Utility of Trichoscopy

Rachita S. Dhurat
Department of Dermatology, LTMMC and LTMGH, Mumbai, Maharashtra, India

Abstract

Trichoscopy is evolving as an indispensable aid to the dermatologist by providing valuable clues on dermatoscopy of the scalp and hair. Trichoscopy presents as a bridging tool between clinical and histological diagnosis. It is useful to distinguish congenital atrichia from other forms of childhood hair loss such as alopecia universalis. There are a set of women who present with chronic hair loss without any discernible reduction in hair density over the crown. Such early forms are often overlooked, and clinical evaluation may not be adequate to make the right diagnosis. Trichoscopy has been widely used as a diagnostic as well as a prognostic tool to measure anisotrichosis in cases of overt androgenetic alopecia and female pattern hair loss (FPHL) and to distinguish them from telogen effluvium. It can be used to distinguish FPHL from diffuse and subtotal alopecia areata (AA) as well as trichotillomania from AA which can have similar clinical presentations. Trichoscopy also helps in monitoring treatment response in patients of AA. It is also useful in diagnosing infectious conditions such as noninflammatory tinea capitis, seborrheic dermatitis, pedra, and pediculosis. Trichoscopy represents a valuable, noninvasive and low-cost technique, still underutilized, to rapidly differentiate clinically frequent hair disorders.

Keywords: Terminology, trichoscopy, trichoscopy algorithm

Introduction

“The right diagnoses lets you turn to the right page of therapy” – Shelly and Shelly. Dermatoscopy (also known as dermoscopy or epiluminescence microscopy) is the examination of skin lesions with a “dermatoscope.” Now, handheld dermoscopes are fitted with both nonpolarized and polarized lights with the help of filters. This conventionally consists of a magnifier (typically ×10), a nonpolarized light source, a transparent plate, and a liquid medium between the instrument and the skin and allows inspection of skin lesions unobstructed by skin surface reflections.

When images or video clips are digitally captured or processed, the instrument can be referred to as a “digital epiluminescence dermatoscope.” Common systems for digital dermoscopy are Fotofinder®, Molemax®, DermoGenius®, or Easyscan®.

To better understand the utility of trichoscopy, one must have a look at the era before trichoscopy was developed.

Pretrichoscopy Era

Hair loss or alopecia can be broadly classified as cicatricial and noncicatricial alopecia. Among noncicatricial alopecia, the common conditions are androgenetic alopecia (AGA), alopecia areata (AA), telogen effluvium (TE), trichotillomania (TTM), and tinea capitis (TC), while lichen planopilaris (LPP), discoid lupus erythematosus (DLE), and frontal fibrosing alopecia (FFA) are common cicatricial disorders encountered in clinical practice.

Before the 20th century, hair diseases were diagnosed clinically and on histopathology. Clinical diagnosis of AGA in males is relatively simple; however, it is difficult to ascertain the diagnosis of female pattern hair loss (FPHL). Increase in the midscalp parting of hair is the clinical clue to diagnose FPHL. However, by the time, a woman develops increased midscalp partition; there is substantial amount of hair loss. Hence, it is imperative to diagnose FPHL in early stages.

The most challenging part is to differentiate FPHL from chronic TE (CTE) as clinically these conditions may resemble each other forcing one to perform a scalp biopsy in these groups.
of patients. Calculation of terminal-to-vellus (T:V) ratio in triple horizontally sectioned biopsy specimens had shown better diagnostic definition as compared to a single biopsy.\[1\] However, not all patients may consent for scalp biopsy.

Similarly, the classical presentation of AA can be diagnosed clinically. Unusual presentations of AA warrant a tissue biopsy. In earlier days, pull test and trichogram might have been helpful procedures for the assessment of severity of AA.

Noninflammatory TC mimics AA making it difficult to differentiate them clinically. Potassium hydroxide mount of hair is not only time-consuming but also has lower yield.

TTM presents with localized loss of hair similar to the presentation of AA. In earlier days, clinicians would rely on history of pulling of hair and biopsy to confirm the diagnoses. Scalp psoriasis might have gone undiagnosed without trichoscopy.

