Primary cutaneous cryptococcosis in an elderly pigeon breeder

Meghan Beatson, BS,[a,b,c] Michael Harwood, MD,[d] Vail Reese, MD,[e] and Leslie Robinson-Bostom, MD[b,c]
Washington, DC; Providence, Rhode Island; New Haven, Connecticut; and San Francisco, California

Key words: *Cryptococcus neoformans*; disseminated cryptococcosis; primary cutaneous cryptococcosis; secondary cutaneous cryptococcosis.

INTRODUCTION

Disseminated cryptococcosis is an infection seen most commonly in immunocompromised populations. Although infection with the dimorphic fungus *Cryptococcus neoformans* can cause serious systemic complications, 10% to 20% of these patients also have cutaneous lesions.[1] The existence of cutaneous cryptococcosis in immunocompetent patients, without evidence of disseminated disease, is less common. We report a case of an otherwise healthy pigeon breeder presenting with cutaneous cryptococcosis without evidence of disseminated illness.

Abbreviations used:

CT: computed tomography
PCC: primary cutaneous cryptococcosis

CASE REPORT

An 80-year-old man with a medical history of hypertension, gout, and hypercholesterolemia, presented with a 4-week history of ulcerated plaques on the left cheek and right ear. The lesions began as pruritic papules that progressively ulcerated. Physical examination found 2 well-demarcated crusted plaques on his left cheek, measuring 2.4 × 2.1 cm and 2.6 × 2.8 cm (Fig 1). In addition, on the patient's right ear was an ill-defined, ulcerated plaque with yellow crust extending into the external auditory canal (Fig 2). He was initially treated with clotrimazole cream, bacitracin, Domeboro soaks, and dicloxacillin, 500 mg 4 times a day. The patient was otherwise healthy with no systemic symptoms or history of immunosuppression. He denied recurrent infections, intravenous drug use, and history of receiving blood transfusions and had been in a heterosexual relationship for 40 years. The patient reported that he raised pigeons for 50 years.

A punch biopsy was performed on the superior left cheek lesion and the lesion on the right ear. On histopathologic review, granulomas with surrounding mixed inflammation composed of lymphocytes, histiocytes, neutrophils, plasma cells, and numerous eosinophils were seen. Central caseation necrosis was not present. Spores with a thick clear capsule were seen on hematoxylin-eosin stain (Fig 3). Periodic acid—Schiff and Gomori methenamine silver stains found narrow budding yeast forms within giant cells and in histiocytes, ranging in size from 2 to 4 μm. *C neoformans* grew on sabouraud dextrose agar from cultures from both the left cheek and right ear.

A workup was initiated to investigate whether these lesions reflected a diagnosis of disseminated cryptococcosis. A lumbar puncture was obtained, and Cryptococcal antigen from the cerebrospinal fluid was negative. Urinalysis found no fungal elements. A head computed tomography (CT) scan and chest radiograph were normal. Sputum culture was negative. Serum cryptococcal antigen titer was 1:8. All other serum chemistries were within normal limits. The HIV antibody test was negative. The patient was started on fluconazole, 200 mg/d. After

From George Washington University School of Medicine, Washington, DC[a]; Department of Dermatology, Alpert Medical School of Brown University, Providence[b]; Center for Dermatoepidemiology-111D, Veterans Affairs Medical Center, Providence[c]; Department of Dermatology, Yale New Haven Hospital[d]; and Union Square Dermatology, San Francisco.[e]

Funding sources: None.
Conflicts of interest: None disclosed.

Correspondence to: Meghan Beatson, BS, Dermatoepidemiology Fellow, Providence VA Medical Center, 830 Chalkstone Avenue, Providence, RI 02908-4799. E-mail: mbeatson@gwu.edu.

JAAD Case Reports 2019;5:433-5.
2352-5126

https://doi.org/10.1016/j.jdcr.2019.03.006

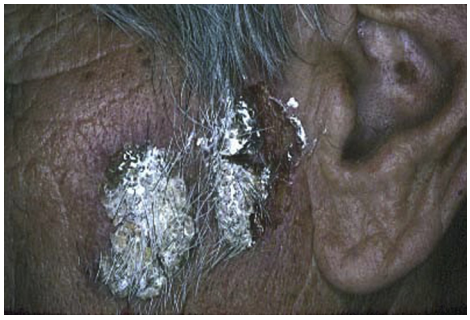

Fig 1. Two well-demarcated ulcerated plaques measuring 2.4 × 2.1 cm and 2.6 × 2.8 cm, with yellow crusty exudate on the left cheek.

