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CORRELATION BETWEEN HISTOPATHOLOGICAL AND DERMOSCOPIC FINDINGS IN ALOPECIA AREATA

Dermatology

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ABSTRACT

Background: Different studies have been done on alopecia areata, most studies were done on histopathological and dermoscopic findings separately. **Objective:** The aim of study was to correlate between dermoscopic and histopathological findings in patients with alopecia areata. **Methods:** A total of 50 patients were subjected to dermoscopic examination using Denolite and then biopsy was done in all the same patients after taking consent. **Result:** Among 50 patients studied, 26 pateints had acute and sub-acute onset of alopecia areata and 24 patients had chronic alopecia areata. Characteristic dermoscopic and histopathological findings in acute and sub-acute alopecia areata were yellow dots corresponding to dilated follicular infundibulum. In chronic alopecia areata common dermoscopic findings were fibrosis and honey comb pigmentation which correspond to fibrosis around anagen follicles on histopathology. **Conclusion:** There is significant association between dermoscopic and histopathological findings.

KEYWORDS

Dermoscopy, alopecia areata, histopathology

INTRODUCTION

Alopecia areata (AA) is a widespread, chronic inflammatory illness that causes non-scarring hair loss on the scalp or any other hair-bearing part of the body. Alopecia areata is a type of hair loss condition that occurs when immune system attacks hair follicles, causing hair to fall out in small round patches. Significant variations in the clinical presentation of AA have been observed, ranging from small, well-circumscribed patches of hair loss to a complete absence of body and scalp hair. It can affect people of all ages and can occur in otherwise healthy individuals. It accounts for 25% of all alopecia cases seen by dermatologists, as well as 2-3% of all new outpatient dermatological services in the United States and the United Kingdom, 3.8% in China, and 0.7% in India[1],[2],[3],[4]. In our study, we co-related the dermoscopic findings with histopathological findings in patients with alopecia areata more than 10 years of age and compared the conclusions with the literature findings which are Yellow dots, black dots, short vellus hairs, exclamation mark hair and broken hair on dermoscopy.[5]

MATERIALS AND METHOD

Patients

Fifty patients (34 males, 16 females) with AA were examined by dermoscopy and then biopsy was performed in all patients after taking consent in Muzaffarnagar Medical College and Hospital , UP from November 2021 to August 2022 after obtaining Institutional Ethical Committee clearance. The age of the AA patients varied from 10 to 60 years, with a median age of 27 years. Of the 50 patients, 45 had localized patchy AA (one to three hair loss patches), 2 had diffuse-type AA, 1 had ophiasis pattern and 2 had Alopecia universalis (AU) (Table 1).

Table 1 Type of alopecia areata and characteristics of the patients enrolled in this study

Type	Number
Patchy, Scalp	37
Beard	9
Eyebrow	1
Ophiasis	1
A.Universalis	2

RESULTS

Dermoscopic Examination

Dermoscopy in all 50 patients was done using Dino-lite dermoscope without using immersion oil. Dermoscope was attached to hp laptop and photographs were taken from the same. Yellow dots (92%) were the most common findings in all cases of alopecia areata .

Acute and sub-acute alopecia areata

The most prevalent dermoscopic findings in individuals with acute and sub-acute alopecia areata were black dots (100%), Yellow dots (84.6) , kinking of hair (65.3%) , Short damaged hair (53.8%) , exclamation mark hair (50%) circle hair (26.9%) and one patient with Tulip hair (3.8%) as shown in **Image 1**

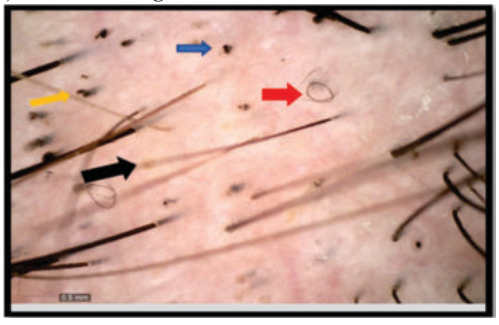

Image 1 :Dermoscopy findings in Acute alopecia areata : Yellow dots , Black dots , Circle hair, Short damaged hair

This image shows multiple black dots (blue arrow) are pigmented residues of hairs destroyed at scalp level , coexisting with Yellow dots (black arrow) which are hyperkeratotic plugs that fill the follicular infundibulum. Yellow arrow showing Short damaged hair, amorphous black structures emerging from the follicular openings . Circle hair (red arrow) demonstrate the regrowth of terminal hair. These all findings are suggestive of active stage of alopecia areata

Chronic alopecia areata

A total of 24 individuals had chronic alopecia areata. Yellow dots (100%) , fibrous tracts (91.6%), honey comb pigmentation (83.3%) and empty follicles (62.5%) were the most frequently discovered, whereas broom hair were also seen in 7 patients (29.1%). Honey comb pigmentation was associated with prolonged exposure of bald patches to sun in chronic stage of alopecia areata.