Psoriasis and seborrheic dermatitis are both inflammatory skin diseases presenting with erythematous squamous lesions. Differential diagnosis between psoriasis and seborrheic dermatitis can be extremely difficult in some cases, especially when the lesions are limited to the scalp. Biopsy may be needed; even so, there are times when histopathological evaluation may be inadequate for diagnosis. Therefore, many patients with scalp psoriasis had been underdiagnosed.

Typically, punch biopsies are taken for vertical and horizontal embedding. These are a few millimeters in size and contain only a sample number of hair follicles. Thus, some authors suggest performing multiple biopsies for representative sampling, what increases the invasiveness of this diagnostic technique and makes it even less useful for monitoring of treatment efficacy.\[2\]

**Posttrichoscopy Area**

The first World Congress of the International Dermoscopy Society demonstrated that potential implications for dermoscopy were significantly wider than expected. Rudnicka et al. established dermoscopic criteria for the diagnosis of AGA and suggested the term “trichoscopy” for videodermoscopy of the hair and scalp.\[3\]

**Types of Dermatoscopy**

A dermatoscope is composed of a transilluminating light source and a magnifying optic (usually a 10-fold magnification). There are three main modes of dermoscopy.\[4\]

- Nonpolarized light, contact
- Polarized light, contact
- Polarized light, noncontact

Polarized light reduces skin surface reflection, thus allowing visualization of deeper skin structures, while nonpolarized light provides information about the superficial skin. Most modern dermatoscopes allow the user to toggle between the two modes, which provide complementary information.

Dermoscopy is a noninvasive diagnostic technique that links clinical dermatology and dermatopathology by enabling the visualization of morphological features not seen by the naked eye. In 2001, a California medical device manufacturer, 3Gen, introduced the first polarized dermatoscope, the DermLite®.

In trichoscopy, hair and scalp structures may be visualized at manyfold magnification. The method allows *in vivo* visualization of the epidermal portion of hair follicles and perifollicular epidermis and hair shafts at high magnification and performing measurements, such as hair shaft thickness, without the need of removing hair for diagnostic purposes. Currently, the magnifications ranging from 10-fold to 70-fold are most popular in research and clinical practice. The usual working magnifications are from 20-fold to 70-fold. While the handheld dermoscope with 10-fold magnification may give an easy and quick evaluation of hair, it does not precisely measure or document.\[5\]

Rakowska established normal values for vellus hairs, follicular units, yellow dots, perifollicular yellow discoloration (hyperpigmentation), and mean hair thickness (mm) at the frontal, occipital, and temporal area. Perifollicular discoloration <25% for frontal area and <15% for occipital area. Frontal area has more number of single follicular hair units than occipital hair.\[5\]

While Van Neste observed that the top of the head shows usually a higher hair density than occipital sites, his observation is useful for hair transplant surgeons.\[6\]

Miteva and Tosti and Rudnicka and Rakowska gave a comprehensive and thorough description of the usefulness of this technique in the diagnosis and follow-up of most common hair and scalp disorders, based on updated data from the literature and their personal experience. Trichoscopic terminology/patterns have been described [Figure 1].

Since then, many trichoscopic algorithms and patterns for common hair loss diseases have been developed.\[7,8\] Trichoscopic images are described in Figures 2-11.

In 2007, the first atlas containing trichoscopy images was published by Tosti.\[9\] The “Atlas of Trichoscopy” is the first book to systematize scientific knowledge about trichoscopy.\[8\]
Algorithmic Method for Diagnosis of Cicatricial and Noncicatricial Alopecia by Trichoscopy

The first step is to observe whether the loss of orifices is present or not. The loss of orifices corresponds to permanent destruction of hair follicles, suggest fibrosis, and is therefore of great importance for predicting prognosis because it determines if the hair loss is irreversible cicatricial or reversible noncicatricial.

When loss of hair orifices cannot be seen in the hair loss area, diagnosis as nonscarring alopecia is established. However, it may be very difficult to define it in some cases. Ophiasis-type AA shows similar appearance to the loss of orifices without other typical signs of AA on hair loss areas, mimicking FFA.\textsuperscript{[10]} These two entities are “look-alike” also in clinical appearance because they show recalcitrant hairline hair loss and pose a diagnostic dilemma. Hence, trichoscopic features of FFA such as perifollicular scale and feeble perifollicular erythema should be looked for.

