

## REVIEW ARTICLE

# Dermoscopic Approach to Nonscarring Alopecia

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## ABSTRACT

Alopecia, though considered a cosmetic disease, can profoundly affect the quality of life of a patient. Clinical diagnosis of alopecia can be difficult and may need invasive procedures, such as biopsy. Dermoscopy is an easy and patient friendly alternative which is useful in diagnosing different causes of alopecia. This article discusses the dermoscopic approach to various types of nonscarring alopecia, such as alopecia areata, androgenetic alopecia, trichotillomania, and telogen effluvium.

**Keywords:** Alopecia areata, Dermoscopy, Telogen effluvium, Tinea capitis, Trichotillomania.

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## INTRODUCTION

Alopecia is a common condition which adversely affects the quality of life. There are several causes which are primarily cicatricial or noncicatricial. It is not always possible to make an accurate and quick diagnosis from clinical examination only. Invasive methods, such as scalp biopsy or painful clinical tests like hair pull test may be required. Under such circumstances, dermoscopy is useful in the form of a noninvasive tool to diagnose different types of hair loss. It is also used to assess prognosis, monitor treatment response, and selecting the ideal site for biopsy, if required.

Trichoscopy is the microscopy of skin of scalp and hair at its surface. This term was first coined by Lidia Rudnicka and Malgorzata Olszewska in 2006.<sup>1</sup> It can be achieved by a handheld dermascope or a video dermascope. The magnification attained varies from 10 to 50 times or higher depending upon the instrument used.<sup>2</sup> The part of hair follicle above scalp surface and the perifollicular epidermis is examined by this method.

Four basic structures on the scalp are analyzed using a dermoscope. They are hair shafts, hair follicle openings, perifollicular epidermis, and blood vessels. A normal scalp in type IV or V skin shows 2 to 4 terminal hairs emanating from a single follicle with a brown reticulate or honey comb pigmented network over the scalp. Single and double hair units are found in temporal scalp, whereas triple hair units predominate in the occipital scalp (Fig. 1).<sup>3</sup>

Hair shafts are described with respect to their thickness and pigmentation along their length, fractures, and shape changes, such as node, curls, and twists. Normally, a terminal hair appears as uniformly pigmented and thick. Vellus hairs which are about 10 percent of all follicles appear as short, less pigmented, and thinner. Regrowing hairs are pigmented as that of terminal hairs and have tapering ends, thus being differentiated from vellus hairs.<sup>4</sup> Follicular openings are seen and described as dots in dermoscopy. The dots are of various colors. The pigmented hairs that are broken at the scalp surface appear as black dots. Yellow dots represent the empty follicular openings that contain sebaceous materials. White dots, if irregular and bigger, represent a perifollicular fibrosis and if regular and smaller, do correspond to eccrine gland openings. Red dots are seen in discoid lupus erythematosus. Dirty dots, seen as brown, black particulate dots, and loose fibers are caused by nonmicrobial environmental particles. These can be easily removed after shampooing



**Fig. 1:** Terminal pigmented hair with follicular units of two to three hair

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and are normally seen in healthy children.<sup>5</sup> Perifollicular epidermis findings include scaling, differences in color and surface characteristics of scalp skin, and presence of any discharge. Blood vessels are also evaluated in dermoscopic examination. Their arrangement is of importance to diagnose inflammatory conditions or scarring alopecia.

### Alopecia Areata

It is a type of alopecia resulting from loss of the immune privilege of the hair follicle, thereby causing autoimmune destruction of the later. Sudden onset of complete patchy hair loss is the commonest presentation (Fig. 2).

*Dermoscopic features:*

*Yellow dots:* These are regularly distributed and represent the hair follicles that contain keratosebaceous material.

*Black dots:* These represent the pigmented hairs which are broken at the scalp surface.

*Micro exclamation hairs:* These are 1 to 2 mm short hairs with tapered proximal end and thicker distal end.

*Regrowing hairs:* These are short and vellus hairs. These regrowing hairs may appear as regularly coiled, described as pigtail hairs. There is an irregular coiling of hair seen in case of trichotillomania.

