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### Authors

Dall Bello, Aline Gehlen  
Severo, Cecilia Bittencourt  
Schio, Sadi  
et al.

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## Case Report

**First reported case of cellulitis due to *Cryptococcus gattii* in lung transplantation recipient: a case report.**

**Aline Gehlen Dall Bello<sup>1</sup>, Cecilia Bittencourt Severo<sup>2</sup>, Sadi Schio<sup>3</sup>, Luiz Carlos Severo<sup>4</sup>**

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<sup>1</sup>**Post Graduation program of Pneumology Science, Faculty of Medicine, Universidade Federal do Rio Grande do Sul (UFRGS); Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES).**

<sup>2</sup>**Mycology Laboratory, Hospital Santa Rita, Irmandade Santa Casa de Misericórdia Porto Alegre (ISCMPA), RS, Brasil.**

<sup>3</sup>**Department of Thoracic Surgery, Hospital Santa Rita, Irmandade Santa Casa de Misericórdia Porto Alegre (ISCMPA), RS, Brazil.**

<sup>4</sup>**Researcher 1B of Conselho Nacional de Desenvolvimento Científico Tecnológico (CNPq); Associated Professor (III), Department of Internal Medicine, Faculty of Medicine, UFRGS. Email:**

## Correspondence:

Dr. Luiz Carlos Severo,  
Laboratório de Micologia, Hospital Santa Rita  
Irmandade Santa Casa de Misericórdia Porto Alegre, Annes Dias, 285, 90020-090. Porto Alegre, RS, Brasil.  
Phone: + 55 5132285208  
E-mail: severo@santacasa.tche.br; severo@pesquisador.cnpq.br

## Abstract

*Cryptococcus gattii* are closely related species of encapsulated yeast-like fungi involved in the etiology of cryptococcosis, especially in immunocompetent individuals. Dissemination with involvement of many organ systems is common. On the other hand, cellulitis in an immunosuppressed patient caused by *C. gattii* is rare. We present a case of disseminated disease caused by *Cryptococcus gattii* in a lung transplant recipient who manifested cellulitis. The disease was also complicated by a lung carcinoma. We emphasize that cryptococcal cellulitis related to *C. gattii* in solid organ transplant (SOT) recipients should be considered in the differential diagnosis of acute bacterial skin infections.

**Key words: Cellulitis; cryptococcosis; *Cryptococcus gattii*; lung cancer; lung transplantation.**

## Introduction

*Cryptococcus neoformans* and *Cryptococcus gattii* are closely related species of encapsulated yeast-like fungi and both are involved in the etiology of cryptococcosis. Dissemination with involvement of many organ systems is the rule in cryptococcosis [8]. On the other hand, cellulitis caused by *C. gattii* is rare, having been reported in only a few patients [5]. We report herein a case of disseminated disease caused by *C. gattii*, which manifested in cellulitis, in a lung transplant recipient who also had a lung carcinoma.

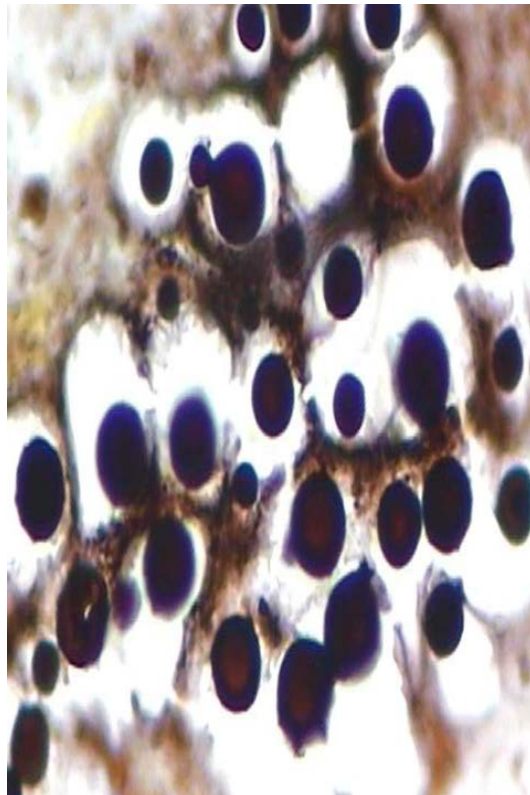
## Case synopsis

A 59-year-old male smoker from southern Brazil, underwent lung transplantation from a cadaveric donor in 1998 for end-stage lung disease related to pulmonary fibrosis. Post-operative immunosuppression consisted of azathioprine, cyclosporine, and corticosteroids. He was discharged from the hospital after 22 days in a good clinical condition.