Are Dots, Broken Hair, or Comma Hair Seen or Not?

The next checkpoint is whether yellow dots, black dots, or broken hairs are seen or not. The term “dots” refers to the small, round hair follicle openings seen on trichoscopy. Trichoscopy may distinguish whether hair follicle openings are normal, empty, fibrotic, or containing biological material, such as hyperkeratotic plugs or hair residues [Table 1].\textsuperscript{[8]} Black dots (cadaverized hairs) represent pigmented hair broken or destroyed at scalp level. Yellow dots are follicular infundibula with keratotic

Figure 1: Schematic diagram of various trichoscopic terminology/patterns

Figure 2: Hair diameter diversity >20% with white dots in woman with female pattern hair loss (×20, FotoFinder Systems, Inc.)

Figure 3: A case of female pattern hair loss with acute telogen effluvium. Hair diameter diversity >20% with newly growing hair in a woman with diffuse hair loss aggravated by recent febrile illness (×20, FotoFinder Systems, Inc.)

Figure 4: Regular white dots distributed in singly and in groups (×20, FotoFinder Systems, Inc.)
material and/or sebum. They vary in color, shape, and size.\[11\] White dots may appear as fibrotic white dots or pinpoint white dots. The classic, big, irregular white dots represent areas of perifollicular fibrosis. The pinpoint white dots are small and regular, with occasional peripheral hyperpigmentation. They correspond to empty hair follicles or to the eccrine sweat duct openings. They are observed in sun-exposed areas and in dark skin phototypes.

Red dots have been described in DLE and in patients with vitiligo.

Pink-gray and gray dots have been observed in the eyebrow area of patients with FFA.\[12\] This finding is believed to be a favorable prognostic factor for eyebrow regrowth [Table 1].\[8\]

When numerous yellow dots are observed, the diagnosis of AA can be ascertained. In AGA, hypotrichosis congenita, and TC, limited number of yellow dots are seen.\[7\]

Furthermore, yellow dots are seen in cicatricial alopecia and DLE.\[11\]

The patients with CTE showed yellow dots, some coiled hair, and a honeycomb pigment network. Thin hairs were not seen, in contrast to acute TE. The most common trichoscopic findings in TTM were broken hair of different

**Table 1: Dots**

| Dot Type                  | Conditions                                                                 |
|--------------------------|-----------------------------------------------------------------------------|
| Black dots               | Active AA, DC, tinea capitis, chemotherapy-induced alopecia, TTM, after laser depilation, after trichogram, incidental finding in other diseases |
| Yellow dots              | AA: Marker of disease severity DLE: Large, dark yellow to brownish-yellow dots androgenic alopecia: “Oily” appearance and predominance in frontal area DC, TTM: Imposed over dark dystrophic hairs |
| White dots               | Primary folliculocentric alopecias, LPP: Fibrotic white dots dark skin, sun-exposed areas: Pinpoint white dots |
| Red dots                 | DLE, vitiligo                                                              |
| Pink-gray/gray dots      | FFA (eyebrows)                                                            |

AA: Alopecia areata, TTM: Trichotillomania, DC: Dissecting cellulitis, DLE: Discoid lupus erythematosus, FFA: Frontal fibrosing alopecia
lengths. “Mace” sign for broken terminal hairs has been described as pathognomic marker of TTM which are uniform in diameter and pigmentation with a bulging distal end. The bulging distal end resembles the head of a mace and the longitudinal proximal end resembles the handle of the mace. Exclamation mark hairs have tapering and less pigmented proximal ends. This is due to suppression of mitosis in hair matrix due to the inflammatory infiltrate.

In TTM, tapering hairs and clustered short vellus hairs are not observed because the premature catagen induction is unlikely to occur. However, we should be careful about coexistence of AA and TTM.

We have to be cautious for trichoscopic differential diagnosis for these two entities and need to obtain comprehensively clinical and/or histopathological data in ambiguous cases.

