ORIGINAL RESEARCH

Trichoscopy -Decoding The Puzzle In Difficult Scenario

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ABSTRACT
Background: Alopecia is a common concern in general population. Conditions like alopecia areata and androgenetic alopecia are usually diagnosed clinically and rarely investigated . Alopecia can be cicatricial or non cicatricial . Cicatricial alopecia is characterised by scarring, fibrosis and destruction of hair follicles whereas non cicatricial alopecia is a non scarring alopecia , usually reversible and amenable to treatment. Common causes of non cicatricial alopecia include telogen effluvium, androgenetic alopecia , alopecia areata , trichotillomania , scalp psoriasis and seborrheic dermatitis and syphilitic alopecia. Cicatricial alopecia like Pseudopelade of Brocq , Lichen plano pilaris and Discoid lupus erythematosus can present diagnostic dilemma. Trichoscopy is a term coined for dermoscopic imaging of scalp and hair .Trichoscope is a hand held self illuminating device which assists in visualisation of the surface and subsurface structures ,constitutions and colour outlines of scalp and hair .[1] It also assists in visualising vascular patterns , loops and arborising vessels .
Trichoscopy aids in visualizing hair at a working magnifications of 10-fold to 70- fold, (up to 160). It may be performed with a manual dermoscope (×10 magnification) or a videodermoscope (up to ×1,000 magnification). [2] It is quick, easy, novel, efficient, and a non-invasive device, saves time and money to achieve a probable diagnosis and enable treatment to start . It predicts the course of the disease and lessens the need for unnecessary biopsies. [3]Depending on hair signs, vascular patterns, pigment patterns and interfollicular patterns, can denote specific disease and aid in making the proper diagnosis.
Aim – 1.To decode various patterns of hair and scalp seen on trichoscopy
2. To differentiate between cicatricial and non cicatricial alopecia
Material and methods: An observational cross sectional study was conducted on 30 new patients visiting with presenting complaint of hair disorder in dermatology OPD in a clinic in Delhi NCR. Trichoscopic findings of these patients was recorded. **Observations & Results**: Yellow dots, white dots and black dots, follicular patterns were seen most commonly. Homogenous brown honey comb pattern was seen on scalp. **Conclusion**: Trichoscopy is a valuable aid to visualize scalp and follicular ostia and aids in diagnosis of scalp disorders.
Key words: Trichoscopy, Yellow dots, White dots , Cicatricial and Non cicatricial alopecia

INTRODUCTION

Hair disorders are a common presenting complaint in dermatology OPD . Hair disorders can be classified as non cicatricial or cicatricial .[4]Telogen effluvium, androgenetic alopecia , alopecia areata are common conditions of non cicatricial alopecia while lichen planopilaris , Pseudopelade of Brocq and Folliculitis decalvans are causes of cicatricial alopecia . [5]Detailed history , cutaneous examination , histopathology (horizontal and vertical sections) are mostly used to diagnose the disorder. Cicatricial alopecia characterized by fibrosis, atrophy, atrichia presents with diagnostic difficulty and requires multiple biopsies to reach a conclusive diagnosis. New technology aiding in diagnosing alopecia is a valuable aid . Recent addition to this armamentarium has been trichoscope which is a handheld magnifying and self illuminating device which allows visualization of hair follicles and interfollicular skin under polarized and non polarized light . [6]It has been extensively used to examine moles to predict risk of melanoma and to predict its course. A trichoscope consists of a light source, achromatic lens, contact plate, and power supply. There are three main modes of dermoscopy

- Polarised contact trichoscopy
- Polarised noncontact trichoscopy
- Nonpolarised contact trichoscopy (also called unpolarised trichoscopy).

