

Case report

Cutaneous *Candida albicans* Infection Associated with Possible Household and Textile Contamination: A Case Report

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Email: S.jrad@uot.edu.ly**Abstract**

Cutaneous candidiasis is a common superficial fungal infection; however, its potential for intra-household transmission via contaminated fomites remains underexplored. In April 2026, a 54-year-old woman presented to a dermatology clinic in Tripoli City, Libya, with erythematous, pruritic lesions involving the neck, arms, and abdomen, without systemic symptoms. *Candida albicans* was recovered from the lesions. Household screening yielded positive cultures in three of four contacts, and the organism was also recovered from a used towel and a bed sheet. The patient received topical clotrimazole cream twice daily for four weeks. Marked improvement was observed within two weeks, followed by complete clinical resolution by week four. Avoidance of shared personal textiles and appropriate laundering were advised. No recurrence was documented during the four-week follow-up. This case demonstrates a temporal and microbiological association between cutaneous *Candida albicans* infection and contamination of shared household textiles. Because molecular typing was not performed, the findings do not establish genetic relatedness or the direction of transmission. Antifungal treatment combined with hygiene measures was associated with clinical resolution.

Keywords: Cutaneous candidiasis; *Candida albicans*; household textiles; possible household reservoir; antifungal therapy.

Introduction

Cutaneous infections caused by *Candida* species represent a significant proportion of superficial fungal diseases worldwide. These opportunistic yeasts are part of the normal human microbiota but may become pathogenic under favorable conditions such as increased moisture, occlusion, friction, immunosuppression, and poor hygiene practices [1,2]. *Candida albicans* remains the most commonly implicated species; however, non-*albicans* *Candida* species are increasingly reported in superficial and persistent infections [3,4]. Clinically, cutaneous candidiasis typically presents as erythematous, macerated, and pruritic lesions, particularly in intertriginous areas where heat and humidity facilitate fungal proliferation [5].

While the clinical aspects of cutaneous candidiasis are well established, the role of environmental reservoirs in infection persistence and transmission has received limited attention. Recent studies have demonstrated that *Candida* species can survive on textile surfaces, including clothing, towels, and bedding, maintaining viability for prolonged periods and acting as potential sources of indirect transmission [6,7].

Candida species can remain viable on porous and non-porous surfaces, including textile materials, for several days. These observations indicate that contaminated towels, clothing, or bed linen may act as temporary environmental reservoirs, although recovery from a surface alone does not prove transmission [5,6].

Well-documented clinical reports combining patient, household-contact, and textile sampling remain limited. This report describes a microbiologically documented case of cutaneous candidiasis and evaluates the possible contribution of shared household textiles without claiming confirmed transmission.

Case Presentation

In April 2026, a 54-year-old woman presented to a dermatology clinic in Tripoli City, Libya, with a three-week history of progressively worsening pruritic skin lesions involving the neck, both upper extremities, and the anterior abdominal wall. The lesions initially appeared as small erythematous patches and gradually increased in size despite the use of over-the-counter topical preparations. The patient denied fever, weight loss, fatigue, or other systemic symptoms. Her medical history was unremarkable. She had no known history of diabetes mellitus, immunodeficiency, malignancy, pregnancy, prolonged corticosteroid therapy, or recent systemic antibiotic or antifungal treatment. She also reported no previous episodes of recurrent or chronic fungal skin infection. During history taking, the patient stated that towels, clothing, and bed linens were frequently shared among members of her household.

Clinical examination revealed multiple well-demarcated erythematous plaques involving the neck, upper extremities, and anterior abdominal wall. The lesions were associated with mild scaling and superficial excoriations caused by scratching. There was no mucosal involvement, purulent discharge, fever, or clinical evidence of secondary bacterial infection. The initial differential diagnosis included tinea corporis, allergic or irritant contact dermatitis, seborrheic dermatitis, and other superficial fungal infections. Tinea corporis was considered less likely because the lesions lacked the characteristic advancing scaly border and central clearing. Contact dermatitis was also considered less likely because no clear history of exposure to a new irritant or allergen was identified. Nevertheless, microbiological investigation was performed because the clinical appearance alone was not considered sufficient to establish the causative organism.

Before initiation of antifungal treatment, sterile swabs were collected aseptically from the active margins of the affected skin lesions. The specimens were inoculated onto Sabouraud Dextrose Agar supplemented with chloramphenicol. The

inoculated plates were incubated aerobically at 25°C and examined daily for fungal growth for two to five days, as shown in Figure 1.



