

Dottorato di Ricerca in SCIENZE DERMATOLOGICHE  
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***THE ROLE OF SCALP DERMOSCOPY IN THE DIAGNOSIS OF  
ALOPECIA AREATA INCOGNITA***

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## **DERMOSCOPY**

Dermoscopy is a non-invasive diagnostic technique for the observation of pigmented skin lesions, permitting the recognition of morphologic structures not visible by the naked eye.

The technique consists in placing mineral oil, alcohol or even water on the skin lesion that is subsequently inspected using a hand-held lens, a hand-held dermatoscope, a stereomicroscope, a camera, or a digital imaging system. The magnifications of these various instruments range from 6x even up to 100x.

The fluid placed on the lesion eliminates surface reflection and renders the cornified layer translucent, thus allowing a better visualization of pigmented structures within the epidermis, the dermoepidermal junction and the superficial dermis.

In trained hands dermoscopy is an indispensable tool for the clinician (1).

## Dermatoscope

Advantages	Disadvantages
<ul style="list-style-type: none"><li>▪ Easy to use</li><li>▪ Low costs</li><li>▪ By using a special lens also lesions located in particular anatomic sites (e.g. interdigital areas) can be observed</li></ul>	<ul style="list-style-type: none"><li>▪ Modification of luminous intensity and magnification not possible</li><li>▪ Storage and retrospective analysis of the images and accurate patient follow-up not feasible</li><li>▪ Close working distance</li></ul>

## Videodermatoscope

Advantages	Disadvantages
<ul style="list-style-type: none"><li>▪ Easy handling requiring only some technical skills</li><li>▪ Easy storage and retrieval of images for follow-up examinations</li><li>▪ Teledermoscopic consultation feasible when connected to telematic networks</li></ul>	<ul style="list-style-type: none"><li>▪ Indirect view of the lesion</li></ul>

Recently it has been shown how dermoscopy of the scalp could improve diagnostic skills in hair disorders (2-4).

This tool is particularly useful since clinical diagnosis of hair and scalp disorders is sometimes difficult even for an expert dermatologist. Not uncommonly, a scalp biopsy may be required and histopathology not always is reliably diagnostic.

Certain aspects of hair and scalp disorders can be better appreciated with dermoscopy than with the naked eye.

In typical alopecia areata, for example, dermoscopy allows evaluation of disease activity by detecting dystrophic hairs, exclamation point hairs and cadaverized hair. The presence of yellow dots within the follicular ostium of both empty and hair bearing follicles is a characteristic feature that is helpful in the diagnosis.

*The aim of this study has been to evaluate the role of scalp dermoscopy in the diagnosis of alopecia areata incognita, a variety of alopecia areata characterized by acute diffuse shedding of telogen hair in the absence of typical patches.*





## **ALOPECIA AREATA INCOGNITA**

Alopecia areata incognita (AAI) has been first described by Rebora in 1987 (5).

Clinically it has the features of telogen effluvium, but it could also be misdiagnosed as alopecia androgenetica. This is the reason why the scalp biopsy is often required to confirm the clinical diagnosis.

Prevalence of AAI is unknown, but the disease seems to be more common in adult females. AAI has an acute onset and a favourable prognosis.

According to Rebora, AAI occurs when alopecia areata affects those people with high percentages of telogen hairs on the scalp.

In these cases early anagen VI hairs (the ones with the highest mitotic rate and so vulnerable to be damaged by a noxious event) are scarce and then only isolated anagen hairs can be damaged. A diffuse hair loss rather than patches will be the result.

## **CLINICAL DATA**

### **Patient's Population**

50 patients, 49 females and 1 male (mean age 37.3 years), presented with severe and diffuse hair loss, lasting from 2 weeks to 2 months before our examination.

The patients were visited during the period 2005 - 2007.

All patients complained of severe hair thinning and often they referred that they had suddenly lost more than 60% of their scalp hair. Clinical examination revealed diffuse hair thinning in all cases (Fig. 1). In 23 patients hair thinning was more severe on the androgen dependent scalp (Fig. 2).



Examination of skin, mucosae and nails was normal in all patients.

All our patients had no history of psychological stress, systemic diseases, nutritional deficiency or assumption of drugs that may cause telogen effluvium.

No patients reported scalp pain or burning sensation (trichodinia).

Laboratory examinations reported positive antibodies to thyreoglobulin and thyreoperoxidase, but normal thyroid function, in 1 patient; ferritin levels were below 70 ng/mL (15 to 62) in 23 patients, but iron levels were normal in all cases.

The pull test was strongly positive in all patients with easy extraction of tufts of hair.

