

Different Clinical Manifestations of Sport-Related Dermatophytosis: A Two-Case Series

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Abstract: Dermatophyte infections are among the most frequent fungal diseases worldwide, and athletes constitute a particularly vulnerable group due to warm, humid microenvironments, occlusive clothing, and repeated skin contact. These conditions promote the transmission of *Trichophyton tonsurans*, a major pathogen responsible for sport-related dermatophytosis. Here, we describe two cases of infection in athletes from different disciplines, highlighting varied clinical manifestations influenced by sport-specific exposure and individual factors. Both patients presented with erythematous, scaly lesions consistent with tinea corporis; however, the clinical manifestation was different. In a basketball player extensive tinea corporis, involving a large area of the trunk was found. The second athlete, practicing Kung-Fu, demonstrated features of tinea corporis gladiatorum with small-sized three round lesions. In both patients *Trichophyton tonsurans* was identified as the causative agent. They responded well to combined systemic and topical antifungal therapy. The cases emphasize that physical contact, perspiration, and shared equipment significantly affect the spread and clinical course of the disease. Accurate mycological confirmation and prompt antifungal treatment remain essential for successful outcomes. Increased awareness among healthcare providers of dermatophytosis in athletes can facilitate early recognition and effective management, ultimately lowering the burden of fungal skin infections in this population.

Keywords: tinea, dermatophytosis, sport, *Tinea gladiatorum*, *Trichophyton tonsurans*

Introduction

Dermatophytes are the most common fungi causing infections in humans, affecting an estimated 20–25% of the global population.¹ Among the numerous factors predisposing to dermatophyte skin infections, elevated temperature and humidity play a significant role, regardless of whether they result from climatic conditions, occlusion, such as wearing non-breathable clothing and footwear, or physical exertion.^{2,3}

A marked increase in these infections has been noted among athletes, where such conditions are present, especially those engaged in contact sports, where superficial mycoses seem to be common.⁴ Tinea gladiatorum (*tinea corporis gladiatorum*, *trichophytosis gladiatorum*) is a specific variety of tinea corporis, transmitted mostly by skin-to-skin contact among athletes, especially wrestlers, judokas and Kung-Fu/karate practitioners.^{5,6} According to estimates, fungal infections associated with athletic activity account for between 2.4% and up to 100% of reported cases among athletes, depending on the study population.⁵ Zalewski et al⁵ in their meta-analysis of 22 publications showed a wide range of sport-related dermatophytosis prevalence rates: United States (8 studies) with reported prevalence ranging from 4.3% to 100%; Iran (6 studies) from 2.4% to 68.3%; and Turkey (4 studies) from 4.2% to 90.6%. These findings challenge population-related or climatic differences as the most obvious explanations for the substantial variability in disease prevalence among athletes.⁵ The level of physical contact determines the type of pathogen involved, which in turn requires different therapeutic approaches.^{7,8} In high-contact sports like wrestling, *Trichophyton tonsurans* - originating from Asia and Australia - is the predominant etiological agent that in the last few decades has become widespread worldwide.^{5,9} This is linked to direct skin-to-skin contact, frequent interaction with mats, and environmental factors such

as sweat, humidity, and surface slipperiness, all of which facilitate minor skin injuries and pathogen transmission.^{4,10} In moderate-contact sports, where physical contact is more transient and exposure to shared surfaces is lower, infections usually occur in areas of abrasion and are often caused by *Trichophyton rubrum*, among others.¹¹

The aim of this case series report was to present two athletes of different sport's disciplines with different clinical manifestations of dermatophytosis.

Case Reports

Case Report I

A 32-year-old male patient presented with widespread cutaneous lesions affecting the buttocks and trunk. He was an active basketball player of Tunisian origin who had moved to a Polish basketball team more than one season earlier. The first skin lesions appeared about one and a half years before presentation and were limited to the groins. They were mildly pruritic and, over the subsequent two months, extended to involve the buttocks. After a further one to two months, new lesions developed on the lower back.

