Volume 24 Number 2| February 2018
24(2): 9

Ulcerative cellulitis of the arm: a case of primary cutaneous cryptococcosis

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Abstract:

Cutaneous cryptococcosis is usually secondary to the hematogenous dissemination of pulmonary or meningeal *Cryptococcus neoformans*. Primary cutaneous cryptococcosis (PCC) is a rare form of the infection, typically caused by direct inoculation from trauma to the skin [1]. Most cases of PCC present as a localized cellulitis, abscess, nodule, or ulceration. Herein, we present a case of a rapidly spreading cellulitis characterized by bullae and ulceration, caused by direct inoculation from a fall.

Keywords: primary cutaneous cryptococcosis, Cryptococcus neoformans, cryptococcal cellulitis, antifungal therapy

Case Synopsis

A 69-year-old man presented with rapidly spreading bullous edema and ulceration of his right arm after injuring his elbow in a fall two weeks earlier. One week prior to presentation, he had been admitted for four days of intravenous cefazolin for suspected bacterial cellulitis (**Figure 1**) and was discharged on oral cephalexin. His past medical history was notable for hemochromatosis and inoperable stage IV bronchial squamous cell carcinoma; he had completed chemoradiation therapy nine months prior. Physical examination showed extensive circumferential ulceration of the epidermis and dermis, extending from the wrist to the shoulder (**Figure 2**). Urgent skin biopsy showed encapsulated yeast on frozen section. Cryptococcal serum antigen titer was positive at 1:2 (normal is undetectable). Histologic findings (**Figure 3**) and biopsy culture confirmed *C. neoformans*. Lumbar puncture, chest x-ray, and HIV antibody test results were normal or negative. The patient was discharged home on oral fluconazole 400 mg daily. One year later, he remains on treatment with near complete healing of the cutaneous ulcers.

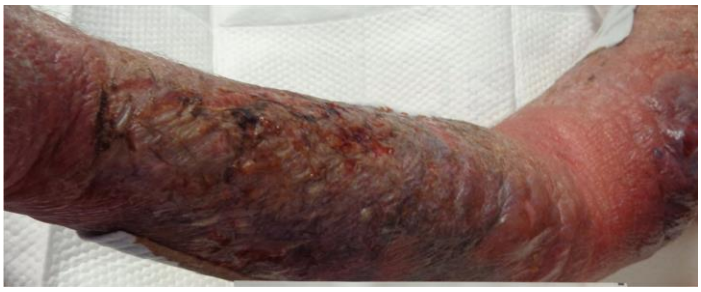

Figure 1. *A bullous cellulitis involving the entire right arm, one week after a fall.*

