Medical Mycology Case Reports 39 (2023) 13–13

Contents lists available at ScienceDirect

Medical Mycology Case Reports

journal homepage: www.elsevier.com/locate/mmcr

Implantation mycoses. An unsolved problem

Several hundred of the 5 million species of fungi can infect mammalian hosts in various ways, including inhalation and traumatic implantation through the skin or mucous membranes. These fungal diseases are characterized by subacute to chronic manifestations that begin at the site of multiple transcutaneous or transmucosal traumas. Invasion of the respiratory tract can lead to allergic manifestations and pulmonary disease, resulting in systemic mycoses depending on the fungal pathogen and the status of the host immune response. In contrast to the agents of systemic mycoses, a group of pathogenic fungi gains accesses through various types of transgumentary (cutaneous or mucosal) wounds or by contact, resulting in implantation mycoses. This fungal disease group is also called "subcutaneous mycoses." Although "subcutaneous mycoses" has been used for decades, it is not entirely accurate because some of these infections may involve lymphatics, fascia, muscle, cartilage, and bone, in addition to cutaneous and subcutaneous tissues. The implantation or inoculation mycoses comprise a group of unrelated fungal diseases whose causative agents are transferred from their sapronotic or zoonotic niche to the cutaneous or mucosal tegument by inoculation trauma or simple contact, as observed in *Sporothrix brasiliensis* infections. The list of implantation mycoses includes sporotrichosis, the most widespread implantation mycosis. However, chromoblastomycosis and eumycetoma are also officially recognized as neglected tropical diseases (NTDs) by the World Health Organization (WHO). Implantation mycoses also include some clinical forms of phaeohyphomycosis caused by various species of melanized fungi, lobomycosis (lacaziosis or Jorge Lobo disease), and entomophthoromycosis (conidiobolomycosis and basidiobolomycosis). These diseases are common health problems in tropical and subtropical areas. Sporotrichosis, chromoblastomycosis, eumycetoma, lobomycosis, and entomophthoromycosis are geographically confined mainly to tropical and subtropical areas.

Mycoses caused by fungi that cause deep or systemic mycoses, such as coccidioidomycosis, paracoccidioidomycosis, and blastomycosis, which invade the respiratory tract and primarily affect the lungs, may also invade exceptionally by skin inoculation and cause a primary cutaneous form that usually has a better prognosis than the secondary or disseminated form. Importantly, they have well-marked ecological niches that must be recognized.

These endemic implantation mycoses are neglected diseases affecting low-income populations in developing regions of Africa, Asia, and Latin America. Although they rarely spread, their morbidity is significant due to sequelae and incapacity to work that occur in the most severe clinical forms. If not detected earlier, implantation mycoses are recalcitrant and very difficult to treat. These infections are characterized by initial lesions that begin at the site of fungal implantation. Over time, depending on the pathogen and host immune defenses, they may evolve to show subacute to chronic clinical manifestations.

In general, the three main implantation mycoses, such as mycetoma, chromoblastomycosis, and sporotrichosis, usually develop a limited clinical picture in immunocompetent patients, and their progression is almost always due to contiguity; however, their social extent is not well calculated; for example, a young patient of productive age who has a slowly developing mycetoma will no longer be able to perform everyday farm work, such as growing crops or caring for animals, which will undoubtedly have an impact on the family in which he lives. He is cut off from a source of economic income. Diseases such as mycetoma, chromoblastomycosis, and lobomycosis usually affect patients from low social backgrounds, most of whom work in the fields and simple rural jobs. Avoiding these infections by wearing only proper footwear and minimum protection during daily work, such as gloves and other instruments that protect against trauma, is easy.

Another major problem that implantation mycoses bring is the high cost of the drugs and the fact that they are usually long treatments. This is particularly evident in mycoses such as mycetoma, chromoblastomycosis, and lobomycosis, where treatment duration can be months to years and cure rates are relatively low. Therefore, it is crucial to advance the development of new, inexpensive, well-tolerated, and effective antifungal agents that are still on the therapeutic horizon.

This section of Medical Mycology Case Reports is intended to draw attention to these diseases so that they become less neglected and more visible, leading to earlier diagnosis and a better response to treatment.

Flavio Queiroz-Telles, Guest Editor[a,*], Alexandro Bonifaz, Guest Editor[b]

[a] *Department of Public Healht, Hospital de Clínicas, Federal University of Paraná, Curitiba, Brazil*

[b] *Mycology Department, Hospital General de México "Dr. Eduardo Liceaga", Mexico City, Mexico*

[*] Corresponding author.

E-mail addresses: queiroz.telles@uol.com.br (F. Queiroz-Telles), a_bonifaz@yahoo.com.mx (A. Bonifaz).

https://doi.org/10.1016/j.mmcr.2022.12.002

Available online 9 December 2022