLE). They are a positive prognostic factor, representing a greater chance...
of hair regrowth. Because of vasodilation and skin atrophy present in DLE lesions, the vascular network that surrounds hair follicles becomes visible and is perceived as FRD through trichoscopy. The presence of such a vascular network suggests that the follicular structure is still viable and patients should be aggressively treated. White dots are more easily perceived in patients with dark scalp. They represent follicular and eccrine gland openings and are known as pinpoint white dots.

**Perifollicular and Interfollicular Patterns**

The differential diagnosis between scalp DLE and lichen planopilaris (LPP) is a good example of how characterization of trichoscopic features such as having a perifollicular versus interfollicular pattern of distribution may help the clinician when using trichoscopy. Lichenoid inflammation in LPP is mainly folliculocentric and this will result in perifollicular inflammatory signs, like scaling. On the other hand, the diffuse lichenoid inflammation typical of DLE means that the interfollicular area also will be affected, and patients will present with diffuse scaling. Likewise, pigment incontinence also will have distinct patterns. In LPP, pigment incontinence will be perceived as blue-gray dots in a target pattern (surrounding hair follicles), whereas in DLE blue-gray dots are diffusely spread, arranged in a speckled pattern.

**Vascular Structures**

Thin arborizing vessels are a normal finding in the scalp and frequently seen in the temporal and occipital regions (Fig. 8). Simple red loops may also be seen in the normal scalp. On the other hand, some vascular structures may be indicative of a scalp disorder. Thick arborizing vessels, for example, are typically present in connective tissue diseases such as DLE and dermatomyositis or as a side-effect in areas of steroid-induced atrophy.

**AM I FACING A SCARRING CONDITION?**

As a general rule, alopecias may be divided into non-scarring, a group in which patients retain the possibility of presenting hair regrowth; and scarring, when hair loss is irreversible. The trichoscopic hallmark of scarring alopecias is loss of follicular openings (Fig. 9). Therefore, when first approaching a patient with hair loss, clinicians should look for this variable to start considering possible differential diagnoses. Pitfalls do exist, as seen in patients with long-standing AA. In these cases, follicular openings may not be clearly visible, misleading one’s diagnosis. Another clue for potentially scarring conditions is the presence of inflammatory signs, such as erythema and scaling or the presence of exudative lesions. Even though this is not a strict rule, overt inflammation is usually part of the trichoscopic picture of potentially scarring conditions, whereas nonscarring conditions, such as AGA, AA, and telogen effluvium do not present obvious inflammatory features.

**MY PATIENT HAS A RECEILING HAIRLINE: HOW TRICHOSCOPY MAY HELP?**

The list of possible diagnoses of patients presenting a receding hair line includes AGA, AA in a sisaipho pattern, traction alopecia, and FFA. Differential diagnosis between them may not be trivial, particularly in early cases or in nonactive disease, in which typical
clinical features may not be present. A useful clue is to check for the presence of vellus hairs in the hairline. In the normal hairline, there is a progressive “transition” from very thin vellus hairs present in the forehead to the thick terminal hairs of the scalp. In FFA, this “transition” is affected: the loss of vellus hairs in the hairline is a typical sign of the disease (see Fig. 2). For such, when approaching a patient with a receding hairline, clinicians should bear in mind this decisive trichoscopic feature. When patients have active ongoing conditions, other trichoscopic features may help the diagnosis, such as the presence of exclamation marks and coudability hairs in AA, perifollicular erythema, and scaling in FFA or hair casts in traction alopecia.

DON’T FORGET THE BIGGER PICTURE

When clinicians and students are first introduced to trichoscopy, attempting to memorize lists of trichoscopic features for each disease is a common (but deceptive) reaction. Trichoscopy is a recent diagnostic tool and, as expected, new trichoscopic features are being continuously described. But, to understand trichoscopy, it is important to make correlation with disease pathogenesis. Many different trichoscopic features represent, in fact, the same pathogenic process. A good example of that is trichotillomania. In this compulsive disorder, we may find, among others, flame hairs, tulip hairs, hair powder, or the v-sign, but all these findings result from a common cause: hair shafts that were broken by the patient by traumatic pulling. Depending on the shape shafts assume after breakage, they receive a different name. To establish diagnosis, more important than knowing all these names, is to understand that they represent broken hair shafts.

In trichoscopy, it is also important to analyze the context in which a trichoscopic feature is present: what other trichoscopic features are also there? What is the patient history? What is the clinical picture? These are simple questions that should always be in the clinician’s mind. Black dots, for example, may be found in a number of conditions. Weakening and breakage of hair shafts forming black dots may result from either the cytotoxic insult of chemotherapeutic agents, inflammation in AA, hypoxemia in pressure-induced alopecia, or even traumatic pulling in trichotillomania. Focusing on a single trichoscopic feature, instead of looking at the bigger picture, may lead the clinician to the wrong diagnosis.

FEATURES UNIQUE TO THE DARK SCALP

Early articles discussing trichoscopy reported features mainly in the context of light-skinned patients. Only a few years ago publications started to focus on the particularities of the dark scalp, and this field still remains to be fully explored.

