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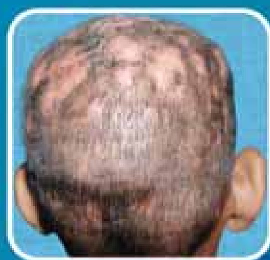
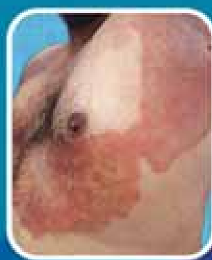
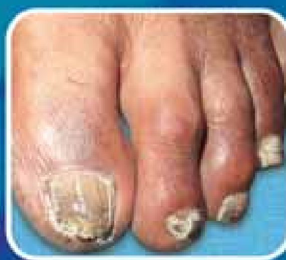
Superficial Fungal Infections of the Skin







Archana Singal
Chander Grover

2nd Edition

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CHAPTER 8

Recalcitrant Dermatophytosis

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INTRODUCTION

Recalcitrant dermatophytosis refers to the relapse, recurrence, reinfection, persistence, and possibly microbiological resistance of dermatophytosis. Over the past decade, cutaneous dermatophytoses have assumed epidemic proportions. We are witnessing much more severe and extensive fungal infections. Treatment-resistant tinea infections have been becoming extremely common. We are seeing atypical and extensive disease presentations. There has been an increase in chronic, relapsing, and recurrent cases.

In the context of this growing menace of superficial dermatophytosis, it is important to define few terms as per literature:

- *Chronic dermatophytosis* refers to a patient who has suffered from the disease for > 6 months to 1 year duration, with or without recurrence, in spite of being treated.
- *Recurrent dermatophytosis* refers to the recurrence of the dermatophyte infection within 6 weeks of stopping the adequate antifungal treatment with at least two such episodes in last 6 months.
- *Recalcitrant dermatophytosis*: This unifying umbrella term encompasses both chronic and recurrent dermatophytosis clubbed together.

CHANGES IN THE PATTERN OF TINEA INFECTIONS

In today's scenario, the following changes are being increasingly observed pertaining to superficial dermatophytotic infections **(Box 1)**. These are also responsible for major challenges in their management and are detailed in the following text.

BOX 1 Changing patterns of superficial dermatophytosis.

- *Involvement of unusual locations*:
  - Rising incidence of tinea faciei
  - Tinea genitalis (males and females)
  - Superficial dermatophytosis of scalp skin
  - Tinea auricularis
  - Tinea labialis
  - Tinea ciliaris and tinea blepharitis
  - Tinea of vellus hair
  - Tinea involving immune compromised districts
- *Changes in morphology*:
  - Tinea pseudoimbricata
  - Arcuate, dumbbell-shaped tinea corporis
  - Large, bizarre-shaped or geographic patches of tinea corporis
  - Double-edged tinea
  - Ill-defined and unclear borders
  - Eczematous tinea
  - Tinea mimicking other dermatoses
- *Changes in clinical behavior*:
  - Unusually extensive diseases with or without comorbidity
  - Multifocal disease at presentation
  - Erythrodermic disease at presentation
  - Rapid progression with involvement of large body areas
  - Absence of inflammation
  - Exaggerated inflammation (especially post initiation of therapy)
  - Poor or partial response to standard dosing of conventional topical and systemic antifungals
  - Persistent eczematous changes post-therapy
  - Involvement of multiple family members
  - Coexistent bacterial infections, e.g., furunculosis
  - Frequent relapses/quick relapses
  - Disabling itch (frequent nocturnal aggravation)
  - Persistent itch after resolution
- Signs of steroid abuse or irritant dermatitis
- *Changes in the impact of disease*:
  - High impact on quality of life indices
  - Higher cost of therapy
  - Longer duration of therapy (>6–8 weeks)
  - Higher chances of treatment failure
  - More family members/close contacts affected

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Factors Affecting Changes in the Pattern of Tinea Infections

This recalcitrant nature of the disease has been attributed to various factors. If we see the epidemiological triad, these include host factors, agent factors, and pharmacologic factors.

