Tinea: A concise synopsis

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CASE

A man aged 25 years presented to the emergency department with a 2-week history of a painful and intensely pruritic rash on his buttocks that had spread to the axillae, inguinal folds and right shin (Figure 1). He also noted changes to his left thumbnail (Figure 2). He was otherwise well and worked as army personnel.

QUESTION 1

What further history and examination would be of importance?

QUESTION 2

What are the provisional diagnosis and differentials in this case?

QUESTION 3

What investigations are needed for the provisional diagnosis?

QUESTION 4

What management can be commenced while awaiting results?

QUESTION 5

How can this condition be prevented?

ANSWER 1

Important diagnostic considerations are highlighted in Table 1. A full skin, hair and nail examination as well as dermoscopy help evaluate the extent of disease.

ANSWER 2

The provisional diagnosis is tinea corporis, cruris and unguium, with other potential differentials shown in Table 2.

ANSWER 3

Dermatophyte infections are transmitted through direct skin contact with an infected person or animal, or indirectly through exposure to fungal spores.[1] Tinea infection is a clinical diagnosis with confirmation from tissue microscopy, culture and polymerase chain reaction (PCR). Samples should be collected prior to treatment initiation and of sufficient quantity to reduce false-negative

Figure 1A, B. Erythematous figurate and annular rash on the left axilla and buttocks with central clearing and evidence of some leading scale at the advancing edge; **C.** Erythematous plaque with advancing border and pustules on the right shin.

results.[2] Skin scrapings should ideally be taken from a lesion that has not been recently treated with a topical antifungal agent. A scalpel at a blunt angle to the skin can be used to collect an adequate sample.[2] Nail samples include clippings and scrapings of subungual debris using a scalpel or curette. A hair sample can be removed using tweezers to include the root in conjunction with surrounding skin scrapings.[2] Yellow-top specimen containers are used for all sample sites, accompanied by pathology requests with appropriate labelling of specimen type and location. PCR testing is available in some Australian laboratories and preferred because of its faster turnaround and superior sensitivity and specificity when compared with microscopy and culture (MCS).[3] If PCR is not accessible, fungal MCS is inexpensive and acceptable, though culture can take up to 6 weeks.[3,4]

Trichophyton rubrum is the leading cause of tinea worldwide.[1,5] Other species, such as *Microsporum canis*, *T. mentagrophytes* and *T. verrucosum*, may be associated with zoonotic exposure through pets (cats, dogs) or other animals (cows, horses).[5]

Figure 2. White discolouration of the left thumb nail plate.

ANSWER 4

Localised mild skin infections can be treated with topical therapies including terbinafine or azoles.[6] Oral therapies are indicated for tinea capitis, widespread infection, immunocompromised status, failed response to topical treatment or when there is involvement of the palms, soles or nails. Oral terbinafine 250 mg daily for 2 weeks is the preferred regimen, with longer courses indicated when there is nail or scalp involvement.[7] Terbinafine is generally well tolerated with a small risk of gastrointestinal side effects and transient liver enzyme elevation. Rare complications include hepatitis, photosensitivity, pancytopenia, cutaneous lupus and Stevens–Johnson Syndrome/toxic epidermal necrolysis.[7] Dose adjustment is indicated in renal impairment. Monitoring of liver function and full blood count is recommended with courses longer than 6 weeks duration.[7] Itraconazole 100 mg daily for 2–4 weeks is an oral alternative to terbinafine.[1] Ketoconazole or selenium sulphide shampoo can be used as a treatment adjunct for tinea capitis.[8]

If there is good compliance and appropriate route of therapy, yet inadequate treatment response, alternative diagnoses as well as terbinafine-resistant species should be considered. High rates of terbinafine-resistant *T. interdigitale* species have been reported in India, Europe and, more recently, Australia.[9,10] Corticosteroid-modified tinea, 'tinea incognito', masks the classical clinical presentation and can delay diagnosis. Topical steroids have an immunosuppressive effect that can compromise the efficacy of antifungal treatment.[1]