Only Broom hair and Trichorrhexis nodosa were shown to be substantially linked with the duration of AA in the current study.

Honey comb pigmentation in chronic stage of areata due to long standing sun exposure to area of hair loss with Yellow dots (black arrow),yellowish color dots with white halo, regularly distributed and arranged in group of two or three and yellowish fibrous area (blue arrow)

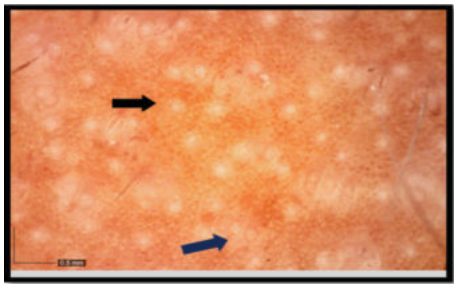

Image 2: Dermoscopic findings in Chronic alopecia areata

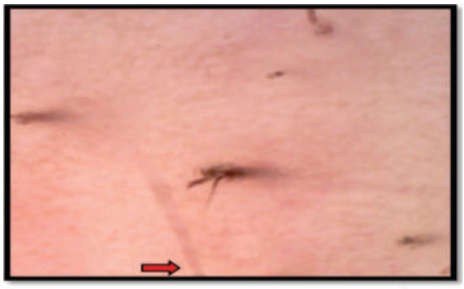

Image 3: Broom hair (red arrow)
Multiple short thin hairs emerging from one follicular unit. This finding is not specific for alopecia areata but was commonly seen among patients with chronic duration of disease with intense itching

Histopathological Findings
It is important to evaluate sections through lower or reticular dermis as well as through upper papillary dermis to capture terminal hair bulbs and miniaturized , vellus like hairs respectively.

Acute and sub-acute alopecia areata
Dilated follicular infundibulum (69.2%) and decreased Anagen :Telogen ratio (69.2%) were the most prevalent histological results in individuals with acute and subacute Alopecia areata, whereas nanogen hair (7.6%) was also present as least common finding.

Table 2: showing histopathological findings in patients of acute Alopecia areata (n=26)

Features	Frequency (n=26)	Percentage
Dilated follicular infundibulum	18	69.2
Peribulbar lymphocytic infiltrates	16	61.5
Decreased Anagen: Telogen ratio	18	69.2
T: V ratio	8	30.7
Nanogen hair	2	7.6

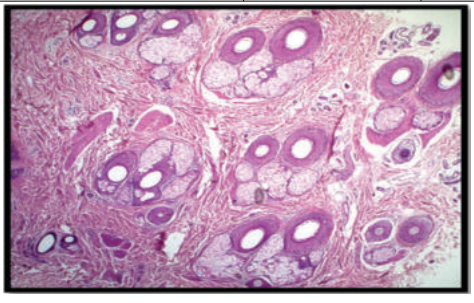

Image 4 Horizontal section showing decreased hair follicular units

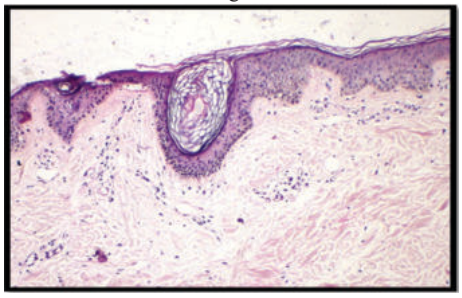

Image 5: Vertical section showing dilated follicular infundibulum seen in sub-acute stage of alopecia areata

Chronic alopecia areata
The most prevalent histological finding in patients with chronic Alopecia areata was miniaturized hair (95.8%) followed be dilated follicular infundibulum (87.5%) and fibrosis (87.5%). Peribulbar lymphocytic infiltrates were not seen in long standing cases of alopecia areata and among these patients pigment casts were also seen in some follicles with miniaturization of hair and with few dystophic hair (Nanogen hair) , which was seen in 2 patients .

