Case Report/Case Series

Newly Described Features Resulting From High-Magnification Dermoscopy of Tinea Capitis

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IMPORTANCE Recent studies have reported "comma hairs" as a typical dermoscopic feature of tinea capitis observed at low magnification (×10). The aim of this study was to evaluate the dermoscopic aspects of tinea capitis at high magnification (×150) and its diagnostic role.

OBSERVATIONS Five children (2 boys and 3 girls; aged 4-10 years) with multiple scaly patches of alopecia underwent scalp dermoscopy, direct microscopic examinations, and mycological cultures of skin scrapings. Using low magnification (×30), typical comma hairs, "Morse code–like" hairs, and "zigzag" hairs were observed. When using high magnification (×150), additional features were horizontal white bands that appear as empty bands that are likely related to localized areas of fungal infection. These horizontal white bands are usually multiple and may cause the hair to bend and break. We also identified a new dermoscopic feature consisting of translucent, easily deformable hairs that look weakened and transparent and show unusual bends; they are likely the result of a massive fungal invasion involving the whole hair shaft. Direct microscopic examination showed fungal infection and results of mycological culture were positive for *Microsporum canis* in all cases.

CONCLUSIONS AND RELEVANCE The identification of new findings using higher-magnification dermoscopy may enhance the diagnosis of tinea capitis and be of help to better understand some pathogenetic mechanisms.

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Tinea capitis is a common fungal infection, especially among children. The diagnosis is based on results of direct microscopic examinations and mycological cultures of skin scrapings. Recent studies have reported "comma hairs" as a typical dermoscopic feature of tinea capitis observed at low magnification (×10); these C-shaped short hair shafts have been related to the bending and breakage of hair shafts that are filled with hyphae.[1-4] Other features reported at low magnification include "Morse code–like" hairs, which show multiple white bands across the hair shaft, and "zigzag" hairs with numerous bands at sharp angles[2]; this finding has also been observed in other diseases associated with focal weakening of the hair shaft, such as alopecia areata and trichorrhexis nodosa.[2] Because most modern videodermoscopy systems provide high-magnification lenses,[5] we decided to evaluate and compare the dermoscopic aspects of tinea capitis using low and high magnification in a series of patients.

Report of Cases

Five children (2 boys and 3 girls; aged 4-10 years) with a history of scalp hair loss and pruritus and the presence of multiple scaly patches of alopecia underwent scalp dermoscopy at ×30 and ×150 magnification (Videodermoscope Easyscan; Business Enterprise), direct microscopic examinations, and mycological culture of skin scrapings. Institutional review board approval was waived by the local ethics committee (Comitato Etico, Policlinico Universitario "G. Rodolico") at the University of Catania, Catania, Italy.

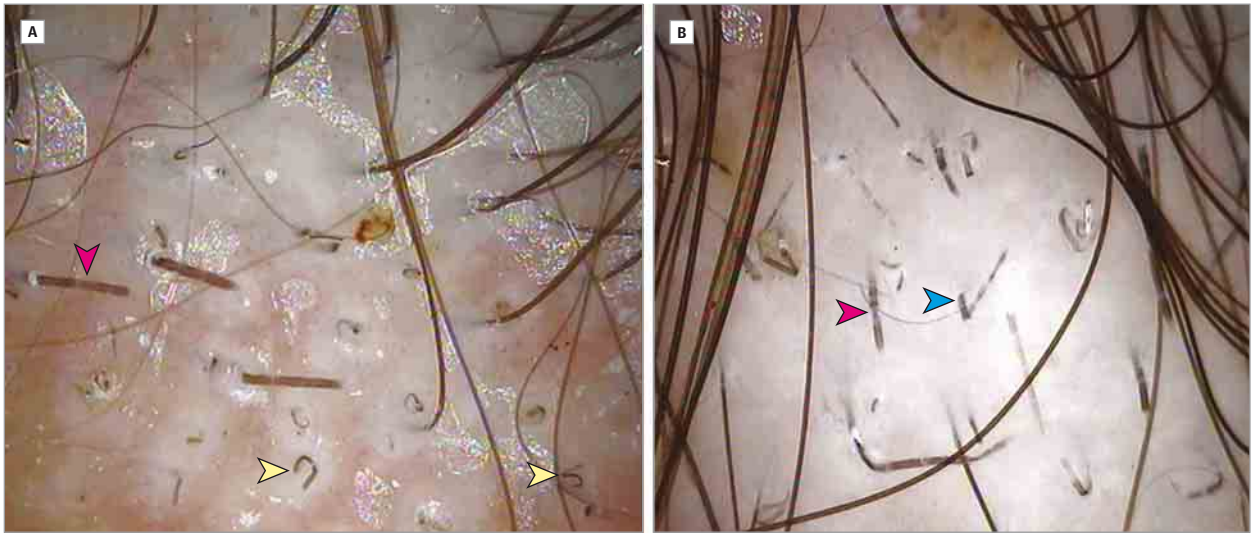
Using low magnification (×30), typical comma hairs were present in all cases. Moreover, Morse code–like hairs and zigzag hairs were observed in some cases (**Figure 1**). When using high magnification (×150), additional features were evident: horizontal white bands (**Figure 2**A), bent hairs (Figure 2B), and broken hairs (Figure 2C) in 4 cases, and translucent, easily deformable hairs (Figure 2D) in 2 cases.