Comma hairs, zigzag hairs, and interrupted (Morse code-like) hairs are characteristic for TC. When these are not detected, further clinical and/or histopathological investigation is needed.

Lacarrubba et al. demonstrated new trichoscopic patterns on a higher magnification. When using high magnification (×150), additional features are evident: horizontal white bands, bent hairs, broken hairs, and translucent, easily deformable hairs.

When there are no yellow dots, black dots, or broken hairs, but the presence of perifollicular yellow scale possibly mixed with sebum, they serve as a clue to diagnose seborrheic alopecia.

Significant findings in scalp psoriasis are red dots and globules, twisted red loops and glomerular vessels, which correspond to dilated capillaries in the dermal papillae. Trichoscopic findings of seborrheic dermatitis are arborizing vessels and atypical red vessels.

Is hair diameter diversity seen or not?

When hair diameter diversity (HDD) (>20%) is seen, the diagnosis is AGA. In a study done by Bhamla et al., using >20% HDD as a diagnostic parameter, trichoscopy confirmed 75% of women with Grade 1 FPHL (Sinclair grading for women hair loss) and 93% of women with Grade 2 FPHL. In all these, women histopathology confirmed T:V ratio <4:1 on horizontally sectioned triple scalp biopsies. This increase in trichoscopic detection from Grade 1 to Grade 2 of FPHL could be due to the increasing miniaturization with increasing grades of FPHL, further signifying the correlation between HDD and follicle miniaturization. Vellus hairs are also seen in TTA.

The diagnostic criteria including trichoscopic findings for TTA were proposed as follows:

- Triangular or lancet-shaped patch of alopecia involving frontotemporal scalp
- Trichoscopically normal follicular openings with vellus hairs surrounded by normal terminal hair area
- Trichoscopically no broken hairs, tapering hairs, black dots, yellow dots, and orifice loss
- Persistent without significant hair regrowth for 6 months.
Are the Loss of Orifices Seen?

Inui revised the trichoscopic algorithm in 2012.[7] According to this algorithm, the first step is to assess the presence or absence of orifices. Loss of orifices corresponds to permanent destruction of hair follicles, pointing toward a diagnosis of cicatricial alopecia. When loss of hair orifices cannot be seen in the hair loss area, diagnosis of noncicatricial alopecia is established. Subsequently, one should look for yellow dots, black dots, or broken hair and HDD to make a diagnosis of various noncicatricial alopecias such as AA, TC, and AGA, respectively.

Romero JAM and Grimalt R have summarized the main trichoscopic findings in cicatricial alopecia [Table 2].[24]

Are Hair Shaft Abnormalities Seen?

Hair shaft abnormalities can be diagnosed from the characteristics of trichoscopy summarized in Table 3.[25-28] In a case of woolly hair syndrome, differential diagnosis from curly hairs of normal subjects is easy using trichoscopy because they do not differ significantly from straight hairs.[25]

Rakowska et al. suggested the term “regularly bended ribbon sign” for describing the specific dermoscopic feature of monilethrix. It helps to differentiate monilethrix from pseudomonilethrix and other causes of hair loss.[25]

Trichoscopic Clues for Diagnosing Other Hair Loss Diseases

In lichen planus, the linear area of telangiectasia within the scalp creases, possibly caused by compression of the superficial blood capillaries, can be trichoscopically seen.[29] The orange spots seen by trichoscopy suggest scalp sarcoidosis and dystrophic hairs may indicate granulomatous activity.[30]

The orange spots correspond to the round, well-formed granulomas in the superficial dermis. Hair casts trichoscopically detected as white-to-brown cylindrical structures encircling the proximal hair shafts provide a diagnostic clue for traction alopecia.[31]

SA may clinically mimic a wide range of hair disorders, including AA, TTM, LPP, TC, TE, and AGA.[32]