Microscopic examination of the extracted hairs revealed telogen roots at different degrees of maturation with a high prevalence of early telogen roots (Fig. 3).



The scalp examination was performed by a computerized polarized-light videomicroscopy (FotoFinderdermoscope®; Teachscreen Software, Bad Birnbach, Germany). Lenses with 20X to 70X factors of magnification, at 10X increments, were used for viewing. Alcohol was the interface solution (Kodan spray®, Schulke and Mayr, Vienna, Austria).

Probed images were digitalized and displayed on a high-resolution monitor in real time and stored for future use.

A 4-mm punch biopsy for horizontal sections and a 4x3 mm biopsy for vertical sections were performed in all patients who previously signed a written informed consent. The biopsy specimens were taken from a scalp area selected with the aid of the video-dermoscope.

Biopsy specimens were fixed in 10% formalin, paraffin embedded and routinely processed. Horizontal and vertical sections were cut and stained with hematoxylin & eosin.

All patients were then treated with clobetasol propionate 0.05% cream applied under occlusion every night for 6 months and intramuscular triamcinolone acetonide 40 mg once a month for 2 months. Iron supplementation was not given to any patient.

## **Results**

The dermoscopic features of the scalp were similar in all patients. Using the epiluminescent mode of operation, the scalp showed many diffuse, round or polycyclic yellow dots, which varied in size and were uniform in color and distribution. The yellow dots were evident within the follicular ostium of both empty and hair-bearing follicles and affected about 70% of the follicles. A large number of regrowing tip shaped terminal hairs (2-4 mm long) was also evident in the entire scalp (Figs. 4A, 4B). Dystrophic hairs, exclamation point hairs and cadaverized hair were not present.