Figure 1. Growth of *Candida albicans* on Sabouraud Dextrose Agar after

After incubation, smooth, creamy-white yeast colonies were observed. Microscopic examination of representative colonies using lactophenol cotton blue staining demonstrated oval budding yeast cells with pseudohyphal formation. The isolates produced positive germ-tube reactions, supporting presumptive identification as *Candida albicans*. Phenotypic identification was subsequently performed using the API 20C AUX biochemical system, which identified the isolates as *C. albicans*. Quantitative culture of the baseline clinical specimens yielded fungal counts ranging from 10^3 to 10^5 CFU/swab. The combination of compatible clinical findings, repeated isolation of *C. albicans* from the affected sites, microscopic findings, and phenotypic identification supported the diagnosis of cutaneous candidiasis caused by *C. albicans*.

Following identification of the index case, microbiological screening was extended to four household contacts, consisting of the patient's spouse, two children, and one sibling. The spouse had no clinical signs of infection but had a positive culture for *C. albicans*, which was interpreted as asymptomatic colonization or contamination rather than active infection. One child had a mild cutaneous rash and a positive culture, while the second child had no clinical signs and a negative culture. The sibling also had a mild cutaneous rash accompanied by a positive culture. Overall, three of the four household contacts were culture-positive, corresponding to a positivity rate of 75%. Two of the four contacts were both symptomatic and culture-positive, representing 50% of those screened.

Environmental sampling was subsequently performed on one used towel and one shared bed sheet. Sterile saline-moistened swabs were used to collect specimens from the selected textile surfaces. The specimens were cultured on Sabouraud Dextrose Agar supplemented with chloramphenicol and incubated under the same conditions used for the clinical specimens. *Candida albicans* was recovered from both sampled items. Quantitative recovery from the used towel ranged from 10^1 to 10^3 CFU/cm², whereas *C. albicans* was detected on the bed sheet but was not quantified. Thus, both sampled textile items were culture-positive. However, because only two selected household items were examined, this finding should not be interpreted as representing the overall prevalence of household environmental contamination.

Antifungal activity was evaluated by the disk-diffusion method against fluconazole, itraconazole, ketoconazole, and nystatin. The tested isolates demonstrated measurable growth inhibition around all four antifungal disks, and no complete absence of inhibition was reported. However, because the disk contents and inhibition-zone diameters were not available in the laboratory record, formal susceptible, intermediate, or resistant classifications could not be independently verified. Therefore, the findings were interpreted descriptively as evidence of in vitro growth inhibition rather than definitive susceptibility percentages. The patient was treated with topical clotrimazole cream applied to the affected areas twice daily for four weeks. The exact concentration of the preparation was not documented in the available clinical record. She and her household contacts were advised to avoid sharing towels, clothing, and bed linens and to implement appropriate laundering and drying practices.

A marked reduction in erythema and pruritus was observed by the second week of treatment. By the fourth week, the lesions had resolved completely, with no evidence of secondary infection or mucosal involvement. Follow-up swabs collected after completion of treatment demonstrated a marked reduction in fungal recovery, with counts decreasing to below 10^2 CFU/swab. No clinical recurrence was documented during the four-week follow-up period. The symptomatic household contacts also improved following hygiene measures and topical antifungal treatment when clinically indicated.

Written informed consent was obtained from the patient for the publication of anonymized clinical and microbiological information. All identifying information was removed to preserve patient confidentiality.

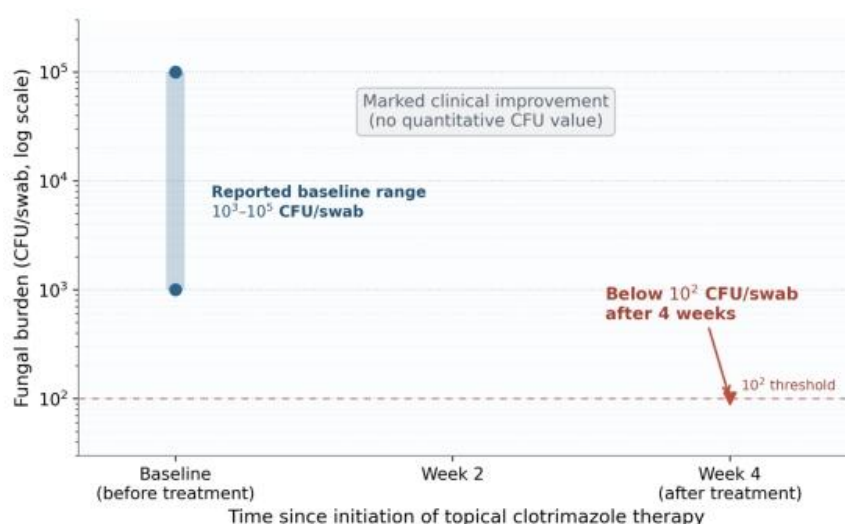


Figure 2. Changes in fungal burden before and after topical Clotrimazole treatment.

