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Tinea corporis due to *Trichophyton rubrum* in a Woman and *Tinea capitis* in her 15-Day-Old Baby: Molecular Evidence of Vertical Transmission

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Abstract We report a case of a 40-year-old Caucasian woman who came under our observation with a 7-year history of a chronic erythematous scaly dermatitis, diagnosed as psoriasis, involving gluteal area and thighs, and treated with topical steroids without benefit. During pregnancy, a progressive worsening of her condition and an extension of cutaneous lesions were observed. Her newborn, a 15-day-old girl, presented a similar scaly and squamous lesion on her scalp. Mycological examination was positive for *Trichophyton rubrum* in both cases, and random amplified polymorphic DNA analysis confirmed the isogenicity of the two isolates. We performed a diagnosis of *T. rubrum tinea corporis* and *tinea capitis*. The case we describe illustrates an unusual clinical presentation of *tinea corporis* with remarkable extension of cutaneous lesions due to the diagnostic delay and the continuous use of local steroids, together with a rare *tinea capitis* in the newborn. Our experience highlights the possibility of mother–child transmission and the importance of an early diagnosis.

Keywords *Tinea corporis* · *Tinea capitis* · *Trichophyton rubrum* · Steroid-modified *tinea*

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Introduction

Most of superficial fungal infections of the skin are caused by a few dermatophyte species, of which *Trichophyton rubrum* is the most common [1]. *T. rubrum* is an anthropophilic fungus that has adapted to infect humans and usually causes mild lesions. In immunocompetent individuals, chronic dermatophytoses are commonly associated with foot, hand and nail dermatophyte infections and rarely *tinea cruris* and *corporis* [2]. However, in patients with haematological malignancies or receiving corticosteroid therapy, *T. rubrum* could invade the dermis causing deep subcutaneous infections [3].

Case Report

A 40-year-old woman presented at the outpatients' clinic of our Dermatologic Department with a 7-year history of chronic relapsing dermatitis treated with several cycles of topical steroid treatment. During an

otherwise uncomplicated pregnancy, in 2009, a diagnosis of psoriasis was performed and the patient was treated with mometasone furoate cream for the entire period of her pregnancy with a progressive worsening of her condition and extension of cutaneous lesions.

In February 2010, she gave birth by vaginal delivery to a healthy, normal-weighted girl. Fifteen days later, she arrived for the first time to our clinical observation. She presented large, merging erythematous plaques, with thinly scaling surface and polycyclic edges, covering the entire areas of her thighs, pubic and gluteal regions (Fig. 1). Her abdomen, right forearm and back of feet were spotted with few lesions of the same aspect, sharply marginated with raised edges. A mycologic examination revealed mycelial elements at light microscopy. Fungal culture on Saboraud dextrose agar (SDA) at 30°C yielded a white, cottony fungal colony, with a port wine burgundy on the reverse (Fig. 2a, b). The microscopic