According to its clinical appearance, SA is further classified into three forms: (1) diffuse alopecia, characterized by a diffuse hair loss; and (2) mixed form (i.e., combination of diffuse hair loss and alopecic moth-eaten patches). The tropism of *Treponema pallidum* for the hair bulge epithelium and peribulbar capillaries was demonstrated by scalp biopsies detecting spirochetes in the peribulbar region and penetrating into the follicle matrix.[33] The current hypothesis supporting the pathogenesis of SA is vasculitis of peribulbar capillaries causing perifollicular lymphocytic infiltration with scattered plasma cells that stop the hair cell cycle. In moth-eaten alopecia of secondary syphilis, the histopathology is similar to that of AA.[34,35] Ye et al. observed black dots, focal atrichia, hypopigmentation of hair shaft, and yellow dots in the center of the alopecic patches along with few black dots at the periphery of the patches.[35] Tapered bended hairs are likely to be the expression of the chronic peribulbar sparse lymphocytic infiltration elicited by *T. pallidum*.[35] Tognetti et al. described tapered bended hairs, erythematous background, diffuse scaling, and perifollicular hyperkeratosis in mixed pattern of SA.[36] Vellus hairs are usually observed in the center of the AA patch, whereas in SA, they appear at the periphery.[7,8]

Selection of optimal biopsy site

Trichoscopy may be used to select the best area to obtain a biopsy specimen. Ex vivo assessment of scalp biopsies by dermatoscopy can identify the correct plane of transversal bisection, and it is useful to control tissue processing.[16]

Quantitative analysis using trichoscopy

Trichoscopy can be used for quantitative analysis for hair loss diseases and also to monitor treatment response.[37,38]

Recent development in trichoscopy

Moreover, recently, ultraviolet (UV)-enhanced trichoscopy has been introduced by Rudnicka et al.[13] and by using this new equipment, TC, pityrosporum folliculitis, and porphyria are more precisely and easily diagnosed because UV light covers the spectrum of a Wood’s lamp. As a new technique, reflectance confocal laser scanning microscopy has been reported to be helpful for observing hair follicle structures in hair loss diseases.[39-41]

Conclusion

Trichoscopy is a novel, sensitive, and underutilized means which facilitates the visualization of the scalp surface and

### Table 2: Trichoscopic findings in common types of cicatricial alopecia

| LPP | FFA | DLE |
|-----|-----|-----|
| Intense perifollicular scaling, tubular structures | Minor perifollicular scaling | Large yellow dots (follicular keratotic plugs) |
| Violaceous inter- or perifollicular areas | Perifollicular erythema | Mottled dyschromia |
| Fibrotic irregular white dots | Single-hair follicular units at the hair-bearing margin (lonely hair sign) | Thin and radial arborizing vessels that emerge from yellow dots (“red spider in yellow dot”) |
| Blue-gray dots | Absence of vellus hairs | Thick arborizing vessels at the periphery of the lesion |
| Small hair tufts | Pink-gray and gray dots in the lateral eyebrow area | Follicular red dots |

LPP: Lichen planopilaris, FFA: Frontal fibrosing alopecia, DLE: Discoid lupus erythematosus
Table 3: Characteristic trichoscopic patterns of hair shaft disorders

| Study year       | Condition             | Trichoscopic pattern                                             |
|------------------|-----------------------|------------------------------------------------------------------|
| Rakowska et al., 2007 | Monilethrix           | Monilethrix regularly bended ribbon sign                          |
| Wallace et al., 2009 | Chemically dyed       | Hair color change, sharply demarcated                             |
| Wallace et al., 2009 | Netherton syndrome    | Nodules on hair shaft                                             |
| Rakowska et al., 2008 | Bubble hair           | Dysmorphia of distal hair shaft                                   |
| Wallace et al., 2009 | Pili annulati         | Subtle spangly, shimmering                                       |
| Rakowska et al., 2008 | Pili torti            | Appearance with alternating light and black areas                 |
|                   | Woolly hair syndrome  | Regular width, white bands with misty appearance                 |
| Wallace et al., 2009 | Hair casts            | Keratin casts adhering to hair shafts                             |

hair. It provides rapid detection of scalp and hair disorders with advanced diagnostic accuracy, predicts the course of the disease, and decreases the unnecessary need for biopsies. In addition, trichoscopy will avoid unnecessary invasive scalp biopsies. However, if a biopsy is mandatory, trichoscopy can aid in assessing the active biopsy sites. It has been proposed to use dermoscopy when performing a trichogram, instead of using the optical microscope.