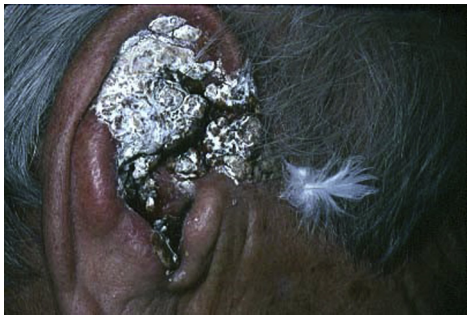

Fig 2. An ill-defined, ulcerated plaque with yellow crust extending into the external auditory canal of the right ear. Note the pigeon feather resting in the hair anterior to the ear.

10 days of therapy, the lesions were much improved. After 2 months, the lesions had completely resolved, and treatment was discontinued (Fig 4). Follow-up serum cryptococcal antigen levels were negative, and the lesions did not recur during 2 years of follow-up. The patient never exhibited any clinical evidence of disseminated disease.

DISCUSSION

Cryptococcosis is caused by infection with *C neoformans*, a dimorphic fungus found in soil contaminated with pigeon droppings and in decaying wood, fruits, and vegetables.[2] Infection is most commonly acquired by inhalation.[3] In immunocompromised patients, *Cryptococcus* can disseminate to many sites, including the brain and skin. Secondary cutaneous cryptococcosis can present with a variety of clinical manifestations, including ulcers, acneiform papules and pustules, vegetating plaques, granulomas, or subcutaneous nodules.[4] The lesions can also mimic molluscum contagiosum, herpes simplex infections, pyoderma gangrenosum, and bacterial cellulitis.[5,6] A biopsy specimen and the patient's clinical presentation are critical components used to make the diagnosis of disseminated

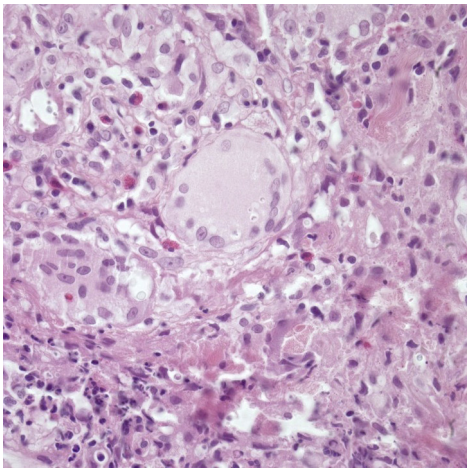

Fig 3. Spores with a thick clear capsule. (Hematoxylin-eosin stain; original magnification: ×60.)

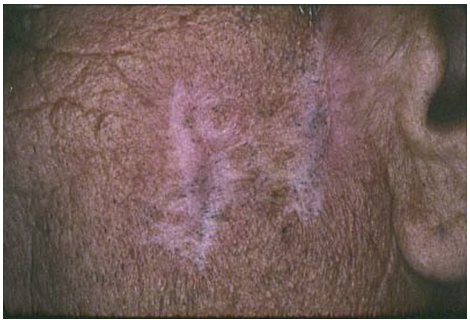

Fig 4. Resolution of lesions with 2 hypopigmented patches.

cryptococcosis. Although rare, cutaneous cryptococcosis has been reported in the absence of disseminated disease.[3,5]

Like secondary cutaneous cryptococcosis, primary cutaneous cryptococcosis (PCC) can have a varied presentation, including abscesses, ulcers, cellulitis, nodules, and plaques.[3] Frequently, these lesions are seen at the site of a skin injury, such as an excoriation, suggesting cutaneous inoculation caused by direct contact with the dimorphic fungus.[2,3] Although our patient could not recall any trauma to his skin, it is possible he had an unrecognized excoriation prior to the infection. Although most cases of PCC present with a solitary lesion on the extremities, previous case reports describe patients who presented with multiple lesions, including multiple lesions located on the face.[2,3,7]

