Black fungus and COVID-19: role of otorhinolaryngologists and audiologists

Aiza Fatima Raza¹ · Dilli Raj Paudel¹ · Prashanth Prabhu¹

Received: 27 May 2021 / Accepted: 8 June 2021 / Published online: 13 June 2021
© The Author(s), under exclusive licence to Springer-Verlag GmbH Germany, part of Springer Nature 2021

A rare form of infection called mucormycosis, commonly known as the black fungus, belonging to Mucorales order of fungus, has become a common occurrence in patients recovering from COVID-19 in the recent wave that has hit India and some parts of Russia and Pakistan in 2021. Experts from the COVID-19 task force highlight that the patients vulnerable to mucormycosis usually have uncontrolled diabetes and falling immunity. Mucormycosis usually affects many organs and, if not treated earlier, can result in fatality. Infection sites are mainly sinonasal or pulmonary.

Mucormycosis involving the ear is a rare occurrence. Despite its rarity, it is a dangerous infection. There are reports of invasive mucormycosis of the temporal bone in immunocompromised patients [1]. Mucormycosis may present as otitis externa, and the otological symptoms do not respond to conventional antibacterial treatment [2]. Out of the five cases of mucormycosis, one of them had ear pain with purulent otorrhea and hearing loss as reported by Bellazreg et al. [3], which even resulted in middle-ear polyps and granulation tissue in the middle ear. There are isolated reports of middle-ear mucormycosis along with facial palsy and oto-cerebral mucormycosis [4].

Middle ear mucormycosis is such a rare condition that it becomes difficult for the clinician to make it a principal diagnosis. In a non-diabetic patient, the clinical presentation of mucormycosis bears a solid resemblance to attic-antral disease but with ear pain as a chief complaint. Mucormycosis of the middle ear in non-diabetic patients appears to be non-invasive and is not fatal. The non-invasive variety may occur as indolent infection producing symptoms similar to chronic suppurative otitis media (CSOM), as seen in a case study by Hazarika et al. [5]. Gaining access into the middle ear increases the risks of conductive hearing loss in patients.

The extensive angioinvasion caused by mucormycetes can result in vessel thrombosis and tissue necrosis, leading to cholesteatoma in the middle ear [5].

There might have been COVID-19 patients with symptoms of hearing loss or reduced hearing sensitivity in reported cases of black fungus, yet not much noticeable due to various other complications caused by it. Not responding to conventional line of treatment for the ear infection also lines up in the queue with other problems. A long-standing middle-ear infection could lead to further involvement of the inner ear. Negligence of hearing loss could become problematic while the patient battles with other effects of mucormycosis. Thus, there is a need to rule out middle ear involvement and related hearing loss by otorhinolaryngologists and audiologists. A detailed otological evaluation and audiological tests are essential before the discharge from the hospital. Thus, we highlight that Otorhinolaryngologists and audiologists also play a crucial role in the early assessment and rehabilitation of COVID-19 patients with black fungus.

Acknowledgements The authors acknowledge with gratitude Prof. M Pushpavathi, Director, All India Institute of Speech and Hearing, affiliated to University of Mysore, for permitting to conduct the study at the institute. The authors also like to acknowledge the participant for co-operation.

Authors' contributions AFR was involved in study design, interpretation and writing the manuscript; DRP was involved in study design, interpretation and writing the manuscript; and PP was involved in study design, interpretation and writing the manuscript.

Funding There is no funding by any agency for the manuscript.

Declarations

Conflict of interest The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Ethical approval The manuscript adheres to the ethical standards according to the Declaration of Helsinki. Ethical approval was obtained

✉ Prashanth Prabhu
prashanth.audio@gmail.com

¹ Department of Audiology, All India Institute of Speech and Hearing, Mysore 570006, India

from the All India Institute of Speech and Hearing (AIISH) Ethical Review board for carrying out the study.

References

1. Tuzcu A, Bahceci M, Celen MK, Kilinc N, Ozmen S (2006) Necrotizing (malignant) otitis externa: an unusual localization of mucormycosis. *Indian J Med Microbiol* 24(4):289
2. Biniyam K, Bhat V, Bhandary SK, Aroor R (2014) Asymptomatic mucormycosis of middle ear: An incidental finding during tympanoplasty. *Indian J Otol* 20(2):83
3. Bellazreg F, Hattab Z, Meksi S, Mansouri S, Hachfi W, Kaabia N, Said MB, Letaief A (2015) Outcome of mucormycosis after treatment: report of five cases. *New Microbes New Infect* 1(6):49–52
4. Kermani W, Bouttay R, Belcadhi M, Zaghouani H, Ali MB, Abdelkafi M (2016) ENT mucormycosis. Report of 4 cases. *Eur Ann Otorhinolaryngol Head Neck Dis* 133(2):83–86
5. Hazarika P, Zachariah J, Victor J, John M, Devi C, Abraham P (2012) Mucormycosis of the middle ear: a case report with review of literature. *Indian J Otolaryngol Head Neck Surg* 64(1):90–94

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.