**Tinea cruris in Routine Urology Practice**

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**Introduction**

Tinea cruris is a ringworm infection of the groin, including genitalia, pubic area, perineum and perianal regions \([1, 2]\). It is almost exclusively an adolescent and adult male disease, mainly due to the role of the scrotum giving a humid and warm ambient that favors fungal growth \([3]\). The lesion may demonstrate an active border with erythema, scaling, papules, and vesicles. The eruption can be symptomatic or asymptomatic, unilateral or bilateral \([4]\). The simultaneous infection of the toe webs and/or plantar surfaces is common.

It is also easily differentiated from tinea incognito, seborrheic dermatitis, psoriasis, atopic eczema and inguinal lichen planus \([1, 2]\). Positive direct microscopic examination (DME) and/or culture confirms the diagnosis \([1, 2, 4]\). The most common causative agents are anthropophilic dermatophytes, *Trichophyton rubrum*, *Trichophyton mentagrophytes* and *Epidermophyton floccosum* \([1, 2, 4–6]\). However, infections due to zoophilic *Microsporum canis* \([5]\) or *Trichophyton verrucosum* \([6]\) were also reported. Predisposing factors also include high humidity, diabetes mellitus, obesity and autoinoculation from the foot to the groin \([1, 2]\).

The aim of this study is to describe and analyze the frequency of tinea cruris and its possible interrelation with tinea pedis in routine urology practice.
Patients and Methods

One hundred and fifty-five patients, with various clinical diagnosis and/or conditions, admitted to the Department of Urology at the Faculty of Medicine, Çukurova University between October 2003 and February 2004, were included in the study. The inguinal area and toewebs of the patients were examined and scrapings were taken from these areas during routine urologic examination. The inguinal region and feet were cleaned with 70% ethanol. Inguinal and toeweb scrapings were with and without lesions aseptically collected into sterilized paper packets. Mycologic examination of the clinical material was carried out at the Department of Clinical Microbiology, Faculty of Medicine, Çukurova University. DME was performed using 15% (w/v) potassium hydroxide (KOH). A portion of the specimens was placed on a microscopic slide and 50 μl of KOH was added. After 20 min, the wet preparation was examined for the presence of fungal elements and their diagnostic morphology such as spores, cross-walled septate hyphae, arthroconidia and/or yeast cells. Samples were also cultured onto agar slants of Sabouraud glucose agar (SGA; Acumedia, Baltimore, Md., USA), potato dextrose agar (PDA; Merck, Darmstadt, Germany) and mycobiotic agar (Difco Laboratories, Detroit, Mich., USA). The cultures were incubated at 25 °C and checked twice weekly. No growth by the 4th week was considered as culture-negative.

Dermatophyte isolates, if any, were then subcultured on SGA and PDA in Petri dishes. These species were identified by colony morphology and microscopic examination with lactophenol cotton blue preparation. In order to differentiate *T. rubrum* poorly pigmenting strains from *T. mentagrophytes var. interdigitale*, the urosease test was used. *Candida* species was identified using standard laboratory methods, including germ-tube test in human serum, morphology on corn-meal agar plus Tween 80 using the Dalmau method and the Fungichrom identification system [7, 8].

Results

From a total of 155 patients, 130 (83.9%) were male and 25 (16.1%) were female. The mean age of the patients was 55.5 ± 16.7 (range 19–80) years. In 36 (23.2%) of the patients urolithiasis, in 29 (18.7%) bladder cancer, in 17 (11.0%) benign prostate hyperplasia, in 16 (10.3%) prostate cancer and in 57 (36.8%) various other pathologies were the reason for admission. The mycological examination of these cases revealed, 2 (1.3%) positive only on culture, 15 (9.7%) positive only in DME, 22 (14.2%) positive on both culture and DME, and 116 (74.8%) negative on both culture and DME. Twenty-seven (69.2%) males and 12 (30.8%) females were found to be infected. There was no correlation between the reason for admission and the types of dermatomycosis.