Polarised and nonpolarised trichoscopy are complementary and the combination of both methods increases diagnostic accuracy and clinician confidence. Polarised dermoscopy can be used to view deeper layers (the dermo-epidermal junction and superficial dermis).Nonpolarised dermoscopy is used

to view superficial layers (the superficial epidermis to the dermo-epidermal junction).The patterns seen on trichoscope are hair follicle patterns (dots), vascular patterns and condition of the scalp . Trichoscopic images can be photographed and saved for future references and can also be used to document the effectivity of treatment. [7] Since trichoscopy has been added recently to the diagnostic armamentarium , not many studies are there to describe the various hair features seen on trichoscopy and if the trichoscopic features are sufficient to reach a conclusive diagnosis . More studies are needed to identify follicular and interfollicular patterns and their correlation with the disease. The study is done to acquaint clinicians regarding the follicular patterns and their significance.

AIM
The aim of the study was to describe common hair and scalp features seen on trichoscopy.
To differentiate between cicatricial and non cicatricial alopecia by trichoscopy

MATERIAL AND METHODS
An observational study was conducted on patients visiting Dermatology clinic in Delhi NCR. Thirty patients presenting with hair related complaints were included in the study after taking verbal consent . All the patients were new and had taken no prior treatment. Relevant history and examination were done to reach a presumptive diagnosis. Laboratory investigations were carried out , wherever necessary . In suspected Tinea capitis case , scraping and 10 % potassium hydroxide mount was made to look for fungal elements , (hyphae and spores). Diagnosis was broadly classified to cicatricial and non cicatricial alopecia .The patients included in the study were between 15 to 51 years age range . There were 22 males and 8 female patients. Most common diagnosis

in males was androgenetic alopecia,seen in 13 male patients. In females, telogen effluvium was the most common diagnosis seen in 5 female patients . Alopecia areata was the next common diagnosis with 6 males and 3 female patients .Tinea capitis was seen in two male patients .
Trichoscopy was done using Dinolite dermoscope and hair follicular units and scalp was visualized .

