

TRICHOSCOPIC FINDINGS IN VARIOUS SCALP ALOPECIAS

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Abstract

Background: Many patients of alopecia are encountered in our daily practice with diagnostic dilemma. Dermatoscopy is evolving as an important tool which aids to our clinical diagnosis.

Aims and objectives: To explore the utility of dermoscopy and to study the dermatoscopic findings in Cicatricial and Non Cicatricial Alopecias of the scalp.

Methods: An Observational study was conducted at rural based tertiary centre in Gujarat, India after getting ethical clearance.

Results: Amongst 194 enrolled, 142 (73.12%) were males and 52 (26.80%) were females. 45.36% were diagnosed to have Alopecia Areata (AA) with the most common finding being exclamation marks found in 75% patients. 35.05% were diagnosed to have AA with the most common finding being thin and vellus hairs found in 83.82% patients. 6.19% were diagnosed to have Psoriasis with red dots, globules and silvery scales seen in 100% patients. 5.15% were diagnosed to have Tinea Capitis with corkscrew hairs seen in 100% patients. 3.6% were diagnosed to have Discoid Lupus Erythematosus with scattered dark brown discoloration of skin being the commonest finding, seen in 85.71 patients. 2.58% were diagnosed to have Seborrheic dermatitis with yellow scales seen in 100% patients. 2.06% were diagnosed to have Lichen Plano Pilaris with perifollicular inflammation seen in 100% patients.

Conclusion: Dermoscopy has been shown to enable the visualization of submacroscopic morphologic structures invisible to the naked eye. Trichoscopy is used as a diagnostic aid in differential diagnosis of hair loss and scalp diseases.

Key words: Trichoscopy, Alopecia, Lichen plano pilaris, Scalp Psoriasis, Seborrheic Dermatitis, Discoid Lupus erythematoses, Tinea Capitis

Introduction

The word "alopecia" comes from the Greek word "alopex" for "fox.", which means hair loss when afflicted with a skin disease (the "mange"). Alopecia is defined as complete or partial loss of hair from scalp and other hair bearing sites of the body.¹ A dermoscope (dermatoscope) is a non-invasive, diagnostic tool which visualizes subtle clinical patterns of skin lesions and subsurface skin structures not normally visible to the unaided eye. The basic principle of dermoscopy is transillumination of a lesion and studying it with a high magnification to visualize subtle features.² Some dermatoscopic patterns are observed consistently with certain diseases and these then could be used for their diagnosis. Skin surface microscopy of the scalp is termed as Trichoscopy.

Structures which may be visualized by trichoscopy include Hair shafts, Hair follicle openings, Perifollicular epidermis and Cutaneous microvessels. Trichoscopy allows analyzing acquired and congenital hair shaft abnormalities.^{3,4,5} Normal hair shafts are uniform in shape and color with continuous, interrupted, fragmented or absent medulla.⁶ About 10% of normal human scalp hairs are short, hypopigmented vellus hairs.^{4,5} Trichoscopy may distinguish whether hair follicle

openings are normal, empty, fibrotic or containing biological material, such as hyperkeratotic plugs or hair residues.

"Dots" is a common term for hair follicle openings seen by trichoscopy. Black dots ("cadaverized hairs") represent pigmented hairs broken or destroyed at scalp level.⁶ They are observed in alopecia areata,⁷ dissecting cellulitis, tinea capitis, chemotherapy-induced alopecia, and trichotillomania, but may be incidentally observed also in other diseases and after laser depilation or trichogram.

Yellow dots are follicular infundibula with keratotic material and/or sebum variable in color, shape and size. Yellow dots are present in alopecia areata (AA),⁷ discoid lupus erythematosus (DLE) and androgenic alopecia (AGA).⁷ The predominance of yellow dots in the frontal area compared to the occipital area favors the diagnosis of (female) AGA.⁸ White dots represent areas of perifollicular fibrosis and are observed most commonly in Lichen Planus Pigmentosus. Another type of white dots, the small, regular pinpoint white dots are observed in sun exposed areas and in dark skin phototypes regardless of hair loss. They correspond to empty hair follicles or to the eccrine sweat duct openings.