A diagnosis of PCC requires ruling out visceral disease, which can be difficult because skin lesions can be the only manifestation of disseminated disease or predate other symptoms by 2 to 8 months.[8] Therefore, it is imperative that the clinician undertakes a complete investigation into the possibility

of subclinical disseminated disease. In addition to a thorough history and physical examination, workup may include serum cryptococcal antigen titers, sputum culture, urine titers, chest radiographs, or lumbar puncture. In this case, a history and physical examination offered no evidence of dissemination. We note that the typical route for infection for systemic cryptococcosis is inhalation of the organism, and a chest CT scan was not performed to exclude the possibility of pulmonary involvement. A serum cryptococcal antigen titer was positive at 1:8, which can indicate severe local infection.[2] In the absence of evidence of other organ involvement at the time of diagnosis and after significant follow-up, such a small detectable level could be the result of local infection.

The treatment of PCC varies. Disseminated disease is commonly treated with fluconazole, or a combination of amphotericin B and flucytosine.[9] The treatment of PCC is less well established. From 2004 to 2014, 21 cases of PCC were reported in immunocompetent hosts, and fluconazole was used in 10 cases, with complete clearance confirmed in 8 cases.[10] Most case reports suggest good success after treatment with different azoles, with duration of treatment ranging from weeks to many months.[3,10] In the case of our patient, 200 mg/d of fluconazole resulted in clinical improvement within 10 days and complete resolution after 2 months. The patient was last seen 2 years after his presentation, and there was no evidence of any further lesions during this time.

In this unusual case, the possibility of systemic cryptococcosis is not completely excluded because a chest CT scan was not performed to definitively exclude subtle subclinical pulmonary involvement. The localization of his lesions to the skin with no obvious evidence of disseminated infection and his direct work with pigeons suggest that the patient may have been directly inoculated with *C neoformans*. PCC should be considered in the differential diagnosis in cases of nonhealing crusted plaques, especially in those who work with birds.

REFERENCES

1. Sampaio R, Medeiros B, Milfort M, Alves G, Reis C, Campbell I. Systemic cryptococcosis with solitary lesion in an immunocompetent patient. *Int J Dermatol*. 1999;38(10):773-775.
2. Neuville S, Dromer F, Morin O, et al. Primary cutaneous cryptococcosis: a distinct clinical entity. *Clin Infect Dis*. 2003; 36:337-347.
3. Revenga F, Paricio JF, Merino FJ, Nebreda T, Ramirez T, Martinez AM. Primary cutaneous cryptococcosis in an immunocompetent host: case report and review of the literature. *Dermatology*. 2002;204:145-149.
4. Wang J, Bartelt L, Yu D, et al. Primary cutaneous cryptococcosis treated with debridement and fluconazole monotherapy in an immunosuppressed patient: a case report and review of the literature. *Case Rep Infect Dis*. 2015;2015:131356.
5. Wechniak AE, Baughman RD. Primary cutaneous cryptococcosis in an elderly man. *Clin Exp Dermatol*. 2004;29(2):159.
6. Patel P, Ramanathan J, Kayser M, Baran J. Primary cutaneous cryptococcosis of the nose in an immunocompetent woman. *J Am Acad Dermatol*. 2000;43:344-345.
7. Naka W, Masuda M, Konohana A, Shinoda T, Nishikawa T. Primary cutaneous cryptococcosis and Cryptococcus neoformans serotype D. *Clin Exp Dermatol*. 1995;20:221-225.
8. Trent J, Kimer R. Identifying and treating mycotic skin infections. *Adv Wound Care*. 2003;16(3):122-129.
9. Saag M, Graybill R, Larson R, et al. Guidelines from the Infectious Diseases Society of America: practice guidelines for the management of cryptococcal disease. *Clin Infect Dis*. 2000;30:710-718.
10. Du L, Yang Y, Gu J, et al. Systemic review of published reports on primary cutaneous cryptococcosis in immunocompetent patients. *Mycopathologia*. 2015;180:19-25.