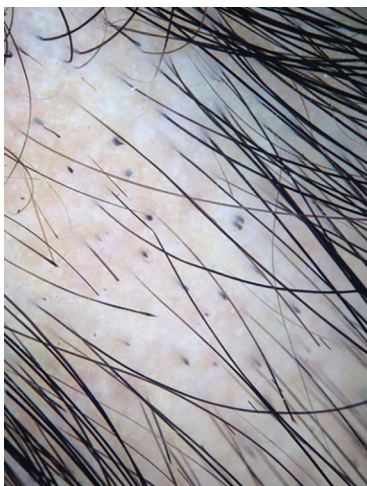
*Coudability sign:* It is a terminal hair with a kink at its proximal end. This is considered as sign of disease activity and can be a substitute for the hair-pull test.<sup>6</sup>

Short vellus hairs and yellow dots are the sensitive marker of alopecia areata.

Black dots, cadaverized hairs, and tapering hairs are the most specific findings and correlate with disease severity.<sup>7</sup>

### Alopecia Areata Incognita

An acute and diffuse form of alopecia areata usually involves whole scalp, clinically resembles telogen effluvium.



**Fig. 2:** Black dot, exclamation hair, and coudability sign in alopecia areata

*Dermoscopic features:*

Numerous diffuse yellow dots of different sizes and a large number of regrowing tapered terminal hairs are in the entire scalp.

### Androgenetic Alopecia (AGA)

This is the most common patterned alopecia in both the sexes. Male and female AGA share similar dermoscopic features (Fig. 3).