Host Factors

Self-medication (suggested either by family member/friend or chemist) has been considered responsible for emergence of resistance against many antimicrobials. Dermatophytoses are no exception. This has directly as well as indirectly led to altered and difficult-to-treat tinea.

- Potent topical steroids (Schedule H drugs) are used rampantly due to easy over-the-counter availability in India due to poor implementation of control measures. They are economical as well as compared to topical antifungals. The patient's readiness to use them for symptomatic relief has been directly as well as indirectly responsible for altered presentation and recalcitrance of the disease.
- Use of tight, synthetic, and occlusive clothing provides an ideal environment for the fungus to flourish in a tropical climate like ours.
- Overcrowding and sharing of infected clothing promote spread of infection through fomites.
- Global warming with higher temperatures, prolonged summers, and more humidity predisposes to fungal infections.
- Often, there is a failure to address comorbid situations such as diabetes mellitus, obesity, and immunosuppression satisfactorily, resulting in poor treatment outcome.
- As the treatment duration is long and disease is not life threatening, there is nonadherence to the treatment schedule after initial relief.

Agent Factors

There has been a significant epidemiological shift regarding etiological agents. With the evaluation of emerging drug resistance and its molecular basis, the emergence of resistant species has also been recognized.

- The once common *Trichophyton rubrum* has been slowly outnumbered by *Trichophyton mentagrophytes,* which has better adaptability to the human body and survives longer on fomites outside the body. *T. mentagrophytes* infection is considered responsible for more widespread inflammatory lesions with pustulation.
- The incidence of primary drug resistance to terbinafine and fluconazole has been rising.

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- *Trichophyton indotineae* is a newly identified species, isolated in near-epidemic proportions now, in a number of countries. It is identical to genotype VIII within the *T. mentagrophytes/T. interdigitale* species complex. It was described in 2019 by sequencing the *internal transcribed spacer* (ITS) region of ribosomal DNA. More than 10 ITS genotypes of *T. interdigitale* and *T. mentagrophytes* have been identified. Among these, *T. indotineae* seems to be the most problematic. It causes inflammatory, itchy, widespread disease affecting the groins, gluteal region, trunk, and face. It has been isolated from patients of all age groups and genders. It has been documented to have in-vitro genetic resistance to terbinafine (point mutations in the *squalene epoxidase* gene), translating to high in-vivo resistance.

Pharmacologic Factors

- The use of potent topical steroids or oral steroids/injectable steroids for superficial dermatophytosis is very rampant. It has been one of the most important factors responsible for the growing menace of superficial dermatophytosis. There are plenty of erratic and irrational steroid, antifungal, antibiotic combinations available as over-the-counter products that can be bought without prescription. The use of potent topical/injectable/oral steroids leads to an initial transient response and patient may feel symptomatically better. However, their uncontrolled use leads to grim and undesired consequences.
- Fungistatic nature of most of the antifungal drugs as well as their inappropriate/inadequate dosings is the practice that promotes resistance.
- Prolonged therapy with terbinafine and itraconazole, or even with topical antifungals, becomes expensive for the patients. This leads to noncompliance and inadequate treatment, further promoting resistance.
- Poor control of drug quality during production leads to a poor bioavailability of the active ingredient. It has often been seen that cheap medications may be of suboptimal quality as often economy is associated with poor efficacy.
- Many patients with extensive disease also have comorbidities such as diabetes mellitus, hypertension, or cardiac problems. They tend to be on polypharmacy leading to side effects/drug interactions. This often results in poor compliance or poor bioavailability.

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CHANGING PATTERNS OF SUPERFICIAL DERMATOPHYTOSIS

The recalcitrant tinea infection often presents with atypical clinical presentations. These are detailed in the following text.