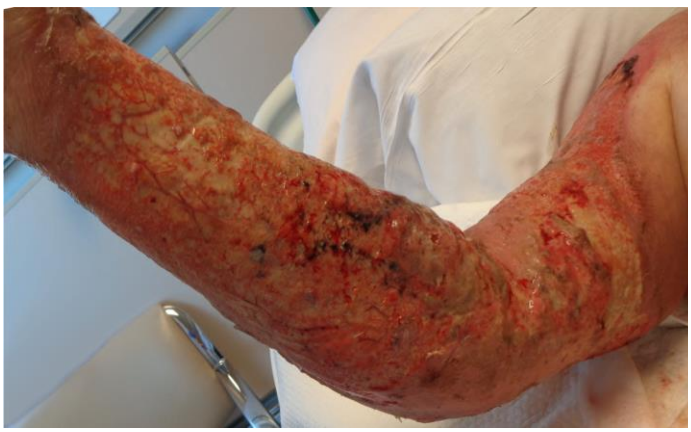

Figure 2. *By week two there has been sloughing of much of the epidermis.*

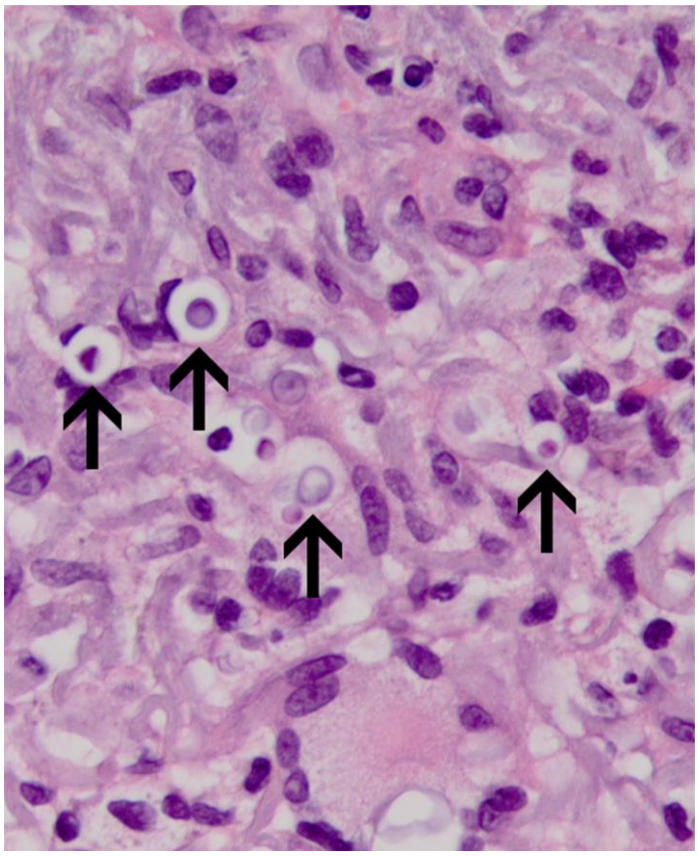

Figure 3. *Skin biopsy demonstrated Cryptococcus yeast forms surrounded by thick mucoid capsules (arrows) H&E, 100×.*

Case Discussion

Cryptococcus is a ubiquitous environmental yeast associated with symptomatic infection, particularly in the immunocompromised host. The most serious complication is cryptococcal meningitis, with approximately one million HIV-associated cases worldwide annually [1]. Skin involvement is usually secondary to central nervous system or pulmonary disease and often presents as multiple scattered umbilicated molluscum-like papules. Primary cutaneous cryptococcosis by direct inoculation is rare and may present as cellulitis, an abscess, a nodule, or an ulceration in both immunocompetent and immunocompromised patients [2, 3]. This case is particularly notable owing to its severity and extensive spread. Preceding trauma is the most common risk factor for acquisition, whereas corticosteroid use and solid organ transplantation are the most common causes of immunosuppression in immunocompromised patients.

The Infectious Disease Society of America recommends oral azole therapy for 6-12 months for treatment of non-central nervous system, non-disseminated cryptococcosis [4]. Fluconazole has frequently been reported as a successful option, often in combination with debridement. Prognosis is generally favorable, with the vast majority of cases reporting cure within ten months of antifungal treatment [4]. However, bacterial superinfection may arise as a complication, necessitating antibacterial co-treatment with coverage for methicillin-resistant *Staphylococcus aureus* and *Pseudomonas*.

Conclusion

Primary cutaneous cryptococcosis is a rare form of cryptococcosis, but carries a significant risk of morbidity in affected patients owing to potential delays in diagnosis and the organism's ability to spread. Although cases of cellulitis have been previously reported, this case presented with an unusually extensive infection. Failure of a suspected bacterial cellulitis to respond to antibacterial treatments, particularly in the setting of recent trauma, should prompt further investigation into potential fungal causes. Skin biopsy is useful for diagnosis, as well as chest X-ray and cerebrospinal fluid studies to evaluate for disseminated infection. Rapid initiation of treatment with fluconazole, often in combination with debridement, generally results in a favorable prognosis.

References

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