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Trichoscopic Clues for Diagnosis of Patchy Scalp Alopecia in the Egyptian Patients

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ABSTRACT

Background: trichoscopy is a non-invasive office technique used for differentiating cicatricial from non-cicatricial alopecia. Trichoscopy helps the dermatologist for diagnosis of alopecia with rarely need of histopathology. Hair loss is distressing problem and associated with psychological complications. Common causes of hair loss include *Alopecia areata, Tinea capitis, Traction alopecia* and *trichotillomania*.

Objective: this study aimed to assess the trichoscopic features in the Egyptian patients with patchy hair loss and to find sensitive and/or specific trichoscopic findings that can help in their diagnosis and follow up.

Methodology: our study included 500 patients categorized into two groups cicatricial (176 cases) and non-cicatricial (324 cases). Cicatricial included four types 2ry alopecia 139, DLE 24. FD 5 &LPP 8 and non-cicatricial included five types AA 148, localized androgenetic 21, CTA 15, TC 117 and TTM 23.

Results: in our study, the sensitivity and specificity of trichoscopic patterns were evaluated in diagnosis of **PCAs** and **NCAs**. We found some trichoscopic patterns that were sensitive and specific for making diagnosis of **PCAs**. The perifollicular scale had 90% sensitivity and 99.5% specificity for a diagnosis of **PCAs**. Hair tufting was only observed in LPP and FD. This study showed 100% specificity for the presence of each blood vessel pattern that was seen in PCA. The specificity of tortuous branching vessels was 100% for a diagnosis of DLE.

Conclusion: dermoscopy was very useful to identify signs of early clinical response, adverse effects and markers of disease activity even if that couldn't be detected by unaided naked eyes.

Keywords: dermoscopy, trichoscopic, hair loss, patchy scalp alopecia.

INTRODUCTION

Hair loss is daily complaint in dermatologic clinics, true diagnosis and evaluation of hair loss is very important, many patients with hair loss especially in female consider their hair loss to be a serious problem leading to distress and negatively affecting their activities [(1)].Hair loss may be diffuse or localized diffuse as androgenic alopecia and telogen effluvium localized as *Alopecia areata*, also they may be classified as cicatricial or non-cicatricial [(2)].The dermoscopic examination of the hair and scalp known as trichoscopy [(3)]. Trichoscopy (Dermoscpe of hair and scalp) is a noninvasive diagnostic technique used in evaluation of hair loss beside other diagnostic techniques as pull test and trichogram that allows the recognition of morphologic structures not visible by the naked eye [(4)]. Trichoscopy is useful for the diagnosis and follow-up of hair and scalp disorders. Dermoscopy help dermatologists to make true diagnosis of different type of hair loss [(5)]. Trichoscopy allows for magnified observation of the following: 1- hair shafts, 2- hair follicle openings, 3- the perifollicular and 4- blood vessels. Abnormalities in the appearance of these four structural components of the scalp aid in the differential diagnosis of hair loss [(6)].

AIM OF THE WORK

The aim of this study was to assess the trichoscopic features in the Egyptian patients with patchy hair loss and to find sensitive and/or specific trichoscopic findings that can be helpful in their diagnosis and follow up.

PATIENTS AND METHODS

Study population:

Five hundred patients with patchy hair loss were included in this study. The examined patients were collected from dermatology, venereology and andrology outpatient clinics in Al Azhar University Hospitals. Duration from September 2017 to January 2019.

Ethical consideration:

A verbal consent was taken from all the patients about the aim of this study.

The study was approved by the Ethics Board of Al-Azhar University.

Inclusion criterion:

Patients with patchy alopecia either:

1. Child or adult.
2. Cicatracial or noncicatracial.
3.

METHODS

All patients of the study were subjected to the following:

History:

- Duration.
- Associated symptoms Itching, Pain and Burning.
- Drug history.
- Psychosocial history.
- History of hair care practices/use of hair cosmetics.

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Clinical examination:

- Overall, scalp examination and diseased part examination.
- Pattern Distribution Frontal hairline: integrity and density.
- Close up examination scarring vs. non scarring scalp.
- Scales/crusts.
- Papules/pustules.