Red dots represent blood vessels and are commonly seen in Psoriasis in "honeycomb pattern" and are believed to be a

positive prognostic factor.⁹ Brown or brown-gray dot are the characteristic finding in the eyebrow area of patients with frontal fibrosing alopecia(FFA). It is a favorable prognostic factor for eyebrow regrowth.

Androgenetic alopecia (AGA) is characterized by hair diameter diversity due to miniaturization of the hair follicles. Variability in hair shafts diameter of more than 20% is diagnostic of this condition¹⁰. In early AGA, it is common to see peripilar brown depressions described as peripilar sign.¹¹ In patients with advanced androgenetic alopecia, yellow dots can be observed and the sun-exposed scalp often shows the honeycomb pigment pattern. Yellow Dots in AGA are thought to be the result of sebaceous hypertrophy and lagooning in glands as a result of end-organ hypersensitivity⁷. The characteristic trichoscopic findings of AGA known as heterogenous hair density and perifollicular pigmentation is thought to be the result of dermal infiltrates in AGA.

In Alopecia Areata (AA) the dermoscopic findings include yellow dots, black dots, broken hairs, short vellus hair, tapering hair, coudable and cadaverised hair.¹²

The comma hairs and the corkscrew hairs appear to be specific dermoscopic findings of dermatophytosis of the scalp,¹³ regardless of the etiological agent. They have to be distinguished from corkscrew hairs observed in ectodermal dysplasias. Additional findings in tinea capitis are broken hairs, damaged hairs and black dots.

On dermascopy, seborrhoeic dermatitis (SD) is characterized by arborizing vessels and atypical red vessels.¹⁴ Featureless areas devoid of any particular vascular patterns are also frequently observed. Scales are observed commonly and there is no significant difference in the frequency and characteristics of the scales when they are observed using dermoscopy. The most significant dermoscopic features of scalp psoriasis are red dots and globules, twisted red loops, and glomerular vessels all arranged in honeycomb pattern.¹⁴ Twisted red loops are observed at higher magnification and are also seen to a limited extent in unaffected psoriatic scalp as well as in newly treated psoriatic scalp.⁵ Dermoscopy is very useful to distinguish scalp seborrhoeic dermatitis from scalp psoriasis based on the vascular pattern. In seborrhoeic dermatitis, arborizing red lines, which have a wider caliber than the loops, can be observed.^{15,16}

The most characteristic trichoscopy features of DLE of the scalp are thick arborizing vessels and large yellow dots. Scattered brown discoloration of the skin may be observed in some

patients. This feature is sometimes referred to as “red spider in yellow dot”.⁹ Red dots, described by Tosti and colleagues, are considered a good prognostic factor for of hair regrowth⁸. Other findings described in DLE include peripilar erythema and scaling, white patch, branching capillaries keratin plugs and decrease in number of follicular ostia.^{17,18}

Lichen planopilaris presents with big, irregular (classic) white dots, which merge into milky-red (strawberry icecream color) or white areas in the fibrotic stage.¹⁹ There is absence of follicular openings and the presence of characteristic perifollicular scales (peripilar casts) at the periphery of the patch. Perifollicular erythema characterized by the presence of arborizing vessels around the follicular ostia is also observed. Blue-grey dots may be found in some patients, especially those with dark skin. A peculiar pattern of round perifollicular blue-grey dots “target pattern” may be observed in some dark patients with LPP. Usually, LPP spares some terminal hair follicles inside the alopecic patches.

Aim

This study was conducted to observe the dermoscopic findings of various Cicatricial and Non Cicatricial scalp alopecias and to explore the utility of dermoscopy in the examination and diagnosis of various hair loss disorders .

Methods

The study was conducted in the Department of Dermatology, Shree Krishna Hospital after getting ethical clearance from Institutional Human Resource and ethics Committee. All consenting male and female patients, with alopecia were enrolled. Hair loss occurring due to external injury, chemotherapy, other drugs or any systemic cause and hair shaft deformity were excluded.

194 patients were enrolled after written informed consent. In every case detailed history was elicited and clinical examination was carried out following which dermoscopy was done with a non polarised dermatoscope to correlate our clinical findings and aid to our diagnosis. Diagnosis was done clinically and histopathological examination was performed whenever in doubt.