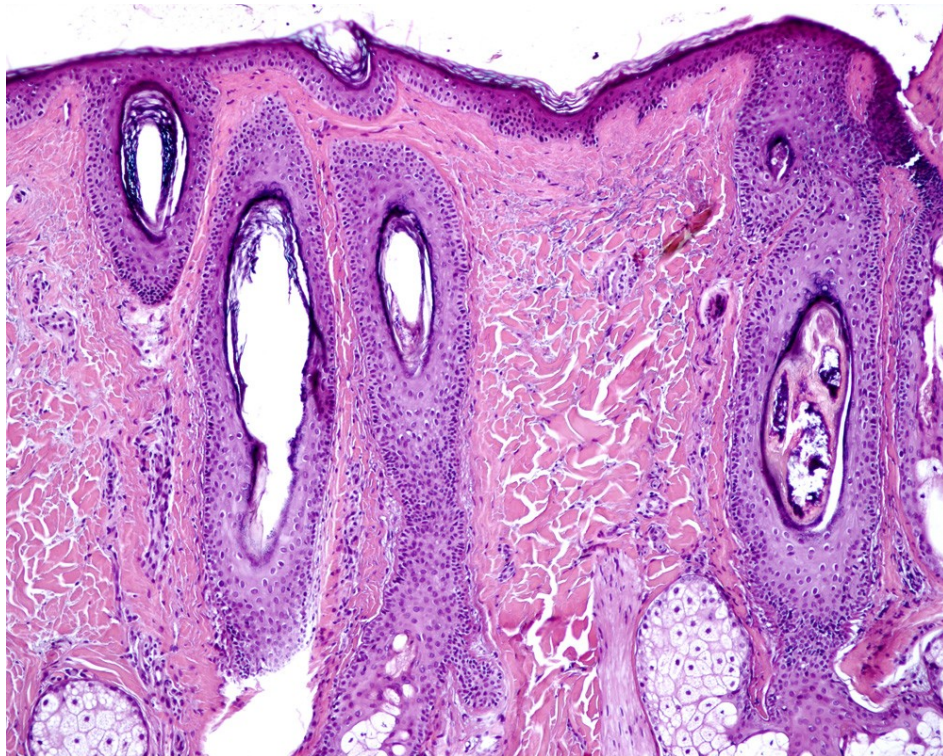




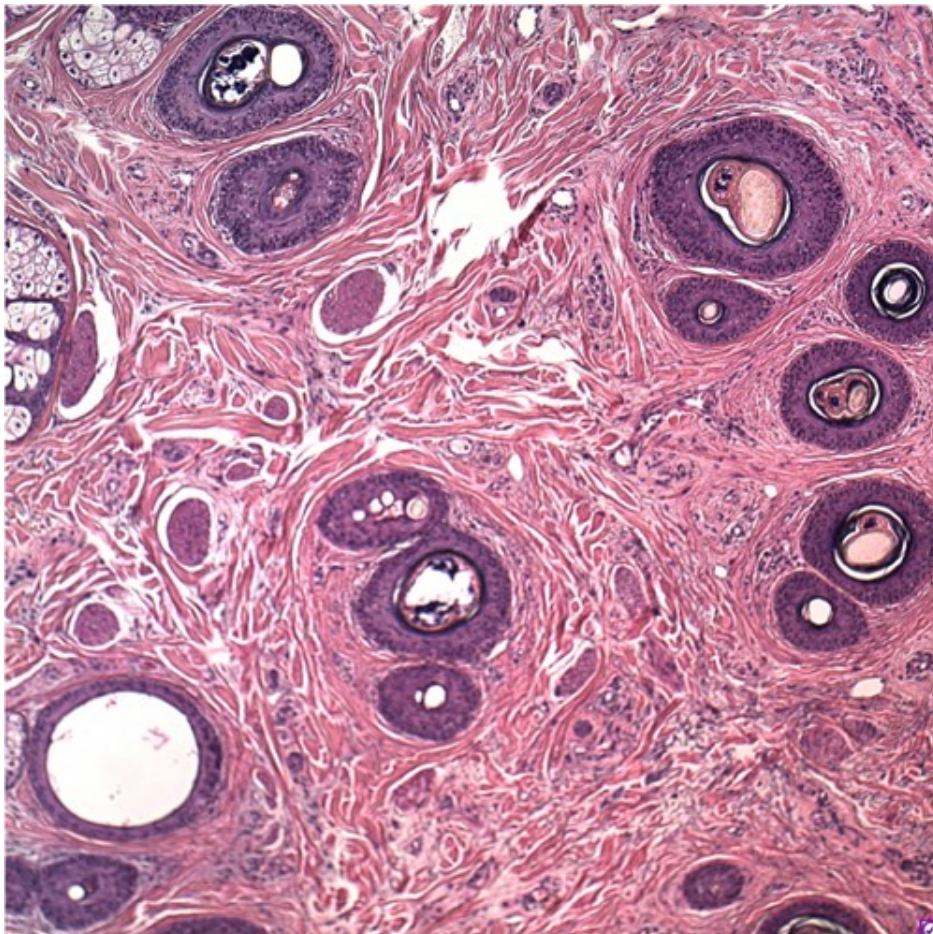
The biopsies were performed in a scalp area of hair loss with numerous yellow dots selected by the video-dermoscope.

The histological features of the scalp specimens were similar in all our patients and correlated to the video-dermoscopy findings.

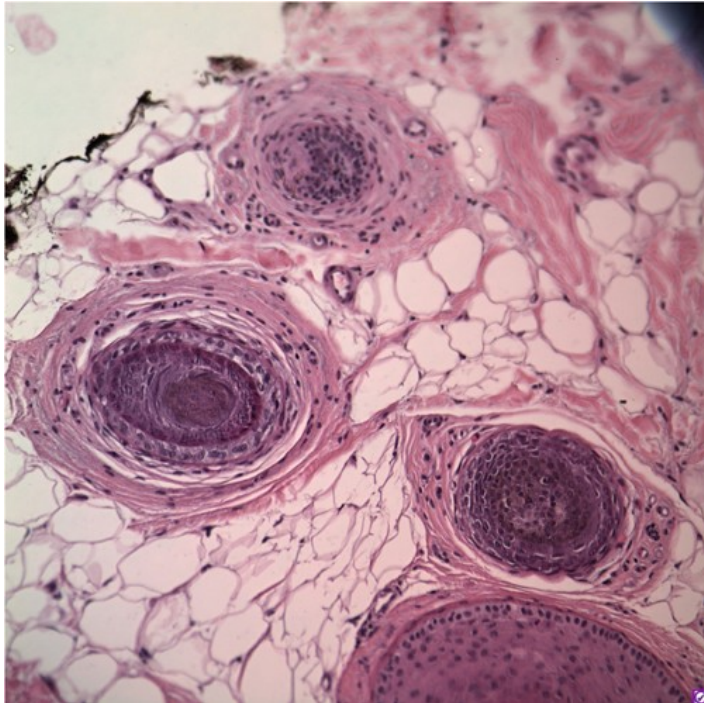
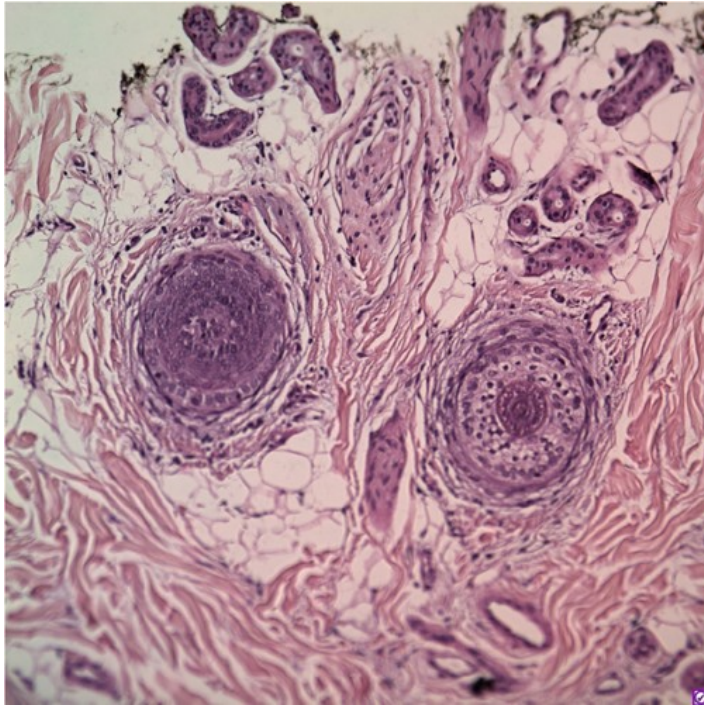
Vertical sections (Fig. 5) showed several small infundibular dilatations of the follicle, lined of stratified squamous epithelium and cornified cells within their cavities. The granular zone was still present. Bacteria and yeasts were often observed.