Trichoscopy can be used for quantitative analysis as mentioned above, and additional criteria for other diseases will be developed in the future.

The use of trichoscopy can result in lower diagnostic accuracy if the physician does not correctly interpret the significance of structures. Moreover, trichoscopy can lead to lower diagnostic accuracy when patients are diagnosed using dermoscopy alone, without clinical context.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

REFERENCES
1. Sinclair R, Jolley D, Mallari R, Magee J. The reliability of horizontally sectioned scalp biopsies in the diagnosis of chronic diffuse telogen hair loss in women. J Am Acad Dermatol 2004;51:189-99.
2. Van Neste MD. Assessment of hair loss: Clinical relevance of hair growth evaluation methods. Clin Exp Dermatol 2002;27:358-65.
3. Rudnicka L, Olszewska M, Majsterek M, Czuwara J, Slowinska M. Presence and future of dermoscopy. Expert Rev Dermatol 2006;1:769-72.
4. Argenziano G, Soyer HP. Dermoscopy of pigmented skin lesions – A valuable tool for early diagnosis of melanoma. Lancet Oncol 2001;2:443-9.
5. Rakowska A. Trichoscopy (hair and scalp videodermoscopy) in the healthy female. Method standardization and norms for measurable parameters. J Dermatol Case Rep 2009;3:14-9.
6. Van Neste D. Female patients complaining about hair loss: Documentation of defective scalp hair dynamics with contrast-enhanced phototrichogram. Skin Res Technol 2006;12:83-8.
7. Inui S. Trichoscopy: A new frontier for the diagnosis of hair. Expert Rev Dermatol 2012;7:429-37.
8. Rudnicka L, Olszewska M, Rakowska A, editors. Atlas of Trichoscopy Dermoscopy in Hair and Scalp Disease. London: Springer Verlag; 2012.
9. Tosti A, editor. Atlas: Dermoscopy of Hair and Scalp Disorders: Pathological and Clinical Correlations. USA: CRC Press; 2007.
10. Inui S, Itami S. Emergence of trichoscopic yellow dots by topical corticosteroid in alopecia areata mimicking frontal fibrosing alopecia: A case report. J Dermatol 2012;39:39-41.
11. Rudnicka L, Olszewska M, Rakowska A, Slowinska M. Trichoscopy update 2011. J Dermatol Case Rep 2011;5:82-8.
12. Mubki T, Rudnicka L, Olszewska M, Shapiro J. Evaluation and diagnosis of the hair loss patient: Part II. Trichoscopic and laboratory evaluations. J Am Acad Dermatol 2014;71:431.e1-11.
13. Malakar S, Mehta PR, Mukherjee SS. Trichoscopy in pediatric age group. Indian J Paediatr Dermatol 2018;19:93-101.
14. Tüeb RM, Cavagni B. Trichotillomania in connection with alopecia areata. Cuts 1996;58:67-70.
15. Wilkin JK. Trichotillomania associated with alopecia areata. Cuts 1983;31:65-6.
16. Hughes R, Chiaverini C, Bahadoran P, Lacour JP. Corkscrew hair: A new dermoscopic sign for diagnosis of tinea capitis in black children. Arch Dermatol 2011;137:355-6.
17. Słowińska M, Rudnicka L, Schwartz RA, Kowalska-Oleżdka E, Rakowska A, Sicinska J, et al. Comma hairs: A dermoscopic marker for tinea capitis: A rapid diagnostic method. J Am Acad Dermatol 2008;59:577-9.
18. Lacarrubba F, Verzi AE, Miceli G. Newly described features resulting from high-magnification dermoscopy of tinea capitis. JAMA Dermatol 2015;151:308-10.
19. Inui S. Trichoscopy for common hair loss diseases: Algorithmic method for diagnosis. J Dermatol 2011;38:71-5.
20. Kim GW, Jung HJ, Ko HC, Kim MB, Lee WJ, Lee SJ, et al. Dermoscopy can be useful in differentiating scalp psoriasis from seborrheic dermatitis. Br J Dermatol 2011;164:652-6.
