

Case Report

Trichosporon species isolated from scald burn wound in an immunocompetent adult: a case report from Southern Assam

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ABSTRACT

There are quite a good number of case reports on fungal infection in burn wounds in addition to the conventionally notorious bacterial infections in immune-compromised burn trauma patients leading to protracted course of morbidity and higher chances of mortality due to delay in diagnosis. The incidence of fungal infection in burn patients has been increasing with paradigm shift of causal fungus over last 2 decades from *Candida albicans* and molds to non-albicans *Candida*, *Trichosporon* species and other yeast like fungus. But there are rarely few cases of invasive *Trichosporon* infection in scald burn wounds in immunocompetent individuals. We therefore report a case of *Trichosporon* species isolation from a scald burn ulcer of an immunocompetent young male industrial worker in 2nd week of its clinical course which responded to oral fluconazole followed by skin grafting since this case scenario in itself is an uncommonly presented and reported event coupled with finding of first ever case with such presentation in this tertiary care institute of Southern Assam. This case is also reported with intention of raising awareness in surgeons for keeping vigil on non-healing burn wounds with empirical antibiotics and about the need of timely pus culture and sensitivity testing to rule out fungal colonization and prevent mortality due to disseminated fungal infection.

Keywords: Trichosporon, Pus culture, Scald burn, Immunocompetent, Assam

INTRODUCTION

Trichosporon species are being increasingly reported to be emerging pathogenic yeast-like fungi among a wide spectrum of clinical presentation ranging from superficial involvement in immunocompetent to disseminated invasive disease among immunocompromised hosts. Though the fungus is an established cause of White Piedra, recently *Trichosporon* species have been implicated in systemic infections in both normal and immunocompromised hosts. Such infections include endocarditis, pneumonia, cellulitis, glomerulonephritis, endophthalmitis, brain abscess, otomycosis, onychomycosis, hypersensitivity pneumonitis, life threatening dissemination.¹ Neutropenia developing to malignancies has been implicated as an important risk for

Trichosporon infection. Burn patients are known to have a transient defect in neutrophil function that can predispose them to *Trichosporon* infections.² But *Trichosporon* in isolated burn wound infection was reported less commonly in the past as compared to incidence of *Candida* species, *Aspergillus* and *Fusarium* in immunocompromised state of burn.³⁻⁵ There are only few case reports of disseminated *Trichosporon* infection in burn patients but that too were in immunocompromised patients.⁶

CASE REPORT

Since there has been very limited reports of this organism in burn wounds, we thus report here a case of isolation of *Trichosporon* species from an ulcer over left thigh following scald burn due to accidental fall of unspecified

boiling molten chemical while working in the factory (Figure 1). The case is being reported or presented with due consent of the patient who was a 20 year old immunocompetent male working in a factory in a rural area of southern part of Assam at the time of his presentation. The patient reported to the only tertiary referral healthcare center of Southern Assam in the month of June 2018, approximately 12 days after sustaining the burn injury at his workplace. Initially there was blister followed by eschar formation on lateral aspect of left thigh which started to slough off after 7 days of sustaining the burn wound. When the patient reported to the department

of surgery with Eschar (Figure 1) over the wound and partially sloughed off ulcer, escharotomy was done. This was followed by thorough debridement and regular wound dressing and empirical antibiotic therapy with meropenem and piperacillin-tazobactam was initiated after sending sample for culture and sensitivity.

Figures 1 show sequential progression of wound from eschar to healing ulcer through escharotomy and debridement.