UNUSUALLY EXTENSIVE DISEASE

Tinea infections were conventionally limited to a part of the body. It has now become common to see involvement of multiple anatomic sites including axillae, groins, trunk, hands, feet, and nails in a single patient **(Figs. 1 to 3)**.

Fig. 1: Extensive tinea involving trunk and extending to axillae as well.

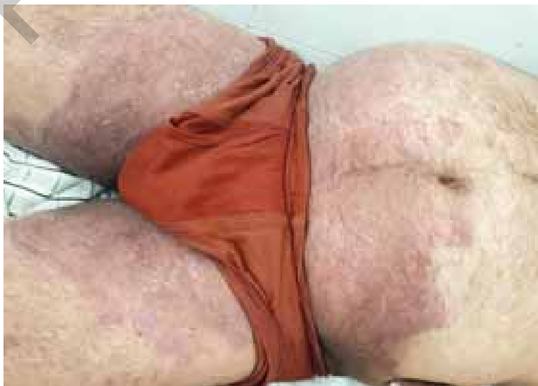

Fig. 2: Extensive tinea involving the lower abdomen up to the mid-thigh region. Both groins and genitalia were involved.

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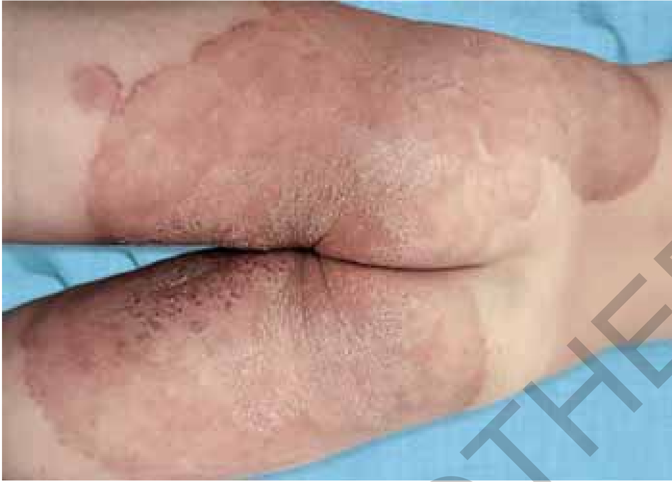

Fig. 3: Extensive tinea involving the trunk, buttocks, and legs (up to mid-thigh).

Fig. 4: Extensive tinea involving trunk in a 6-month-old infant.

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OCCURRENCE IN INFANTS AND YOUNG CHILDREN

The presentation with extensive tinea lesions in small children is seen more often now. This is generally seen when either parents or close family members are involved and there is sharing of clothing **(Figs. 4 to 6)**. Even in children, the disease tends to be extensive and atypical.

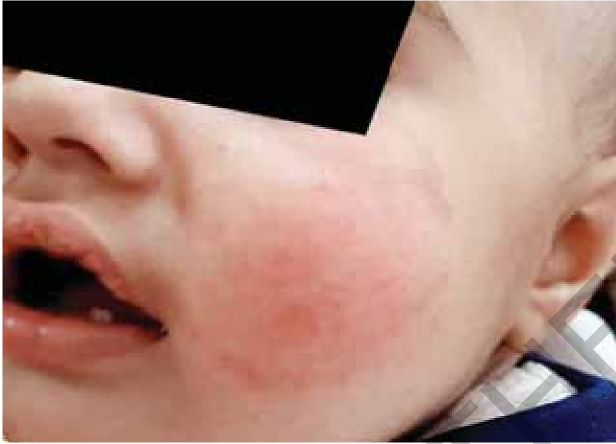

Fig. 5: Tinea faciei in a 3-month-old child.

Fig. 6: Extensive tinea involving distinct areas of the body. There is involvement of groin (tinea cruris) up to the mid-thigh with limb extremity (tinea manuum) in a 2-year-old child.