Trichoscopic examination:

1. Hair shafts.
2. Hair follicle openings.
3. The perifollicular epidermis.
4. Blood vessels.

Dermoscopic imaging was performed by a polarized-light handheld dermatoscope (Derm Lite L3- 3 Gen) with a 10-fold magnification with contact and non dermoscopy as shown in **figure 1**.

The images were taken by Iphone 5S camera (8 mega pixel) as shown **figure 2**.

Digital images were backed up to computer and analyzed for dermoscopic signs.

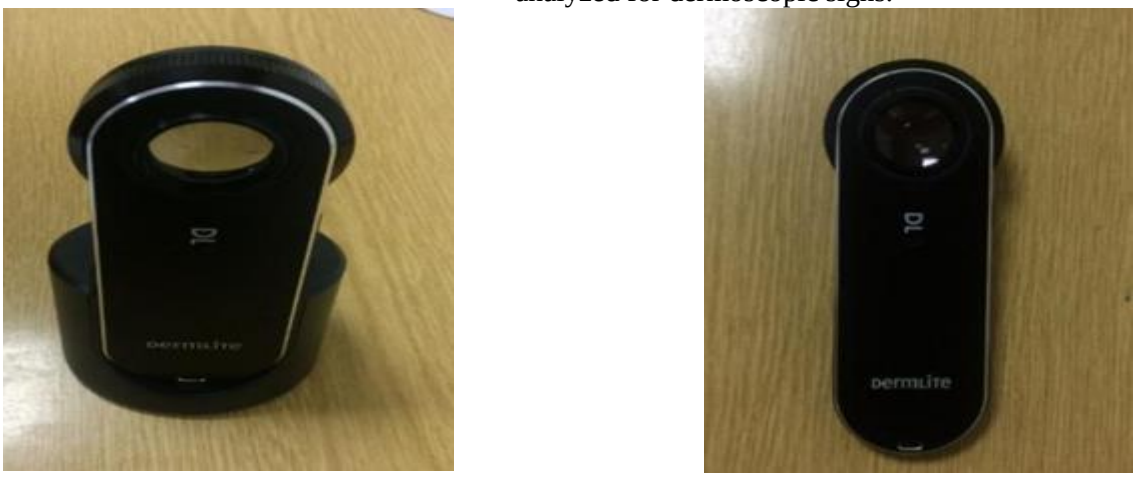

Figure 1: derma lite 3.

Figure 2: the phone used Iphone 5S with 8-megapixel camera.

Table 1: evaluation checklist of dermoscopic features of alopecias [7]

Hair shaft	Follicular	Perifollicular feature
Exclamation mark	red dots	scales
Circle hair	simple red loops	cast
Tapering hair	twisted red loops	peripilar sign
Broken hair	dirty dots	
Short vellus hair	arborizing red line	
Pohl pinkus	honey comb pigmeted pattern	
Comma hair	crust formation	
Corkscrew hair	black dot	
Tufted hair	yellow dots	
Z hair	white dots	
Flame hair	blue grey dots	
Block hair	keratotic plugs	
Coiled hair		
Flame hair		

Statistical analysis

The results were computed on IBM, PC microprocessor by means of a statistical software package "SPSS for windows release 17.0.0", copyright of SPSS Inc. The results were analyzed by statistical methods, which included significance of the results, non-significant difference if P-value > 0.05, significant difference if P value < 0.05. The corresponding P-value for each test was directly computed.

RESULTS

Demographic finding:

This study included 500 patients categorized into two groups cicatricial 176 and non-cicatricial 324 cicatricial included four types 2ry alopecia 139, DLE 24. FD 5 &LPP 8 and non-cicatricial included five types AA 148, Androgenetic 21, CTA 15, TC 117 and TTM 23.The study in cicatricial type included 107 child (Less than 16 years old),69 adult, 145 long duration (More than 6 months) 31 short duration,98 female ,78 male most common site at scalp parietal 101 region.Out of patients included in our study in cicatricial child 240 adult 84 long duration 55 short duration 269, female 144, male 180 most common site occipital 119.

Dermoscopic finding: Most common dermoscopic finding in cicatricial alopecia predominant of single hair 165 (93.7%), diffuse white area 158(89.8%), interfollicular scale 41(23.3%) and honey comb pigment network 64(36.4%).