The counts obtained by horizontal sections demonstrated an increased number of vellus hair follicles and telogen follicles. Follicular stela often contained lymphocytes. Telogen germinal units were present. Subtle peribulbar lymphocytic infiltrate was seen only around vellus anagen hair follicles in the papillary and in the middle dermis (Figs. 6,7,8).







During treatment, patients were evaluated clinically and with videodermoscopy.

When patients experienced hair regrowth, the number of yellow dots considerably decreased and only occasional short regrowing hairs were present.

After 6 months of steroid treatment, complete regrowth was observed in all patients (Fig. 9,10).





At the long-term follow-up (6 months to 3 years) all patients maintained the regrowth despite steroids withdrawal. Eight patients developed a typical patch of alopecia areata during the follow up.

## **DISCUSSION**

AAI is a variety of alopecia areata that mimics telogen effluvium.

AAI has an acute onset and produces diffuse and severe hair thinning in a few months. Adult females are most commonly affected. Clinical history is negative for events known as possible causes of telogen effluvium. This disorder responds promptly to systemic steroids or topical steroids under occlusion. Long term prognosis is good, as in our experience where all patients maintained hair regrowth after discontinuation of treatment.

From a pathological point of view, AAI should be suspected when high percentages of telogen hairs and / or miniaturized hairs are present even in the absence of a peribulbar lymphocytic infiltrate.

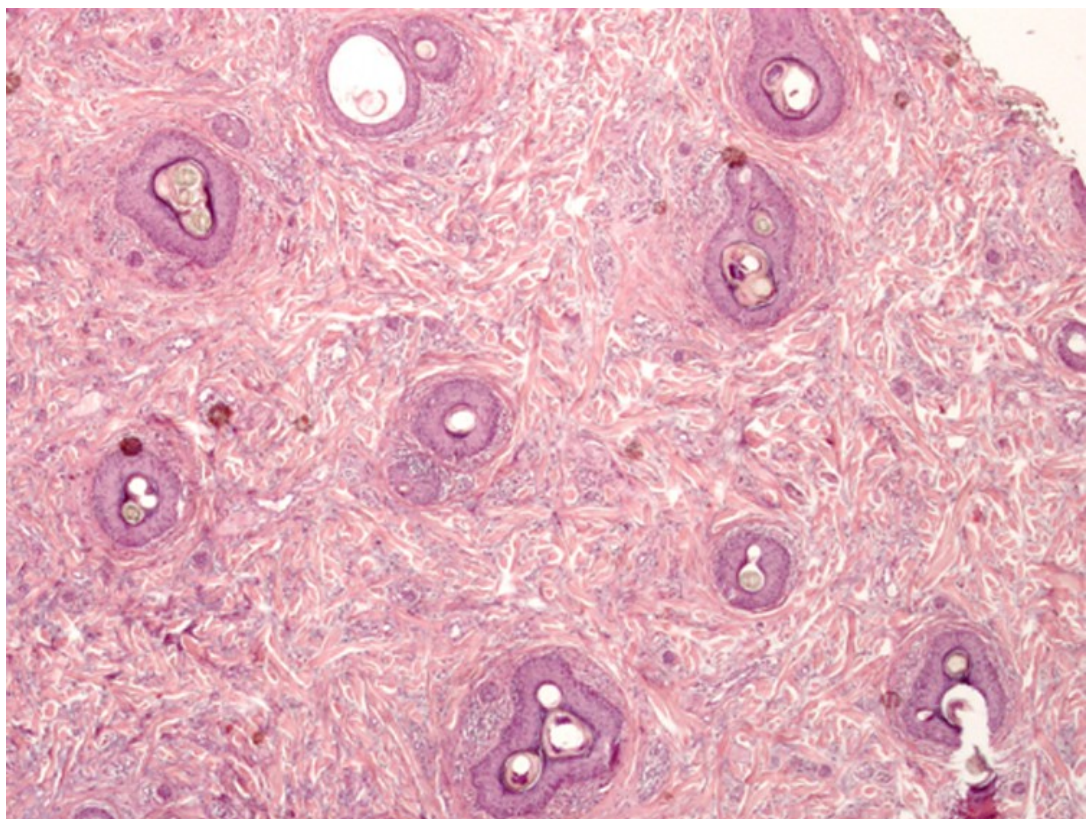
The presence of a subtle lymphocytic infiltrate around miniaturized hairs in the papillary dermis, strongly suggest the diagnosis.