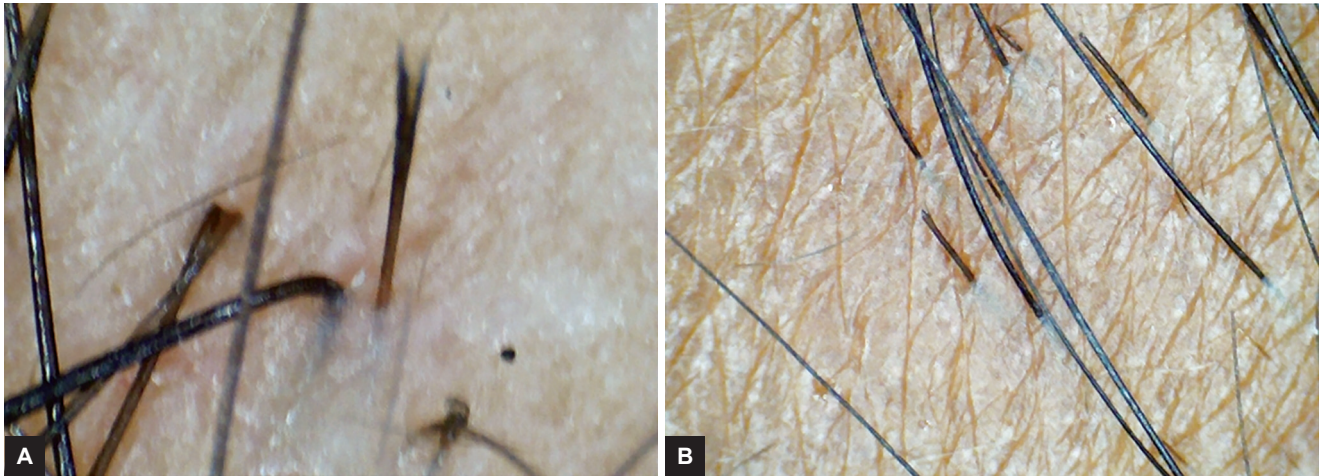
*Dermoscopic features:*

- Heterogenous thickening of the hair shaft is the most striking feature. Miniaturization of hair follicles causes presence of hairs of different thickness simultaneously present on scalp. A hair shaft diameter variation of more than 20% is the characteristic finding. This variation in hair diameter has been termed as "anisotrichosis."<sup>8</sup>
- A higher proportion of vellus hairs is another common feature seen in AGA. This is frequently seen over frontal scalp. However, this finding is not unique to AGA.
- Brown discoloration of the perifollicular scalp is seen in 20 to 66 % of cases of AGA.<sup>9</sup> This is indicative of perifollicular inflammation and is seen in the early stages of AGA.<sup>10</sup> This sign is less seen in darker skin in comparison to western population.<sup>11</sup>
- There is a decrease of number of terminal hairs in individual follicular unit. In the late phase of disease, follicular units with one hair predominate in contrast to normal hair follicles which may have up to four terminal hairs. It is also seen in telogen effluvium and other forms of anagen hair loss.
- Due to the end organ sensitivity, hypertrophied sebaceous glands manifest as pearly white dots in long-standing cases of AGA.<sup>9</sup>



**Fig. 3:** Hair diameter variability more than 20% with follicular units containing single hair





**Figs 4A and B:** (A) Short hair with vertical split at distal end, magnification  $\times 200$ ; and (B) hair broken at different lengths

### Trichotillomania

Trichotillomania is an impulse control disorder which involves pulling out one's hair. It may occur in any hairy region of the body, however, the most common sites are the scalp, eyebrows, and eyelids. The commonest manifestation is patchy areas of hair loss on scalp mimicking alopecia areata (Figs 4A and B).

#### *Dermoscopy features:*

- Hairs broken at different lengths are seen. Black dots are seen, representing the hair shafts broken at the surface of scalp.
- Short hairs with split ends are present and are called trichoptilosis.
- Coiled fractured hairs due to excessive traction on the hair shafts are found. These coils are irregular in contrast to regular coils seen in regrowing stage of alopecia areata.
- Yellow dots with a black dot in the center described as black peppering inside are a rare but characteristic finding in trichotillomania.
- Ise et al described follicular microhemorrhage as a diagnostic sign in trichotillomania. It presents as a red dot corresponding to follicular opening covered with the blood clot and suggests a history of traumatic forced plucking.<sup>12</sup>
- Flame hairs, V sign, tulip hairs, and hair powder are relatively newly described entities and are considered to be specific for trichotillomania.<sup>13</sup>

Flame hairs are semi-transparent, wavy, and cone-shaped hair residues. The V sign is created when two or more hairs emerge from one follicular opening, which are pulled simultaneously and break at the same length above scalp surface.

Tulip hairs are short hairs with darker, tulip flower-shaped ends developing due to a diagonal fracture of hair shaft.

When hair shafts are almost totally damaged only a sprinkled hair residue is visible. This finding is referred to as "hair powder."

### Congenital Temporal Triangular Alopecia (CTTA)

It is a developmental defect which is present at birth and becomes clinically apparent at 3 to 6 years of age. A triangular patch of hair loss over the fronto temporal area, with its apex toward the vertex characterizes the condition. In case of bilateral presentation, it closely mimics AGA and alopecia areata, if present unilaterally.

#### *Dermoscopy features:*

Karadağ and Güleç studied nine patients with CTTA and described short vellus hairs, varying lengths of vellus hairs and white hairs in all their patients.<sup>14</sup> No exclamation mark hairs were seen here, like in alopecia areata.

### Telogen Effluvium

It is a type of alopecia where a large number of hairs throughout the scalp enter the telogen phase simultaneously. There are many causes of this type of hair loss including the less common physiologic conditions like in newborns and postpartum period. Stresses, such as severe chronic illness, prolonged psychological stress, endocrinopathies and drugs precede telogen effluvium.

Persistent shedding of telogen hair beyond 6 weeks is called chronic telogen effluvium.

#### *Dermoscopy features:*

- Upright uniform thickness regrowing hairs are seen. There is no vellus hair or hair shaft thickness variability seen, which distinguishes telogen effluvium from AGA.

The dermoscopic findings do not provide any clue regarding the cause of the same. This is a diagnosis of exclusion.