Most common dermoscopic finding in non-cicatricial alopecia black dot 227 (70.1%), broken hair 232 (71,6), short vellus hair 148(45.7%) and interfollicular scale 134(41.4%).

Table 2: description of type in cicatricial group

ariables		Cicatricial (N = 176)
Type	2ry cicatricial alopecia	139 (79%)
	iscoid lopus erythematosus	24 (13.6%)
	Folliculitis declvans	5 (2.9%)
	Lichen Plano pilaris	8 (4.5%)

This table showed description of type in cicatricial group. 139 patients (79%) were 2ry cicatricial alopecia, 24 patients (13.6%) were discoid lopus, 5 patients (2.9%) were Foliculitis declvans and 8 patients (4.5%) were Lichen plano pilaris.

Table 3: description of type in non - cicatriial group

ariables		Non - Cicatricial (N = 324)
Type	Alopecia areata	148 (45.7%)
	Localized androgenetic alopecia	21 (6.5%)
	Congenital triangular alopecia	15 (4.6%)
	Tenia capitis	117 (36.1%)
	Trichotillomania	23 (7.1%)

This table showed description of type in non-cicatricial group. 148 patients (45.7%) were Alopecia areata, 21 patients (6.5%) were Localized androgenitic alopecia, 15 patients (4.6%) were cong. triangular alopecia, 117 patients (36.1%) were *Tenia capitis* and 23 patients (7.1%) were *Trichotillomania*.

Table 4: comparison between studied groups as regard age and sex

ariables		Cicatricial (N = 176)	Non - Cicatricial (N = 324)	P-value
Age (years)	Child	107 (60.8%)	240 (74.1%)	0.002*
	Adult	69 (39.2%)	84 (25.9%)	
Sex	Male	78 (44.3%)	180 (55.6%)	0.02*
	Female	98 (55.7%)	144 (44.4%)	

***: p-value < 0.05 is considered significant.**

This table shows statistically significant difference **(p-value < 0.05)** between studied groups as regard age and sex.

Table 5: description of site of lesion in studied groups

ariables		Cicatricial (N = 176)	Non - Cicatricial (N = 324)
Site	Parietal	101	117
	Occipital	62	119
	Frontal	47	62
	Temporal	39	85

This table showed description of site of lesion in studied groups. **In Cicatricial group:** parietal lesions were present in 101 patients, occipital lesions were present 62 patients, frontal lesions were present 47 patients while, temporal lesions were present in 39 patients. **In Non- Cicatricial group:** Parietal lesions were present in 117 patients, occipital lesions were present 119 patients, frontal lesions were present 62 patients while temporal lesions were present in 85 patients.

Table 6: comparison between studied groups as regard number and duration of disease

ariables		Cicatricial (N = 176)	Non - Cicatricial (N = 324)	P-value
Number	Single	120 (68.2%)	279 (86.1%)	< 0.001*
	Multiple	56 (31.8%)	45 (13.9%)	
Duration	Short	31 (17.6%)	269 (83%)	< 0.001*
	Long	145 (82.4%)	55 (17%)	

***: p-value < 0.001 was considered highly significant.**

This table showed highly statistically significant difference **(p-value < 0.001)** between studied groups as regard number of lesions and duration of disease short duration less than 6 months and long duration more than 6 months.

Table 7a: comparison between studied groups as regard dermoscope

ariables		Cicatricial (N = 176)	Non - Cicatricial (N = 324)	P-value
Black dot	Present	14 (8%)	227 (70.1%)	< 0.001
	Absent	162 (92%)	97 (29.9%)	
Red dot	Present	5 (2.8%)	10 (3.1%)	0.9
	Absent	171 (79.2%)	314 (96.1%)	
Yellow dot	Present	4 (2.3%)	106 (32.7%)	< 0.001
	Absent	172 (97.7%)	218 (67.3%)	
Broken hair	Present	7 (4%)	232 (71.6%)	< 0.001
	Absent	169 (96%)	92 (28.4%)	
comma hair	Present	0 (0%)	37 (11.4%)	< 0.001
	Absent	176 (100%)	287 (88.6%)	
Corkscrew	Present	0 (0%)	39 (12%)	< 0.001
	Absent	176 (100%)	285 (88%)	
Exclamation mark	Present	0 (0%)	86 (26.5%)	< 0.001
	Absent	176 (100%)	238 (73.5%)	
Short vellus hair	Present	11 (6.3%)	148 (45.7%)	< 0.001
	Absent	165 (93.7%)	176 (54.3%)	
Tufted hair	Present	2 (1.1%)	0 (0%)	0.06
	Absent	174 (98.9%)	324 (100%)	
redominance single hair	Present	165 (93.7%)	9 (2.8%)	< 0.001
	Absent	11 (6.3%)	315 (97.2%)	