OBSERVATIONS
Normal scalp was seen as Follicular units containing 2-4 terminal hairs and 1 or 2 vellus hairs.
A prominent brown homogenous honeycomb pigment network was seen over the scalp, accentuated over sun-exposed areas. Follicular patterns showed white dots , yellow dots , black dots .Yellow dots are yellow colored round or polycyclic dots, best seen under polarized light - represent follicular infundibulum, distended with degenerating keratinocytes and sebum. [fig 1] White dots represent the destroyed follicles that are replaced by fibrous tracts .[fig 2] Black dots -These are seen within the yellow dots and represent stubs of hair (cadaverized hair), that are fractured before emergence from the scalp in alopecia areata .[fig 3] Pattern hair loss was characterized by hair diameter diversity greater than 20 % ,[fig 4] areas of focal atrichia and peripilar halo. Alopecia areata was characterized by exclamation mark hair , pigtail hair and black dots . Perifollicular erythema,perifollicular scaling, perifollicular white macules and areas, blue grey dots, absent follicular openings, were seen in lichen plano pilaris .White dots, peripilar casts and follicular plugging were features seen in discoid lupus erythematosus . Arborising vessels were also seen in interfollicular skin in cicatricial alopecia . Tinea capitis showed comma hairs and zig zag hairs on trichoscopy.
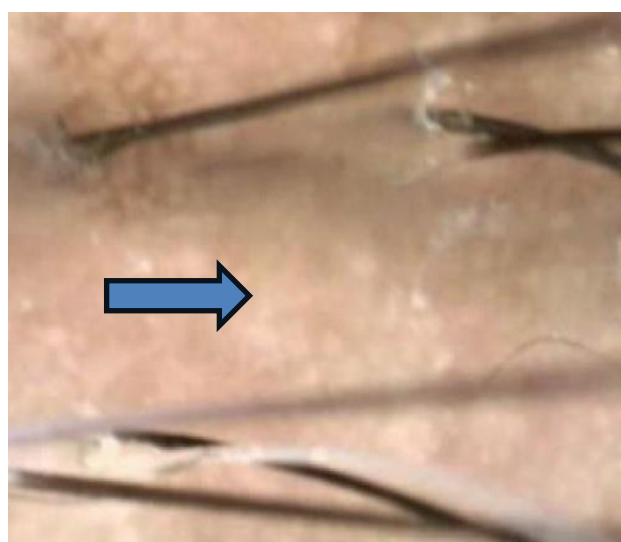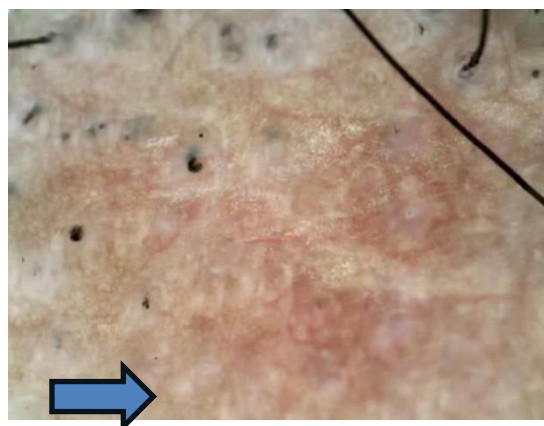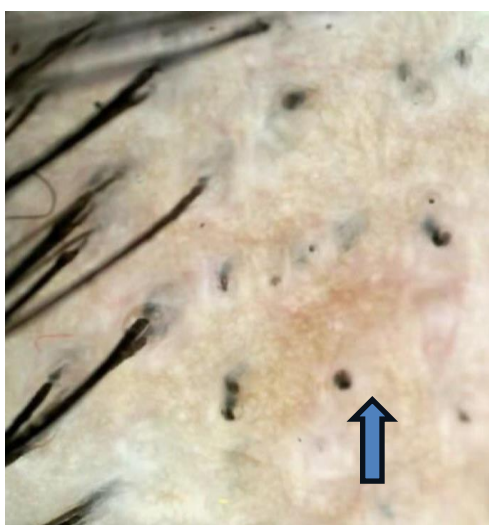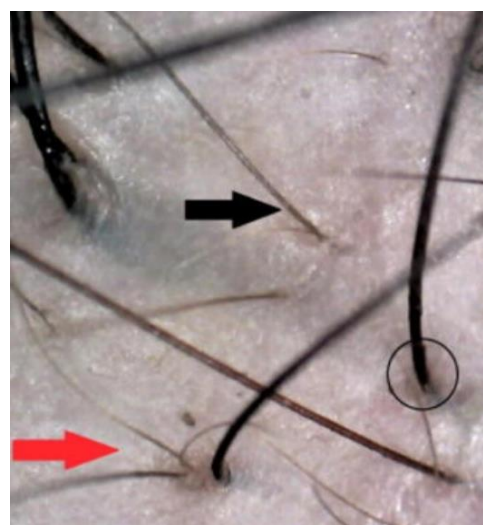

Fig: 1 – Yellow dots

Fig:2 White dots

Fig: 3 Black dots

Fig: 4 Hair diameter diversity >20 % vellus hair, red arrow, thin hair – black arrow