After 84 days post-transplantation, he developed a cytomegalovirus infection, treated with ganciclovir 800mg daily for 14 days. The patient began to exhibit respiratory symptoms and a transbronchial biopsy was performed, which indicated both acute rejection (A2) and cryptococcosis. The allograft rejection required an increase in corticosteroids (prednisone 80mg/day). Seven days later, he developed cellulitis in the right leg (Figure 1). Cryptococcus was isolated from a skin biopsy (Figure 2) showing cream-colored, mucoid colonies in Sabouraud's dextrose agar (SDA) plus chloramphenicol. The culture produced melanin-like pigment in the presence of *Guizotia abyssinica* agar (Straib agar). The canavaliine-glycine-bromothymol agar indicated *C. gattii*. The agent was also isolated from cerebrospinal fluid (CSF), bronchoalveolar lavage, urine, and lung biopsies. Serum and CSF cryptococcal antigen were positive with titers of 1:16584 and 1:2048, respectively.



**Figure 1.** Cryptococcal cellulitis: thigh with erythema and edema



**Figure 2.** A fresh tissue skin biopsy smeared and stained shows yeast forms, surrounded by optically clear capsules, characteristic of *Cryptococcus* (Gomori's methenamine silver stain, x1000).

Therapy with amphotericin B (0.5mg/kg/day) and 5-fluorocytosine (37.5mg/kg/day) was administered for 30 days. The patient was discharged from the hospital taking fluconazole 400mg daily. The patient returned 6 days after discharge, again showing cytomegalovirus infection and was treated again with ganciclovir for a period of 25 days. One year after transplantation, the patient was again hospitalized and underwent a lung biopsy that revealed adenocarcinoma in both lungs, more marked in the right lung and mediastinal lymph nodes; metastasis to the heart was also found. He died 1 year and 4 months after transplantation.

## Discussion

Cryptococcosis is caused by two species of *Cryptococcus*: *C. neoformans* and *C. gattii* [3]. *C. neoformans* is the most common agent and is distributed worldwide. This organism causes mostly central nervous system (CNS) infections in immunocompromised patients, particularly those who are HIV-infected [15]. *C. gattii* has often been associated with tropical and subtropical climates and has emerged as a fungal pathogen of humans and animals in temperate climates [4]. *C. gattii* has a propensity for causing disease in immunocompetent hosts and is more often associated with intracerebral and pulmonary cryptococcal mass lesions. These patients exhibit more severe associated clinical signs, have longer hospitalizations, require more prolonged antifungal treatment, and have a higher recurrence rate than patients infected with *C. neoformans* [3].

In recent decades, solid organ transplantation has been performed increasingly for the treatment of various acute and chronic diseases. To prevent rejection of the transplanted organ, lifelong immunosuppression is required [11]. One of the major problems in solid organ recipients is opportunistic infection.

Cryptococcosis is the third most common fungal infection in transplant recipients [7,14]. However, *C. gattii*, is rarely involved because it is an endemic disease, has limited environmental exposure, and has a reduced ability to reactivate or remain latent in the host [5]. In addition, cutaneous cryptococcosis caused by *C. gattii* is also uncommon [13,15], especially with the manifestation of cellulitis [12]. Cryptococcal cellulitis by *C. gattii* is also indistinguishable in presentation and appearance from acute bacterial cellulitis [12]. Therefore, the importance of a skin biopsy in immunosuppressed individuals presenting with cellulitis is clear [9]. Owing to this fact, cellulitis is seldom considered to be a cutaneous manifestation of the disease in infections by *C. gattii* that, from our knowledge, there is only one report [5]. The present report is the first case of cellulitis by *C. gattii* in SOT recipient.