Discussion

Cutaneous candidiasis is a common superficial fungal infection that develops when *Candida* species shift from harmless colonization to pathogenic growth under favorable local or systemic conditions. In this case, *Candida albicans* was identified as the causative organism in a 54-year-old immunocompetent woman who presented with pruritic erythematous lesions involving the neck, upper extremities, and anterior abdominal wall. The diagnosis was established through clinical examination, fungal culture, microscopic demonstration of budding yeast cells and pseudohyphae, a positive germ-tube reaction, and phenotypic identification using the API 20C AUX system.

The clinical features observed in this patient were consistent with those described by Talapko et al. [1] and Metin et al. [2], who reported erythema, pruritus, scaling, maceration, and superficial erosions among the common manifestations of cutaneous candidiasis. Although candidal lesions most frequently affect intertriginous areas, López-Martínez [3] indicated that infection may also involve other skin sites when moisture, friction, occlusion, or repeated exposure creates a suitable environment for fungal growth. These factors may explain the distribution of lesions over the neck, arms, and abdominal wall in the present case. The patient did not have diabetes mellitus, immunodeficiency, malignancy, pregnancy, prolonged corticosteroid exposure, or recent antibiotic treatment. These findings suggest that local and environmental factors may have played a greater role than systemic predisposition. Frequent sharing of towels, clothing, and bed linens was identified during history taking and was considered clinically relevant because these materials come into repeated contact with the skin and may retain moisture for prolonged periods.

Microbiological identification was based on several complementary methods. The recovery of smooth, creamy-white colonies, together with microscopic detection of budding yeast cells and pseudohyphae, supported the initial identification of a *Candida* species. The positive germ-tube test and API 20C AUX result subsequently identified the organism as *C. albicans*. Arastehfar et al. [4] reported that API 20C AUX performs well in identifying commonly encountered *Candida* species, particularly when its results are supported by colony morphology and other phenotypic tests. The agreement among the identification methods used in this case therefore provided reliable evidence that *C. albicans* was associated with the observed skin lesions.

The baseline fungal burden ranged from (10^3) to (10^5) CFU/swab, indicating considerable fungal recovery from the affected sites. Following four weeks of topical clotrimazole therapy, the fungal count decreased to below (10^2) CFU/swab. This microbiological reduction corresponded with the clinical response, as erythema and pruritus improved markedly by the second week and the lesions resolved completely by the fourth week. This outcome agrees with Metin et al. [2] and López-Martínez [3], who reported that localized cutaneous candidiasis generally responds well to appropriate topical antifungal treatment, particularly when associated local conditions are addressed.

An important observation in this case was the recovery of *C. albicans* from three of the four household contacts. Two culture-positive contacts had mild skin lesions, while the culture-positive spouse was asymptomatic. These findings demonstrate the different clinical states associated with *Candida*, ranging from asymptomatic colonization to superficial infection. Bougnoux et al. [7] identified identical or closely related *C. albicans* isolates among members of the same family and suggested that household members may share strains or experience exposure to common sources. Although their investigation concerned gastrointestinal carriage, their findings support the epidemiological relevance of examining household contacts when *C. albicans* is recovered from several individuals living in the same home.

The isolation of viable *C. albicans* from the used towel and bed sheet further supported the presence of a household environmental reservoir. The fungal burden recovered from the towel ranged from (10^2) to (10^3) CFU/cm², while contamination of the bed sheet was detected qualitatively. Koca et al. [5] demonstrated that *C. albicans* could remain viable on different fabric materials for several days. Similarly, Traoré et al. [6] reported survival of *Candida* species on porous

and non-porous environmental surfaces. The findings of the present case are consistent with these studies and show that frequently used household textiles can retain viable *C. albicans*.

The used towel may have provided particularly favorable conditions for fungal persistence because towels frequently remain moist and come into repeated contact with the skin. Bed linens may also become contaminated through prolonged contact with affected or colonized skin. The recovery of *C. albicans* from both items provides a microbiological explanation for the potential continuation of exposure within the household. These results emphasize the importance of avoiding shared towels and clothing and ensuring appropriate laundering and complete drying of household textiles.

The clinical and environmental findings were addressed simultaneously. The patient received topical clotrimazole twice daily for four weeks, while the household was advised to avoid sharing personal textiles and to improve laundering and drying practices. The complete resolution of the patient's lesions, improvement of the symptomatic household contacts, and absence of documented recurrence during follow-up indicate a favorable outcome following the combined clinical and hygiene interventions. Addressing both the affected individuals and potentially contaminated materials may therefore be beneficial when superficial candidiasis occurs among members of the same household.