Results

Total of 194 patients of alopecia were enrolled out of which 142 (73.12%) were males and 52 (26.80%) were females (Table 1). The most common age group affected was 21-30 with 78 (40.20%) patients.

Cicatricial alopecia				Noncicatricial alopecia			
Disorder	Males	Females	total	Disorder	Males	Females	total
LPP	1	3	4(2.1%)	ALOPECIA AREATA	55	33	88(45.3%)
DLE	2	5	7(7%)	ANDROGENIC ALOPECIA	67	1	68(35.0%)
				PSORIASIS	8	4	12(6.2%)
				SEBORRHEIC DERMATITIS	4	1	5(2.6%)
				T. CAPITIS	5	5	10(5.2%)
Total: males-3, Females-8, Total- 11				Total	139	44	183

Table 1: Types of alopecia with their causes

Total 88 (45.36%) patients were diagnosed to have AA (Table 1). Most common dermatoscopic finding was exclamation marks seen in 66 (75%) patients, followed by black dots seen in 65 (73.86%) patients. Coudability sign, sparing of white hairs was also observed (Fig. 1a,1b,1c) (Table2).

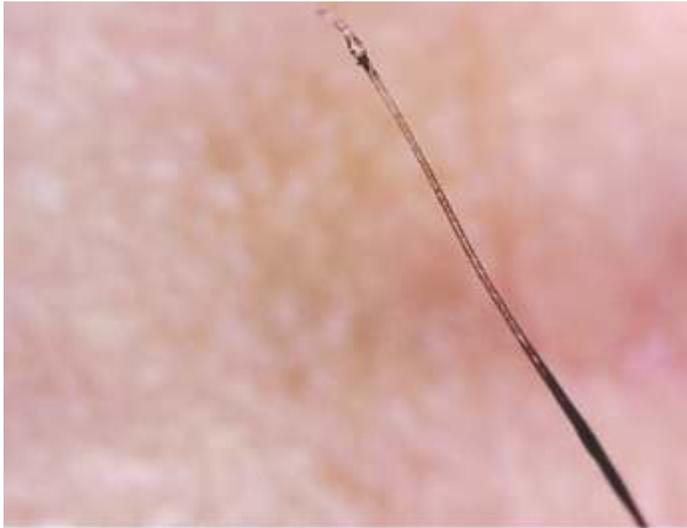


Figure 1a: Dermatoscopy (50x) of alopecia areata showing Exclamation Mark Hair.



Figure 1b: Dermatoscopy (200x) of alopecia areata showing sparing of White Hair.

AGA was seen in 68 patients (35.05%) (Table 1). Most common dermatoscopic finding was thin and vellus hairs seen in 57 (83.82%) patients, followed by yellow dots seen in 51 (75%) patients (Figures 2a,2b) (Table 2). Family history was positive in 43 (63.24%) patients out of whom 36 (83.72%) patients had positive paternal history, 5 (11.63%) patients had positive maternal history, 2 (4.65%) patients had positive family history both paternally and maternally.

Amongst 194 enrolled, 4 (2.06%) were diagnosed to have LPP (Table 1). Most common dermatoscopic finding was perifollicular inflammation seen in 4 (100%) patients, followed



Figure 1c: Dermatoscopy (200x) of alopecia areata showing Coudability Sign.

by silver white perifollicular scaling seen in 3 (75%) patients (Figures 3) (Table 2).



Figure 2a: Dermatoscopy (50x) of androgenic alopecia showing Thin and Vellus hair, Hair shaft thickness Heterogeneity

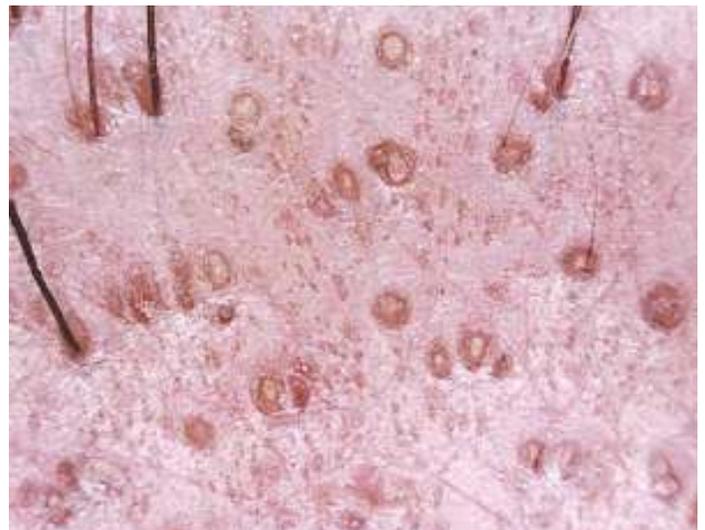


Figure 2b: Dermatoscopy (50x) of androgenic alopecia showing Empty hair follicles.