21. Tosti A, editor. Androgenetic alopecia. In: Dermoscopy of Hair and Scalp Disorders with Clinical and Pathological Correlations. Vol. 2. UK: Informa Healthcare; 2007. p. 15-25.
22. Bhamla SA, Dhurat RS, Sarangi PP. Is trichoscopy a reliable tool to diagnose early female pattern hair loss? Int J Trichology 2013;5:121-5.
23. Inui S, Nakajima T, Itami S. Temporal triangular alopecia: Trichoscopic diagnosis. J Dermatol 2012;39:572-4.
24. Romero JAM, Grimalt R. Trichoscopy: Essentials for the dermatologist. World J Dermatol 2015;4(2):63-8.
25. Rakowska A, Słowińska M, Kowalska-Oleżdka E, Rudnicka L. Trichoscopy in genetic hair shaft abnormalities. J Dermatol Case Rep 2008;2:14-20.
26. Rakowska A, Kowalska-Oleżdka E, Słowińska M, Rosinska D, Rudnicka L. Hair shaft videodermoscopy in Netherton syndrome. Pediatr Dermatol 2009;26:320-2.
27. Wallace MP, de Berker DA. Hair diagnoses and signs: The use of dermatoscopy. Clin Exp Dermatol 2010;35:41-6.
28. Piraccini BM, Voudouris S, Pazzaglia M, Rech G, Vicenzi C, Tosti A. Lipedematous alopecia of the scalp. Dermatol Online J 2009;16:12:6.
29. Torres F, Tosti A, Misciali C, Lorenzi S. Trichoscopy as a clue to the diagnosis of scalp sarcoidosis. Int J Dermatol 2011;50:358-61.
30. Tosti A, Miteva M, Torres F, Vincenzi C, Romaneli F. Hair casts are a dermoscopic clue for the diagnosis of traction alopecia. Br J Dermatol 2010;163:1353-5.
31. Tognetti L, Cinotti E, Perrot JL, Campoli M, Rubegni P. Syphilitic alopecia: Uncommon trichoscopic findings. Dermatol Pract Concept 2017;7:55-9.
32. Nam-Cha SH, Guhl G, Fernández-Peña P, Fraga J. Alopecia syphilitica with detection of Treponema pallidum in the hair follicle. J Cutan Pathol 2007;34 Suppl 1:37-40.
33. Lee JW, Hsu ML. Alopecia syphilitica, a simulator of alopecia areata: Histopathology and differential diagnosis. J Cutan Pathol
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1991, 18: 87-92.
34. Jordaan HF, Louw M. The moth-eaten alopecia of secondary syphilis. A histopathological study of 12 patients. Am J Dermatopathol 1995; 17: 158-62.
35. Ye Y, Zhang X, Zhao Y, Gong Y, Yang J, Li H, et al. The clinical and trichoscopic features of syphilitic alopecia. J Dermatol Case Rep 2014; 8: 78-80.
36. Inui S, Nakajima T, Nakagawa K, Itami S. Clinical significance of dermoscopy in alopecia areata: Analysis of 300 cases. Int J Dermatol 2008; 47: 688-93.
37. Miteva M, Lanuti E, Tosti A. Ex vivo dermatoscopy of scalp specimens and slides. J Eur Acad Dermatol Venereol 2014; 28: 1214-8.
38. Shanshanwal SJ, Dhurat RS. Superiority of dutasteride over finasteride in hair regrowth and reversal of miniaturization in men with androgenetic alopecia: A randomized controlled open-label, evaluator-blinded study. Indian J Dermatol Venereol Leprol 2017; 83: 47-54.
39. Rudnicka L, Olczewska M, Rakowska A. In vivo reflectance confocal microscopy: Usefulness for diagnosing hair diseases. J Dermatol Case Rep 2008; 2: 55-9.
40. Ardigo M, Tosti A, Cameli N, Vincenzi C, Misciali C, Berardesca E, et al. Reflectance confocal microscopy of the yellow dot pattern in alopecia areata. Arch Dermatol 2011; 147: 61-4.
41. Agozzino M, Tosti A, Barbieri L, Moscarella E, Cota C, Berardesca E, et al. Confocal microscopic features of scarring alopecia: Preliminary report. Br J Dermatol 2011; 165: 534-40.