Disk-diffusion testing showed growth inhibition around fluconazole, itraconazole, ketoconazole, and nystatin disks. These findings demonstrated in vitro activity of the tested antifungal agents against the recovered isolates. The observed response to topical clotrimazole was also consistent with the favorable clinical course. Standardized interpretation of disk-diffusion results depends on the tested organism, antifungal agent, disk concentration, and inhibition-zone diameter, as described in CLSI M44 [8]. Therefore, recording complete zone measurements in future household investigations would permit more detailed comparison among clinical and environmental isolates. The main significance of this case lies in the concurrent recovery of *C. albicans* from the patient, household contacts, and shared textiles. Previous studies have separately demonstrated familial carriage of *C. albicans* and its survival on fabrics [5–7]. This case brings these observations together within a clinical household setting and illustrates how patient-related, household, and environmental factors may coexist during cutaneous candidiasis.

Because molecular typing was not performed, the genetic relationship among the recovered isolates and the precise direction of transmission were not determined. Nevertheless, the clinical history, household distribution of positive cultures, and recovery of viable *C. albicans* from shared textiles support the presence of a possible common household reservoir. Further case investigations incorporating molecular comparison of clinical and environmental isolates would provide additional information regarding the dynamics of *C. albicans* within households. Overall, this case demonstrates the importance of extending the assessment of cutaneous candidiasis beyond the affected patient when other household members have compatible symptoms or when personal textiles are frequently shared. The findings support combining appropriate antifungal therapy with household hygiene measures to reduce repeated exposure and promote sustained clinical recovery.

Conclusion

This case describes a microbiologically confirmed cutaneous *Candida albicans* infection in an otherwise healthy woman, with concurrent recovery of *C. albicans* from three household contacts, a used towel, and a shared bed sheet. The findings indicate that frequently shared household textiles may serve as temporary fungal reservoirs and contribute to repeated exposure within the home. Topical clotrimazole treatment administered twice daily for four weeks resulted in marked clinical improvement by the second week and complete resolution by the fourth week. This clinical response was accompanied by a reduction in fungal burden from 10^3 – 10^5 CFU/swab at baseline to below 10^2 CFU/swab after treatment. The improvement observed after combining antifungal therapy with household hygiene measures highlights the importance of managing both the infection and potential environmental reservoirs. Although molecular typing was not performed to establish genetic relatedness among the isolates, the simultaneous recovery of phenotypically identified *C. albicans* from the patient, household contacts, and shared textiles supports the possibility of a common household reservoir. Therefore, avoidance of shared personal textiles, appropriate laundering, and adequate drying should be considered alongside antifungal treatment, particularly when compatible infections occur in more than one household member. Future studies incorporating molecular typing and standardized environmental sampling are recommended to clarify the role of household textiles in the persistence and transmission of cutaneous candidiasis.

Conflict of interest. Nil

References

1. Talapko J, Juzbašić M, Matijević T, Pustijanac E, Bekić S, Kotris I, Škrlec I. *Candida albicans*: the virulence factors and clinical manifestations of infection. *J Fungi (Basel)*. 2021;7(2):79.
2. Metin A, Dilek N, Bilgili SG. Recurrent candidal intertrigo: challenges and solutions. *Clin Cosmet Investig Dermatol*. 2018;11:175-85.
3. López-Martínez R. Candidosis, a new challenge. *Clin Dermatol*. 2010;28(2):178-84.
4. Arastehfar A, Fang W, Pan W, et al. Comparison of 21-plex PCR and API 20C AUX, MALDI-TOF MS, and rDNA sequencing for a wide range of clinically isolated yeast species: improved identification by combining 21-plex PCR and API 20C AUX as an alternative strategy for developing countries. *Front Microbiol*. 2019;10:192.
5. Koca O, Altöparlak U, Ayyıldız A, Kaynar H. Persistence of nosocomial pathogens on various fabrics. *Eurasian J Med*. 2012;44(1):28-31.

6. Traoré O, Springthorpe VS, Sattar SA. A quantitative study of the survival of two species of *Candida* on porous and non-porous environmental surfaces and hands. *J Appl Microbiol.* 2002;92(3):549-55.
7. Bougnoux ME, Diogo D, François N, et al. Multilocus sequence typing reveals intrafamilial transmission and microevolutions of *Candida albicans* isolates from the human digestive tract. *J Clin Microbiol.* 2006;44(5):1810-20.
8. Clinical and Laboratory Standards Institute. Method for antifungal disk diffusion susceptibility testing of yeasts. 3rd ed. CLSI guideline M44. Wayne (PA): Clinical and Laboratory Standards Institute; 2018.