Total 7 (3.6%) were diagnosed to have DLE (Table 1). Most common dermatoscopic finding was scattered dark brown discoloration of skin seen in 6 (85.71) patients, followed by large

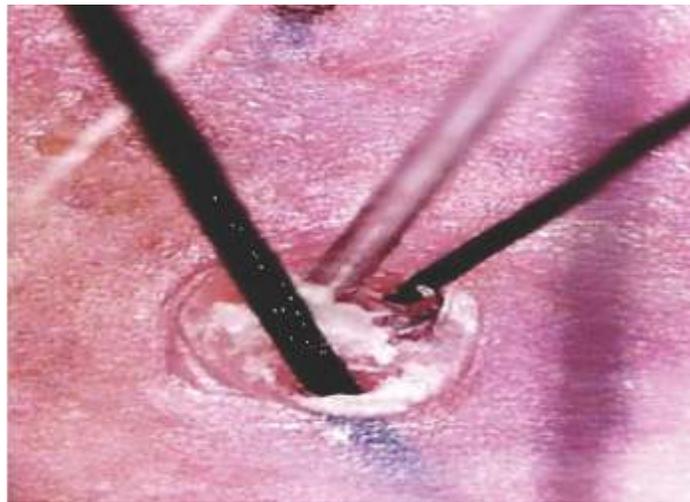


Figure 3: Dermatoscopy (200x) of LPP showing Silver White Perifollicular Scaling

yellow dots seen in 5 (71.42) patients (Figures 4a,4b) (Table2).

12 (6.19%) cases were diagnosed to have Psoriasis (Table 1). Most common dermatoscopic finding was red dots and globules seen in 12 (100%) patients and silvery scales in 12 (100%)



Figure 4a & 4b: 4a: Dermatoscopy (50x) of DLE showing Thick Scaling with Yellow Dots. 4b: Dermatoscopy (200x) of DLE showing Thick Arborizing Vessels (with paraffin).

patients (Figures 5a,5b) (Table 2).

Five patients had Seborrhoeic Dermatitis (Table 1). Most common dermatoscopic finding was yellow scales seen in 5 (100%) patients followed by thin arborizing vessels seen in 3 (60%) patients (Table2).

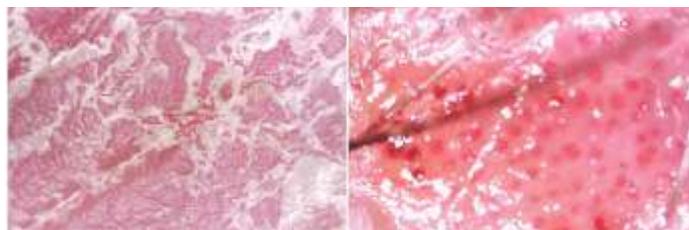


Figure 4a & 4b: 5a: Dermatoscopy (200x) of psoriasis showing Silvery Scales. 5b: Dermatoscopy (50x) of psoriasis showing Red Dots and Globules in Honeycomb Pattern after removing scales (with paraffin).

Total 10 (5.15%) out of 194 were diagnosed to have Tinea Capitis.(Table 1). Most common dermatoscopic finding was corkscrew hairs seen in 10 (100%) patients, followed by black dots seen in 9 (90%) patients (Table2).