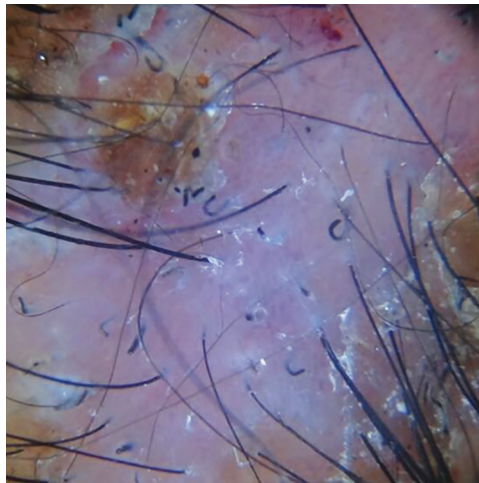


Fig. 5: Black dots and comma hairs

## Tinea Capitis

It is dermatophytic infection of hair usually seen in children. Inflammatory (kerion or favus) and noninflammatory (black dot or grey patch) variants are described. The noninflammatory type of tinea capitis causes nonscarring alopecia (Fig. 5).

### Dermoscopy features:

- Thick pigmented stubs of hair described as comma hairs are seen.
- Zigzag hairs are hair shafts with multiple bends at the narrowed segments along the length of the shaft.
- Broken pigmented hair at the surface of scalp as black dots and broken hairs at varying lengths are seen.
- Bar code hairs are seen which are pigmented hairs with interrupted narrower and pale segments.<sup>15</sup>
- Corkscrew hairs are short hairs and spiral in shape.

Comma hairs, bar code, and corkscrew hairs are specific to tinea capitis.<sup>15,16</sup>

Comma or corkscrew hairs are seen in both endo and ectothrix variants of tinea capitis.

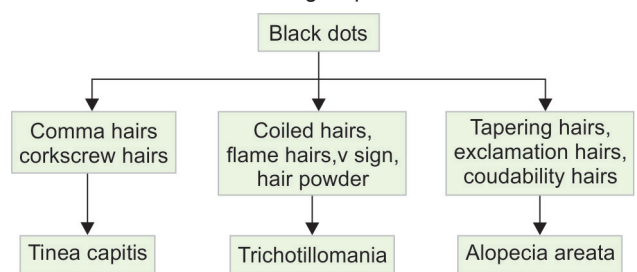
## Chemotherapy-induced Anagen Effluvium

Black dots, monilethrix like hairs, and exclamation hairs are seen.<sup>17</sup>

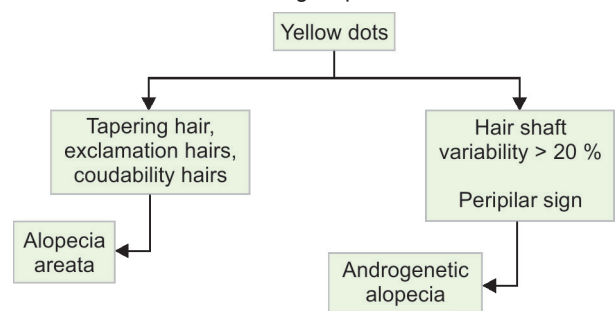
## Dermoscopy as a Diagnostic Tool

Chiramel et al have described the potential of dermoscopy to make the differential diagnosis of various alopecia with ease in 90.5% of cases where clinical diagnosis was not obvious.<sup>11</sup> A study by Elzbleta did find sensitivity and specificity of dermoscopy as a diagnostic method for female pattern alopecia to be 96 and 98% compared to clinical diagnosis. In case of telogen effluvium, the values were 85 and 98%.<sup>18</sup> Dermoscopic parameters, such as black dots, vellus hair, diversity in hair diameter, yellow

**Flow Chart 1:** Dermoscopic approach to black dots in non scarring alopecia



**Flow Chart 2:** Dermoscopic approach to yellow dots in non scarring alopecia



dots, exclamation hair, and thin hair are statistically significant in differentiating a non cicatricial alopecia from cicatricial (Flow Charts 1 and 2).<sup>11</sup>

## CONCLUSION

Dermoscopy is a useful noninvasive office based procedure to diagnose and monitor the treatment of different types of nonscarring alopecia.

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