He was examined by a general practitioner and, based on a diagnosis of eczematous lesions, was prescribed topical corticosteroid therapy - mometasone 1% ointment. Two weeks of once-daily application yielded no clinical improvement. Moreover, new, similar lesions appeared on the entire back and the lateral aspects of the trunk.

On admission, the patient exhibited extensive erythematous, scaly plaques on the buttocks and trunk. Erythematous plaques were also present in the groins, with involvement of the anogenital area and the inner surfaces of the upper thighs. Some lesions, particularly on the back and lateral trunk, were annular with prominent inflammatory papules at the active borders (Figure 1A and B). The itch was preset and its severity was assessed using Numeral Rating Scale – NRS 0–10 points - where “0” means “no itching” and “10 points” means “most severe itching imaginable” - as 6 points, indicating itch of moderate intensity. *Tinea corporis* was suspected, and the patient was referred for mycological evaluation.

The specimens were obtained from the periphery of the skin lesions. The molecular testing detected DNA sequences of *Trichophyton tonsurans*. The molecular identification of the *Trichophyton tonsurans* was performed by the external commercial laboratory using EUROArray Dermatomyces kit from Euroimmune AG[®]. According to the manufacturer's documentation, the kit includes ready-to-use PCR master mixes and a microarray-based hybridization step following amplification, allowing simultaneous detection of 23 dermatophyte species and 3 yeast/mould species.

Oral terbinafine 250 mg once daily was commenced for one month. In addition, during the first two weeks the patient was instructed to apply twice daily a cream containing isoconazole nitrate and diflucortolone valerate, followed by



Figure 1 (A and B) Extensive erythematous, scaly lesions involving the trunk and buttocks.

a further two weeks of isoconazole nitrate cream alone. This regimen resulted in complete remission of the fungal lesions. At follow-up one month after cessation of therapy, the patient remained free of skin lesions.

Case Report 2

A 27-year-old male patient attended for dermatological consultation because of three newly developed skin lesions. He reported moving to Poland three years earlier from Belarus and working as a computer programmer. He was generally in good health, although he had cholecystolithiasis with periodic exacerbations. For the preceding two years, he had been training Kung-Fu twice weekly. He noted that his sparring partners had also suffered from similar skin lesions.

On examination, three almost identical annular erythematous-squamous lesions measuring 1.0–1.5 cm in diameter were found on the trunk, lower and upper limbs (Figure 2A–C). They were all located on the right side of the body. The patient reported no subjective symptoms. Given the clinical suspicion of a dermatophyte infection, mycological testing from the lesions was undertaken. Direct microscopy in 10% potassium hydroxide with the addition of dimethyl sulfoxide (DMSO) demonstrated hyphae with occasional spores. Subsequent molecular testing performed in the same laboratory as done for the previous patient, with the same technical procedure, confirmed *Trichophyton tonsurans* as the pathogen.

The patient was started on oral itraconazole 100 mg twice daily for four weeks and a topical combination cream containing isoconazole nitrate and difluocortolone valerate, applied twice daily. After two weeks, the lesions had markedly improved and resolved completely with a further two weeks of therapy. Follow-up one month later showed no recurrence.

Discussion

In both our patients, the etiological agent identified was *Trichophyton tonsurans*, regardless of the different sports activities they practiced.⁵ Although *T. tonsurans* is primarily associated with *tinea capitis*, it can also cause *tinea corporis* and *tinea cruris*.⁹ Both intensive physical exertion and skin-to-skin contact under conditions of increased temperature and humidity facilitate the transmission of dermatophytes and colonization of skin areas affected by microtrauma.^{10,11} In high-contact sports such as jiu-jitsu, Kung-Fu, wrestling or rugby, direct skin-to-skin contact is the primary route of infection spread.⁴ In sports with moderate or indirect contact, such as basketball or soccer, transmission occurs mainly through contaminated surfaces, including training mats or shared equipment.¹² Moreover, elevated temperature and humidity at the skin surface, resulting from occlusive sports clothing and excessive sweating, impair the epidermal barrier and alter the skin microbiome composition, facilitating adhesion and penetration of dermatophyte conidia.^{2,3}