Discussion

Scalp alopecias reflect a broad spectrum of heterogeneous diseases and are among the most common dermatologic disorders. A careful history and a thorough clinical examination are usually adequate to establish the correct diagnosis. In some cases, eg, cicatricial alopecia, a scalp biopsy may be necessary. However, the histopathologic features are not always diagnostic.⁵ Consequently, new diagnostic methods are required. Scalp dermatoscopy is a promising way to facilitate the diagnosis of scalp and hair disorders and may represent an important link between clinical and histologic diagnoses.^{20,21}

This study highlights the main dermatoscopic findings in the different types of Scalp Dermatoses associated with alopecia. We believe that this important tool has demonstrated to help dermatologists in highlighting minute details thus avoiding unnecessary biopsies.

The prevalence of alopecia in our country has been measured for the major groups of alopecias, but there is no literature regarding the percentage distribution of each. In our study the prevalence of alopecia was 0.58% of the out patient population. AGA is considered to be the commonest cause of alopecia worldwide followed by AA.^{22,23} In a large hospital based study by Sharma et al in North India in 808 patients, AA patients comprised 0.7% of the outpatient population.²⁴ In our study, AA was the commonest diagnosis made with 88 (0.26%) patients followed by AGA 68(0.20%) patients.

In AA, most common dermatoscopic finding seen in our study was exclamation marks in 66 (75%) patients followed by black dots in 65 (73.86%) patients with sparing of gray hair. Males were commonly affected, with male: female ratio of 1.66:1 which is in comparison with study conducted by Inui et al, where male: female ratio was 2.57:1.⁶ Exclamation marks were seen in 31.7% (95/300) cases by Inui et al⁶ and 12.1% (8/66) cases by Mane et al.²⁵ In our study these were seen more frequently (75%). Black dots were seen in our study in 65 (73.86%) patients while, Inui et al⁶ demonstrated it in 44.3% (133/300) and Mane et al in 67.7% (44/66).²⁶ Yellow dots were seen in 58 (65.90%) of cases in contrast to Ross et al study where 94.8% cases with Alopecia had Yellow Dots(55/58 cases).⁵ Mane et al reported an incidence of 81.8% among 66 patients.²⁶ This differences could be explained by the shampooing practices of the patients. Broken hairs were seen in 46 (52.27%) patients in our study, Inui et al demonstrated dystrophic hairs in 45.7% (137/300) cases,⁶ while 55.4% patients had dystrophic hairs in the study conducted by Mane et al.²⁵ Our study findings are consistent with the above study findings. Vellus hairs were seen in 26 (29.54%) patients while study by Inui et al,⁶ small villous hairs were observed in 72.7% (218/300) of cases. Mane et al,²⁵ demonstrated them in 40.9% of patients.

Total 68 (35.05%) were diagnosed to have AGA. Hair shaft thickness heterogeneity, tapered hairs were seen in

47(69.11%)patients, while in study by Inui et al,⁶ hair shaft thickness heterogeneity and thin hair was observed in 100% of patients and yellow dots were seen in 25.4% of patients. Ross et al⁵ emphasized miniaturization as being higher in early AGA while yellow dots being higher in late stage. Perifollicular pigmentation was first described by Deloche et al²⁶ and Inui et al²⁷ reported it in almost all patients who had fair skin. In our study perifollicular pigmentation was seen in only 32(47.05%) patients as the study was done in Asian population, who have darker skin. In our study family history was positive in 43 (63.24%) patients which is lower than reported by Sawant et al,²⁸ 51.3 %.

Most common dermatoscopic finding in patients of LPP was perifollicular inflammation seen in 4 (100%) patients followed by silver white perifollicular scaling seen in 3 (75%) patients. Duque Estrada et al reported perifollicular scales in 100% of patients with no patient having perifollicular inflammation. Also coiled capillaries and branching capillaries were not seen in any patient, pigment network and white patches were seen in 50% patients and blue gray dots seen in 25% of patients.²⁹

Most common dermatoscopic finding in patients of DLE was scattered dark brown discoloration of skin seen in 6 (85.71) patients followed by large yellow dots seen in 5 (71.42%) patients. In Duque-Estrada et al study, perifollicular scales and inflammation were not seen in any cases of DLE while coiled capillaries and branching capillaries were seen in 20% and 100% cases respectively. Pigment Network and blue gray dots were observed in 40% of patients.²⁹ Our findings are consistent with the above study.

