

## BRIEF ARTICLE

**Primary Cutaneous Cryptococcosis in an Immunocompetent 6-Year-Old Female**Mitchell Hobbs MD<sup>a</sup>, Joy King MD PhD<sup>b</sup>, Rana El Feghaly MD MSCI<sup>c</sup>, Robert Brodell MD<sup>d</sup><sup>a</sup>University of Mississippi School of Medicine, Department of Pediatrics<sup>b</sup>University of Mississippi School of Medicine, Department of Pathology<sup>c</sup>University of Missouri-Kansas City School of Medicine, Department of Pediatrics<sup>d</sup>University of Mississippi School of Medicine, Department of Dermatology**ABSTRACT**

A 6-year-old otherwise healthy female presented to the ED with a right eyebrow lesion for one month. Previous I&D attempts and empiric antibiotic treatment had failed to improve the lesion. Following dermatology referral, superficial culture resulted with growth of *Cryptococcus neoformans* after which completion of oral fluconazole treatment resolved the lesion. Though *Cryptococcus neoformans* infections commonly plague immunocompromised patients, primary cutaneous cryptococcosis in the immunocompetent patient is a rare but documented infection with a paucity of reported pediatric cases, and frontline physicians should be aware of such a diagnosis in the setting of persistent skin lesions without response to more commonly utilized therapies.

**INTRODUCTION**

Primary cutaneous cryptococcosis (PCC) refers to an infectious process seen in immunocompetent patients wherein cryptococcal organisms directly inoculate the skin by exposure, typically in unclothed areas. Unlike cryptococcal infections in the immunocompromised, PCC has not been known to spread systemically and responds well to oral antifungal agents. The literature reports PCC typically affects older males in rural areas with hobbies or work predisposing exposure, making pediatric cases atypical.

**CASE REPORT**

A 6-year-old female presented to the ED with the complaint of a right eyebrow “abscess” for one month prior to presentation (Figure 1). She had been treated at a local hospital two weeks prior at which time incision and drainage was attempted but failed to produce any exudate. Following this procedure, she received 5 days of empirical IV ceftriaxone and clindamycin and completed a further 7 days of oral clindamycin and topical mupirocin as an outpatient. These therapies had failed to improve the lesion which had continued to grow as well as “crust over” and bleed at times with associated tenderness. The patient denied pruritis as well as systemic

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symptoms including fever, chills, weakness, or rashes elsewhere. She had never had this problem before, and medical and family histories were negative for immunodeficiency. She lives in rural Mississippi without any known animal or environmental exposures. On exam, a 3 cm crusted plaque with rolled, friable

borders was noted of the right eyebrow. Shave biopsy was obtained as well as superficial cultures which returned with plentiful yeast forms and growth of *Cryptococcus neoformans*, respectively (Figure 2). Serum cryptococcal antigen was negative. The lesion resolved with a course of oral fluconazole.



Figure 1. 3 cm crusted plaque with rolled, friable borders over the right eyebrow.

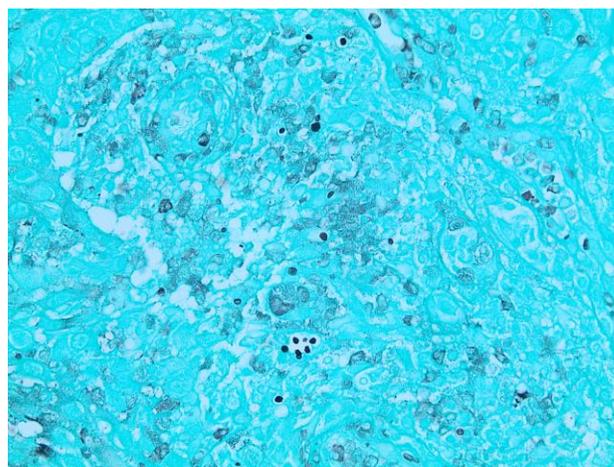


Figure 2. GMS stain of shave biopsy with yeast forms staining dark.