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Unusual Morphology (Tinea Incognito)

There is a higher incidence of difficult-to-recognize presentations and unusual morphologies. These include the following morphological presentations:

- *Tinea pseudoimbricata*: This clinically manifests as a "ring inside a ring" or "waves or rings" of tinea. This presentation generally results from topical steroid application **(Figs. 7 to 9)**.

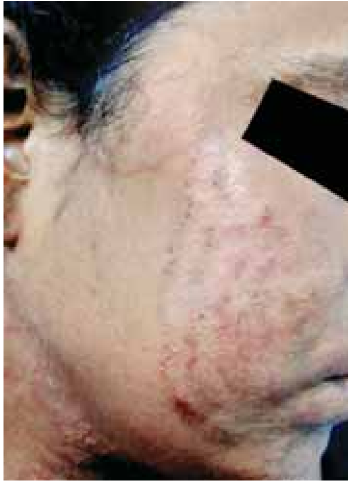

Fig. 7: Tinea pseudoimbricata involving face.

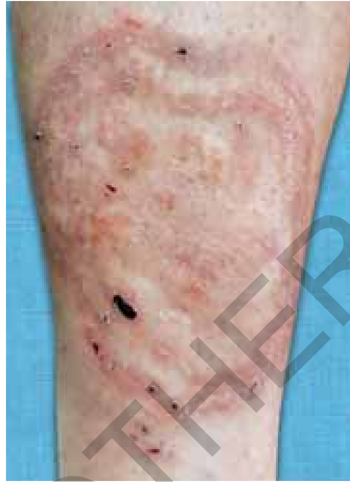

Fig. 8: Tinea pseudoimbricata involving the limbs.

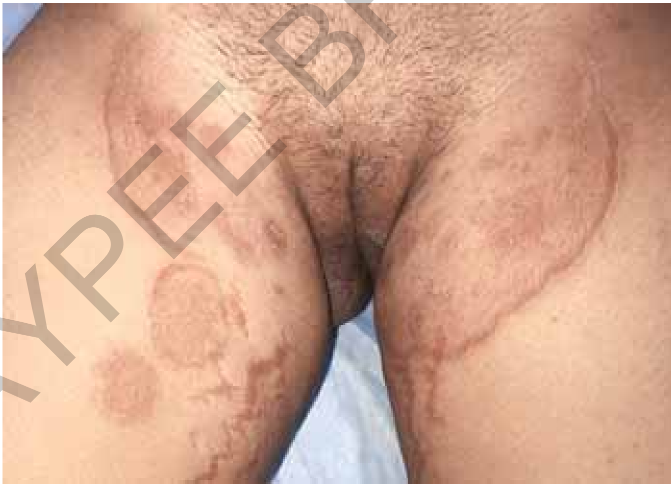

Fig. 9: Tinea pseudoimbricata in the groin area due to repeated steroid application.

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- *Pustular tinea*: Pustular presentation is generally seen in patients with tinea, who were on prolonged steroid use (systemic or topical) and have suddenly stopped it **(Figs. 10 and 11)**. This withdrawal is associated with a pustular flare with intense itching.

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Superficial Fungal Infections of the Skin

Salient Features

- The book focuses on superficial fungal infections in a crisp and concise format.
- It includes 20 chapters which highlight the typical and atypical presentations of superficial fungal infections in different age groups, followed by diagnostic modalities and therapeutics measures which can be used to alleviate these diseases.
- The text is supplemented by tables, boxes, and illustrations for better understanding.
- An ample number of good-quality photographs have been included for easy recognition by the readers.
- It serves as an indispensable guide for on-the-spot diagnosis and management in both clinical and hospitals settings.
- It is written by experts in the field with vast experience.
- It is a useful guide not only for the dermatologists but also for the general practitioners, pediatricians, and students.

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Printed in India

Available at all medical bookstores or buy online at www.jaypeebrothers.com

JAYPEE BROTHERS
Medical Publishers (P) Ltd.
EMCA House, 23/23-B, Ansari Road,
Daryaganj, New Delhi - 110 002, INDIA
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