In psoriasis, most common dermatoscopic finding in our study was red dots and globules and silvery scales in all 12 patients, followed by twisted red loops in 7 (58.33%) patients. Most common dermatoscopic finding in SD was yellow scales seen in 5(100%) patients followed by thin arborizing vessels seen in 3 (60%) patients which is consistent with Kim et al, who evaluated dermatoscopy of 41 patients with SD and found the most common patterns as arborizing vessels and atypical red vessels in the absence of red dots and globules.³⁴

In our study most common dermatoscopic finding in tinea capitis was corkscrew hairs seen in 10 (100%) patients followed by black

Disorder	Findings	Number(%)	Males(%)	Females(%)
Alopecia areata (N=88)	EXCLAMATION MARKS	66 (75)	39(70.91)	27(81.82)
	TAPERED HAIRS	60 (68.18)	41(74.55)	19(57.58)
	BLACK DOTS	65 (73.86)	42(76.36)	23(69.67)
	YELLOW DOTS	58 (65.90)	36(65.45)	22(66.67)
	UPRIGHT REGROWING HAIR	38 (43.18)	14(25.45)	24(72.73)
	VELLUS HAIRS	26 (29.54)	17(30.91)	9(27.27)
Androgenic alopecia (N=68)	BROKEN HAIRS	46 (52.27)	27(49.1)	19(57.58)
	THIN AND VELLUS HAIRS	57(83.82)	56(83.58)	1(100) (Female pattern)
	HAIR SHAFT THICKNESS HETEROGENEITY	47(69.11)	47(70.15)	0
Lichen plano pilaris (N=4)	PERIFOLLICULAR DISCOLORATION	32(47.05)	32(46.27)	0
	YELLOW DOTS	51(75)	50(74.63)	1(100) (Female pattern)
	SILVER WHITE PERIFOLLICULAR SCALING	3(75)	0	3(100)
	PERIFOLLICULAR INFLAMMATION	4(100)	1(100)	3(100)
	CONCENTRIC BLOOD VESSELS	1(25)	1(100)	0
Discoid lupus erythematosus (N=7)	VIOLACEOUS BLUE INTERFOLLICULAR AREAS	1(25)	0	1(33.33)
	WHITE DOTS OVER RED BASE	3(75)	1(100)	2(66.67)
	LARGE YELLOW DOTS	5(71.42)	1(50)	4(80)
Psoriasis (N=12)	THICK ARBORIZING VESSELS	3(42.85)	1(50)	2(40)
	SCATTERED DARK BROWN DISCOLORATION OF SKIN	6(85.71)	2(100)	4(80)
	RED DOTS AND GLOBULES	12(100)	8(100)	4(100)
Seborrheic dermatitis (N=5)	TWISTED RED LOOPS	7(58.33)	5(62.5)	2(50)
	SILVERY SCALES	12(100)	8(100)	4(100)
Tinea capitis (N=10)	THIN ARBORIZING VESSELS	3(60)	3(75)	0
	YELLOW SCALES	5(100)	4(100)	1(100)
	COMMA HAIRS	8(80)	3(60)	5(100)
	CORKSCREW HAIRS	10(100)	5(100)	5(100)
	BROKEN HAIR	7(70)	4(80)	3(60)
Tinea capitis (N=10)	DAMAGED HAIR	3(30)	3(60)	0
	BLACK DOT	9(90)	4(80)	5(100)

TABLE 2 : Trichoscopic findings of various scalp alopecias

dots seen in 9 (90 %) patients, comma hairs in 8 (80 %) patients, broken hairs in 7 (70 %) patients. Slowinska et al reported comma hair in 80 % to be a distinctive marker for tinea capitis, followed by broken (66 %) and black dots (dystrophic hair) (60 %) [31]. Comma hair, corkscrew hair and pigtail hair were all observed only in patients of tinea capitis, thus forming specific features.³²

Conclusion

Dermoscopy has been shown to enable the visualization of submacroscopic morphologic structures invisible to the naked eye. Trichoscopy may be used as a diagnostic aid in differential diagnosis of hair loss and scalp diseases as they show distinct patterns in most cases. Certain aspects of hair and scalp disorders can be better appreciated with dermoscopy than with the naked eye thus avoiding invasive procedures like biopsy.

Limitation

The study sample size was small and thus a study with larger number of cases is required.

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