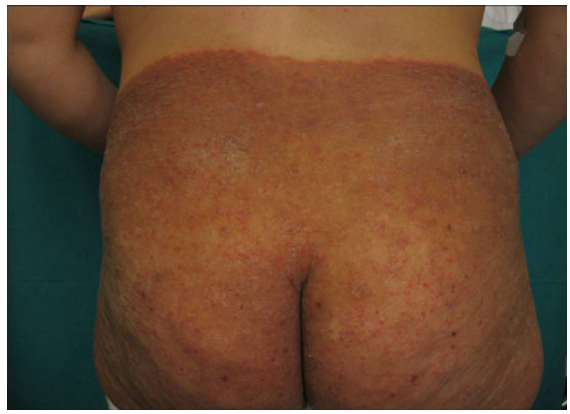

Fig. 1 Erythematous scaly lesions of gluteal region

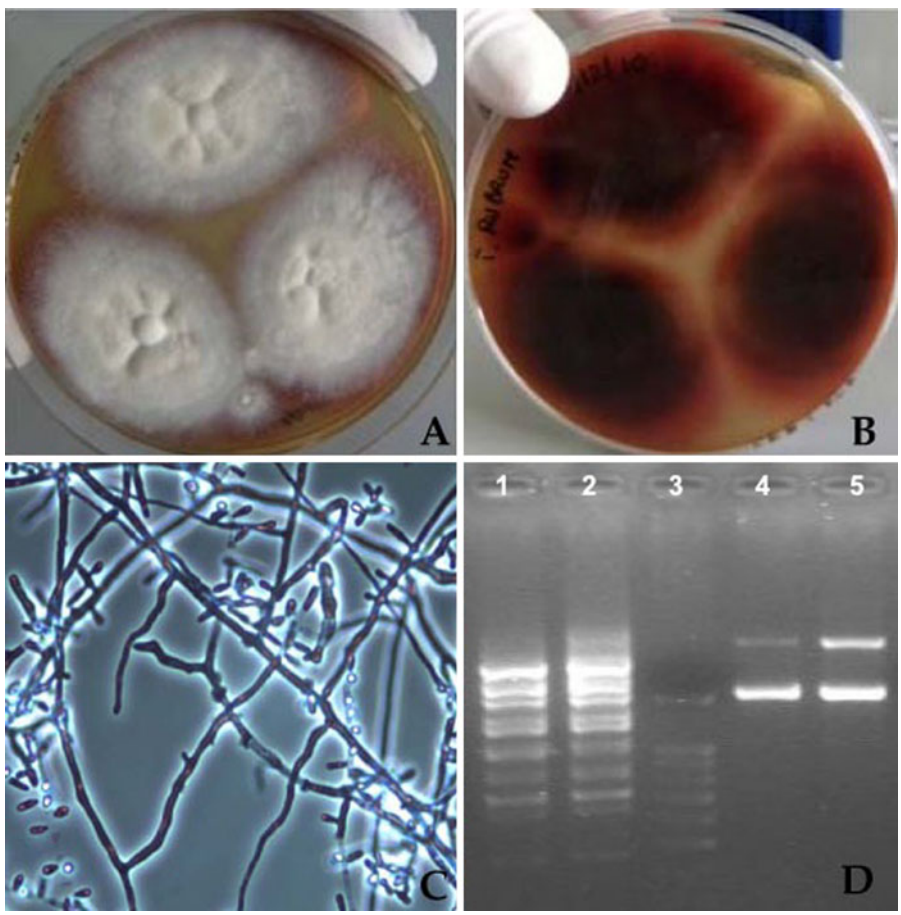

Fig. 2 Mycological investigations: the macroscopic aspect of colony (**a** and **b**), and the microscopic view of hyphae and microconidia (**c**). The panel **d** shows the RAPD analysis of the strains isolated from the mother and the baby, respectively. *Lanes 1* and *2* have been amplified with the primers OPE-03, whereas *lanes 4* and *5* with DERM1. *Lane 3* 100-bp ladder

visualization showed hyaline hyphae and small tear-shaped microconidia (Fig. 2c). The fungus was identified as *Trichophyton rubrum.*

Her newborn baby was previously evaluated by the paediatrician for a scaly patch of the scalp appeared about 7 days after birth and progressively enlarged during the following days. The paediatrician made a diagnosis of seborrhoeic dermatitis, and he prescribed an oily shampoo. A week after, she arrived at our observation; the squamous and scaly lesion of the scalp was still present (Fig. 3). The microscopic examination showed hyphae and ectothrix hair invasion. Cultures were positive again for *T. rubrum*.

The fungal identification was confirmed by sequencing of the internal transcribed region (ITS), using ITS1 and ITS4 primers that amplify the intervening 5.8S ribosomal DNA [4].

Strain relatedness was examined by random amplified polymorphic DNA (RAPD) analysis, using the primers OPE-03 (5′-CCAGATGCAC-3′) and DERM1 (5′-GGTGCGGGAA-3′). The band patterns were highly similar for both primers, confirming the isogenicity of the two isolates (Fig. 2d).

A diagnosis of *T. rubrum tinea corporis* and *tinea capitis* was performed.

At the moment of our observation, the patient was breastfeeding, so a topical therapy with econazole nitrate 1% cream was prescribed. After 2 months of therapy for the woman and 1 month for the baby, they presented a clinical remission of cutaneous lesions. Four weeks after therapy suspension, the woman presented relapses in gluteal and sacral regions. To allow the woman to carry on the breastfeeding, a new topical therapy with terbinafine 1% cream was started. At the end of a 2-month therapy, even with a complete remission and negative mycological examination, the woman presented a prominent hyperpigmentation of the skin involving all areas previously interested by mycoses (Fig. 4). This pigmentation disappeared gradually in about 8 months without any therapy. Interestingly, hyperpigmentation was greater in areas where the infection had a relapse. The woman did not present complication, i.e. skin atrophy or *striae distensae,* due to the prolonged use of topical steroids.