## DISCUSSION

Primary cutaneous cryptococcosis (PCC) is defined as direct inoculation and infection of the skin, and it is a rare condition in immunocompetent patients.<sup>1</sup> A recent systematic review revealed 21 published cases in immunocompetent patients from 2004 to 2014 with certain commonalities; those infected tended to be male, older in age with upper limb lesions, inhabitants of rural areas, and engaged in work or hobbies predisposed to hand injury in the presence of soil, wood debris, or birds.<sup>2,3</sup> Of these known factors, our patient differed with the exception of rural living area. Presentation of the lesion varies significantly and in reported cases has included whitlow,

phlegmon, ulceration, nodule, and cellulitis, typically in unclothed areas—most commonly fingers and hands.<sup>3</sup> When genotype and serotype have been identified in isolates, prevalence of *C. neoformans* and *C. gattii* have been nearly equal followed by *C. laurentii* in the minority of cases. Treatment has been typically successful with systemic fluconazole, and in recalcitrant cases, itraconazole is useful as a second-line option.<sup>2</sup> As an alternative means of therapy, surgical excision and further monitoring has been reported with resolution in the absence of systemic antifungal therapy.<sup>4</sup> One patient has been reported to exhibit dissemination from primary infection,

but this is favored to be a rarity as more cases have been reported to have resolved without intervention, suggesting most patients' immune systems are capable of overcoming the infection.<sup>2,5</sup>

In contrast, secondary cutaneous cryptococcosis is known to result from hematogenous dissemination in the setting of a systemically infected immunocompromised host. In the classic and relatively common clinical scenario, exposure in the immunocompromised patient occurs via inhalation of spores ubiquitous in the environment resulting in primary infection of the lungs followed by CNS manifestations. The indolent clinical course includes symptoms such as fever, malaise, headache, cough, and dyspnea. A classic cutaneous finding appears as umbilicated papules.<sup>6</sup>

In consideration of the evolving knowledge of this clinical entity and the well-known pathologies this organism usually inflicts on the immunocompromised, the significance of our case of PCC in a 6-year-old immunocompetent female is two-fold. First, it broadens known epidemiologic data of a disease with a typical presentation at odds with our patient's. Second, it augments awareness of a rare dermatologic disease in otherwise healthy patients that is refractory to commonly employed therapies and caused by a pathogen most commonly associated with medically complex, immunosuppressed patients.

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**References:**

1. Nascimento E, Bonifácio da Silva ME, Martinez R, von Zeska Kress MR. Primary cutaneous cryptococcosis in an immunocompetent patient due to *Cryptococcus gattii* molecular type VGI in Brazil: a case report and review of literature. *Mycoses*. 2014 Jul;57(7):442-7.
2. Du L, Yang Y, Gu J, Chen J, Liao W, Zhu Y. Systemic Review of Published Reports on Primary Cutaneous Cryptococcosis in Immunocompetent Patients. *Mycopathologia*. 2015 Aug;180(1-2):19-25.
3. Neuville S, Dromer F, Morin O, Dupont B, Ronin O, Lortholary O; French Cryptococcosis Study Group. Primary cutaneous cryptococcosis: a distinct clinical entity. *Clin Infect Dis*. 2003 Feb 1;36(3):337-47.
4. Lenz D, Held J, Goerke S, Wagner D, Tintelnot K, Henneke P, Hufnagel M. Primary cutaneous cryptococcosis in an eight-year-old immunocompetent child: how to treat? *Klin Padiatr*. 2015 Jan;227(1):41-4.
5. Spiliopoulou A, Anastassiou ED, Christofidou M. Primary cutaneous cryptococcosis in immunocompetent hosts. *Mycoses*. 2012 Mar; 55 (2): e45-7.
6. Kliegman, Robert M, Nina Schor, Bonita Stanton, and Joseph W. St Geme III. *Nelson Textbook of Pediatrics*. Philadelphia: Elsevier, 2016.