Malignancy is a common and dreaded complication following organ transplantation [10]. However, the association between immunosuppression and lung carcinoma is less certain [1]. Some in vitro studies of human cells have shown the possible carcinogenicity of cyclosporine [6,10]. In addition, heart and lung transplant recipients are a select group at higher risk of development of lung carcinoma by virtue of previous smoking history, more advanced age, and underlying obstructive or fibrotic lung disease [1,2]. These could be possible reasons for the appearance of lung cancer in our patient.

Cryptococcal cellulitis related to *C. gattii* in solid organ transplant recipients should be considered in the differential diagnosis of acute bacterial skin lesions. This case was also complicated by lung cancer, additional anecdotal evidence that cyclosporine may have a role in the development of neoplastic disease [1,2,6,10]. *C. gattii* should be kept in mind as a possible cause of cellulitis in immunosuppressed patients.

## References

1. Anyanwu AC, Townsend ER, Banner NR, Burke M, Khaghani A, Yacoub MH. Primary lung carcinoma after heart or lung transplantation: Management and outcome. *J Thorac Cardiovasc Surg.* 2002;124:1190-7.
2. Arcasoy SM, Hersh C, Christie JD, Zisman D, Pochettino A, Rosengard BR, Blumenthal NP, Palevsky HI, Bavaria JE, Kotloff RM. Bronchogenic carcinoma complicating lung transplantation. *J heart lung transplant.* 2001;20:1044-53.
3. Chayakulkeeree M, Perfect JR. Cryptococcosis. *Infect Dis Clin North Am.* 2006; 20:507-44.
4. Galanis E, MacDougall L. Epidemiology of *Cryptococcus gattii*, British Columbia, Canada, 1999-2007. *Emerg Infect Dis.* 2010;16:251-7.
5. Hamann ID, Gillespie RJ, Ferguson JK. Primary cryptococcal cellulitis caused by *Cryptococcus neoformans* var. *gattii* in an immunocompetent host. *Australas. J. Dermatol.* 1997; 38:29-32.
6. Hojo M, Morimoto T, Maluccio M, Asano T, Morimoto K, Lagman M, Shimbo T, Suthanthiran M. Cyclosporine induces cancer progression by a cell-autonomous mechanism. *Nature.* 1999; 397:530-4.
7. Husain S, Wagner MM, Singh N. *Cryptococcus neoformans* infection in organ transplant recipients: variables influencing clinical characteristics and outcome. *Emerg Infect Dis.* 2001;7:375-81.
8. Lin X, Heitman J. The biology of the *Cryptococcus neoformans* species complex. *Annu. Rev. Microbiol.* 2006; 60:69-105.

9. Lu HC, Yang YY, Huang YL, Chen TL, Chuang CL, Lee FY, Lee SD. Disseminated cryptococcosis initially presenting as cellulitis in a rheumatoid arthritis patient. *J Chin Med Assoc.* 2007; 70:249-52.
10. Penn I. Cyclosporine and oncogenesis. *Mt Sinai J Med.* 1987; 54:460-4.
11. Penn I. Post-transplant malignancy. The role of immunosuppression. *Drug Safety.* 2000;23:101-13.
12. Rakvit A, Meyerrose G, Vidal AM, et al. Cellulitis caused by *Cryptococcus neoformans* in a lung transplant recipient. *J Heart Lung Transplant.* 2005;24:642.
13. Ridell RJ, Entwisle BR. Cryptococcal granulomata of the skin with pulmonary and cerebral cryptococcosis. *Australian J Dermatol.* 1969;10:100-8.
14. Singh N, Dromer F, Perfect JR, Lortholary O. Cryptococcosis in solid organ transplant recipients: current State-of-the-science. *Clin Infect Dis.* 2008;47:1321-7.
15. Speed B, Dunt D. Clinical and host differences between infections with the two varieties of *Cryptococcus neoformans*. *Clin Infect Dis.* 1995;21:28-34.