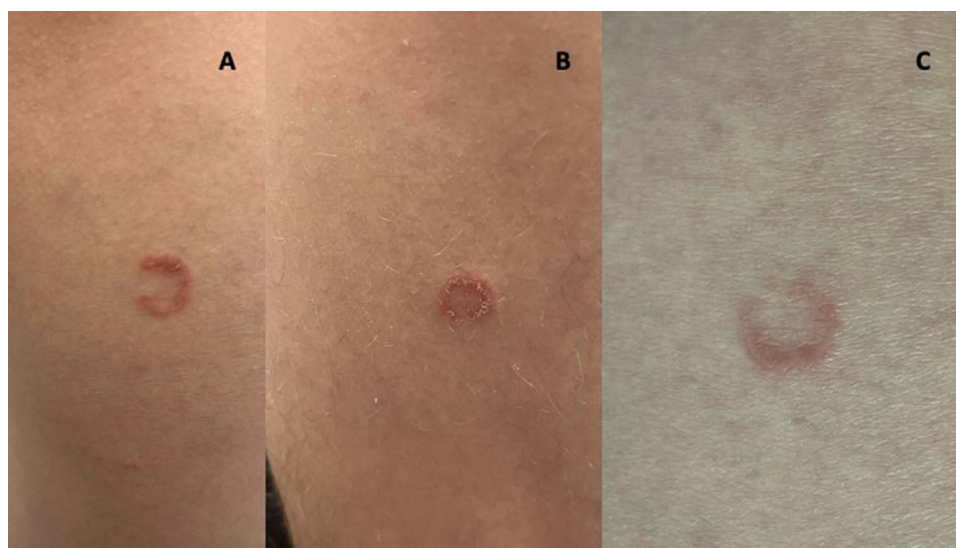


Figure 2 Tinea corporis gladiatorum: a limited number of annular erythematous-squamous lesions on the trunk (A), lower extremities (B), and upper extremities (C).

Sardana et al³ demonstrated that local pH disturbances, moisture, excessive perspiration, and the use of topical corticosteroids are key factors contributing to chronicity and recurrence of infections.

Both patients developed *tinea corporis* of varying severity and extent, indicating that the course of infection may be modulated by individual host factors and the skin microenvironment. In the first case (a professional basketball player), extensive lesions involving the buttocks, trunk, and groin were observed, suggesting a chronic course with dissemination following prior topical corticosteroid use. Such treatment predisposes to the development of *tinea incognito* - an infection variant with atypical morphology, masked by the anti-inflammatory effects of the steroid.³ In the second case (an amateur Kung-Fu athlete), the infection was localized, with a typical annular configuration of lesions consistent with a recent, superficial infection. It is worth mentioning that athletes practicing Kung-Fu wear looser clothing than other sports practitioners training in Eastern martial arts. This could also predispose our patients to more frequent skin-to-skin interactions.

The first case highlights the importance of accurate differential diagnosis of skin lesions in physically active individuals. Misdiagnosis and the use of topical steroids without prior mycological confirmation can lead to dissemination and chronicity of infection. Therefore, this case illustrates a typical extensive *tinea corporis* in a predisposed individual with previous corticosteroid treatment leading to the picture of *tinea incognito*. Introduction of systemic antifungal therapy (terbinafine 250 mg/d) combined with topical isoconazole resulted in complete remission, in accordance with current recommendations for the management of extensive dermatophyte infections.^{8,11}