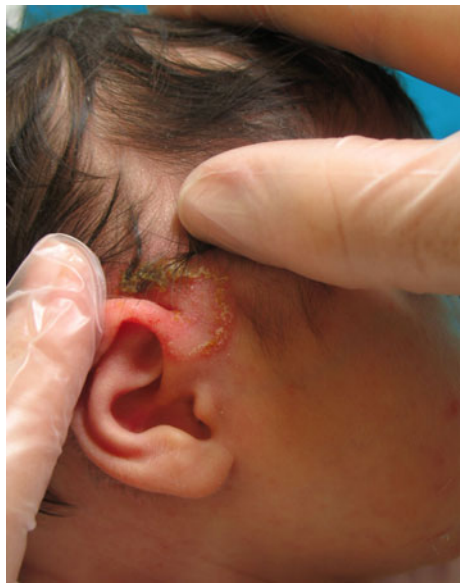

Fig. 3 Squamous lesion of the scalp of the newborn baby

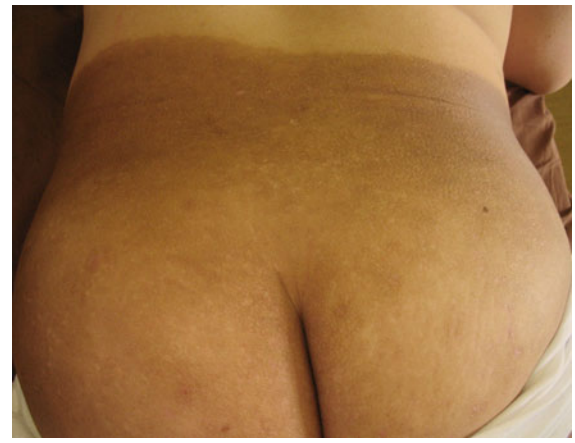

Fig. 4 Hyperpigmented outcome of dermatitis after antifungal therapy

Discussion

We reported this case for the unusual clinical presentation with remarkable extension of cutaneous lesions due to the diagnostic delay and the continuous use of local steroids. Another point of interest of this report is the evidence of a vertical transmission in the first days of life.

Identifying cases of tinea previously mistreated is a diagnostic challenge for Dermatologist. The term *tinea incognito* (TI) was introduced in 1968 by Ive and Mark to describe epidermomycosis that have lost their usual clinical appearance or with unusual extent because of steroids use [5]. More recently,

pimecrolimus- and tacrolimus-induced *tinea incognito* has been reported [6].

The use of topical steroid on undiagnosed fungal infection promotes a disease pathomorphosis with different clinical features that could mimic other pathologies. The anti-inflammatory and immune-depressive activity of steroids usually triggers a virulent reaction of the fungi.

Clinically, lesions can lose their peculiar ringworm appearance or can present unusual extent [7].

Trichophyton rubrum is the most frequent causative agent of TI in Italy, probably because it causes little inflammation that may be neglected by patients and misdiagnosed by doctors [8].

Other than steroid-modified tinea, several cases of primary atypical presentation of dermatomycosis, that simulating other diseases, have been described in literature. This broad variety of clinical features could increase the diagnostic challenge for general practitioner and dermatologist. Mycological examination is a simple, cost effective and largely diffuse diagnostic device, and it could be resolving in many situations. We suggest performing a mycological examination in all cases that do not respond to the therapy and when the diagnosis is not clear. In these cases only, this examination, performed by an expert in dermatomycology with the support of a mycologic laboratory, can provide a correct diagnosis.

In our case, the prolonged delay of diagnosis caused not only a progressive worsening of patient's conditions, with a repercussion on her private and social life, but also the contagion of her newborn baby. Our experience highlights the possibility of mother–child transmission in the very first days of life.

Paediatricians should be aware of the possibility of a vertical transmission, and they should be conscious that dermatophytes could infect newborn and infants.

Dermatophytoses are rarely reported before 2 years of life. Up to date, less than 50 cases of *tinea capitis* in infants under 1 year of age have been recorded in literature [9]. The main sources of infection may be originated from the infected adults or asymptomatic carriers. In our case, the contagion may be occurred during the delivery or during the strict mother–child contact in the first few days of life, actually the infant presented a scaly patch since her seventh day of life.

Another peculiar aspect of this case is that the healing of the lesions left hyperpigmented patches (Fig. 4). To our knowledge, this kind of pigmentation has never been reported in literature before. There is no clear explanation of this fact, but we could speculate that be a post-inflammatory hyperpigmentation due to the prolonged course of skin pathology, pregnancy and patient's phototype.

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