In this study, genital dermatomycosis was found only in 6 patients; *T. rubrum* in 1 (16.7%), *T. mentagrophytes* in 2 (33.3%), *Candida albicans* in 2 (33.3%), and only DME was positive in 1 (16.7%) case. Toeweb dermatomycosis was found in 26 cases; *T. rubrum* in 6 (23.1%), *T. mentagrophytes* in 5 (19.1%), *C. albicans* in 6 (23.1%), *C. glabrata* in 1 (3.9%) and *C. tropicalis* in 1 (3.9%), also in 7 (26.9%) cases with both genital dermatomycosis and toeweb dermatomycosis was found positive in DME, but the causative agents could not be isolated (table 1).

Discussion

Tinea cruris is a common infection worldwide and is probably more prevalent in humid tropical countries [1, 2]. When the causal organism is *T. rubrum* there may be a reservoir of infection, such as the nails or soles of the feet. With *E. floccosum* infection there is no reservoir [4]. The scrotum may appear completely normal or minimally involved, even though mycologic examination shows the presence of organisms [1]. When the infection is caused by *Candida* spp., satellite pustules are less likely to be present in adults than in children, and in contrast, often present with obvious clinical disease on the scrotum or penis [1, 4].

In the present study, dermatomycosis was found in 39 of the patients. In 3 (7.7%) cases tinea cruris, in 11 (28.2%)
cases tinea pedis in 10 (25.6%) patients with *Candida* intertrigo (8 toeweb and 2 groin), and only DME were found positive in the remaining 15 (38.5%) cases. However, in our 3 patients with tinea cruris no lesion and no reservoir was defined. Also no lesion was detected on the buttocks, scrotum or penis. There was no concomitant infection of tinea pedis and tinea cruris. Dermatophyte fungi, *T. rubrum* and *T. mentagrophytes* var. *interdigitale* were responsible for most of the infections. Several species of *Candida* may be the causative agents, most commonly, *C. albicans*, as in our study. Tümbay et al. [5] reported the results of mycological examinations, in the inguinal epithelial scraping samples of 1,717 (94%) patients with DME and of 1,353 (74%) with culture, from a total of 1,827 patients suspected of inguinal mycosis. The causative fungi were reported as dermatophyte species in 88% and yeast fungi in 12% (*C. albicans* in 89%).

Tinea of the scrotum or penis is usually associated with tinea cruris. In the literature, scrotal involvement is common and often produces sharply demarcated, erythematous or pigmented areas on the groin [2]. Dekio et al. [9] described tinea of the scrotum with lichenified erythematous plaques with scaling on the scrotum. However, penile lesions are very rare, occurring more often with *E. floccosum*, and are scarcely evident clinically, of short duration, and often heal spontaneously. Also, Pandey et al. [10] detected penile involvement in 19.5% of 261 patients with tinea cruris, and this condition was more common under the age of 20, which probably related to the use of a langota, a semiocclusive undergarment that may favor the growth of fungi. Dekio and Jidoi [11] reported tinea of the glans penis due to *T. mentagrophytes* without any other skin lesion on the patient’s entire body. Dekio et al. [12] also reported tinea of the glans penis presenting as a crop of papules with slight scaling.

Tinea cruris may also be sexually transmitted. Infection in females is very rare. Otero et al. [13] diagnosed tinea cruris in 7 (0.4%) of 1,923 female prostitutes during the screening for the control of various sexually transmitted diseases (STD). For this reason, the patients who applied to STD units should also be examined for tinea cruris, and the sexual partner(s) of patients who has an infection should be investigated and treated accordingly.

Transmission is via direct contact or contact with infected squames, towels, bed linen, bedpans, clothing and urinals. The causative dermatophytes (especially *E. floccosum*) have been found to survive for long periods on shed squames. These infected scales provide a source for future infections that is difficult to eradicate and cause epidemics especially in places like dormitories, among military recruits, hospitals, and where people live together [1, 2]. *E. floccosum* is the most commonly known causative agent of tinea cruris epidemics [14–16].

In conclusion, examination of the genital area for dermatomycosis should be a part of routine urologic examination and the clinical diagnosis should be confirmed by mycological methods.

References