In the second, milder case, *Tinea gladiatorum* was diagnosed. *Tinea gladiatorum* is a distinct form of dermatophytosis closely associated with combat and contact sports, most commonly caused by *Trichophyton tonsurans*, occurring among athletes from various countries, including the USA, Sweden, Spain, France, Turkey, Iran, and Mexico, and reported in the literature for over 30 years, reflecting its global distribution from northern to southern regions.⁵ Reported prevalence rates of *Tinea gladiatorum* vary substantially between cohorts, ranging from 4.3% in American high-school athletes, reflecting the impact of routine skin inspection and preventive hygiene protocols, to 20.1% among Iranian wrestlers.^{13,14}

The infection is particularly common in high-contact sports, where continuous physical interaction and shared sports equipment favor transmission.^{8,10} Contaminated mats, protective gear, and towels may serve as secondary sources of infection, while asymptomatic carriers often sustain the circulation of the pathogen within teams.¹⁰⁻¹² Clinically, tinea infections usually manifest as ring-shaped erythematous plaques with a slightly raised, scaly margin and a tendency toward central clearing.¹⁵ The extent and morphology of these lesions may vary from discrete rings to confluent inflammatory patches, depending on the individual host response and the duration of infection.^{3,16} In athletes - especially those affected by *Tinea gladiatorum* - lesions are most often observed on the head, neck, and upper trunk, corresponding to regions exposed to intense friction and close physical contact during training.⁵ Such microenvironmental factors, including humidity and perspiration, further facilitate fungal adhesion and persistence, increasing the likelihood of reinfection.^{2,3}

The Kung-Fu athlete exhibited three small annular lesions on the limbs corresponding to the early, localized form of *Tinea gladiatorum* described in the literature, consistent with the infection's presentation in high-contact sports where *Trichophyton tonsurans* transmission occurs through repeated skin-to-skin exposure.^{5,16} The identified pathogen, *Trichophyton tonsurans*, is well adapted to persist in such athletic environments, underscoring the importance of targeted prevention and hygiene measures to reduce transmission risk.^{10,11} At the same time, appropriate antifungal therapy may be crucial, and in our patient, treatment with itraconazole and a combined topical preparation proved effective, confirming the utility of combination therapy in localized superficial infections.

While inappropriate use of topical corticosteroid monotherapy in dermatophytic infections only transiently suppresses inflammation and masks clinical symptoms without preventing disease progression or spread, the use of combined topical antifungal/topical corticosteroid therapy offers several advantages over antifungal monotherapy alone.¹⁷ Combination therapy leads to more rapid resolution of inflammation and subjective symptoms, particularly itch. Reduction of itching decreases scratching behavior, thereby lowering the risk of skin barrier disruption and secondary bacterial infection. Clinical improvement in cutaneous dermatophytic infections treated with antifungal agents alone is often gradual.^{5,17} Faster visible improvement achieved with antifungal/corticosteroid combinations reinforces patient confidence in the treatment, improves adherence, and increases the likelihood of therapeutic success. Importantly, topical corticosteroids should not be used for longer periods, as prolonged use is associated with an increased risk of adverse effects, including cutaneous atrophy and secondary infections.¹⁷

Taken together, these two cases highlight complementary and clinically relevant aspects of sport-related dermatophytosis. The first case illustrates how inappropriate topical corticosteroid use in an athlete may mask typical features of dermatophytosis, leading to extensive disease and delayed diagnosis, consistent with the phenomenon of tinea incognito. In contrast, the second case underscores the potential for team-based transmission in contact sports such as Kung-Fu, where repeated skin-to-skin exposure may result in clustered, early-stage lesions typical of tinea corporis gladiatorum. The key clinical message is that in athletes, persistent or worsening annular or scaly plaques, particularly following topical steroid treatment, should prompt early mycological confirmation and timely initiation of antifungal therapy. Equally important are basic preventive measures at the team level, including identification of close contacts, avoidance of shared towels or equipment, and reinforcement of hygiene practices, to limit further transmission. Furthermore, education of athletes and coaches on early symptom recognition and prompt isolation of infected individuals could be crucial to limit the spread of disease outbreaks.¹²

Informed Consent

The consent was obtained from the patients to publish the case details and accompanying images. Institutional approval is not required for this case study.

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Disclosure

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