Table 7b: comparison between studied groups as regard dermoscope (continued)

ariables		Cicatricial (N = 176)	Non - Cicatricial (N = 324)	P-value
Perifullicular erythema	**Present**	13 (7.4%)	9 (5.3%)	**0.02**
	Absent	163 (92.6%)	315 (97.2%)	
Perifullicular pustules	**Present**	4 (2.3%)	34 (10.5%)	**0.001**
	Absent	172 (97.7%)	290 (89.5%)	
Perifullicular scales	**Present**	41 (23.3%)	121 (37.3%)	**0.001**
	Absent	135 (76.7%)	203 (62.7%)	
Honey comb pigmented network	**Present**	64 (36.4%)	40 (12.3%)	**< 0.001**
	Absent	112 (63.6%)	284 (87.7%)	
Pinpoint white dot	**Present**	33 (18.7%)	44 (13.6%)	0.1
	Absent	143 (81.3%)	280 (86.4%)	
Arborizing vessels	**Present**	13 (7.4%)	100 (30.9%)	**< 0.001**
	Absent	163 (92.6%)	224 (69.1%)	
Diffuse white area	**Present**	158 (89.8%)	5 (1.5%)	**< 0.001**
	Absent	18 (10.2%)	319 (98.5%)	
Interfollicular scale	**Present**	41 (23.3%)	134 (41.4%)	**< 0.001**
	Absent	135 (76.7%)	190 (58.6%)	

***: p-value < 0.05 was considered significant.**
****: p-value < 0.001 was considered highly significant.**

This table showed:

- Highly statistically significant difference **(p-value < 0.001)** between the studied groups as regard black dot, Yellow dot, broken hair, comma hair, corkscrew, exclamation mark, short vellus hair, predominance single hair, honey comb pigmented network, arborizing vessels, diffused white area and interfullicular scale.
- Statistically significant difference **(p-value < 0.05)** between studied groups as regard perifullicular erythema, perifullicular pustules and perifullicular scales.
- No statistically significant difference **(p-value > 0.05)** between studied groups as regard red dot, tufted hair and pinpoint white dots.

