TRICHO SCOPY IN ALOPECIAS

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1. INTRODUCTION

Trichoscopy is the term for dermoscopic imaging of the scalp and hair. This technique, both simple and non-invasive, is a valuable tool for diagnosing common hair and scalp disorders. Handheld dermoscopy usually has a 10x magnification lense, while videodermoscopy can have the magnification up to 1000x. Magnification of 20 times or more allows the evaluation of scalp vessels.

Dermoscopy of normal scalp shows hair follicles containing 2 to 3 mature hairs that are similar in thickness and color. The average thickness of the hair is about 0.06mm, about 10% of the hairs are vellus hairs.

Trichoscopic observation can be divided into 4 groups: hair signs, vascular patterns, follicles signs, interfollicular patterns.

In this article, we have briefly described the trichoscopic features in the common alopecias such as androgenetic alopecia, alopecia areata, telogen effluvium, tinea capitis, trichotillomania, lichen planopilaris, discoid lupus erythematosus. These finding can help to avoid unnecessary biopsies and when a biopsy is still needed it is helpful in choosing an ideal biopsy site.

2. TRICHO SCOPIC PATTERNS

2.1. Follicular patterns

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow dots: follicles plugged with keratin and/or sebum</td>
<td></td>
</tr>
<tr>
<td>Black dots: follicles containing broken hair remnants</td>
<td></td>
</tr>
<tr>
<td>White dots: represent eccrine sweat gland duct openings in normal scalp</td>
<td></td>
</tr>
<tr>
<td>Red dots: widened follicles surrounded by dilated vessels and extravasated erythrocytes</td>
<td></td>
</tr>
</tbody>
</table>

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### 2.2. Interfollicular patterns

<table>
<thead>
<tr>
<th>Patterns</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Honeycomb pigment pattern:</strong></td>
<td><img src="image1" alt="Image" /></td>
</tr>
<tr>
<td>a perifollicular pigmented network, in shape of honeycomb</td>
<td><img src="image2" alt="Image" /></td>
</tr>
<tr>
<td><strong>Focal atrichia:</strong></td>
<td><img src="image3" alt="Image" /></td>
</tr>
<tr>
<td>white plaque with well-define border, represent fibrosis.</td>
<td><img src="image4" alt="Image" /></td>
</tr>
</tbody>
</table>

### 2.3. Hair shaft features

<table>
<thead>
<tr>
<th>Patterns</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exclamation mark:</strong></td>
<td><img src="image5" alt="Image" /></td>
</tr>
<tr>
<td>fractured hairs, whose tips are wider than the proximal portion of the shaft</td>
<td><img src="image6" alt="Image" /></td>
</tr>
<tr>
<td><strong>Broken hair:</strong></td>
<td><img src="image7" alt="Image" /></td>
</tr>
<tr>
<td>fractured hairs with vary length and uniform shaft diameter</td>
<td><img src="image8" alt="Image" /></td>
</tr>
<tr>
<td><strong>Vellus hair:</strong></td>
<td><img src="image9" alt="Image" /></td>
</tr>
<tr>
<td>less than 0.03 mm in thickness, representing miniaturized hairs or regrowing hairs</td>
<td><img src="image10" alt="Image" /></td>
</tr>
</tbody>
</table>

### 3. TRICHOSCOPIC FINDINGS IN SOME COMMON CATEGORIES OF ALOPECIAS

#### 3.1. Androgenetic alopecia (AGA)

Early clinical diagnosis is sometimes difficult, especially in women. Some dermoscopic features may simplify the diagnosis in such cases.

The early diagnostic feature is a hair shaft diameter variation of more than 20% total hair shafts, but there is no standard method for assessing this diversity. AGA results from progressive miniaturization of hair follicles. Hair miniaturization does not equally affect all hair follicles of the same area, resulting in the simultaneous presence of terminal, intermediate, and vellus hairs. In addition, in AGA, there is a predominance of single hair follicles compared to 2-4 hairs in each normal follicle.
Brown halo or peripilar sign is a specific sign in androgenetic hair loss. This marker is described as a hyperpigmentation halo around hair follicle, reflects perifollicular inflammation.

Other significant sign is yellow dots, a common sign in AGA but not specific, because it can be observed in other disease like AA, DLE.