Results of direct microscopic examination using potassium hydroxide were positive for fungal infection, and mycological culture of skin scraping samples revealed the presence of *Microsporum canis* in all cases.

Discussion

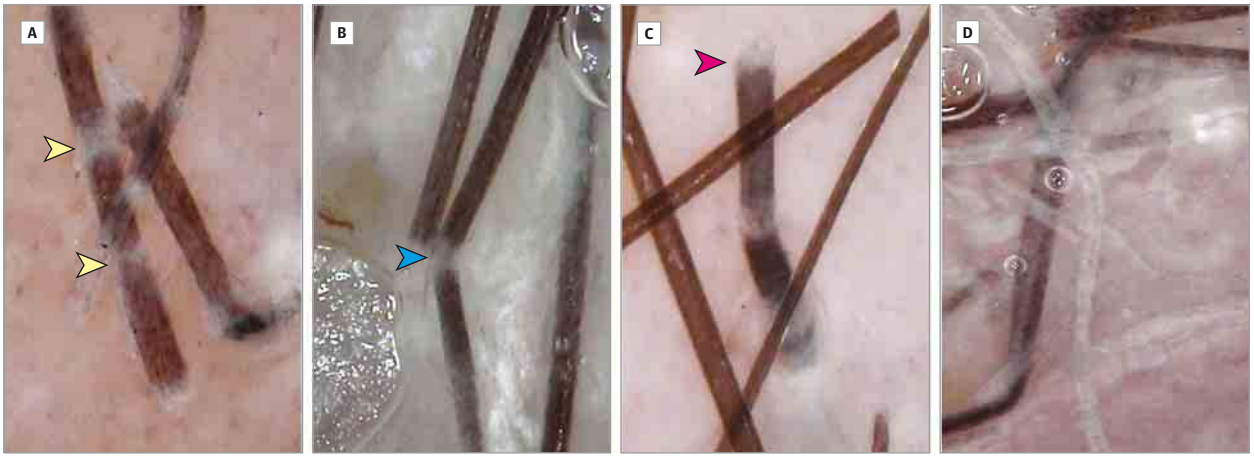
The standard diagnostic approach for tinea capitis is based on 2 steps. The first is skin scraping, followed by observation with potassium hydroxide that will demonstrate the presence of septate branching hyphae. The second step is to grow the col-

Figure 1. Tinea Capitis: Low-Magnification Videodermoscopy (×30)



A, "Comma" hairs (yellow arrowheads). A and B, "Morse code–like hairs" (red arrowheads). B, "Zigzag" hair (blue arrowhead).