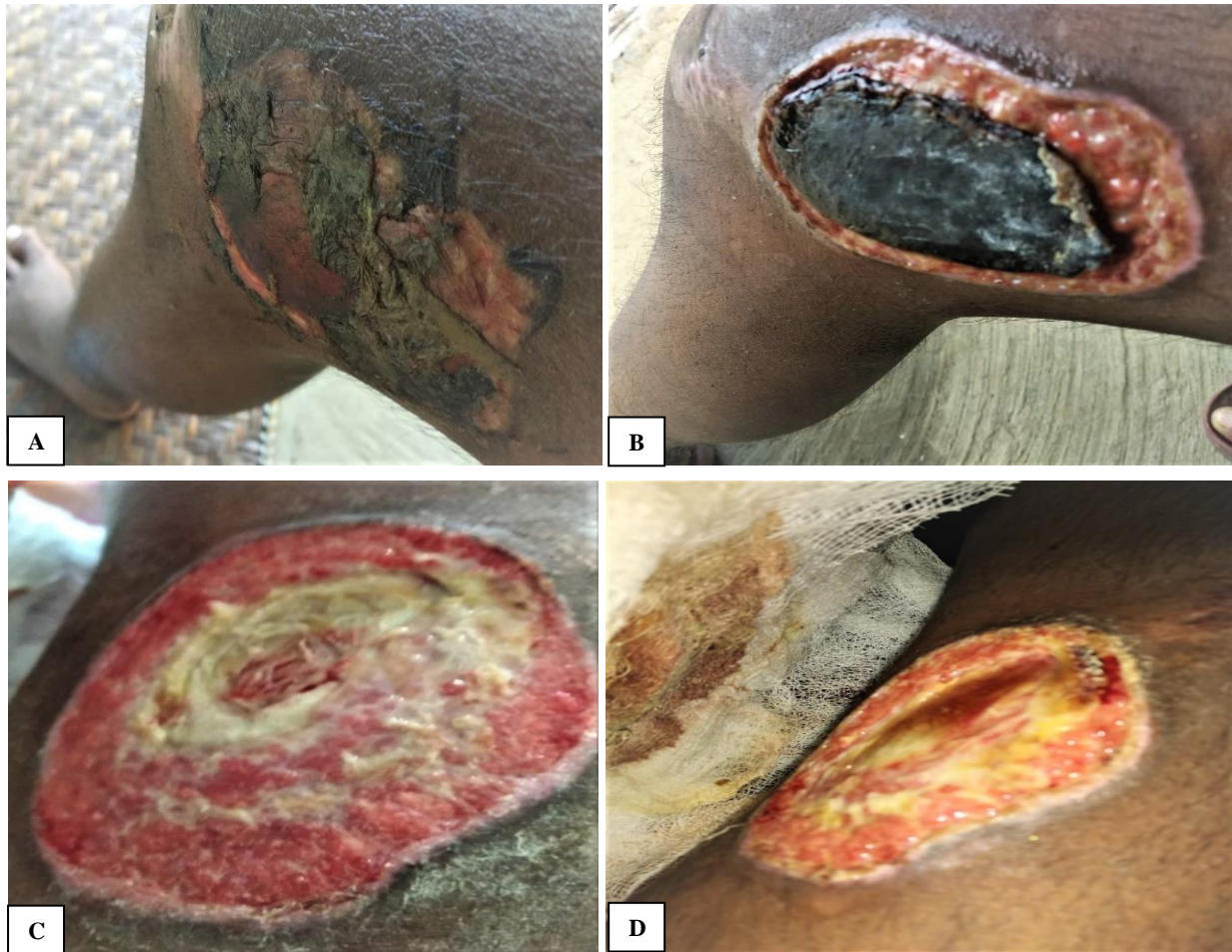


Figure 1 (A-D): Figures show sequential progression of wound from eschar to healing ulcer through escharotomy and debridement.

The patient was non diabetic and not on steroid or any other immunosuppressive therapy. His routine hematological and biochemical parameters did not show any significant anomaly except raised total leucocyte count and C-reactive protein (CRP). Result of his serological screening for blood borne viruses was also negative. Pus and slough (Figures 1) culture confirmed the causative organism to be *Trichosporon* species after which the patient was initiated on oral fluconazole 150 mg/day for 4 weeks in response to which the lesion started to heal and partial thickness skin grafting was planned after observing for 7 days post initiation of therapy. Meropenem

coverage was continued to prevent nosocomial superadded bacterial infection of burn wound.

Material and Method

Sterilized cotton swab carefully rolled over the slough material and edge and base of the ulcer (10×6×0.5 cm) was collected and sent to the department of microbiology for culture and sensitivity of pus and slough samples. The swabs were streaked on blood agar and MacConkey's agar plates and incubated under aerobic conditions at 37° C.



Figure 2: Colonies of *Trichosporon* species on Blood Agar plate.



Figure 3: Colonies of *Trichosporon* species on MacConkey agar.

After 24 hours, moist yeast like cream colored, soft and folded grain like colonies were formed on both types of agar plate. Gram staining from both the plates were done which revealed budding yeast like cells with hyphae following which lactophenol cotton blue mount was done by scotch tape method which revealed septate hyphae with rectangular arthrospores in chains. Since it pointed towards isolation of yeast like fungus other than *Candida*, an initial intimation was sent and this being an uncommon isolate in a burn wound, request for a fresh sample was made for confirmation of diagnosis and thus repeat sample was collected from the burn wound ulcer for to rule out skin contamination. Direct examination of slough material with 10% potassium hydroxide (KOH) revealed hyaline septate fungal hyphae. The repeat swab containing pus was inoculated by streak culture on blood agar, MacConkey agar and sabouraud dextrose agar with chloramphenicol but without actidione simultaneously and incubated at 37° C. After 36 hours of incubation in the mycology section of microbiology, moist white yeast-like cream colored, soft and folded radiating colonies were noted on all the 3 media (Figures 3-5).