Table 3: Histopathological findings in patients of chronic Alopecia areata (n=24)

Features	Frequency (n=24)	Percentage
Dilated follicular infundibulum	21	87.5
Peribulbar lymphocytic infiltrates	1	4.1
Fibrosis	21	87.5
Miniaturized hair	23	95.8

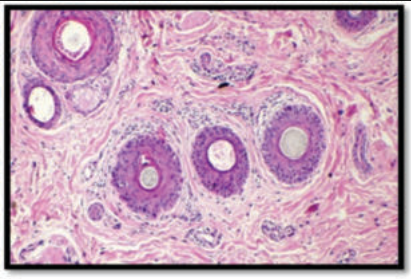

Image 6: Horizontal section showing miniaturized hair and decreased terminal hair in chronic alopecia areata, with mild infiltration around miniaturized hair ,H&E stain

DISCUSSION

Our study was designed to look at the co-relationship between histopathological and dermoscopic findings in Alopecia Areata.

According to our study, the most common histopathological finding was dilated follicular infundibulum and these dilated follicular infundibulum on histopathology corelates with Yellow dots on dermoscopy which was consistent with the study done by Mane et al.[6]

These yellow dots represent distension of affected follicular infundibulum which can be filled with keratinous material and sebum. [7] Bapu et al.,[8] proposed that higher incidence of YDs could be due to the south Indian practice of oiling hair.

Similarly, peribulbar inflammation was seen in some patients, with lymphocytes predominating in acute stage of alopecia areata. Black dots and short damaged hair on dermoscopy corresponds to peribulbar lymphocytic infiltrates in acute stage of alopecia areata.

Yellow fibrous tracts or areas on dermoscopy were consistent with fibrosis on histopathology in chronic stage of alopecia areata. It was revealed that there is a significant association between dermoscopic and histopathological findings **(p value 0.02).** Chi square test was applied.

Table 4: Correlation between dermoscopic and histopathological findings in patients with alopecia areata (n=50)

ALOPECIA STAGE (n=50)	DERMOSC-OPIC FINDINGS	HISTOPATHOLOGIC AL FINDINGS
All stages (n=50)	Yellow dots (46)	Dilated follicular infundibulum (39)
Acute stage & sub-acute (n=26)	Short damaged hair (14) Tulip hair (1) Black dots (26) Exclamation mark hair(16) Short vellus hair (26) Circle hair (7) Kinking of hair(17) Yellow dots(22)	Peribulbar Lymphocytic infiltrates(16) Decreased Anagen: Telogen ratio(18) Dilated follicular infundibulum (18)
Chronic stage (n=24)	Fibrous tracts(22) Yellow dots (24) Honey comb pigmentation (20) Broom hair(7)	Fibrosis (21) Miniaturized hair (23) Absent terminal hair Dilated follicular infundibulum(21)

CONCLUSION

In most instances areata is readily diagnosed based on history and clinical picture, with support of dermoscopy and biopsy if needed. Biopsy in alopecia areata is distressing to both the patient and physician due to its invasive nature and formation of scar at the site of biopsy in modern day practice. Dermoscopy is a useful non-invasive diagnostic tool which can help in avoiding biopsy like invasive procedure.

Black dots with short damaged hair together corresponds to peribulbar lymphocytic infiltrates in acute stage of alopecia areata. Yellow fibrous areas or tracts on dermoscopy correspond to fibrosis around hair follicles in chronic stage of alopecia areata. It was revealed that there is a significant association between dermoscopic and histopathological findings **(p value 0.02).** Chi square test was applied.

Hence dermoscopy can be used as an useful tool for making confirm diagnosis of alopecia areata and biopsy can be reserved for doubtful cases.

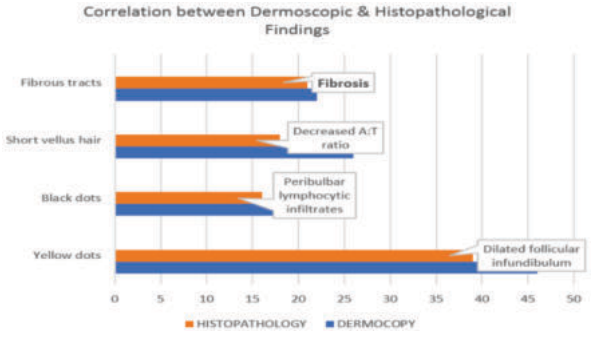

Image 7 : Bar diagram showing correlation between dermoscopic and histopathological findings in patients with alopecia areata

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