According to Francesco et al, three major criteria for early female AGA have been suggested:

+ More than four yellow dots in four images (70x magnification) of the frontal area
+ A lower average hair thickness in the frontal area compared to the occipital area
+ Vellus hairs (below 0.03 mm) comprising more than 10% of total hairs in the frontal area

Yellow dots can present in any stages of alopecia areata. This sign can also be observed in other hair problems such as AGA, discoid lupus erythematosus ...

Short, hypopigmented vellus hairs are a common finding in AA and are usually indicative of long-lasting and remitting stage of the disease.

3.2. Alopecia areata (AA)

The trichoscopy findings can vary depending on the stage, site and severity of the disease.

Dystrophic hairs are an indicator of damaged anagen stage, which is related to the severity of the disease, and may result in broken hair, exclamation hair or black dots. Exclamation hair is the most specific sign of acute alopecia areata, but can also be seen in chemical-induced hair loss. Black dots are common sign but nonspecific because it presents in many other diseases such as tinea capitis, trichotillomania.
AA: black dots (black arrow) and broken hairs (circle), circle hair (red arrow)

AA: exclamation hair (circle) and yellow dot (arrow)

AA: hypopigmented vellus hairs at remitting stage of the disease
3.3. Telogen effluvium

On trichoscopy, telogen effluvium is a diagnosis of exclusion, there is no specific trichoscopic criteria of this disease. Telogen effluvium is suspected when we find a decrease of hair density with presence of empty follicles in trichoscopic image. It can be easily differentiated from AGA because it affects the entire scalp and we don’t observe hair shaft diameter variation and peripilar halo. There is no black dot and yellow dot as well as other hair shaft damage like broken hair, exclamation hair.

3.4. Trichotillomania (TTM)

TTM is a disorder of hair pulling, classically leaving bizarre-shaped area(s) of hair loss with broken hairs of different lengths.

Trichoscopy shows the presence of broken hair shafts of different lengths. Recently, some other signs have been described, including coiled hairs, V-signs (2 or more hairs from one follicular unit and broken at the same length), trichoptilosis (split ends).

A specific sign on the trichoscopy of TTM is flame hairs: a broken hair with a wavy and cone-shaped extremity resembling the shape of a fire flame. This sign is the result of the restoration of the rest of a healthy hair shaft after being pulled out, it is less likely to occur in fragile and damaged hair.
3.5. Lichen planopilaris

Lichen planopilaris is the most common cause of scarring alopecia, it is clinically characterized by the presence of irregular patches of hair loss. Trichoscopy reveals the absence of follicular openings and the presence of white perifollicular scales (or casts) that surround the hair shafts at their emergence, especially at the peripheral edge of the alopecia. White dots, which indicate the expression of follicle fibrosis, are generally observed in alopecic areas. In addition, there may be keratin plugs in follicular sites. In dark-skinned people affected by lichen planopilaris, the persistence of a normal pigmented network inside the plaques of hair loss is typical, as the interfollicular epidermis is commonly unaffected by the inflammatory process.

3.6. Discoid lupus erythematosus (DLE)

In cases DLE involving only the scalp, dermoscopy helps in differentiating it from other causes of cicatricial alopecias.

Dermoscopy of the affected scalp shows atrophy with complete loss of follicular openings. Hyperkeratotic follicular plug is a common sign, mostly seen at the periphery of the plaque. “Red
dot” sign, which are regularly distributed around follicular openings, indicate active disease and are related to a good prognosis, with possible hair regrowth upon prompt treatment.

Other features are yellow dots, arborizing vessels, and the loss of the normal pigmented network in dark-skinned patients due to the involvement of inflammation of the interfollicular epidermis.

3.7. Tinea capitis

Trichoscopy may be useful both for diagnosis and therapeutic monitoring of this disease. The typical finding using trichoscopy are:
- Black dot
- Comma hairs
- Crokscrew hairs
- Zigzag hairs
- Morse code-like hair (horizontal white bands separated by normal looking hair keratin, giving the appearance of a barcode)

*Tinea capitis: comma hair (circle), crokscrew hair (red arrow), Morse code-like hair (blue arrow)*
4. CONCLUSION

Trichoscopy enhances the diagnosis of different forms of hair loss, especially when faced with difficult case. This method is simple, quick and easy to perform, is well accepted by patients and is also useful for treatment follow-up.

REFERENCES