DISCUSSION

Cicatricial and Non cicatricial alopecias require timely diagnosis and long term treatment and follow up . [8]Trichoscope is a device which has a magnifying lens and a source of light .It is easy to conduct , most importantly, non invasive , quick method to deduce a diagnosis , though it requires practice and knowledge about the common types of hair patterns . It is the best method to differentiate cicatricial and non cicatricial alopecia .Non cicatricial alopecias show differences in shaft diameter , black dots , yellow dots , but scalp skin shows no atrophy . Cicatricial alopecias show white dots , follicular plugging , perifollicular pigmentation , casts arborizing vessels on the scalp , white atrophic areas.[9][10] Alopecia areata is the most common cause of non cicatricial alopecia.It shows exclamation mark hairs , black dots , pig tail hair , coudability hair .[11] Lichen planopilaris shows peripilar casts , peripilar pigmentation . [12,13] Discoid lupus shows follicular plugging , white dots and tracts , focal atrichia.[14,15,16] In all non-cicatricial alopecias presence of empty follicular openings is a common trichoscopy finding. In alopecia areata black dots and micro-exclamation mark hairs and tapered hairs correlate with disease activity, whereas yellow dots and vellus hairs correlate with disease severity. In androgenic alopecia trichoscopy shows hair shaft thickness heterogeneity, multiple thin and vellus hairs, yellow dots, perifollicular discoloration, and predominance of follicular units with only one hair. These features predominate in the frontal area. In all forms of cicatricial alopecia, trichoscopy shows milky-red or ivory-white areas lacking follicular openings. In classic lichen planopilaris, trichoscopy shows perifollicular inflammation, tubular perifollicular scaling, elongated, concentric blood vessels and "classic white dots", which merge to form white areas. Frontal fibrosing alopecia shows mild perifollicular scaling. Folliculitis decalvans is characterized by tufted hairs, large follicular pustules with emerging hair shafts and perifollicular starburst pattern hyperplasia. In dissecting cellulitis characteristic findings are "3D" yellow dots imposed over dystrophic hairs, large, yellow amorphous areas and pinpoint white dots with a whitish halo. Trichoscopy is particularly useful to diagnose hair shaft abnormalities in trichorrhexis nodosa, trichorrhexis invaginata, monilethrix, pili torti, and pili annulati. In hair shaft disorders , fractured hair shaft , thrust paint brushes appearance are seen .

Broken hair , flame hair ,split ends are seen on trichoscopy. The method may be also useful in diagnosing inflammatory scalp diseases. In discoid lupus erythematosus trichoscopy shows large arborizing vessels and large hyperkeratotic folliculilar yellow dots. Trichoscopy of scalp psoriasis shows regularly distributed twisted and lacelike blood vessels, whereas in seborroic dermatitis thin arborizing vessels may be observed. In tinea capitis trichoscopy shows comma, corkscrew hairs, zigzag hairsand morse code hairs are seen [17].[18]In conclusion, trichoscopy is a non-invasive method which may be applied in differential diagnosis of most hair and scalp diseases. Cicatricial alopecia is difficult to treat and sometimes non amenable to treatment . Trichoscope is also invaluable to demonstrate increase in follicular count following interventions like platelet rich plasma for androgenetic alopecia or surgical hair transplant .

CONCLUSION

Diagnosing alopecia can sometimes present with challenges. Invasive diagnostic methods like biopsy which may require both horizontal and vertical sections and may require multiple sections to diagnose the condition, presents a practical difficulty . In addition ,cicatricial alopecias also are a challenge to treat with not many treatment modalities available. Patients are lost to follow up and often do not comply with treatment . Trichoscope , being non invasive , easy to use , portable , is an invaluable aid to diagnosis , at times supplanting the need for biopsy. Use of trichoscope adds value to the patients consultation and increases his compliance with the treatment and follow up.Trichoscopy provides quick detection of scalp and hair disorders with advanced diagnostic accuracy, predicts the course of the disease, and decreases the need for unnecessary biopsies. [19,20,21] Various signs seen on trichoscope require practice to decode , hence more studies decoding trichoscopic patterns are required. With newer treatment modalities for alopecia especially androgenetic alopecia , trichoscope is the only objective way to evaluate treatment response and outcome . It can demonstrate increase in follicular count per unit area by evaluating same anatomic areas and reference points on the scalp during follow up visits . It is most important tool to objectively demonstrate treatment success or failure Use of trichoscope is going to increase in future hence knowledge about trichoscopic patterns and signs should be studied. In the era of artificial intelligence , trichoscope could be an important instrument to formulate diagnostic algorithm.

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