Sato-Kawamura et al. reported in a recent study (6) a new type of diffuse hair loss with a good prognosis. The authors studied 9

females with acute and diffuse hair loss that they named “acute diffuse and total alopecia of the female scalp (ADTAFS)”. Eight of the 9 cases had a cosmetically acceptable hair regrowth after steroid administration. The histology of the lesions was indistinguishable from that of alopecia areata except for a remarkable eosinophilic infiltrate. In our cases we did not find eosinophils at pathology. In our patients the presence of numerous yellow dots and short regrowing hairs was a constant feature easily observed at videodermoscopy and at all magnifications (20X to 70X). The yellow dots are a specific feature of alopecia areata occurring in 95% of patients in all stages of the disease. The only other condition where they may occasionally be seen is the bald scalp of men with advanced androgenetic alopecia, but we never found this sign in female pattern hair loss, telogen effluvium or scarring alopecia (3).



Our pathological data indicate that the yellow dots correspond to degenerated follicular keratinocytes and sebum contained within the dilated ostium of nanogen and miniaturized hair follicles (Fig 11).





The video-dermoscopy findings were correlated and supported by the histological features of the scalp specimens.

This study shows how video-dermoscopy could be useful in helping the clinician in performing the diagnosis of AAI.

Video-dermoscopy is a first aid before performing the biopsy and can help the clinician to find the right place to perform the sample, but it can also avoid unnecessary biopsies. The device is finally useful to follow up the disease during and after treatment withdrawal.

Moreover clobetasol propionate under occlusion and a short course of intramuscular triamcinolone acetonide were effective in inducing hair regrowth. The prognosis was remarkably excellent because complete regrowth of hair was observed within 6 months and the patients maintained the regrowth despite the steroids withdrawal.

At least in our patients hair regrowth was not influenced by ferritin levels because even patients with ferritin levels below 70 ng/mL experienced good regrowth without iron supplementation.

In patients with alopecia areata relapses are frequent after steroid withdrawal and thus a strict follow up should be mandatory for patients with AAI because future relapses cannot be excluded.

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## **FIGURE LEGENDS**

Fig. 1. A 36-old-woman with severe and diffuse hair loss at the time of first visit.

Fig. 2. A 35-old-woman at the time of first visit: hair thinning is more severe on the androgen dependent areas of the scalp.

Fig. 3. Pull test showing telogen roots at different stage of maturation.

Fig. 4A. Scalp dermoscopy showing yellow dots and numerous short regrowing hairs (magnification 20X).

Fig. 4B. The regrowing hairs are more evident (magnification 40X).

Fig. 5. Vertical section: several small infundibular dilatations of the follicle, lined of stratified squamous epithelium and cornified cells within their cavities (H&E 10X).

Fig. 6. Horizontal section showing plugged infundibula (H&E 10X).

Fig. 7. Horizontal section at mid dermis level showing peribulbar lymphocytic infiltrate around anagen follicles (H&E 8X).

Fig. 8. Horizontal section at hypodermis level showing mild peribulbar lymphocytic infiltrate (H&E 8X).

Fig. 9. The same patient of Fig.1: note a diffuse regrowth after 3 months of treatment.

Fig. 10. The same patient of Fig.2: note a diffuse regrowth after 6 months of treatment.

Fig. 11. Horizontal section at infundibular level showing several small infundibular cysts of follicular origins (H&E 8X)