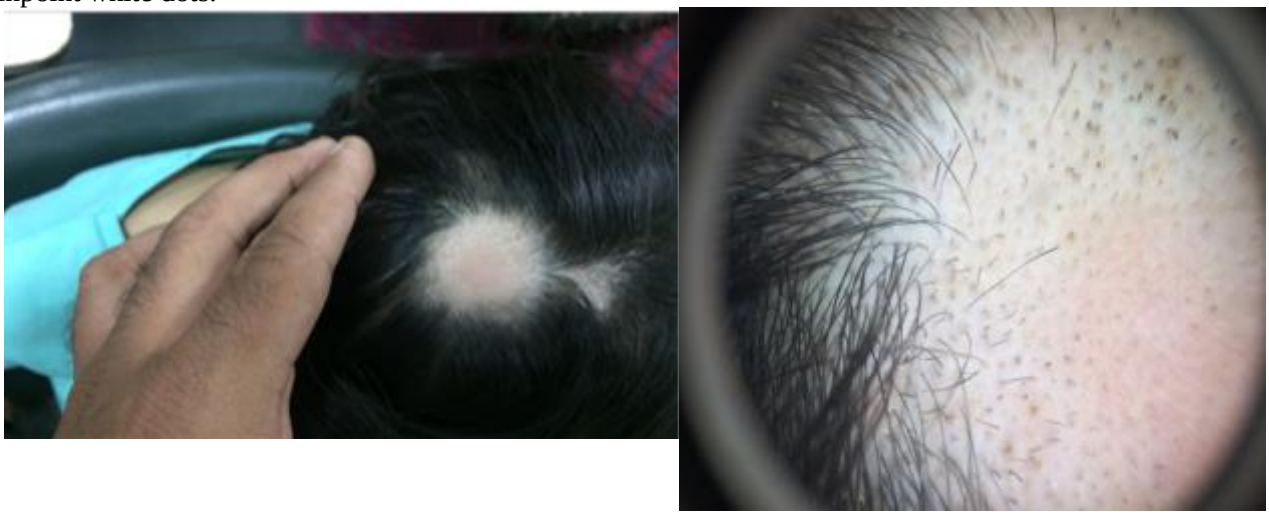

Figure 3: male patient 12 years old complaining of localized area of hair loss on the vertex of the scalp (2 months duration), left one is clinical photo and right one, Dermoscopy shows multiple black dots, broken hairs and exclamation mark hairs suggestive for active *Alopecia areatea*. (Dermlite 3 ,10 X- iphone camera).

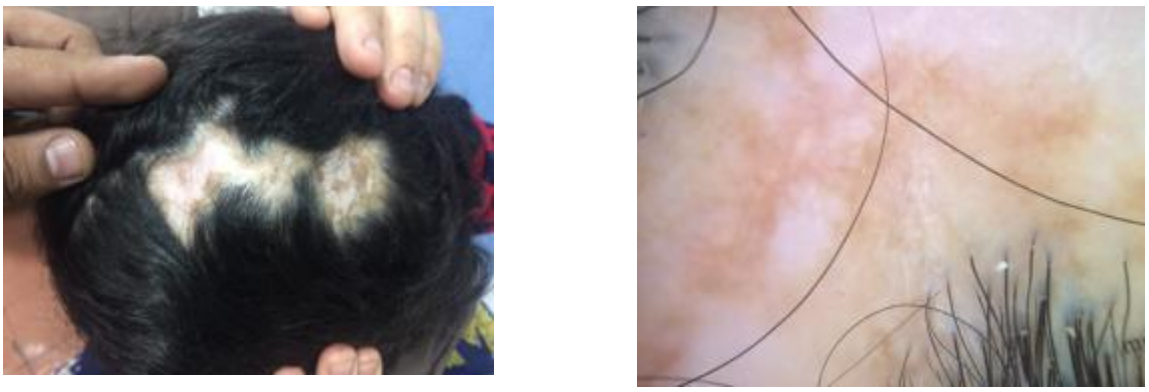

Figure 4: female patient 38 years old complaining of localized area of hair loss (7months duration) on the middle of the scalp, left one is clinical photo and right one, Dermoscopy showed absence of follicular openings, diffuse, irregular white dots (due to fibrosis) and scales suggestive for DLE (dermlite 3 ,10 X- iphone camera).

DISCUSSION

Trichoscopy is a non-invasive office technique used for differentiating cicatricial from non-cicatricial alopecia. Trichoscopy helps the dermatologist for diagnosis of alopecia with rarely need of histopathology. **Miteva and Tosti** [5] reported sensitivity and specificity of dermoscopic features of alopecia either localized or diffused especially in PCAs. Hair loss is distressing problem and associated with psychological complications. Common causes of hair loss include alopecia areata, tinea capitis, traction alopecia, and trichotillomania. In the last few years, few published studies support using trichoscopy of hair loss. Our study included 500 patients divided into two groups cicatricial (176 cases) and non-cicatricial (324 cases). cicatricial include four types 2ry alopecia 139, DLE 24. FD 5 &LPP 8 and non-cicatricial included five types AA 148, localized androgenetic 21, CTA 15, TC 117 and TTM 23.In our study, (117 cases) of *Tinea capitis* patients were investigated. *Tinea capitis* is a superficial fungal infection of the scalp and hair. In our study, 88 cases were inflammatory, 22 cases were non-inflammatory and seven cases with favus. The most common findings in TC perifollicular scaling, diffuse scaling and broken hairs, observed in the majority of the patients with TC. On the other hand, black dots, corkscrew hairs, pustules and comma hairs were seen in about one-third or fewer of those patients. In our study, the trichoscopic features of *Tinea capitis* were black dot (77.8%), corkscrew hair (39%), short broken hair (25.6%) and perifollicular scale (88%). This met study done by **Torres and Tosti** [8].

Trichoscopy of *Alopecia areata* may differ depending on disease activity, severity, and duration. All of these trichoscopic features had been observed in our study as summarized in **tables 14 and 15**.