Gram staining done from similar colonies on all 3 plates showed budding yeast like cells with hyphae and

rectangular arthroconidia. Lactophenol cotton blue mount was done from SDA tube which showed septate hyphae, rapidly fragmenting to form rectangular arthroconidia (Figure 6). Germ tube test was negative. Urea hydrolysis was positive due to urease production. This isolate did not ferment carbohydrate but showed sugar assimilation. All this pointed towards diagnosis of *Trichosporon* species.

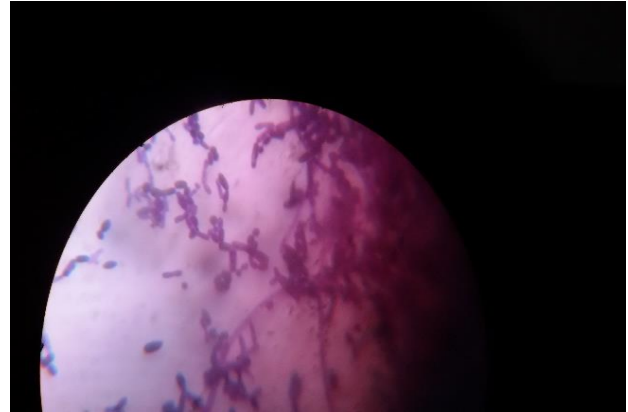


Figure 4: Budding yeast like cells with hyphae and pseudohyphae seen in gram-stained smear.

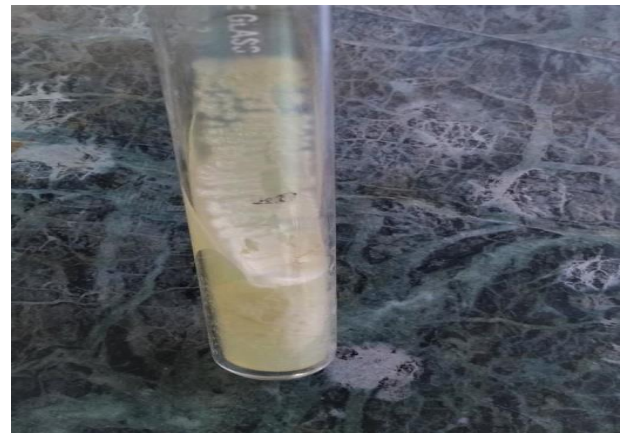


Figure 5: *Trichosporon* spp colony morphology on SDA.

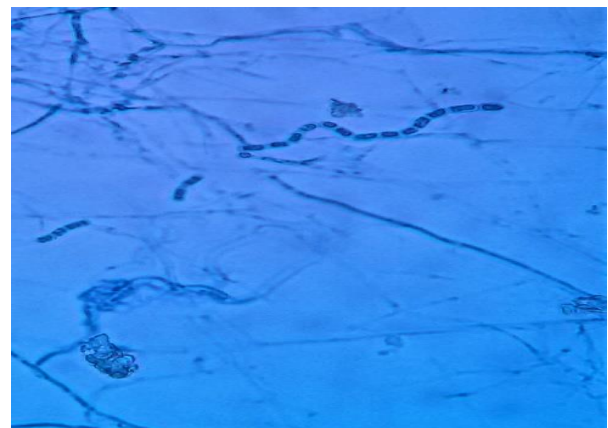


Figure 6: Appearance of arthroconidia in LPCB.

DISCUSSION

Invasive fungal burn wound infection is an important emerging cause of late onset morbidity and high mortality in patients with major burns.⁷ So, management of invasive fungal burn wound infection by emerging opportunistic nosocomial pathogen like *Trichosporon* is often a challenging task.⁸ But early diagnosis and correct treatment can help reduce dissemination and mortality. Sharma et al found that the incidence of fungal infection in thermal burn tends to increase from second week onwards post burn.⁹ So has been found in this case too where he reported to hospital with this infection on day 12 post burn. But Sharma et al also found *Candida* species and moulds like *Aspergillus* to be the common causative organism of fungal burn wound infections like Still et al, Macmillan et al, and Kidson et al.³⁻⁵ This has also been seconded by Sarabhai et al from North India.⁷ In contrast to this finding, cases of isolated and disseminated *Trichosporon* infection of burn wounds have been reported by Gardener et al after 3rd week post burn, Hajjeh et al, Orville et al and Cawley et al in burn care centres which supports our isolation of *Trichosporon* in this case of scald burn ulcer.^{2,6,10,11}