ANSWER 5

The dermatophyte infects the stratum corneum only with an incubation period of 1–3 weeks.[1] Fungal spores shed from the skin persist in warm, moist environments. Measures to prevent initial or recurrent infection include good personal hygiene and avoidance of routes of spread, such as sharing of combs, bedding, towels or clothing. Specifically for tinea pedis, drying between toe web spaces and wearing thongs in public showers/changerooms is important.[1] Cases of recurrent tinea should be evaluated for any potential reservoir of dermatophytes, commonly toenails.[1]

Table 1. Important diagnostic considerations

Theme	Clinical features
Clinical findings suggestive of fungal infection	• Skin and/or hair and nail involvement • Pruritus • Risk factors: public changerooms, pets, overseas travel, immunosuppression
Clinical findings not suggestive of fungal infection	• Systemic symptoms • Constitutional symptoms • Pain • Triggers: photosensitivity, new medication, new topical exposures
Diagnostic nuances	• Atypical presentation ('tinea incognito') – due to partial treatment and/or corticosteroid use • Isolated tinea unguium – requires careful exclusion of other more sinister conditions (ie squamous cell carcinoma or nail bed melanoma)
Decision-making challenges	• Body site affected – influences treatment route and duration • Regular medications – may interact with future potential therapy • Neonates and infants – require more close monitoring +/– paediatric dermatologist opinion with oral treatment

Table 2. Differentials for generalised pruritic annular rash[1]

Differential diagnosis	Similarities to tinea	Differences to tinea
Annular psoriasis	• Well-demarcated round plaques with central clearing • Can have scalp involvement	• Nail pitting • Silvery scale • Extensor distribution
Atopic dermatitis	• Pruritus • Erythema and scale	• Poorly defined erythematous patches or papules • Flexural distribution • Presence of personal or family history of atopy
Annular subacute cutaneous lupus erythematosus	• Annular plaques with central clearing • Scale may be present	• Photosensitive distribution
Urticaria	• Well-demarcated erythema	• Wheals are primary morphology • Non-scaly • May be associated with angioedema • Triggers: food, medications, sun, cold weather, viral illness
Erythema annulare centrifugum	• Annular plaques with central clearing	• Triggers: cutaneous fungal infection, internal malignancy, medication reaction • Trailing scale (inner side of advancing edge) when compared with leading scale (advancing edge) in tinea
Erythema gyratum repens	• Erythematous scaly plaques	• Concentric erythematous rings with 'wood-grain' appearance • Trailing scale (inner side of advancing edge)
Erythrasma	• Scale may be present • Predilection for moist areas (groin, feet)	• No advancing border • Less pruritic than tinea

Figure 3A. Resolved axilla rash; **B.** Fading of erythematous rash on buttocks; **C.** Improved erythema and resolving pustules on right shin.

Conclusion

A skin scraping and nail clipping were sent for microscopy, culture and PCR. Both samples returned positive for *T. rubrum* on PCR, but only the nail clipping showed fungal filaments on microscopy, demonstrating the rapid and superior sensitivity of PCR. The patient was commenced on oral terbinafine 250 mg daily. On review in the dermatology clinic 2 weeks later, he described dramatic symptomatic improvement – complete resolution of pain with improved redness and pruritus. On examination, there was significant fading of the erythema of the buttocks, axillae and right shin (Figure 3). Given his good clinical response but presence of nail involvement, he was continued on oral terbinafine to complete a total 3-month course.

This is a florid case of acute, widespread tinea, which is less frequent than the more common localised cases observed in general practice settings. However, it demonstrates the importance of early recognition and appropriate specimen collection to guide timely and effective management.

Key points

- Tinea commonly presents as a pruritic rash +/– hair and nail involvement.
- Skin scrapings, nail clippings or plucked hair should be sent for MCS +/– PCR if available.
- Topical or oral terbinafine is preferred for management of tinea, with duration guided by location and response.

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