Figure 2. Tinea Capitis: High-Magnification Videodermoscopy (×150)



A, Horizontal white bands (yellow arrowheads). B, Bent hair in the area corresponding to a horizontal white band (blue arrowhead). C, Broken hair in the area corresponding to a horizontal white band (red arrowhead); note the presence of an additional horizontal white band below the breakage point. D, Translucent, easily deformable hairs likely due to massive fungal invasion.

lected scales in a Sabouraud dextrose agar medium to identify the causative agent. Both direct observation and mycological culture of skin scrapings consume time and money; simple, direct, and rapid methods are desirable. In our study, we evaluated 5 patients suspected to have tinea capitis using low- and high-magnification dermoscopy. Visualization at high magnification revealed previously unreported findings not visible at low magnifications. The horizontal white bands observed, at low magnification in the Morse code–like hairs (whose frequency and specificity have not been reported to our knowledge), at higher magnification appear as empty bands that are likely related to localized areas of fungal infection (Figure 2A). They are usually multiple and represent "locus minoris resistentiae" that may cause the hair to eventually bend (Figure 2B), thus configuring the zigzag hairs, and break (Figure 2C). In our experience, bent hairs correlate with the presence of horizontal white bands. At higher magnification, we also identified a new dermoscopic feature consisting of translucent, easily deformable hairs (Figure 2D). These hairs are different from the surrounding ones, have no horizontal white bands, and look weakened and transparent, showing unusual bends; they are likely the result of a massive fungal invasion involving the entire length of the hair shaft.

Interestingly, we saw 2 patterns of invasion. One was characterized by the presence of empty bands, which may be the cause of early hair breakage, and the other by a massive parasitation that appeared in the entire length of the hair shaft, with no empty bands, as well as signs of early breakage. In all patients, results of a mycological culture of skin scraping samples were positive for *Microsporum canis*.

Conclusions

The identification of additional findings using higher-magnification dermoscopy, which is achievable using a dedicated videodermoscope (rather than a handheld dermoscope connected to a digital camera provided with a zoom lens), may enhance the diagnosis of tinea capitis and be of help to better understand some pathogenetic mechanisms. Further studies, however, are needed to confirm our preliminary findings.

ARTICLE INFORMATION

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Study concept and design: All authors.
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Conflict of Interest Disclosures: None reported.

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NOTABLE NOTES

The Evolution of Dermatology Grand Rounds
From Alibert to Osler

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Grand rounds (GR) is one of the key components of dermatology training and continuing education. In a recent study, GR was found to be among the most popular and well-run educational activities in dermatology programs across the United States.[1] One of the earliest documentations of dermatology lectures to large groups of physician and trainees are those of Baron Jean-Louis Alibert (1768-1837). Alibert is known as one of the fathers of French dermatology and was the first physician to study skin disease at the Hôpital Saint-Louis in Paris. Alibert became very well known for his teaching, and, in addition to trainees and young physicians, esteemed and experienced physicians would often attend his clinic to learn from him. He would teach large groups of people in the Pavillion Gabrielle at the Hôpital Saint-Louis, but eventually his audience outgrew this space. He moved his lessons outside under the lime trees next to the Pavillion Gabrielle and taught in the fashion of Greek philosophers. He hung paintings of various skin diseases from the lime trees and called patients, wearing signs indicating their diagnoses, up to the wooden platform from which he presented the patients in a theatrical manner to his audience.[2]

Grand rounds as we know them today in the United States originated in internal medicine with Sir William Osler at the Johns Hopkins University School of Medicine in the late 19th century. Osler and other highly respected clinicians conducted bedside rounds to teach trainees and other physicians, in keeping with the idea that exposure to patients was the best strategy for effective education. As the group of individuals attending these sessions became larger, it was no longer possible to conduct rounds at the bedside.[3] Similar to Alibert, Osler began teaching in a venue that could accommodate a larger audience and conducted rounds in an amphitheater or auditorium where patients were brought to be presented and discussed.[2,3] Osler is credited with starting patient presentations at GR in the United States, but there is no documentation of the genesis of patient viewing sessions in departments of dermatology across the United States.

While the emphasis of grand rounds has shifted away from patient presentations and toward lectures in some other disciplines of medicine in the United States, patient viewing remains a core component of dermatology grand rounds.[1,3] Given their popularity and the well-accepted importance of seeing cutaneous disease to master diagnosis and treatment, patient viewing sessions are likely to remain an integral component of dermatological education. However, an understanding of the evolution of grand rounds over the course of history allows dermatologists and trainees to appreciate the grand tradition in which they participate and will continue to participate for generations to come.

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