In our study, AA (148 cases) yellow dots were detected in (64%) of *Alopecia areata* patients these were marked by distinctive array of yellow to yellow-pink, the second common finding in *Alopecia areata* was the black dots (75%). Exclamation marks were a common finding in our study (40%). Short vellus hair was detected in 61% of *Alopecia areata* cases. This met study done by **Kowalska- Oledzka *et al.*** [9] Yellow dots were the most sensitive marker for AA, whereas tapering hairs constituted a diagnostic feature for this disease. Although, black dots and broken hairs were also suggestive findings, they were not indicative patterns of AA.

Trichotillomania was another important cause of patchy hair loss that was investigated in this study, 23 cases had been examined by trichoscopy. This disease represented the most common in this study and most difficult differential diagnosis for *Alopecia areata*, especially in children. All of the cases presented to the clinic complaining of hair loss and the initial parent's thought was *Alopecia areata*. Because of this, it is necessary to use a tool to document the presence of diagnostic features for the disease to confirm the diagnosis. Trichotillomania was not a simple diagnosis; specific psychological assessment is needed.The known trichoscopic features for **TTM** were broken hair 100% exclamation mark 34% short vellus hair 25% scratching and hemorrhage were seen. These features were common in all cases which were examined and nearly present in each case examined. Broken hairs of different lengths, flame hairs and V-sign are the most specific finding in TTM. This met study done by **Shim *et al.*** [10]**. CTA**; also known as **TTA**, is a type of circumscribed, nonprogressive, non-inflammatory, non-cicatricial type of *Alopecia*. It remains stable throughout the life. It had an incidence of 0.11%. Many of these cases were manifested in pediatric age group, whereas in our case the symptoms were present since birth. There were also reports of the disease manifested in adulthood. It can present as triangular, oval or lancet-shaped patch of *Alopecia*. **Yin Li and Yesudian** [11] reported that up to 79% cases were presented with unilateral involvement.Most common finding in **CTA** vellus was hair length diversity. It defines the presence of both short and longer vellus hairs in the same alopecic patch and white hairs which were not identified by the

naked eye, but just visible by trichoscopy. Yellow dots 27% Short vellus 25% white hair 75%. This met results of **Song *et al.*** [12]. In our study, the sensitivity and specificity of trichoscopic patterns were evaluated in the diagnosis of **PCAs** and **NCAs**. We found some trichoscopic patterns that were sensitive and specific for making a diagnosis of **PCAs**. The perifollicular scale had 90% sensitivity and 99.5% specificity for a diagnosis of **PCAs**. Hair tufting was only observed in LPP and FD. The absence of follicular opening had 100% sensitivity and 99.5% specificity in PCA in our study. Follicular openings may be found in the early phases of DLE; therefore, the absence of follicular ostia in conjunction with milky-red areas was more confirmatory for a diagnosis of PCA. White patches and scalp erythema were sensitive and specific features in PCAs.The presence of one scarring pattern (White dot, patch or peripilar white halo) had 90% sensitivity and 93% specificity for making a diagnosis of PCA.

This study showed 100% specificity for the presence of each blood vessel pattern that was seen in PCA. The specificity of tortuous branching vessels was 100% for a diagnosis of DLE.The presence of peri-follicular scaling and hair tufting can increase the specificity for a diagnosis of PCA and LPP. Our study had limitations such as the small sample size of the patients with FD and LLp . We did not have any patients with CCCA, DC and FFA because of the low prevalence in Egypt. The results of the current study coincide with that results presented by **Rudnicka *et al.*** [13].

The results of the current study coincide with those results presented by **Duque- Estrada *et al.*** [14]. Dermoscopy patterns of cicatricial *Alopecia* resulting from discoid lupus erythematosus and lichen planopilaris. Results of the current study coincide with that results presented by **Rudnicka** [15]. Trichoscopy of cicatricial *Alopecia*.The results of the current study coincide with that results presented by **Shim *et al.*** [10].

CONCLUSION

- Dermoscopy is non-invasive office technique aids in diagnosis of hair diseased.
- Dermoscopy is accepted by patients as method of examination.
- Dermoscopy help for diagnosis and monitor efficacy of treatment as well as follow up.
- Dermoscopy reduce need for scalp biopsy.

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