A remarkable normal finding of the dark scalp is the visualization of a pigmented network (Fig. 10). This feature is present in the dark scalp due to the greater amount of pigment in the skin and reflects normal cutaneous architecture with rete ridges forming the darker network, whereas the thinner epidermis overlying the dermal papilla forms the lighter areas in-between. Assessing this pattern is particularly useful in the differential diagnosis of some forms of scarring alopecia. Although the pigmented network remains unaffected in folliculocentric conditions such as LPP, DLE presents with a lichenoid dermatitis that affects the whole dermal-epidermal junction in addition to hair follicles. For such, in DLE, the skin architecture is affected and loss of the pigmented network pattern is an expected trichoscopic feature of the disease in dark-skinned patient. Damage to the basal layer leads to pigment incontinence, which in turn results in the visualization of blue-gray dots in trichoscopy.

![Fig. 9. Lichen planopilaris: absence of follicular openings; also note peripilar casts around hair shaft emergence.](image)

![Fig. 10. Pigmented network.](image)
Blue-gray dots, either in a target or speckled pattern as previously discussed, are also more commonly seen in patients with darker skin types. When facing a potentially inflammatory condition of the scalp, clinicians should be aware that the severity of the process may be underestimated in one’s evaluation, for the visualization of erythema may be hampered by the overlying intensely pigmented skin.

A trichoscopic feature described in the same population is the “starry sky” pattern, the presence of multiple pinpoint white dots on the darker skin background. This is a normal finding caused by the visualization of the eccrine grand openings.

Peripilar white gray halos have been described in the trichoscopy of central centrifugal cicatricial alopecia, the most common cause of scarring alopecia in African American women. They correspond on pathology to the lamellar fibrosis surrounding the outer root sheath. In our experience, they may also be seen in dark-skinned patients with other forms of folliculocentric scarring alopecias, such as FFA.

Traumatic hair styling makes some populations and ethnicities, such as Africans and African descendants particularly prone to traction alopecia. Hair casts are a useful trichoscopic sign of ongoing traction. On trichoscopy, hair casts appear as white to brown cylindrical structures that encircle the proximal hair shafts (Fig. 11). Traction-induced hair casts consist of the pulled out inner and/or outer root sheath and are not characterized by prominent parakeratosis.25

CHILDREN! WHAT TO EXPECT IN TRICHOSCOPY?

A variety of conditions are more frequently seen in children, ranging from infections and infestations to hair shaft formation disorders. The fact that trichoscopy is noninvasive and painless makes this diagnostic method particularly interesting in the evaluation of hair and scalp disorders in children. Even so, few studies regarding the use of trichoscopy have been done exclusively in children and much of the current knowledge derives from studies in adults. However, some features that are inherent to this group should be observed.

In our experience, follicular units in children usually consist of 1 or 2 hairs and often have shafts of different diameters, which may mislead to the diagnosis of AGA by an unwary clinician.

A normal trichoscopic feature commonly seen in children is dirty dots. Dirty dots appear as brown, black, and occasionally red, yellow, and blue particulate dots and loose fibers and likely represent environmental particles. This finding possibly results from the inability of the scalp to repel particulate debris from exogenous environmental sources due to low activity of the sebaceous glands in patients of early age. The involution of sebaceous glands with age may also explain the presence of dirty dots in the elderly.

The low activity of sebaceous glands is also responsible for the lower incidence of yellow dots in children. Clinicians should keep this information in mind. Long-standing patches of AA may not reveal yellow dots, and visualization of follicular openings may be hampered. For this reason, cases of AA may end up being misdiagnosed as scarring alopecia, which in reality is quite uncommon in children.

PITFALLS IN TRICHOSCOPY: BE AWARE!

Pitfalls in trichoscopy are artifacts that may simulate hair disorders. It is important to identify such artifacts to avoid misdiagnosing a hair condition. The most important pitfalls are secondary to scalp deposits, scalp staining, and hair shaft deposits.

Scalp Deposits

Scalp deposits may be either due to deposition of environmental particles, like dust, or camouflage products. Environmental particles are the
previously discussed “dirty dots.” To the untrained eye, dirty dots may simulate a few trichoscopic features, depending on the shape and color of the particle. Some deposits are commonly misinterpreted as black dots, a sign of ongoing hair follicle damage observed in a few conditions, such as AA. Importantly, dirty dots can be completely removed after intense shampooing.

Another type of scalp deposit is camouflage products used by patients to conceal areas of decreased hair density. They can be present as a powder on the scalp surface or, more commonly, as fibers. In this later case, it is important not to confuse them with broken hair shafts.

**Scalp Staining**

Common causes of scalp staining include hair dye, topical medication, such as anthralin, or scalp tattoos, which is an increasingly popular method to camouflage decreased hair density.

Hair dye may be present on the scalp surface and within follicular openings simulating both interfollicular hyperpigmentation and dots (Fig. 12). Anthralin also may stain follicular openings and resemble black dots. Because anthralin is used in the treatment of alopecia areata, identification of this pitfall is essential to not misclassify your patients as having active AA. Finally, ink deposition in scalp tattoos may have a blue hue and simulate a few trichoscopic features, such as blue-gray dots or even a blue nevus, depending on the pattern of distribution.

**Hair Shaft Deposits**

Another common pitfall is hair shaft deposits. They may be secondary to the use of dry shampoos, hair sprays, or other hair-styling products. These products may form concretions around hair shafts and mimic hair casts, as seen in LPP and traction alopecia, or even nits, simulating infestation by pediculosis (Fig. 13).

![Fig. 12. Permanent hair dye staining.](image)

**Fig. 13. Pseudocasts due to hair spray.**

**SUMMARY**

The aim of this article was to bring selected information from the literature and our clinical experience that may help dermatologists to use trichoscopy in their everyday practice. Clinicians should keep in mind that trichoscopy is a recently described and evolving technique; many new concepts are constantly arising and constant update is required.

**REFERENCES**