As found in this reported case that culture positive fungal burn wound infection was diagnosed in 2nd week post burn, similar conclusion was stated by Bruk et al who stated that incidence of colonisation of burn wound by fungi and yeast was high after 1st week post burn, which was also found true in thermal burns by Sharma et al.^{9,12} At par with our report, isolation of *Trichosporon* after 2nd week of clinical course post burn was published by Orville et al.⁶

Although there has been reports of resistance of non-*Candida albicans* yeasts to triazoles and variable response to amphotericin B by Still et al and Orville et al surprisingly this case responded satisfactorily to oral fluconazole therapy daily for 4 weeks. Similar to our finding, susceptibility of *Trichosporon beigelli* isolate to triazoles from a burn case was also reported by Hajjeh et al in a burn care centre of Atlanta.^{2,3,6} This finding of antifungal susceptibility is also seconded in the study on yeast in burn care centre of Georgia by Still et al where *Trichosporon beigelli* isolates from burn wounds were more susceptible to fluconazole than other triazoles and amphotericin B.¹³

One note-worthy point in this case was fungal isolation from localised burn ulcer despite overall immunocompetent state and no history of prior prolonged use of any corticosteroids or immunosuppressant drugs.

CONCLUSION

Though some bacterial pathogens are notorious for nosocomial infections of burn wounds, the possibility of fungal colonization of burn wounds must always be borne in mind by clinicians and surgeons both in immunocompetent and especially in immunocompromised states as fungal burn wound

infection if not diagnosed timely may lead to dissemination and contribute to invasive morbidity and mortality of the cases.

Keeping in mind the reports of isolation of *Trichosporon* like yeasts and emergence of drug resistance in *Candida* and other yeast like species, it's always advisable to the clinicians to maintain strict vigil on non-healing burn wounds and send pus or slough from wound or ulcer for timely culture and sensitivity so that causal fungal pathogen if any can be detected and specified susceptible antifungals can be initiated without any delay by experimenting with empirical antibiotics.

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REFERENCES

- Chander J. Text Book of Medical Mycology. 4th edition. Jaypee Brothers Medical Publishers. 2018.
- Hajjeh RA, Blumberg HM. Bloodstream infection due to *Trichosporon beigelli* in a burn patient: case report and review of therapy. Clin Infect Dis. 1995;20:913-6.
- Still JM, Orlet K, Law EJ. *Trichosporon beigelli* septicaemia in a burn patient. Burns. 1994;20(5):467-8.
- Macmillan B, Law E, Holder I. Experience with *Candida* infections in the burn patient. Arch Surg. 1972;104:509-12.
- Kidson A, Lowbury JL. *Candida* infection of burns. Burns. 1979;8:228-30.
- Heslop OD, Nyi MPN, Abbott SP, Rainford LE, Castle DM, Coard KCM. Disseminated *Trichosporon* infection in a Burn Patient: Meningitis and Cerebral Abscess Due to *Trichosporon asahii*. J Clin Microbiol. 2011;9:4405-8.
- Sarabahi S, Tiwari VK, Arora S, Capoor MR, Pandey A. Changing pattern of fungal infection in burn patients. Burns. 2012;38:520-8.
- Lomasa LT, González MDG, Luengo AIM, Bouzab JME, Pérez JMP. Nosocomial infection due to *Trichosporon asahii* in a critical burned patient. Rev Iberoam Micol. 2015;32(4):257-60.
- Sharma S, Bajaj D, Sharma P. Fungal Infection in Thermal Burns: A Prospective Study in a Tertiary Care Centre. J Clin Diagnost Res. 2016;10(9):5-7.
- Gardener JC, Chopra VK, Filicori F, Murphy J, Greenway A, Gallagher JJ, Bessey PQ, Hough A, Eachempati SR, Barie PS. Angioinvasive mold in the

- surgical and burn intensive care unit: A case series and review of the literature. *Surg Infect Case Rep.* 2016;1:1:72-8.
11. Cawley MJ, Braxton GR, Haith LR, Reilly KJ, Guilday RE, Patton ML. *Trichosporon beigelii* infection: experience in a regional burn Center. *Burns.* 2000;26:483-6.
 12. Bruck HM, Nash G, Foley FD, Pruitt BA. Opportunistic Fungal infection of burn wound with phycomycetes and aspergillus. A Clinical-pathological review. *Arch Surg.* 1971;102:476.
 13. Still JM, Law EJ, Belcher KE, Spencer SA. A comparison of susceptibility to five antifungal agents of yeast cultures from burn patients. *Burns.* 1995;21(3):167-70.

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